

UNITED STATES ARMY IN WORLD WAR II

The Technical Services

THE ORDNANCE DEPARTMENT: ON BEACHHEAD AND BATTLEFRONT

by

Lida Mayo



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UNITED STATES ARMY IN WORLD WAR II

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. . . to Those Who Served

Foreword

For the fighting man in time of war, the crucible that proves or disproves his training and his theories is combat with the enemy. So it is too with those whose milieu is not the drill field but the drawing board, not the staff college but the proving ground, those who design, develop, and maintain the weapons, munitions, and vehicles of war. The crucible for the Ordnance Department, like the individual fighting man, is the battlefield.

In previous volumes in the Ordnance Department subseries of *The Technical Services* in the series UNITED STATES ARMY IN WORLD WAR II, historians have told the preliminary stories, the complex, often frustrating saga of planning munitions for war and of procuring and getting them to the troops who use them. This, the third and final volume in the subseries, tells the climax of the Ordnance role in World War II, the story of how the vast armory and its administrators fared in combat.

In presenting this story of Ordnance in the overseas theaters, Mrs. Mayo has concentrated logically on Ordnance at the level of the army headquarters, for from this level munitions and fighting equipment flowed directly to the user. While giving some attention to all theaters involved in the global story of Ordnance administration, she has concentrated on the three main theaters as representative of the problems, the improvisations, the shortcomings, the achievements worldwide.

From the dispatch of the first American observers to embattled Britain in 1941 to the last gunshots on Pacific islands in 1945, it is an exciting story as befits the vital contribution of the tools of war to success or failure in battle.

Washington, D.C.
17 June 1966

HAL C. PATTISON
Brigadier General, USA
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The Author

Lida Mayo, a graduate of Randolph-Macon Woman's College, served as historian with the Military Air Transport Service from 1946 to 1950, when she joined the Ordnance Historical Branch, becoming its chief in June 1959. In 1962, when Ordnance historical activities were transferred to the Office of the Chief of Military History, she became a senior historian on its staff. She contributed substantially to *The Ordnance Department: Planning Munitions for War* (1955), first of the three Ordnance volumes published in this series, and was coauthor of the second, *The Ordnance Department: Procurement and Supply* (1960). Other published works to her credit are *Henry Clay* (New York, 1943, and London, 1944) and *Rustics in Rebellion* (Chapel Hill, 1950). Her articles have appeared in *American Heritage, Virginia Quarterly Review, Encyclopaedia Britannica,* and numerous professional journals. Mrs. Mayo is presently at work on another volume in the series UNITED STATES ARMY IN WORLD WAR II: *The Corps of Engineers: The War Against Germany.*

Preface

On a July evening in 1942 in the wilds of New Guinea, a sixteen-year-old native Papuan houseboy named Gibson Duluvina proffered to Australian war correspondent Osmar White some penetrating remarks on the writing of history. They illustrate the author's dilemma in planning *On Beachhead and Battlefront,* the third and last volume in the Ordnance series.

White, who was Gibson's taubada (master), took the boy along when he went from Port Moresby far into the interior to cover guerrilla operations against the Japanese from the wrecked gold mining town of Wau. One evening in an abandoned cottage overshadowed by a mountain on whose slopes birds of paradise were feeding, White began to question Gibson about the history of his tribe. He got nowhere. Gibson remembered an old woman in his village who had been a girl when the first white man's ship came to Port Moresby, but he did not think her tales very interesting. Beyond that he knew no history.

"Taubada," he said suddenly, "white people say that they know just what happened a thousand years ago. Is it true?" White explained that it was all written down; that history had been written for thousands of years. Gibson was silent in deep thought. Then he said, "Taubada, I can write." "Yes, Gibson, I know." He wrote a beautiful copperplate hand taught him in a mission school. "You write very well."

"Taubada, when I write, it is too hard very much to write the truth. To write the words is hard, but I could never write *all* the words to tell *all* the truth. To write at all I must make all the things seem easy. Then, when it is written, it is not all the truth. . . ."[1]

To write all the words to tell all the truth about Ordnance overseas operations in World War II has been impossible, at least in the confines of one volume. Therefore I have concentrated on the Mediterranean, European, and Southwest Pacific theaters, covering the Central Pacific only as background for Okinawa and omitting entirely, except for passing references, the South Pacific and China-Burma-India theaters. Nor have I attempted coverage of Ordnance operations in Alaska or the Caribbean and Atlantic bases, except for a brief section on early planning for Iceland. If I had been able to include all overseas theaters and commands, this might have been a better book; on the other hand, it might have been a worse one, certainly bulky and probably repetitious, since most of the Ordnance problems are exemplified in the areas I have covered.

[1] Osmar White, *Green Armor* (New York: W. W. Norton, 1945), pp. 152–53.

In those areas, the story has been centered in the main around the Ordnance officer at army level. After corps was relieved of administrative responsibilities early in the war, support to the combat forces flowed from army. Only from the point of view of the Ordnance officers of the various armies have I described Communications Zone Ordnance operations. For more detail on such operations in the European theater, the reader is referred to Roland G. Ruppenthal's two-volume *Logistical Support of the Armies* in UNITED STATES ARMY IN WORLD WAR II.

On Beachhead and Battlefront was begun under contract by the Ordnance Corps with the Bureau of Social Science Research of The American University. Two years later the Ordnance Corps terminated the contract and transferred the project to the Historical Branch, Office of the Chief of Ordnance. In the summer of 1962 when the Office, Chief of Ordnance was abolished, the Office, Chief of Military History took over project and author. Under all these auspices, I have been assisted by a number of able people: in the contract phase by Dr. Stanley L. Falk as junior historian on the project and Dr. Morris R. Short as administrative assistant; in the Ordnance phase by Mrs. Irene House as research historian and Mrs. Feril Cummings as administrative assistant; in the OCMH phase by members of the General Reference Branch, particularly Miss Hannah Zeidlik. Throughout all phases the exploration of the vast resources of the World War II Reference Branch, National Archives and Records Service, Alexandria, Virginia, has been made both profitable and pleasant by the efforts of Mrs. Caroline Moore, Mrs. Hazel Ward, and above all, Mrs. Lois C. Aldridge, who has not only been a discerning guide through the maze of records but a valued adviser and friend. At the Military Records Branch, Federal Records Center, Mrs. Virginia Nestor has been invariably helpful.

The book was completed under the direction of Brig. Gen. Hal C. Pattison, Chief of Military History, and Dr. Stetson Conn, Chief Historian, to both of whom I owe a great deal for wise counsel and unfailing support. Others in OCMH to whom much is due for careful review of the entire manuscript and detailed criticisms that have saved the author from many errors of fact and style are the late Dr. John Miller, jr., Col. Albert W. Jones, Mr. Charles B. MacDonald, and Miss Mary Ann Bacon. The illustrations were selected by Miss Ruth A. Phillips; the maps prepared by Mr. Billy C. Mossman; and the volume was shepherded through the editorial process by Mrs. Loretto C. Stevens and Mrs. Frances R. Burdette. Mrs. Muriel Southwick prepared the index.

Among "Those Who Served" I am grateful to many who read and commented upon all or parts of the manuscript including the wartime Chief of Ordnance, Lt. Gen. Levin H. Campbell, Jr., the Ordnance officers of First, Third, Sixth, Eighth, Ninth, Tenth, and Fifteenth Armies, and the chief Ordnance officers of the European and Southwest Pacific theaters. Numerous other participants, both within and outside Ordnance, gave generously of their time in interviews and made personal papers available.

To Maj. Gen. John B. Medaris I am particularly indebted for a statement that illustrates how vital was Ordnance support on beachhead and battlefront: "An army can fight on short rations and with ragged clothes, but when an army is without ammunition and guns it is no longer an army."

For interpretations made and conclusions drawn, as well as for any errors of omission or commission, the author alone is responsible.

Washington, D.C.
17 June 1966

LIDA MAYO

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THE ORDNANCE DEPARTMENT:
ON BEACHHEAD AND BATTLEFRONT

CHAPTER I

The Military Missions

Late in May 1941 London celebrated War Weapons Week. Bands played in parks bright with tulips; there were parades in the spring sunshine. War Weapons Week, said the London *Times* on 20 May, was "a crushing reply to the Luftwaffe." These were brave words. On 10 May there had been a bad air raid, more than 3,000 persons killed or injured, 2,000 fires started, and the House of Commons destroyed. There was ever present the real fear of an invasion of Great Britain, and elsewhere the Empire was in danger. The Germans were in possession of the greater part of Europe, had occupied Tripoli and Libya, and were threatening Egypt, the Suez Canal, and the Near East.

The military leaders in London painted a very black picture to the U.S. Army's ranking Air officer, Maj. Gen. Henry H. Arnold, who was in England for talks with British Air Chief Marshal Sir Charles Portal. Arnold did not overlook the possibility that they were deliberately trying to paint the picture as black as they could in order to influence the President of the United States, but he concluded that they were really desperate, "so desperate that for once their cloak of conservatism was cast aside; their inbred policy of understatement thrown into the discard. They needed help, needed it badly, and were frank to admit it."[1]

Yet War Weapons Week was not just a valiant gesture. Weapons were on the way. Deliveries on cash contracts placed by the British in the United States were at last coming through in volume; shipments in March, April, May, and June 1941 were two and a half times what they had been in the last four months of 1940. And these stocks of tanks and trucks and aircraft would eventually—though not immediately—be tremendously augmented by transfers made possible after the passage of the Lend-Lease Act on 11 March 1941. The United States' special representative for lend-lease, Mr. W. Averell Harriman, had been in London since mid-March.[2]

By May, Londoners were reading encouraging reports on the climate of opinion in America. The publisher of the *Saturday Evening Post,* hitherto isolationist, was quoted in the London *Times* on 19 May as saying that the *Post* had abandoned isolation; that the United States was "in the war now. We are like a man who has jumped off a springboard and hasn't yet touched water. He isn't wet, but he hasn't a chance of getting back on the springboard again."

The Special Observer Group

Behind the scenes, British leaders had heartening news of a secret and very im-

[1] Henry H. Arnold, *Global Mission* (New York: Harper & Brothers), 1949, pp. 215, 235.

[2] Edward R. Stettinius, Jr., *Lend-Lease: Weapon for Victory* (New York; Macmillan, 1944), p. 99.

portant development in Anglo-American relations—an unprecedented collaboration in war planning between a neutral and a belligerent nation. Late in January 1941 at the suggestion of Admiral Harold R. Stark, the U.S. Chief of Naval Operations, representatives of the U.S. Army Chief of Staff and the Chief of Naval Operations and of the British Chiefs of Staff had begun in Washington a series of meetings known as the American-British Conversations (ABC) to plan joint operations in the event the United States entered the war.[3]

The conferees agreed that the United States, like Great Britain, had more to fear from Germany than from any of the other great powers, and that if the United States entered the war the earliest American operations on foreign soil should take place in the North Atlantic area. American air forces would be sent to Great Britain to help the Royal Air Force bomb Germany. The first U.S. ground forces to go overseas after Mobilization Day would be used to garrison Iceland and to guard American air and naval bases in the British Isles. The Iceland garrison would protect convoys from America and release British troops for service in the Middle East and Mediterranean—"the hinge," according to Prime Minister Winston S. Churchill, "on which our ultimate victory turned."[4]

In order to facilitate continuous planning and co-ordination, the conferees agreed to exchange military missions at once. To head the American mission, General George C. Marshall, Chief of Staff of the Army, selected an Air Corps officer because the first units to be sent overseas in case of war would be primarily antiaircraft and Air Corps. The man was Maj. Gen. James E. Chaney, who had been sent to observe the Battle of Britain in 1940. His chief of staff was also an Air Corps officer, Brig. Gen. Joseph T. McNarney. The rest of the mission consisted of fifteen officers, including five representing the General Staff and one each from the Ordnance Department, the Corps of Engineers, and the Quartermaster, Signal, and Medical Corps.

Because of delicate considerations of neutrality, the true nature of the mission was disguised. General Chaney was designated Special Army Observer, London, and was responsible directly to the Chief of Staff. His organization was called the Special Observer Group (SPOBS). When the members arrived in London by air via Lisbon between 16 and 29 May, wearing civilian dress, Londoners might easily have taken them for part of the expanding staff of the American Embassy. They were housed on the top floor of the Dorchester Hotel in rooms that were pleasant though

[3] Unless otherwise indicated, the material in this chapter is based on the following volumes in UNITED STATES ARMY IN WORLD WAR II: Stetson Conn, Rose C. Engelman, and Byron Fairchild, *Guarding the United States and Its Outposts* (Washington, 1964); Richard M. Leighton and Robert W. Coakley, *Global Logistics and Strategy, 1940–1943* (Washington, 1955); Maurice Matloff and Edwin M. Snell, *Strategic Planning for Coalition Warfare, 1941–1942* (Washington, 1953); T. H. Vail Motter, *The Persian Corridor and Aid to Russia* (Washington, 1952); Charles F. Romanus and Riley Sunderland, *Stilwell's Mission to China* (Washington, 1953); Roland G. Ruppenthal, *Logistical Support of the Armies, Volume I: May 1941–September 1944* (Washington, 1953). The Matloff and Snell volume, *Strategic Planning for Coalition Warfare,* has been used most extensively.

[4] Winston S. Churchill, *The Second World War: The Grand Alliance* (Boston: Houghton Mifflin Company, 1950), p. 5.

rather uncomfortably exposed to bombs.[5]

The Ordnance member of SPOBS was one of the last of the group to arrive. He was Lt. Col. John W. Coffey, a sandy-haired man of medium build with a ruddy face and a pleasant manner. Executive to the chief of Field Service at the time of his appointment to SPOBS, he had been selected by the General Staff without referral to Maj. Gen. Charles M. Wesson, Chief of Ordnance, or Brig. Gen. James K. Crain, chief of Field Service, an unusual procedure, but Generals Wesson and Crain did not object to the appointment since they considered him an extremely competent officer.[6] With six other members of the group, Coffey flew to Lisbon, where he was held up several days waiting for a seat on one of the crowded flights to London.[7]

When he arrived in London Coffey found that SPOBS headquarters, the first two floors of a bombed-out apartment house at 18–20 Grosvenor Square, was not quite ready for occupancy but that General Chaney and other early arrivals had been meeting with British military leaders, explaining the peculiar nature of the Special Observer Group and laying the groundwork for liaison between members of the group and the British Chiefs of Staff Organization and Service Departments. The conferees agreed on the basic function of SPOBS: to insure that the machinery would be ready for a smooth, rapid, changeover from peace to war if the United States declared war. In discussions on the conduct of the war in general, the British revealed that they had four main objectives. First and most vital was defense of the British Isles and the North Atlantic shipping lanes; second in importance were Singapore and the sea routes to Australia, New Zealand, and the East Indies; third were ocean routes all over the world; and fourth was bolstering the British position in the Middle East and the Mediterranean.[8]

On Monday following Colonel Coffey's arrival, representatives of SPOBS and the British War Office agreed that specific aspects of the ABC–1 war plan and RAINBOW 5, the American implementing war plan, would be settled by four committees: one to plan personnel, discipline, welfare, and medical matters; a second to tackle problems of accommodation, bases, maintenance, and movement; a third to handle communication; and a fourth to cope with antiaircraft defenses and the coast defense of Iceland. General Chaney assigned Colonel Coffey to the second and fourth committees. Committee meetings began the next day, 4 June, and on 5 June Colonel Coffey inspected the British ordnance depot at Greenford, reporting that British weapons seemed heavier and possibly sturdier than American, but that American equipment was "more compact and modern."[9]

[5] [Henry G. Elliott], The Predecessor Commands, SPOBS and USAFBI, pt. I of The Administrative and Logistical History of the ETO, Hist Div USFET, 1946 (hereafter cited as The Predecessor Commands), MS, OCMH, pp. 20–28.

[6] (1) Interv with Maj Gen James K. Crain, 26 Oct 54. (2) Min, Wesson Conference, 5 May 41, OHF. As Chief of Ordnance, General Wesson held regular 11 o'clock conferences with his staff during the 1940–42 period.

[7] Memo, Maj Gen John E. Dahlquist, 15 Jul 45, Elliot Notes, Admin 322B.

[8] (1) Ltr, Maj. Gen Harold M. McClelland to Maj Roland G. Ruppenthal, 9 Jul 46, Folder, SPOBS Letters 1946, OCMH. (2) [William F. Sprague] SPOBS: The Special Observer Group Prior to the Activation of the European Theater of Operations, October 1944 (hereafter cited as Sprague History), pp. 17–19, 23–26, Admin 323A. (3) Ltr, Chaney to Marshall, 18 Jun 41, WPD 4402-141.

[9] Sprague History, pp. 30–33.

The Special Observer Group found that there were many differences between the British and the American systems of supply, even in terminology. In the British Army the word *ordnance* traditionally meant almost everything needed to equip a soldier, not only weapons and ammunition but clothing and other gear as well.[10] The term *quartermaster* was even broader: the Quartermaster General was the agent who supplied everything. He was responsible for logistics just as the Chief of the General Staff was responsible for operations. Under him the supply services were organized along functional rather than commodity lines.

The Royal Army Ordnance Corps (RAOC) was "the storeholding corps," responsible for the receipt, storage, and issue of all supplies except fuel and rations and specialist items of the Royal Engineers and the Royal Medical Corps. It also inspected ammunition and made repairs. The Royal Army Service Corps (RASC) was responsible for transporting supplies by motor truck, for storing and issuing fuel and rations, and for performing some maintenance. The Royal Engineers was the work service, constructing buildings and sharing maintenance and repair responsibility with RAOC and RASC. None of these three supply services had anything to do with procurement or design.[11]

The British had no organization similar to the U.S. Army's Ordnance Department, which designed, procured, and supplied all armament. The U.S. Army Ordnance Department's Technical Staff was responsible for research and development, its Industrial Service for procurement, and its Field Service for supply. The Ordnance Department maintained its own manufacturing arsenals where in peacetime the art of the armorer was kept alive.[12] The British Army did not control either the design or the procurement of its weapons. All military stores were designed and procured by the Ministry of Supply, an organization entirely separate from the War Office and staffed largely with civilians. American officers noted that within the ministry the authority for research and development was widely divided among many offices, a fact that made it difficult for the British Government to reach quick and sound decisions on vital projects, and that there was confusion, duplication, and conflict of interest between the procuring and using services.[13]

It was perhaps natural for American Ordnance officers at first to look with a critical eye on the British method of supplying weapons, so different from their own. But as time went on, they came to see that the complex mechanism had saving features that made it work. Most important of these were the typically British administrative system of interlocking committees to obtain co-ordination and the British spirit of co-operation.[14]

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[10] Maj. Gen. A. Forbes, *A History of the Army Ordnance Services* (London: Nedicia Society, Ltd., 1929), III.

[11] Foreign Logistical Organizations and Methods, a Report for the Secretary of the Army, 15 October 1947 (hereafter cited as Foreign Logistical Organizations), pp. 171–77, U168U5, TICAF. The Royal Electrical and Mechanical Engineers (REME), a maintenance agency, was not formed until October 1942.

[12] Constance McL. Green, Harry C. Thomson, and Peter C. Roots, *The Ordnance Department: Planning Munitions for War*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1955), ch. IV.

[13] (1) Foreign Logistical Organizations, pp. 159–69. (2) Memo, Brig Gen Gladeon M. Barnes, Chief Tech Div, for Maj Gen Levin H. Campbell, Jr., CofOrd, 3 Sep 42, sub: Report of United States Technical Mission to Great Britain, O.O. 350.05/1243.

[14] Foreign Logistical Organizations, p. 169.

Ordnance Plans for Iceland

The SPOBS-British liaison committees had scarcely begun the work of indoctrination and co-ordination when a cable from the United States turned their attention to Iceland. On 24 May England's largest and fastest capital ship, H.M.S. *Hood,* was sunk in the North Atlantic by the German battleship *Bismarck* in a howling spring storm of snow and rain. German ships, U-boats, and aircraft swarmed in and over the waters between Greenland and Iceland. The news a few days later that the people of Iceland had overwhelmingly voted to sever the last ties with the Danish king and set up a republic brought clearly to the minds of experienced observers the possibility that the new nation might move closer to America.[15]

On 27 May President Franklin D. Roosevelt in a radio broadcast said that the war was "approaching the brink of the Western Hemisphere." Attacks on shipping along the North Atlantic convoy route presented an actual military danger to America, he continued, and the German occupation of Iceland or bases in Greenland would bring war close to American shores. Repeating the famous sentence, "The only thing we have to fear is fear itself," he declared an unlimited national emergency. Under the headline, "America Ready to Fight," the London *Times* printed the text of the broadcast on Thursday, 29 May.

Early in June Roosevelt decided to accede to the wishes of the Icelandic Government that American troops be sent to relieve the British garrison in Iceland. The British needed their troops elsewhere; Iceland, athwart the vital North Atlantic convoy routes, could not be left defenseless;[16] leaders on both sides of the Atlantic called to mind the saying, "Whoever possesses Iceland holds a pistol firmly pointed at England, America, and Canada."[17] This was the official explanation. Behind the decision were convincing secret reports that the Nazis were planning to invade the Soviet Union. It therefore appeared much more likely that the United States could take action in Iceland without risking retaliation by the Germans.[18]

On 5 June General Chaney obtained from Secretary of War Henry L. Stimson permission to send a reconnaissance party of seven SPOBS officers, including Colonel Coffey, to Iceland immediately. The officers departed on 9 June, and in a week's stay Colonel Coffey visited the British installations and made plans for Ordnance support of the relief expedition. These were the earliest detailed Ordnance plans for a specific theater of operations.[19]

In general, RAINBOW 5 had contemplated sending to Iceland one division reinforced with special combat and service units, together with such air forces as the situation dictated. The whole would constitute a

[15] London *Times,* May 26, 28, 1941.

[16] (1) Department of State Bulletin X (17 June 1944), "Iceland," p. 563. (2) U.S. Army Iceland Base Command, *Armed Guardians: One Year in Iceland* (Reykjavík(December 1942), p. 11. (3) Messages Between the President of the United States and the Prime Minister of Iceland, 14 Jul 41, WPD 4493–14.

[17] Churchill, *The Grand Alliance,* p. 138.

[18] (1) Stetson Conn and Byron Fairchild, *The Framework of Hemisphere Defense,* UNITED STATES ARMY IN WORLD WAR II (Washington, 1960), pp. 124–25. (2) For the fluctuations between mid-1940 and mid-1941 in American planning with respect to Iceland, see Conn, Engelman, and Fairchild, *Guarding the United States and Its Outposts,* pp. 461–72.

[19] (1) Memo, Brig Gen Leonard T. Gerow, Actg ACofS, for TAG, 5 Jun 41, sub: Iceland Reconnaissance, WPD 4493. (2) The Predecessor Commands, pp. 40–41. (3) Sprague History, pp. 33–36.

task force, a term just coming into use in the U.S. Army. Colonel Coffey's plans for INDIGO, the code name for troop movements to Iceland, included detachments of several types of Ordnance companies: the medium maintenance company, which was the backup company for the division's organic light maintenance company; the ammunition company, which received ammunition at the dumps where it was unloaded and issued to the unit ammunition officer; the depot company, which stocked and issued everything except ammunition; and the aviation company, which supplied bombs and kept the guns on the aircraft in repair.[20]

The maintenance of ground weapons and combat vehicles such as tanks (Ordnance did not yet have responsibility for transport vehicles) was performed at three levels, or echelons. First echelon consisted of the proper care of weapons (sometimes called preventive maintenance) and minor repairs and was done by the individual soldier. More difficult repairs requiring special tools and skills, designated second echelon, were done by the Ordnance units assigned to the line organizations: the light maintenance company assigned to the infantry division, often backed up by a medium maintenance company or detachment (as in plans for INDIGO); the medium maintenance company assigned to the cavalry division; or the maintenance battalion assigned to the armored division. Everything beyond the capacity of these accompanying, and thus highly mobile, Ordnance units was sent to the rear. This was called third echelon, and included all major overhaul or complete rebuild.[21]

In planning the Ordnance supplies that would be needed for INDIGO, Coffey had to adapt the rather general plans of RAINBOW 5 to local conditions. Iceland is essentially a volcanic island, its center a barren tableland covered with lava flows and immense glaciers from which great turbulent streams run down to the sea. The towns are along the coast, which is so deeply indented with fjords that the coast line measures more than three thousand miles, though the circumference of the island is only about half that distance. On the southwest coast is the capital and principal port, Reykjavík, in comparison with which the other towns of the island are villages. The three other ports that could be used to land supplies during the winter were Akureyri in the north and Seydhisfjördhur and Reydharfjördhur in the east. There were thus three supply areas, the northwestern-western-southwestern area, the Akureyri area, and the area served by the eastern ports. Among the three areas there was no communication during the winter except by sea, and the sole supplies available locally were, as Colonel Coffey observed, "rock and mutton." [22]

[20] (1) Memo, Gerow, Actg ACofS, for CofS, 21 Jun 41, sub: U.S. Forces for INDIGO, WPD 4493-15. (2) For Ground Force organization at the time see Kent R. Greenfield, Robert R. Palmer and Bell I. Wiley, *The Organization of Ground Combat Troops,* UNITED STATES ARMY IN WORLD WAR II (Washington, 1947); for other types of Ordnance maintenance companies see Harry C. Thomson and Lida Mayo, *The Ordnance Department: Procurement and Supply,* UNITED STATES ARMY IN WORLD WAR II (Washington, 1960), ch. XXII.

[21] Thomson and Mayo, *Procurement and Supply,* pp. 448–49. After the transfer of responsibility for motor vehicles from Quartermaster to Ordnance in September 1942, the system was expanded to five echelons.

[22] (1) Memo, Chaney for CofS, 19 Jun 41, sub: Report of Reconnaissance of Iceland (hereafter cited as Iceland Recon Rpt), WPD 4493-20. (2) Memo, Comdr D. L. Ryan for CNO, 2 May 41, sub: Reconnaissance of Iceland by USS *Niblack,* WPD 4493-1.

The Royal Army Ordnance Corps had base depots at Reykjavík and neighboring Lagafell, and advance depots at Seydhisfjördhur and Akureyri. The depot at Reykjavík was, by American standards, really a quartermaster installation, for not more than 20 percent of the stock was ordnance supplies in the American sense of the term. That at Lagafell resembled a U.S. Ordnance depot, with a maintenance company operating on the depot site. It was Lagafell that Colonel Coffey recommended for the American main base depot and shop, with smaller depots at Seydhisfjördhur and Akureyri.

The most important and critical Ordnance problem in Iceland, in Coffey's opinion, would be ammunition supply. He found the British storage "deplorable." Too much of the ammunition was concentrated in thin Nissen huts (which Coffey considered much inferior to the American portable igloo hut) or in the open. He recommended that two of the four British ammunition depots be abandoned and the remainder be considerably expanded and reorganized in the interest of safety, and that requirements for U.S. ammunition troops be increased from a detachment to a full company.[23]

The Ordnance plan for the Iceland expedition is interesting because it indicates the factors that had to be taken into account in planning overseas operations. On the scale contemplated it was not put into effect. Limitations on housing, storage, shipping, and port facilities and legislative restrictions on sending selectees out of the United States caused repeated fluctuations in the plans for the Iceland task force. On 7 July, the day President Roosevelt announced that U.S. troops would garrison Iceland, about 4,000 marines landed, to give effect to his words; a month later 1,200 men of the 33d Pursuit Squadron of the Army Air Forces (AAF) landed, and in mid-September a force of about 5,000 men of the 5th Division arrived as an advance detachment. Changes in the logistics planning for Iceland, by then a responsibility of the administrative agency, General Headquarters (GHQ), continued. At one time in midsummer 1941, the War Department proposed to group the Iceland troops with those of Newfoundland and Greenland for command purposes, but nothing came of this. In June 1942 the island came under the European Theater of Operations, United States Army (ETOUSA), for tactical purposes, though it continued to be administered and supplied from the United States.

[23] Iceland Recon Rpt.

The Lend-Lease Missions to the Middle East and China

By the summer of 1941 it was becoming increasingly evident that each of the five lend-lease agencies in the United States—War, Navy, Treasury, and Agriculture Departments and the Maritime Commission—would have to establish field organizations in the foreign countries receiving aid to see to it that lend-lease materials were not being wasted. The proposed groups would not be concerned with policy, which would be the responsibility of the local lend-lease representative, but would furnish advice and supervision to insure that the American equipment was properly shipped and stored, kept in good repair, and effectively used. To do the job in China, General Marshall approved a military mission early in July and by September the Division of Defense Aid Reports (DDAR), predecessor of the Office of Lend-Lease

Administration, was suggesting that somewhat similar arrangements should be made for England and the Middle East.[24]

The War Department had been aware of the problem for some time and was already contemplating sending groups to England and Egypt, as well as China, to administer several kinds of Army activities having to do not only with types, quantity, and delivery of lend-lease matériel but also with exchange of equipment and information on new designs, reports on manufacturing methods abroad, tests of American weapons in combat, and interchange of men for training. The work had grown too large in those countries to be handled by the local military attachés. For England, SPOBS had been the logical choice; and when General Chaney was consulted in August he was asked whether the Middle East group, which also involved liaison with the British, might not be a subsidiary of the group in England.[25]

Chaney urged that a technical agency composed of Signal, Air, and Ordnance specialists be organized at once in England, preferably under SPOBS, to co-ordinate on research and manufacture with the British and to supervise American service teams and technical observers and report on the performance of American weapons. He thought the agency might also advise on lend-lease "when the situation crystallizes." After Hitler invaded the Soviet Union in June, the situation on lend-lease was hazy; aid might have to be extended to the Russians. Decisions on the final distribution of equipment would have to be made at the highest political levels, and it seemed to Chaney unwise to make a definite plan until the methods of lend-lease operation were clearer.[26]

Late in September the Secretary of War established under SPOBS the technical agency Chaney wanted and also made SPOBS the War Department agency for military matters pertaining to lend-lease, with emphasis on the supply and maintenance of American equipment. Details of SPOBS's new duties were subsequently worked out in conferences by War Department planners with Chaney when he was on a trip to the United States, and in discussions with Harriman. By November it was clearly understood that Chaney would shoulder only the War Department's responsibilities for lend-lease, confining himself to technical matters and leaving the political side to Harriman.[27]

The Middle East

Very early in the planning for lend-lease missions it was decided that the Middle East mission would be a separate group, not under SPOBS; this mission was to become more and more important as news came of German victories in the east. A shift in the "strange, sombre warfare of the desert," as Churchill called it,[28] brought

[24] Memo, Maj Gen James H. Burns, DDAR, for Secy War, 8 Sep 41, AG 400.3295.

[25] (1) Memo, Secy War for Burns, 2 Oct 41, AG 400.3295. (2) Draft Memo, Brig Gen Sherman Miles, ACofS G-2, for CofS, 11 Jul 41, sub: Miscellaneous Activities in Foreign Countries, WPD 4549. (3) Memo, Gerow, Actg ACofS, for TAG, 9 Aug 41, sub: Proposed Administrative Missions in Great Britain and the Middle East, WPD 4402-51.

[26] Msg. Chaney to CofS, 26 Aug 41, WPD 4402-51.

[27] (1) Msg 57, AGWAR to SPOBS, 25 Sep 41. (2) Memo, Gen Gerow for Maj Gen Richard C. Moore, 17 Nov 41, sub: Letter to General Chaney. (3) Ltr, Moore to Chaney, 19 Nov 41. All in AG 400.3295.

[28] Speech in House of Commons, "Progress of the War," 27 Jan 42, in *Hutchinson's Pictorial History of the War, 24 December 1941–17 March 1942*, Walter Hutchinson, ed. (London & Melbourne: Hutchinson & Co., Ltd., n.d.), pp. 101–07, 125–41.

Generalleutnant Erwin Rommel's *Afrika Korps* to Egypt, threatening the Suez Canal; and Hitler's sweep eastward after his invasion of the USSR endangered not only Iraq but Iran, a country vital to England for its vast oil fields and to the Soviet Union for its passage to the Persian Gulf. To forestall the Germans, Great Britain and the USSR jointly occupied Iran.

In late July 1941 the British planned to allocate 60 percent of all the American lend-lease tanks to the Middle East and contemplated asking the United States to provide the equipment and personnel to carry out a systematic program of overhaul immediately for every tank in Egypt, and later possibly a program for Iraq and Iran.[29] This idea went far beyond anything that had been conceived up to that time. When the first shipload of American light tanks went out to Egypt in May 1941 the Ordnance Department had had to consider the problem of training British troops in operation and repair. The British had requested that Ordnance mechanics be sent on the same ship for that purpose, but without result. General Wesson, Chief of Ordnance, was inclined to believe that the British ought to send their men to the United States for training. In any case, he did not have enough technicians to spare for an all-out effort. The best he could do was to send Capt. Joseph M. Colby and four technical sergeants to Egypt, Colby (attached to the military attaché's office at Cairo and soon to be promoted to major) as an observer to see how the U.S. tanks stood up in combat and the sergeants to help train the British on all types of American weapons. They also helped to set up a base ordnance workshop and depot for American equipment at the British depot at Tel-el-Kebir near Cairo.[30]

At the British-American Atlantic Conference in August, or shortly thereafter, the British specifically asked the Americans to establish and operate depots in the Middle East to stock and repair lend-lease munitions, and President Roosevelt found a way to satisfy the request without violating neutrality. On 13 September he asked the Secretary of War to contract with American commercial companies to operate supply and maintenance depots in the Middle East. The operation would mainly concern aircraft and ordnance of all kinds. In addition to performing the functions usually assigned to base and intermediate depots in a theater of war, such as stocking spare parts and providing maintenance facilities, the depots would serve as instruction centers where British troops could be trained in operating American equipment. Also, the contractors would have to arrange for port, railroad, and truck facilities. For the maintenance of trucks and automobiles, then a Quartermaster responsibility, the President thought it might be necessary later to establish Quartermaster depots also. On all details of this vast undertaking, the British authorities would have to be consulted. The Middle East Directive stated flatly, "Their needs should govern."[31]

As a consequence, a large organization was required to administer throughout the Middle East the great maintenance and

[29] Rpt. War Office Meeting With Ministry of Labour, 24 Jul 41, Folder, North African Military Mission, Plans, Tab 24, OHF.

[30] (1) Wesson Conferences, 10, 12 May, 23, 27 Aug 41. (2) Ltr, Capt Colby to Brig Gen Earl MacFarland, 27 Sep 41, AG 400.3295. (3) Colby, Progress Report for the Period of August 1st to January 9th, Folder, North African Military Mission, Reports, OHF.

[31] Memo, Franklin D. Roosevelt for Secy War, 13 Sep 41, AG 400.3239.

supply program the President had ordered, an organization much more directly concerned with operations than the Egyptian mission originally planned, and much more extensive in scope and territory. The term Middle East now embraced more than Egypt. The German threat to Cairo from the west called for depots elsewhere, south of Suez and in Palestine, in the Red Sea area; the German threat from the north, involving Iraq and Iran and the necessity for furnishing arms to Russia, meant depots in Iraq and Iran as far north as Tehran.

The size of the area to be covered, the fact that there would be more than one British headquarters to deal with, and the difference in the problems of immediate aid to Britain and future aid to Russia, brought the War Department to the decision to send not one military mission to the Middle East but two—the Military North African Mission (MNAM) and the Military Iranian Mission (MIM). The North African Mission was assigned as its sphere of action "the theatre based upon the Red Sea," including Egypt and the Levant, an area under the jurisdiction of British Middle East headquarters in Cairo. The Iranian Mission was assigned to "the theatre based upon the Persian Gulf," including Iraq, Iran, and western India as far as Agra, falling partly within the area of the British commander in Iraq, partly in that of his superior, the Commander-in-Chief, India. The mission in the Red Sea area was to be headed by Brig. Gen. Russell L. Maxwell, an officer with long experience in the Ordnance Department, and the choice was appropriate, for the first need in that area was the supply and maintenance of weapons. The mission in the Persian Gulf area, an arid, primitive region where construction and improvement of transportation had to precede supply, was to be headed by Brig. Gen. Raymond A. Wheeler of the Engineers. In October 1941 a military mission to the USSR under Maj. Gen. John N. Greely was established, but it lasted only a few months, partly because of the attitude of the Russians and partly because it overlapped to some extent both the lend-lease organization in Moscow under Brig. Gen. Philip P. Faymonville and the Iranian Mission.[32]

The two Middle East missions and the China mission differed in several respects from the Special Observer Group. The main difference was that their lend-lease responsibilities were heavier. SPOBS's lend-lease functions were limited, thanks to the presence of the Harriman office in London and to the tendency of the British to go direct to Washington. The Middle East and China missions had instructions to operate on a much larger scale.

China

In announcing the American Military Mission to China (AMMISCA) on 26 August 1941 President Roosevelt defined its function as the study of China's needs for defense and the giving of advice and suggestions on lend-lease aid. The head of the mission, Brig. Gen. John Magruder, defined the principal purpose more broadly as "increasing the effectiveness of the Chinese forces."[33] Magruder (who had served for eight years as military attaché in China) and other old China hands in

[32] C. Bradford Mitchell, Ordnance Operations in Middle East Theatre, October 1950 (hereafter cited as Mitchell MS), MS, OHF.

[33] Memo, Magruder for CofS, 11 Aug 41, sub: Military Mission to China, ASF International Div, Missions Br, 334.8.

the War Department such as Maj. Haydon L. Boatner of G–4 knew that aid to China was in an entirely different category from aid to England. The Chinese were asking for more equipment than they could use or even transport into China; moreover, some of it was too complicated for the untrained Chinese soldier. Competent military advice was badly needed.[34]

In General Magruder's advance party, which left by air for China on 18 September 1941, was his chief of staff, Col. Edward E. MacMorland, an Ordnance officer. Stopping at Honolulu, Midway, and Wake, which MacMorland found "in a fever of defense preparations," and at Guam—"practically defenseless"—the party spent several days in Manila conferring with General Douglas MacArthur before flying via Hong Kong to Chungking. Arriving in much-bombed Chungking on 9 October, the members of the mission were surprised to find no blackout—electric lights were blazing. They were given a fine brick building for their headquarters and living quarters, with a pleasant garden and a huge staff of servants, and were immediately engulfed in a round of receptions and elaborate, fourteen-course dinners.[35]

On MacMorland's recommendation, the two Ordnance members of the China Mission were a specialist on arsenals and production, Lt. Col. Walter H. Soderholm, and a specialist on maintenance, 1st Lt. Eugene P. Laybourn.[36] Soderholm came in by air on 23 October. Laybourn was the last to arrive, having stayed behind to participate in conferences on the 7-ton Marmon-Herrington tank that seemed the most practical tank to furnish the Chinese, since it was in production and could be used on the primitive Chinese road net. With Lt. Col. John R. Francis, the mission's tank expert, and four or five other members of the mission, including officers concerned with the Burma Road, he arrived at the port of Rangoon on the *Silver Dawn* the second week of November and traveled up the Burma Road, making firsthand observations on a problem that had received a good deal of study—how to transport the tanks from Lashio, the railhead, to Chungking.[37]

Soderholm conferred with Maj. Gen. Yu Ta-wei, the Chinese Army's Chief of Ordnance, and visited Chinese arsenals. What he found in the twenty arsenals was not encouraging. There were about a million rifles. There was a heterogeneous assortment of artillery from the arsenals of Europe and Japan, about 800 pieces, but spare parts and ammunition, especially for the artillery brought from the Soviet Union, were almost exhausted. The Chinese arsenals could make field artillery, mortars, machine guns, rifles, and ammunition, but for several months had been operating at

[34] (1) Ltr, Col Henry W. T. Eglin to Co-ordinator of Information, 12 Nov 41, ASF International Div 319.1. (2) Memo, Maj Boatner for Lt Cols Albert W. Waldron and Henry S. Aurand, 3 Jun 41, sub: Reorganization and Expansion of China Defense Aid Activities, ASF International Div, Missions Br, 334.8.

[35] Col. E. E. MacMorland, "Mission to China," *Army Ordnance,* XXIV, 137 (March-April, 1943), 284–85.

[36] Memo, MacMorland for CofOrd, 20 Aug 41, sub: Detail of Personnel for Military Mission to China, ASF International Div, Missions Br, 200 Personnel–China Mission.

[37] (1) Hq AMMISCA Weekly Rpts, No. 2, 23 Oct 41, No. 9, 22 Nov 41. (2) Rpt, Maj Boatner, 7 Oct 41, sub: Conference—Reference to Details on Republic of China Requisition No. C-39 for 240 7-ton Marmon-Herrington Tanks. (3) Rpt, Col Eglin, Chief, Washington Detail AMMISCA, 29 Sep 41, sub: Weekly Report of Activities—Home Office September 16 to September 27, 1941. All in ASF International Div 319.1.

one-fourth capacity because of shortages of raw materials. Powder and metal for ammunition were almost nonexistent. The most pressing need seemed to be for arsenal metals, explosives, and machinery, and for finished small arms ammunition. Next in importance were infantry weapons and artillery. Members of AMMISCA learned that most of General Yu's needs for procurement had already been submitted by T. V. Soong, head of China Defense Supplies, Inc., the purchasing authority in the United States; and that Mr. Soong's estimates had been based on thirty Chinese divisions, a strength that had not been finally approved by Generalissimo Chiang Kai-shek. Until it was approved, General Magruder radioed Secretary of War Stimson, little more could be done on matériel. In any case it seemed impossible to obtain from the Chinese definite data on what was most needed.[38]

Vagueness and procrastination on the part of Chinese military leaders also hampered the Ordnance officers in making plans for training Chinese soldiers in the use of lend-lease arms. They learned that the Generalissimo contemplated establishing two training centers, one near Kunming, the other near Kweiyang, but the Chinese National Military Council hesitated to locate the centers or name their commanders. On the all-important subject of tanks, it was not until 27 November that Lt. Gen. Shueh Ting-Yao, in charge of mechanized training, asked Colonel MacMorland what buildings and grounds would be needed for an armored force training school. Plans for the organization and use of tank and scout car units had not gone beyond the most rudimentary stage.[39]

The Chinese Army lacked not only weapons and training but also means of getting supplies to the various fronts. For example, west of the main railroad terminus at Kunming there were no roads. Only trails led to the front and all supply was by coolie or pack animal. It was obviously impossible for the Chinese to launch a large-scale offensive for a long time to come. In the meantime, as General MacArthur had suggested to AMMISCA members on the stop in Manila, the Chinese might have engaged in guerrilla warfare behind the sprawling front, but this they had failed to do. The reason for the failure, General Magruder bluntly reported, was to be found in China's "lack of aggressiveness and initiative, and in the age-long practice of Chinese commanding officers of regarding their soldiers as static assets to be conserved for assistance in fighting against their fellow-countrymen for economic and political supremacy."[40]

Even had the Chinese leaders shown more initiative and aggressiveness and provided better operating conditions, there would still be the problem of getting matériel into the country. Because the Japanese controlled the east coast of China, all supplies had to be landed at the port

[38] AMMISCA Weekly Rpts, No. 7, 21–27 Nov 41, and No. 8, 28 Nov–4 Dec 41, ASF International Div 319.1.

[39] (1) Radio, MacMorland to AMMISCA, 15 Nov 41. (2) Memo, Laybourn, 27 Nov 41, sub: Memorandum of a Meeting of Chinese Army Officers and Members of the American Military Mission on November 27, 1941, at 2:30 P.M., ASF International Div 319.1.

[40] (1) Telg, The Military Mission to China to the War Department (signed Magruder), Chungking, February 10, 1942, No. 256 AMMISCA, in Department of State Publication 6353, *Foreign Relations of the United States. Diplomatic Papers 1942, China* (Washington, 1956). (2) MacMorland, "Mission to China," p. 284. (3) Ltr, Francis to Gerow, WPD WDGS, 12 Jan 42, WPD 4389-102.

of Rangoon in Burma, hauled up the Burma railway and highway to Lashio, and then trucked over the Burma Road to China. Members of AMMISCA considered the Burma Road the worst logistical bottleneck of all. Congested with civilian traffic, lacking provisions for maintenance and any semblance of orderly administration by the Chinese, it permitted only a trickle of matériel to get through. The growing seriousness of the transportation problem was reflected in the figures on lend-lease shipments. Out of 110,864 long tons shipped to China between May 1941 and April 1942, 67,828 consisted of trucks, petroleum, and road building supplies, compared with only 11,398 long tons of ordnance matériel, of which 8,725 tons were ammunition. Trucks and their spare parts accounted for 29,081 tons.

Some of these supplies were never delivered. After Pearl Harbor the Japanese advanced into Burma, taking Rangoon and cutting the Burma Road. The door to China was closed. The primary mission of AMMISCA was over; its members, feeling that they were "buried here," without mail or radios between late November and mid-January, were anxious to get away. Colonel Soderholm was recalled to Washington in January. Early in March, Lt. Gen. Joseph W. Stilwell arrived in Chungking to take over command of all military forces in China, Burma, and India, departing very soon for Burma to supervise the two Chinese armies engaged there with the Japanese. While the fight for Burma was still going on, Colonel MacMorland was shifted down to Yunnan Province to act as chief adviser for the Chinese Communications Zone. Lieutenant Laybourn participated in the unsuccessful effort to hold Burma and in the grueling withdrawal. He was a member of the group led by General Stilwell that had to abandon its vehicles on 6 May and walk through the jungle for four exhausting days. When the party reached a river flowing west and embarked on rafts, Laybourn took the mules and a group of Chinese overland to a rendezvous on the border of India. Henceforth India was to provide the bases from which China would be supplied—first by air, and later by a road from Ledo, in Assam, to Kunming—and the main problem of the soon to be activated China-Burma-India (CBI) Theater was to be a problem of transportation.[41]

Initiation Into Coalition Warfare

The military mission phase of the Ordnance Department's overseas operations, beginning in May 1941 with the arrival of the SPOBS Ordnance officer in London, ended in England on 8 January 1942 when SPOBS was transformed into U.S. Army Forces in the British Isles (USAFBI); in China on 4 March 1942 when the members of AMMISCA came under Headquarters, U.S. Army Forces, China, Burma and India; and in the Middle East on 13 June 1942 when both MIM and MNAM came under U.S. Army Forces in the Middle East (USAFIME).

In this phase, the Ordnance officers of the missions were learning characteristics of their future allies and were discovering to what extent unfamiliar terrain and climate in faraway countries, some of them more primitive than could have been imagined, would affect Ordnance operations. Above all, they were learning the restrictions of coalition warfare, in which plans

[41] (1) Ltr, Francis to Gerow, WPD WDGS, 12 Jan 42, WPD 4389-102. (2) MacMorland, "Mission to China," p. 289.

depended on military conversations between governments that frequently had differing points of view.

The Ordnance task in the Middle East missions was far greater than that in SPOBS and AMMISCA because of the large allocation of tanks to the Middle East and because of the huge maintenance and supply program ordered by the President's Middle East Directive. In the months following Pearl Harbor, the task in the Middle East would become more difficult because plans would be constantly revised to fit the shifting pattern of warfare in North Africa and the changing requirements of the Allies.

CHAPTER II

Middle East Kaleidoscope

Brilliant sunshine suddenly blotted out by black rainclouds, clear air all at once hazy with sandstorms, hot days followed by bitter cold nights; above all, on a huge empty plain the flash and smoke of marching armies moving fast in complex patterns, suddenly advancing or retreating, meeting or veering off—this was the kaleidoscope of warfare in the Western Desert. Scarcely less kaleidoscopic were the changes in the direction and scale of the American effort in early 1942 to support Allied forces in the vast expanse known as the Middle East.

At the outset, it seemed clear that a major part of the American effort should be to keep the British lend-lease tanks and trucks in operation, especially the tanks. In the fall of 1941 Lt. Gen. Sir Claude J. E. Auchinleck, British commander in chief in the Middle East, was preparing to move into the Libyan desert to challenge Rommel's *Afrika Korps*. During the build-up for the operation, Auchinleck had received some 470 British tanks (300 of the cruiser type, 170 of the more heavily armored "I" or Infantry type), and 300 American Stuart light tanks, but he was still below the strength he thought necessary. Every tank counted, for it took many weeks for a new tank to come from England and longer still for one to arrive from the United States.[1]

After spending a morning in the desert near Cairo watching a British brigade demonstrating its new American Stuart tanks, Auchinleck reported to Prime Minister Churchill that the men were delighted with the reliability and endurance of the Stuarts "when compared with our own tanks, and are frankly amazed at the length of time they can be kept in work without having to go into the shops to be overhauled." [2] The British tanks required frequent overhauls, and when a tank landed back in the shops, it was usually out of action for about three months, since the Royal Army Ordnance Corps workshops were short of experienced tank mechanics and had no repair equipment other than what had been brought from England. There was no engineering industry to speak of in the Middle East.[3]

Following the President's Middle East Directive, the British submitted in October 1941 a list of tasks that they would like the U.S. Army to undertake in the Middle East. They put at the top of the list the overhaul of tanks. For this, two plants were required—one was to be in Egypt and

[1] I. S. O. Playfair, *The Mediterranean and Middle East*, III, *September 1941 to September 1942* (London: Her Majesty's Stationery Office, 1960), 4.

[2] Ltr, Gen Auchinleck to Prime Minister, 29 Sep 41, quoted in John Connell (pseudonym for John Henry Robertson), *Auchinleck, A Biography of Field Marshal Sir Claude Auchinleck* (London: Cassell, 1959), p. 311.

[3] Playfair, *The Mediterranean and Middle East III*, p. 4.

the other possibly at Bombay or Port Elizabeth in South Africa. The second task was the overhaul of motor transport vehicles, and for this shops were required not only in Egypt and South Africa but also in Palestine. The third was the construction of a plant in Egypt to service "warlike" American equipment, including armament, instruments, and so on. These were immediate requirements for North Africa. More than a month later, after General Wheeler had gone to India and conferred with the British commander in chief, the British outlined the tasks to be performed in aid to the USSR and Great Britain in Iraq and Iran. The first was a base at Karachi to repair tanks; the second was an Ordnance depot and workshop at Tehran to service arms and equipment being shipped from Indian and Persian Gulf ports to the Soviet Union.[4]

The Ordnance planning was the work of Col. Francis H. Miles, Jr., who had been designated Ordnance officer for both the North African and the Iranian missions, an arrangement that permitted a single plan for the entire Middle East and the placing of a contract for all activities (except motor transport) with a single contractor, since all tasks would be performed by a commercial contractor, as the Middle East Directive ordered. Miles approached several engineering companies with experience in foreign construction, and also the Chrysler Corporation, which had been producing tanks for the Ordnance Department. Contractors generally seemed reluctant to undertake the job, some suggesting that it ought to be a military enterprise; Chrysler declined outright. The firm finally chosen was the J. G. White Engineering Corporation. For automotive vehicles, General Motors Overseas Operations (a division of General Motors Corporation) accepted a separate contract for all vehicles except Fords, which required a separate contract with the Ford Motor Company.[5]

The OMET's

Using the British requirements as a blueprint, Colonel Miles planned seven installations, which he called OMET's (Ordnance Middle East Tasks): OMET 1—a base depot at Bombay to serve the North African and Iranian advance depots and to act as the principal distribution, transfer, and assembly point for all material of all services being sent to the Middle East; OMET 2—a base depot at Port Elizabeth, South Africa, for the overhaul of tank and motor vehicle assemblies; OMET 3—an intermediate depot at Asmara in Eritrea to overhaul tanks and aircraft armament; OMET 4—an intermediate depot at Karachi in India to overhaul tanks and motor vehicles; OMET 5—a large advance depot in the Cairo area to repair not only tanks but also artillery, small arms, and instruments, and Signal and Engineer equipment; OMET 6—an advance depot in Palestine

[4] (1) Ltr, Supply Committee to British Supply Council in North America, 7 Oct 41. (2) Cable, 24 Nov, Gen Wheeler GHQ India to Gen Moore. Folder, North African Military Mission, Plans, OHF.

[5] (1) Capt Paul D. Olejar, Ordnance Activities in the Middle East Missions, 15 Jun 44, note 12, MS, p. xvix, OHF. (2) Mitchell, Ordnance Operations in Middle East Theatre, pp. 14–15. Unless otherwise cited, the Mitchell study and Motter, *The Persian Corridor and Aid to Russia*, are the principal sources for Ordnance base activities in the Middle East. (3) Memo, Miles for Crain, sub: Status of Ordnance Participation in the North African and Iran Military Missions as of November 26, 1941 (hereafter cited as OMET Plan), Folder, NAMM, Plans, Tab 11, OHF.

primarily to repair instruments and optical apparatus, but also to overhaul tanks; OMET 7—the depot and workshop at Tehran for equipment destined for the Soviet Union. The White Corporation estimated that the seven OMET's, some of them underground to be bombproof, and air-conditioned, would cost approximately $71,000,000.[6]

Colonel Miles's plan, which the men in the theater considered a "rather elaborate scheme," objecting particularly to the time involved in placing the OMET's underground, was hardly on paper before the Pearl Harbor attack and other developments made revisions necessary. Miles, flying via Hawaii to the Middle East, and en route on 7 December, returned to the United States. From Washington he sent a cable to Cairo suggesting that Major Colby, recently appointed acting Ordnance officer for MIM and MNAM, conduct a survey to determine whether changes were necessary, primarily whether Karachi rather than Bombay should be the main point for Ordnance supply and repair in the Middle East. After on-the-spot investigation by Colby and a survey by Miles upon his arrival in Cairo in late January 1942, after the fast-moving tactical developments in the Western Desert in late 1941, and after a more careful assessment of the problems posed by the President's Middle East Directive, the OMET plan was drastically revised.[7]

The fluidity of the warfare in North Africa, beginning 17 November when Auchinleck moved into the Western Desert to challenge Rommel, raised questions not only as to the feasibility of attempting to support the operations by large fixed installations but also as to the wisdom of doing so. When the battle was going well, as when the British advanced far into Cyrenaica in December 1941, the evacuation of damaged armor from Tobruk to shops in Egypt, for example, meant a 1,500-mile round trip over primitive railways and sand-choked roads. When the battle was going badly, as when Rommel made a counterthrust into Egypt, there was the possibility that the elaborate shops would fall into enemy hands. It is not surprising that the plans for the Port Elizabeth OMET were soon quietly dropped; that the Palestine depot, located near Tel-Aviv at Tel-Litwinsky, was relegated to a minor role; and that the depot at Asmara, about 1,100 miles south of Cairo, was scaled down from a large, specially built intermediate depot to a small arsenal housed in Italian shops and used for the repair of small arms, trucks, motorcycles, and tires and the manufacture of tools, parts, buckets, and other small items. Only at Heliopolis, the OMET near Cairo, was there eventually a tank shop of any size in the Red Sea area.[8]

In the Persian Gulf area, the main base depot (OMET 1) was located at Karachi rather than at Bombay because Bombay

[6] OMET Plan, NAMM, Plans, Tab 11, OHF.

[7] (1) Memo, unsigned rough draft [possibly from NADiv CE], for Gen Wheeler, 20 Jan 42, ASF International Div, Missions Br, 600.12 Iranian Mission Projects in Middle East. (2) Ltr, Capt Alden K. Sibley, CE, to Mission Engineer, USMNAM, Washington, D.C., 27 Jan 42, sub: First Interim Report on the Status of Engineer Construction in North Africa. (3) Cable, Miles to Maxwell, 24 Dec 41. (4) Progress Rpt, Ord Sec, USMNAM, 11 Jan 42–31 March 42. All in NAMM, Rpts, Tabs 40, 17, 64, OHF.

[8] (1) Comments by Vail Motter on Dr. Mitchell's Draft of Middle East Ordnance Activity, 2 Nov 50. (2) Intervs with Cols Earl S. Gruver, Floyd C. Devenbeck, Joseph A. McNerney, and Lt Col F. G. White, 14 Sep 50. All in Mitchell MS Notes. OHF.

was not being used as a port of entry on account of the Japanese naval threat; moreover, Bombay was already overloaded with supply activities and was in a monsoon area that made open-air storage and shops impractical. The intermediate base planned for Karachi was changed to Umm Qasr, a Persian Gulf port designated as the point for unloading Ordnance equipment. OMET 7 at Tehran was canceled because the Russians did not want tanks delivered there, preferring Archangel; instead, a mobile Ordnance unit would be sent to Baghdad, where the British were organizing an armored division equipped with American tanks.[9]

When Colonel Miles arrived in Cairo he was faced with the immediate problem of obtaining enough spare parts to keep the American tanks operating. There were then 505 M3 Stuart light tanks in Egypt and Palestine (writing off 75 lost by enemy action) and 70 M3 Grant mediums in Egypt. The British controlled spare parts, a function given them by the Middle East Directive—to Ordnance one of the most frustrating aspects of the President's directive—and the system they had set up seemed to the Ordnance people extremely cumbersome. From British Middle East depots, on which the American depots would draw, requisitions went to London and thence to Washington, and supplies returned through the same channels. The differences in nomenclature and stockkeeping methods added to the confusion, for when the Americans came to the British depots to pick up the parts, the British often did not know what they had in stock. Miles made strenuous efforts to get spare parts shipped direct from U.S. depots to American shops in the Middle East, but got nowhere. On their right to control spare parts, the British remained adamant, and the main American tank shop at Heliopolis was never able to obtain enough spare parts to permit full-scale operation.[10]

Militarization

The War Department directive of 18 February 1942 that all mission activities be militarized as speedily as possible gave the Ordnance Department the opportunity to terminate the contract with the J. G. White Engineering Corporation, which up to that time had done no more than initiate some procurement and recruit a partial staff. No contract workers had reached the theater. The opportunity to terminate the contract was welcomed, for by then Ordnance was well aware of the problems it posed. The corporation was inexperienced in Ordnance operations; its letter of contract to operate supply and repair depots for tanks and miscellaneous Ordnance, Signal, Engineer, Chemical Warfare, and other military equipment also implied duplication of effort and confusion as to responsibility. More important than either of these considerations was the fact that there were inherent dangers in assigning to a civilian contractor tasks that were essentially military.

[9] (1) AMSEG 170, Bullivant to Maxwell, 31 Jan 42, ASF International Div, Missions Br, MI 311.27, Cables, N. Africa. (2) Ltr, Colby to Maxwell, 18 Jan 42, sub: Survey of Proposed Ordnance Establishments in Iraq, Iran, and India, copy, NAMM, Rpts, Tab 17, OHF.

[10] (1) Memo, Miles for Crain, 9 Feb 42, sub: Status of American Tanks, Egypt & Palestine. (2) Memo, Lt Col Marshall E. Darby for Gen Crain, 5 Mar 42, sub: Status of Foreign Missions. (3) Ltr, Gruver to Chief of Field Service, 18 Jul 42, sub: Ordnance Service in the Middle East. (4) 1st Ind, Darby to Field Service, Exec Br [n.d.]. All in NAMM, Rpts, Tabs 28, 44, 74–76, OHF.

The contractor might abandon the work, or the employees could leave when they saw fit. Civilian workers in a combat area might be captured, in which case they did not have the protection of military status, or they might be killed. And the very nature of Ordnance matériel argued against contract operations, for the storage, issue, and repair of munitions was essentially too vital an operation, and too vulnerable to sabotage and security violations, to be entrusted to civilians.[11]

Yet the possibility that any Ordnance troops could arrive in the Middle East immediately was very slim because of the shipping and men needed in the build-up in England in early 1942. It was even impossible for the Ordnance Section of the Military North African Mission to obtain its quota of 80 officers that spring, though Lt. Col. Earl S. Gruver, who headed the section after Colonel Miles went home because of ill health on 10 March, protested strongly that the twenty officers on duty with the mission were too few to handle the heavy work load.[12]

The first Ordnance unit sent to the Middle East, the 525th Heavy Maintenance Company (Tank), did not arrive until 22 June 1942, debarking from the *Queen Mary* along with 12,000 British reinforcements picked up in Scotland, after a long voyage around the Cape of Good Hope. Gruver reported that "all of us here in the Middle East were thrilled at their arrival," but there was considerable disappointment when it was discovered that the company had arrived without its hand tools or any transportation, the latter a most serious lack since the company had been designed as a mobile maintenance unit to support the British in the desert operations. While waiting for its trucks to arrive, the company was sent to the British Tel-el-Kebir tank shop on the outskirts of Cairo, quartered in tents dug into the sand, with a mess hall described by the company historian as "a large, canvas-covered building addicted to tea, corn beef, and flies." But the stay at the Tel-el-Kebir shop was short. Rommel, having taken Tobruk on 21 June and won a brilliant victory at Matruh a week later, was at El 'Alamein at the beginning of July, posing so serious a threat to Cairo that many units were evacuated from the city, including the American Ordnance company. On 2 July the company was sent by ship to Asmara Arsenal in Eritrea and remained there about two months. Then it was flown back to Cairo to open the Heliopolis tank shop. After the British breakthrough at El 'Alamein in November 1942, the 525th was sent out with Lt. Gen. Sir Bernard L. Montgomery's Eighth Army in the pursuit of Rommel and helped the British considerably in advanced workshops at Benghazi and Tripoli. The 525th was the only American company attached to Eighth Army at the time.[13]

[11] (1) Memo, Robert P. Patterson, Under Secy War for Secy War, 21 Jan 42, sub: Contracts with Civilian Concerns for Overseas Facilities, NAMM, Plans, Tab 10, OHF. (2) Memo, CofOrd for ACofS G–3, 23 Jan 42, sub: Contracts with Civilian Concerns for Overseas Facilities, O.O. 160/111555 Misc. (3) Memo, Lt Col S. F. Clabaugh for Gen Crain, 7 Mar 42, sub: Closing Out of Overseas Contracts and Militarization of Contract Activities, NAMM, Rpts, Tab 43, OHF. (4) Motter Comments on Mitchell MS, OHF.

[12] (1) Leighton and Coakley, *Global Logistics and Strategy, 1940–1943*, pp. 506–07. (2) Ltr, Gruver to CofOrd, 12 Jun 42, sub: Progress of Ordnance Section, USMNAM, NAMM, Rpts, Tab 79, OHF.

[13] (1) Robert J. Martinez, "Saga of the 'Great 525th,'" *Army Ordnance*, XXX, 156 (May-June 1946), pp. 326–28. (2) Ltr, Gruver to Chief of Field Service, 23 Jun 42, sub: Status of Ordnance

Not until mid-November 1942 did an Ordnance unit designed especially for base maintenance arrive in Egypt, the 1st Battalion of the 303d Ordnance Base Regiment. It was an innovation, for only in the spring of 1942 had the Ordnance Department been able to get General Staff approval for regimental organization. The battalion commander set one company to work in the Heliopolis tank shop, reinforcing it with about fifty civilians; he employed his other three companies in setting up a spare parts depot, an artillery and fire control shop, and a small arms shop. Though conditions were primitive at first—shops not yet built and the men quartered in tents—the shops were in operation by the end of November. But the shops were hardly shaken down and ready to produce when the volume of work fell off sharply. By the spring of 1943, thanks to the success of the Eighth Army's desert campaign, the sources of both damaged vehicles and replacement parts had moved so far away that the shops could get nothing to work with; in May the Heliopolis tank shop closed down. Tank maintenance men moved into vehicle maintenance, which in mid-1942 became an Ordnance responsibility and continued to be a rather heavy task in support of the Ninth Air Force's operation until early fall of 1943.[14]

As air operations also dwindled and the war swept on and away from Egypt, the only remaining Ordnance activity of any importance in the area was the manufacture of cans and drums for oil and water, undertaken for the British and performed by the Overseas Steel Container Corporation under contract to the Ordnance Department. The contract, reminiscent of the earlier arrangement with the J. G. White Engineering Corporation, was signed on 8 February 1943, but the plant equipment did not begin to arrive in the Middle East until the following July and the operation was on the whole so unsuccessful that it was terminated on 1 November 1943. Responsibility for the container plants passed from Ordnance to the Quartermaster Corps on 9 February 1944.[15]

The tank shops and depots in the Persian Gulf area, planned at the time when, as one Ordnance officer put it, "the Mission bubble was being inflated,"[16] hardly got beyond the planning stage. At first designed to support the British line of communications in Iraq, with a main base at Karachi, an intermediate base at Umm Qasr, and an advance base at Baghdad, the mission was changed in early 1942 to supplying the Soviet Union through Iran. The Iraqi projects at Umm Qasr and Baghdad were returned to the British in April 1942. Be-

Projects in the USMNAM, NAMM, Rpts, Tab 65, OHF. (3) For the panic in Cairo, which the British called "The Flap," see J. A. I. Agar-Hamilton and I. C. F. Turner, *Crisis in the Desert May–July 1942* (Cape Town: Oxford University Press, 1952), pp. 281–84.

[14] (1) Maj. Gen. J. K. Crain, "Ordnance in the Field," *Ordnance*, XXXIX (September–October, 1954), 329. (2) Memo, Brig Gen Harry L. Twaddle, ACofS, for TAG, 5 Mar 42, sub: Constitution and Activation of Certain Ordnance Units, NAMM, Plans, Tab 16, OHF. (3) Roy F. Dunlap, *Ordnance Went Up Front* (Plantersville, S.C.: Small-arms Technical Publishing Co., 1948), pp. 15–17. (4) Intervs with Gruver, Devenbeck, McNerney, and White, 14 Sep 50, Mitchell MS Notes, OHF.

[15] For the conflict between the British and Americans over the can and drum program see Ltr, Col Forrest C. Shaffer to Maj Gen L. H. Campbell, 9 Jul 43, Folder, General Levin H. Campbell's Personal Correspondence (Overseas Material) (hereafter cited as Campbell Overseas File), OHF.

[16] 1st Memo Ind, Darby for Field Service, Exec Br, Mil Missions Sec, 30 Jul 42, NAMM, Rpts, Tab 77, OHF.

cause the Iranian route overland from Karachi was not acceptable to the Russians, Karachi was also eliminated as a base for USSR supplies and henceforth would be concerned only with supply to the China-Burma-India Theater.[17]

The Russians had very early made it plain that they did not want a depot at Tehran. To comply with their wishes, the American planners late in 1941 decided that the port for supply to the USSR would be Bandar Shahpur, at the head of the Persian Gulf and at the beginning of the Trans-Iranian Railway. When American tanks began to arrive in numbers at Persian Gulf ports in the summer of 1942, Ordnance officers established a school at Bandar Shahpur to teach Russians how to repair them. It lasted only a few days. Word came from Moscow that the tanks could not be delayed but must be forwarded to the front. An attempt to move the school to Baku failed when the USSR refused to grant visas to the three instructors.[18]



CAPTAIN JARRETT

The Desert Proving Ground

Whatever the accomplishments and frustrations of the Ordnance men in the Middle East missions in attempting to provide base support to the Allies, Ordnance was able to assist the British very materially with technical information on their lend-lease weapons and ammunition. This effort, begun when Captain Colby and the four sergeants were sent out to Egypt late in the summer of 1941, was intensified in February 1942 with the arrival in Cairo of Capt. George B. Jarrett, who constituted the one-man technical section of the MNAM Ordnance Section. Early assigned as ammunition adviser to British GHQ, he conducted demonstrations of new U.S. ammunition and weapons and, at General Maxwell's request, established a

[17] (1) Memo, Home Office MIM to Harry L. Hopkins, 21 Feb 42, sub: Activities of the U.S. Military Iranian Mission. (2) Memo, Home Office MIM to Brig Gen Henry S. Aurand, 1 Apr 42, sub: Iranian Mission Activities. Both in ASF International Div, Missions Br, 319.1. (3) Motter Comments on Mitchell MS, OHF.

[18] (1) Iranian Military Mission: History of Ordnance, Persian Gulf Service Command to January 1943, MS, OHF, p. 5. (2) Later, Ordnance was involved in the truck assembly plants (TAP) in the Persian Gulf Command at Andimeshk (TAP I) and Khorramshahr (TAP II). First operated under contract with General Motors Overseas Operations, after 1 July 1943 they were operated by three Ordnance medium automotive maintenance companies (the 3474th, 506th, and 3455th), with the help of native labor. For an ineresting story on the operation, see Joel Sayre, "Persian Gulf Command," *The New Yorker* (February 17, 1945). (3) For the efforts to supply the Russians through Iran, see Leighton and Coakley, *Global Logistics and Strategy, 1940–1943*, chs. XX, XXI.

school to train the British on American ordnance.[19]

The Ordnance Section of MNAM rendered even more important service in the long run by providing expert firsthand information to the technicians in the United States on friendly and enemy equipment at a date early enough to permit improvements in American weapons destined for Europe in 1944. The great battles of 1941 and 1942 in the Western Desert, beginning with the so-called Winter Battle around Sidi Rezegh airfield near Tobruk between late November 1941 and January 1942, were an excellent proving ground.

Some early information was sent to the United States by the American military attaché at Cairo, Col. Bonner F. Fellers, who witnessed the beginning of the Winter Battle and talked to British commanders, but his reports were based largely on British sources—unofficial sources for the most part, because the British were reluctant to release official records on such touchy matters as the performance of American tanks as compared with their own.[20] The Ordnance members of the Military North African Mission, on the other hand, carefully studied the crippled tanks brought back to the British shop at Tel-el-Kebir, visited the battlefields, and even managed to send important German equipment to the United States for testing by Ordnance at Aberdeen Proving Ground.[21]

[19] (1) See above, p. 12. (2) G. B. Jarrett Middle East 1942, pp. 54, 91, MS Collection of Col. George B. Jarrett (USAR Ret).

[20] Military Attaché Rpts 2122 of 6 Jan 42 and 843 of 23 Feb 42, OKD 451.25/330.1 and OKD 451.25/333.1.

[21] (1) Ltr, Maxwell to Secy War, 10 Jan 42, sub: Progress Report, United States Military North African Mission, for the period November 22, 1941, to January 10, 1942, Folder, Middle East (African-Levant), OHF. (2) Ltr, Gruver to CG U.S. Military North African Mission, 31 Mar 42, sub: Progress Report, Ordnance Section, from January 11, 1942, to March 31, 1942, NAMM, Rpts, Tab 64, OHF.

The Famous "88"

The most important enemy weapon shipped to the United States from North Africa at this early date was the multipurpose German 88-mm. gun. Developed primarily as an antiaircraft (*Flugabwehrkanone* or *Flak*) gun at the end of World War I, the 88 with its long range, its flat trajectory, and its excellent sights was also extremely useful as a weapon against ground forces, especially as an antitank (*Panzerabwehrkanone* or *Pak*) gun. It had been tested in various employments in 1938–39 during the Spanish Civil War, but under such good security that foreign observers (including American) could learn little about it.[22]

In its antitank role the gun made its first real impression on the British when Rommel used it to repel tank attacks in the June 1941 Eighth Army BATTLEAXE operation at Halfaya Pass. The British discovered then that it could penetrate the thick-skinned Matilda infantry tank at distances up to 2,000 yards. After the battle a member of Rommel's staff overheard a captured British tank driver under interrogation expressing his indignation:

> "In my opinion," said the Englishman, with an unfriendly glance at a near-by 88, "it is unfair to use 'flak' against our tanks."
>
> A German artilleryman who was sitting on his haunches near by, listening to the interpretation, interjected excitedly, "*Ja,* and I think it most unfair of you to attack with

[22] (1) Green, Thomson, and Roots, *Planning Munitions for War,* p. 247. (2) Brig. Gen. Henry J. Reilly, "Proving Ground in Spain," *Army Ordnance,* XIX, 114 (May–June, 1939), p. 334. (3) Mark S. Watson, "American Ordnance in Korea," *Ordnance,* XXXV, 186 (May–June, 1951), pp. 569–70.

tanks whose armour nothing but an 88 will penetrate." [23]

A diabolical employment was made possible by the fact that the Germans could fire the 88 from its wheels. Several times (until the ruse was discovered), Rommel enticed the British to attack the gun by using as bait an innocent-looking convoy composed of a few trucks, with an 88 hidden among them under a paulin. Unmasking the 88, the Germans would fire it from its wheels, still limbered up, and destroy the attackers.[24] After BATTLEAXE, the Germans provided the 88 with a half-tracked tow vehicle that enabled it to get into action against ground targets very quickly. They also became even more adept at camouflaging it—no easy matter for such a big gun.[25]

With only forty-eight of these guns, Rommel in the first three days of the Winter Battle used them with murderous effect against the British armored forces. Major Colby, after a trip to the Western Desert in late December, reported that the most dangerous weapon to tanks was the 88-mm. gun, firing armor-piercing (AP) ammunition. In a single action, the attack on Sidi Omar 22 November 1941, a British brigadier with 51 thick-skinned infantry tanks lost 47, most of them to 88-mm. antitank fire. By the end of the Winter Battle, out of 1,276 tanks sent to Libya, 674 were damaged and 274 were destroyed. Rommel's *Afrika Korps* had so crippled the armor that the British could not resume the offensive until May 1942.[26]

During the lull in the desert warfare, Jarrett (now a major) visited the wreckage-strewn battlefield near Sidi Rezegh and discovered an 88-mm. gun that Rommel had been forced to leave behind. Well aware of the importance of his find, he became even more interested when he paced off the distance from the gun position to a destroyed Matilda tank and recognized the 88 for the menace it undoubtedly was. The big problem was to get the 88 sent to the United States. All captured equipment went to British shops in Alexandria, and the British usually refused to release any of it, being so short of weapons that they repaired and reused all that they could. Somehow Jarrett managed to obtain the gun at the yards in Alexandria, and with the help of Capt. William E. Summerbell of the Military North African Mission and a gang of mechanics he took it apart, carted it in trucks to Cairo, and got it aboard two DC–3 (C–47) airplanes bound for Accra. There it was transferred to new C–54's, just then coming into service, and flown to the United States via Ascension Island. When it arrived at Aberdeen Prov-

[23] (1) Heinz Werner Schmidt, *With Rommel in the Desert* (London: Harrap, 1951), p. 65. (2) J. A. I. Agar-Hamilton and I. C. F. Turner, *The Sidi Rezeg Battles 1941* (Cape Town: Oxford University Press, 1957), pp. 45–46. (3) I. S. O. Playfair, *The Mediterranean and Middle East*, II, *1941* (London: Her Majesty's Stationery Office, 1956), 173, 429.

[24] Ltr, Col George B. Jarrett to Lida Mayo, 5 Mar 64.

[25] Playfair, *The Mediterranean and Middle East III*, p. 429.

[26] B. H. Liddell Hart, ed., *The Rommel Papers* (London: Collins, 1953), p. 196. (2) Ltr, Col Jarrett to Lida Mayo, 28 Mar 63. (3) Military Attaché Cairo #2122, 6 Jan 42, and Incl, Rpt of Maj Joseph M. Colby on Visit to Western Desert, Dec 17 to 23 incl, OKD 451.25/330.1. (4) Connell, *Auchinleck*, p. 390. (5) Playfair, *The Mediterranean and Middle East III*, 198–99. (6) Msg, Military Attaché Cairo to War Dept, 12 Jan 42, sub: Western Desert Tank Situation, File, Cables Incoming, Paraphrase of Secret Messages 1941 (sic). This message notes: "Slow and inadequate repair facilities will cost the British many months time before their 674 damaged tanks can be rendered action trim."



THE U.S. 90-MM. AND THE GERMAN 88-MM. ANTIAIRCRAFT GUNS *(left and right, respectively) at Aberdeen Proving Ground, 1943.*

ing Ground the 88 was put together and carefully studied. The findings contributed to one of the most important weapon developments on the Allied side—the conversion of the American 90-mm. antiaircraft gun to antitank use.[27]

Tank-to-Tank Battles in the Desert

On the relative merits of the German and Allied tanks used in the desert campaigns, discussion raged at the time in bivouacs and messes and on the terraces of Cairo, and continued long after the war to rage on paper. A great deal of the argument concerned the penetrative power of the tank guns employed in the Winter Battle: the 2-pounder (40-mm.) guns on the British tanks and the 37-mm. on the American Stuarts versus the short-barreled, low-velocity 50-mm. tank gun, *Kwk* (*Kampfwagenkanone*) on the main German fighting tank, the *Pzkw* (*Panzerkampfwagen*) III. Less was said about the short-barreled, low-velocity 75-mm. *Kwk* on the Germans' secondary tank, the

[27] Ltrs, Col Jarrett to Lida Mayo, 28 Mar 63, 5 Mar 64.

Pzkw IV, because it normally fired high-explosive (HE) rather than antitank ammunition.

Writing in 1959, Capt. B. H. Liddell Hart, a British authority on tanks, concluded that the 2-pounder was a shade superior to the short 50-mm. *Kwk* and that the 37-mm. had considerably better penetration. He based his conclusion on figures published in 1956 in Volume II of the official British history, *The Mediterranean and Middle East,* by Maj. Gen. I. S. O. Playfair.[28] But General Playfair in his Volume III, after further work on captured German documents, revised his figures to show that the 2-pounder was not superior to the short 50-mm. *Kwk* and that the 37-mm. (using capped ammunition) was only slightly better than the 2-pounder.[29] All figures on which these various calculations were made were for penetration of homogeneous armor plate. Beginning in late 1941 many of the *Pzkw* III's and some of the *Pzkw* IV's had extra face-hardened plates that would defeat the 2-pounder except at very short ranges. At the time of the Winter Battle, Eighth Army tank gunners complained that their 2-pounder shot bounced off German armor. Major Jarrett, who tested all German and Allied tank guns while he was in Egypt, contended that except at very short ranges the British and American guns were ineffective against both the *Pzkw* III and the *Pzkw* IV, while the short 50-mm. *Kwk* and the short 75-mm. *Kwk* as well, whose HE shells were capable of damaging tracks and bogeys at 2,000 to 3,000 yards, did much damage to all Allied tanks except the Matildas.[30]

When the desert battles were resumed at the Gazala Line with Rommel's attack in late May 1942, Eighth Army had 167 new American tanks of a type far more effective than the light Stuarts, which by then had come to be employed mainly as reconnaissance and observation vehicles. The new tank was the M3 Grant. Its appearance was rather singular. Mounted in the sponson (with very little traverse) was the M2 75-mm. field gun with excellent high-explosive effect; mounted in the turret was the 37-mm. antitank gun. The Grant was the only tank to fire both HE and AP ammunition. The British crews liked it, and the Germans were surprised by the thickness of its armor, which enabled it to get close enough to inflict deadly shell-bursts on infantry and gun crews with its 75-mm. gun. One German antitank officer at Gazala considered the tank more nearly a match for the *Pzkw* III and IV of the time than anything the British had yet sent into the desert. And the supply seemed inexhaustible. In the British retreat—the "Gazala Gallop" that enabled Rommel to enter Tobruk on 21 June 1942—nearly half the 167 Grants were destroyed, mostly by 88-mm. guns, but more Grants continued to arrive in Egypt, and by the time of the battle of El 'Alamein in October 1942 there were 210 Grants in Eighth Army. By then, Montgomery also had 270 of the best American tank yet

[28] (1) B. H. Liddell Hart, *The Tanks: The History of the Royal Tank Regiment and Its Predecessors* (New York: Praeger, 1959), II, 93, 154. (2) Agar-Hamilton and Turner in *The Sidi Rezeg Battles 1941,* take much the same position as Liddell Hart, and cite Playfair's Volume II.

[29] Playfair, *The Mediterranean and Middle East III,* pp. 442–43; for the 37-mm. see p. 28.

[30] (1) Liddell Hart, *The Tanks,* II, 93, 156. (2) Playfair, *The Mediterranean and Middle East II,* p. 343. (3) Playfair, *The Mediterranean and Middle East III,* p. 435. (4) Ltr, Col Jarrett to Lida Mayo, 17 Sep 63, and incl.



TWO SHERMAN M4 TANKS MOVING TOWARD THE FRONT

produced—the M4 Sherman, mounting the M3 75-mm. gun (with a somewhat longer barrel, though little more velocity, than the Grant's M2). The 75-mm. gun was mounted in the first American 360-degree turret. Because of its rather high silhouette, Rommel's men referred to it as the "high-domed" Sherman, but they soon learned to respect the "incredibly good" armor on its turret.[31]

New German tanks had also begun to arrive in the desert by May 1942. The first was the *Pzkw* III Special, which had more firepower and better armor and which arrived in sufficient numbers to participate in the fighting at Gazala. It had the long-barreled 50-mm. *Pak* 38 antitank gun, now designated the *Kwk* 39; it also had "spaced armor" (an extra 20-mm. plate bolted four inches in front of the basic 50-mm. plate on the mantlet), which made it remarkably resistant to armor-piercing shot. By mid-June the Germans also had a few *Pzkw* IV Specials, mounting the long-barreled, high-velocity *Kwk* 40 75-mm. gun—the ominous forerunner of the formidable gun on the Panther tank that was to be introduced in Italy. The guns on both the "Specials" had considerably higher muzzle velocity than those on either the

[31] (1) Schmidt, *With Rommel in the Desert*, pp. 133–34, 185–89. (2) Liddell Hart, *The Tanks*, II, 155. (3) Agar-Hamilton and Turner, *Crisis in the Desert May–July 1942*, p. 67. (4) Playfair, *The Mediterranean and Middle East III*, pp. 243, 437. (5) Jarrett, Middle East 1942, p. 173, MS, Jarrett Collection.

Grant or the Sherman, and also better ammunition. But these new tanks were very scarce. At the start of the battle of El 'Alamein on 23 October 1942 the Germans had only 88 *Pzkw* III Specials and 30 *Pzkw* IV Specials.[32]

After El 'Alamein Major Jarrett spent considerable time examining wrecked tanks. He concluded that most of the German tanks destroyed in the battle had either been hit during Montgomery's "colossal" artillery barrage at the start or had been set afire by their own crews when they ran out of gas. Finding only a few German tanks showing evidence of Allied tank gun hits, he was convinced that in tank-to-tank battles "the Germans had out-gunned us."[33] However, German tanks at El 'Alamein had been badly outnumbered. Eighth Army started the battle with more than 1,100 tanks and brought up 200 more during the action, while *Afrika Korps* had barely 200 gun-armed German tanks, plus 280 poorly armed, thin-skinned Italian medium tanks that had little effect on the outcome. Moreover the German tanks did not have complete freedom of maneuver because of a gasoline shortage, and their power plants were inferior to those on American tanks. The mechanical reliability and mobility of the American tanks were highly praised by the British, and Montgomery's skillful use of the plentiful Shermans in his desert victories at El 'Alamein and after, backed by massive artillery barrages, was so impressive that the U.S. Army became committed to the Sherman as the main American tank of World War II.[34]

Antitank Weapons and Ammunition

Whatever the differences of opinion regarding the tanks in the desert battles, there was general agreement then and later that the German antitank weapons were superior to those of the Allies. The 88-mm. was Rommel's most spectacular weapon of this type, but it was by no means his only effective one. Beginning in May 1941 and continuing through 1942 the standard equipment of German antitank batteries was the *Pak* 38, a long-barreled, high velocity 50-mm. gun with a penetration nearly half as much again as the British 2-pounder antitank gun, and a range in proportion. It also had an excellent sight that gave it great accuracy and was so low to the ground that it became almost invisible when dug a foot deep into the sand and covered with a camouflage net.[35]

The British brought to the desert warfare in May 1942 a 6-pounder (57-mm.) antitank gun, which had a performance about 30 percent better than that of the *Pak* 38. Much was hoped from "these venomous little cannons"; but because there had been too little time for men to train with them, the weapons did not always live up to expectations.[36] In any case, by the time the

[32] (1) Playfair, *The Mediterranean and Middle East III*, pp. 436, 442–43. (2) Jarrett, Middle East 1942, p. 173, MS, Jarrett Collection. (3) Liddell Hart, *The Tanks*, II, 229; for a comparison of all tank guns, German and Allied, see table, page 98.

[33] Jarrett, Middle East 1942, pp. 174, 182–83, MS, Jarrett Collection.

[34] (1) Liddell Hart, *The Tanks*, II, 229. (2) The Germans referred to the Italian tanks as *rollende Särge*—"mobile coffins." Agar-Hamilton and Turner, *The Sidi Rezeg Battles 1941*, p. 36. (3) Liddell Hart, *The Rommel Papers*, p. 196. (4) Jarrett, Middle East 1942, p. 182, MS, Jarrett Collection. (5) Green, Thomson, and Roots, *Planning Munitions for War*, pp. 278–83.

[35] (1) Agar-Hamilton and Turner, *The Sidi Rezeg Battles 1941*, pp. 10, 16, 33, 44–45. (2) *Crisis in the Desert*, p. 11.

[36] Liddell Hart, *The Tanks*, II, 156, 202.



AIMING A BAZOOKA

6-pounder appeared the Germans had a new antitank gun that considerably outmatched it. Major Jarrett, riding with a British patrol between the British and German lines near Bir Hacheim in March 1942 was fired on by a German patrol with a gun that seemed remarkably accurate. After Rommel was driven off, leaving some of his weapons behind, Jarrett found that the gun was a 76.2-mm. Russian piece that the Germans had captured by the thousands in the early part of the war and adapted to their own use, primarily as a *Pak* gun. By May 1942, 117 of them had arrived at Cyrenaica, and some appeared at Gazala in a self-propelled version mounted on 5-ton half-tracks or on tanks. At El 'Alamein the 76.2 effectively supplemented Rommel's dwindling supply of 88's—he was down to twenty-four 88's in late October 1942. This light and efficient gun, sometimes referred to as the 76.2-mm. Putilov, was sent to Aberdeen Proving Ground and led to the serious study there of all Russian matériel.[37]

[37] (1) Ltr, Col Jarrett to Lida Mayo, 29 Mar 63. (2) Liddell Hart, *The Tanks*, II, 227–29. (3) Playfair, *The Mediterranean and Middle East III*, pp. 437, 442–43. (4) The 76.2-mm. gun sent

The ammunition used in German antitank and tank guns contributed much to their success. Calibers of 50-mm. and larger had armor-piercing caps to help penetration and ballistic caps to reduce air resistance—a virtue possessed on the Allied side only by the shot used in the American 37-mm. gun. Adapting captured 75-mm. APCBC (armor-piercing-capped, ballistic-capped) ammunition for use in the American Grant tank's 75-mm. gun, which meant reworking the rotating bands, was a major effort in the Royal Army Ordnance Corps workshops in preparing for the May 1942 offensive, an effort to which Major Jarrett contributed so largely that he was decorated by the British Government. Other very effective German antitank rounds were the AP-HE (armor-piercing, high-explosive) fired by the 88, which had an explosive as well as a "hole-punching" effect, and the *Panzergranate* (*Pzgr*) 40, a tungsten-carbide-cored AP shot fired by most German guns, though in small proportions because of its scarcity.[38]

In the summer of 1942 the Germans began using "hollow charge" ammunition to increase the effect of their low-velocity guns. This type of ammunition (which the Americans called "shaped charge") depends on its own explosive action rather than the kinetic energy of the projectile. It improved the armor-piercing action of the short-barreled 75-mm. *Kwk* on the *Pzkw* IV, and of the old French 75's of World War I vintage that the Germans had captured in large quantities at the beginning of World War II and converted to antitank use by mounting them on the *Pak* 38 carriage.[39]

In September of 1942 a ship from America docked at Suez with some highly secret cargo—600 bazookas, the first the men in the theater had seen. Then known only under the code name of THE WHIP, the bazooka (so called because of its resemblance to a musical instrument improvised by a popular radio comedian of the time) was a shoulder projector launching an effective 2.36-inch antitank rocket. For the first time in history a foot soldier had a weapon specifically designed to penetrate armor. When Jarrett took a sample to the big British ammunition dump along the Suez Canal and dissected it, he was amazed to find in the rocket the German hollow-charge antitank principle; the secret had been so well kept that he had not known of the similar American shaped charge. During a demonstration the bazooka proved that at very close ranges it could penetrate the 50-mm. armor plate of a *Pzkw* III.[40]

to Aberdeen Proving Ground had the original Russian chamber. Later the Germans rebored the chamber to take German 75-mm. *Pak* ammunition, which had a higher velocity than the Russian round. Ltr, Col Jarrett to Lida Mayo, 5 Mar 64.

[38] (1) Playfair, *The Mediterranean and Middle East III*, pp. 442–43, 437–38. (2) Ltr, Col Jarrett to Lida Mayo, 28 Mar 63. (3) Jarrett, Middle East 1942, pp. 158–60, MS, Jarrett Collection. (4) For application in the United States of information in early reports from North Africa on the failure of uncapped AP shot against German face-hardened armor, see Green, Thomson, and Roots, *Planning Munitions for War*, p. 372.

[39] (1) Playfair, *The Mediterranean and Middle East III*, p. 438. (2) Pamphlet, U.S. Army Ordnance Center and School, *Things to See at the Ordnance Museum* (Aberdeen Proving Ground, Md., 1963), p. 23. (3) Green, Thomson, and Roots, *Planning Munitions for War*, pp. 212–13. (4) Leslie E. Simon, *German Research in World War II* (New York: J. Wiley and Sons, Inc., 1947), pp. 118–20.

[40] (1) Jarrett, Middle East 1942, pp. 158–61, and Achtung Panzer: The Story of German Tanks in WW II, pp. 160–62, both in MS, Jarrett Collection. (2) Green, Thomson, and Roots, *Planning Munitions for War*, pp. 357–59.



THE PRIEST, A SELF-PROPELLED HOWITZER, EGYPT

After the demonstration, the British concluded that the bazooka was unsuitable for desert warfare, since the desert provided none of the concealment, such as trees or bushes, that the bazooka operator needed to hide him from small-arms fire until the tank came close enough for his rocket to be effective. Therefore they decided, reluctantly, not to employ bazookas in the Middle East, and the shipment was presumably placed in storage. The first use in North Africa was in the Tunisia Campaign in the spring of 1943. By then the new weapon was no longer a secret to the Germans. At the first demonstration in Washington, D.C., in May 1942 Soviet observers had requested bazookas. Consequently, a large shipment arrived in the USSR about the same time as the arrival of the shipment to Egypt. Apparently the Germans captured a bazooka in the Soviet Union very soon thereafter and copied it in a larger size, providing it with an 88-mm. rocket. This copy, known as the *Panzerschreck,* was superseded by the *Panzerfaust,* which was to do much damage in Europe in 1944–45.[41]

[41] (1) Ltr, Col Jarrett to Lida Mayo, 20 May 66. (2) Green, Thomson, and Roots, *Planning Munitions for War,* pp. 358–59. (3) Simon, *German Research in World War II,* pp. 187–88. (4) For performance of the *Panzerfaust* in Europe, see below, p. 333.

Applying the Lessons

Thanks to very early reports on Rommel's use of antitank guns in the desert battles, Montgomery had at El 'Alamein an American self-propelled antitank gun, which the British called the "Priest" because of its pulpitlike machine gun platform. It had been hastily devised in the United States by mounting a 105-mm. howitzer on an M3 tank chassis. Information from the desert gave great impetus to the "tank destroyer" program already initiated by the Ordnance Department; also, it convinced Army Ground Forces planners, including Lt. Gen. Lesley J. McNair, commanding general of AGF, that the proper adversary of the tank was the antitank gun rather than another tank, a conviction that to some extent hindered Ordnance in developing a more powerful tank than the Sherman. This was one example of a tendency among U.S. Army planners to apply the early experience of the Allies without enough imagination or flexibility. To cite another example, the British experience with the Germans' deadly antitank Teller mines in Libya led to an ambitious program in the United States for developing an effective mechanical mine exploder along the lines of the British Scorpion, a program that consumed much money and effort and contributed little toward solving the mine problem.[42]

On the other hand, Americans learned valuable lessons in the desert. First tested in the desert were not only tanks and antitank guns and ammunition but also new developments such as gyrostabilizers that enabled the tank to fire while moving. Some of the Shermans that arrived in Egypt in the fall of 1942 were equipped with the gyrostabilizers—an early model not yet tested in combat. Also, Americans gained useful experience on trucks and tank transporters, the latter an early British invention that was to play an important part in Europe, not only as a tank transporter but as a cargo carrier. And the desert continued to be most productive in captured enemy matériel; for example, shells of the 170-mm. gun, which was to inflict much damage later in Italy, were first examined after El 'Alamein. Following Jarrett's pioneer efforts, an Ordnance seven-man team went to Cairo in the summer of 1942 and sent by ship to Aberdeen Proving Ground about 3,000 tons of assorted matériel for study. This team was the forerunner of the Ordnance Technical Intelligence Teams later sent to all theaters, beginning with North Africa in December 1942.[43]

[42] (1) Col. H. W. Miller, "After the Tank, What?," *Army Ordnance*, XXVI, 142 (January–February, 1944), p. 87. (2) Green, Thomson, and Roots, *Planning Munitions for War*, pp. 315, 389–94. (3) See also below, p. 331.

[43] (1) Jarrett, Middle East 1942, pp. 80–83, 170–71, 183, MS, Jarrett Collection. (2) Green, Thomson, and Roots, Planning Munitions for War, pp. 262, 342–43. (3) On tank transporters, see below, pp. 122, 343. (4) Lt. Col. G. Burling Jarrett, "Desert Salvage: An Account of the First U.S. Ammunition Detachment in Africa," *Army Ordnance*, XXV, 140 (September–October, 1943), p. 354.

CHAPTER III

Early Arrivals in Australia

After the attack on Pearl Harbor, the spotlight swung away from the Middle East. For the next three weeks it focused on the west coast of the United States and the Alaska-Hawaii-Panama triangle, where defenses had to be bolstered. Following the arrival of British Prime Minister Churchill in Washington at the end of December, it began to swing back toward the North Atlantic. In January, the shock of the crisis in the Far East, where the Philippines were threatened, brought about another quick shift of emphasis. The spotlight then focused on Australia, where, with the dramatic arrival of the *Pensacola* convoy in late December 1941, the Americans had begun to build up a logistical base.[1]

The Pensacola Convoy

The U.S. naval transport *Republic,* just returned from carrying troops to Iceland, sailed from San Francisco for the Philippines on 21 November 1941 with the ground echelon of the 7th Heavy Bombardment Group, an Army Air Forces unit of B–17 bombers dispatched to bolster General MacArthur's air strength. The B–17's, which could be flown across the Pacific, were then being prepared for the long flight at Hamilton Field, California. Taking off on 6 December, they were over Oahu in the midst of the attack on Pearl Harbor.[2]

Among the ground elements of the bombardment group aboard the *Republic* was the 453d Ordnance (Aviation) Bombardment Company, one of three types of Ordnance companies designed to support the three types of air groups—bombardment, pursuit, and air base. Normally, an Ordnance bombardment company consisted of 6 officers and 181 enlisted men, and its equipment was considerable: 40 bomb trailers and 20 bomb service trucks to haul them, 4 shop trucks for emergency repairs, and 18 cargo and pickup trucks; but the 453d still did not have its full complement of men and equipment since there had been only ten days for preparation. Its

[1] Leighton and Coakley, *Global Logistics and Strategy, 1940–1943,* pp. 165–67.

[2] (1) Brig Gen Julian F. Barnes, Report of Organization and Activities, U.S. Forces in Australia, December 7, 1941–June 30, 1942 (hereafter cited as Barnes Rpt), p. 8, photostat copy, OCMH. (2) Ltr, Byrne C. Manson to Lida Mayo, 2 Jul 56, Manson File, OCMH. (3) Wesley F. Craven and James L. Cate, eds., "The Army Air Forces in World War II," vol. I, *Plans and Early Operations: January 1939 to August 1942* (Chicago: University of Chicago Press, 1948), 199–200 (hereafter cited as *AAF I*). (4) The Barnes Report and the Manson File, consisting of Manson's personal files and correspondence between Manson and the author have been relied upon throughout this chapter. Other principal sources have been two volumes in the series UNITED STATES ARMY IN WORLD WAR II, both by Louis Morton: *The Fall of the Philippines* (Washington, 1953) and *Strategy and Command: The First Two Years* (Washington, 1962).

commander, 1st Lt. Byrne C. Manson, who had been attending the Ordnance School at Aberdeen, Maryland, had joined the company on 1 November.[3]

Arriving at Honolulu on 28 November, the *Republic* on the 29th joined a convoy being escorted by the cruiser *Pensacola* and the submarine chaser *Niagara*. Other vessels in the convoy were three other transports, the *Chaumont*, the *Meigs*, and the *Holbrook*, and three freighters, the *Admiral Halstead*, the *Coast Farmer*, and the *Bloemfontein*, the last flying the Dutch flag. Of the transports, only the *Republic* and *Holbrook* carried troops and equipment. The *Chaumont* and the *Meigs* carried aircraft, bombs, guns, antiaircraft ammunition, and general supplies; the entire deck space of the *Meigs* was crowded with fifty knocked-down A–24 dive bombers. The small freighters were mainly loaded with peacetime supplies for civilian shops in Manila and Guam. The *Bloemfontein* also carried passengers, mostly civilians, some of whom were en route to China and the Java area to serve as consultants in setting up motor maintenance shops.[4]

Proceeding at approximately ten knots, the speed of the slowest freighters, the *Pensacola* convoy took a southwesterly course toward the Philippines through the South Pacific instead of the usual westerly course through the Japanese mandated islands. Commander Guy Clark, the captain of the *Republic*, told Brig. Gen. Julian F. Barnes, the senior Army commander, that the course was to be via Port Moresby, New Guinea. On 6 December the convoy crossed the equator, and there was the largest Army shellback initiation up to that time.

On 7 December at 1100 Commander Clark received a radio message that Pearl Harbor was being attacked. He assumed that a radio operator had picked up a message issued during naval maneuvers, but a later message from the Commander in Chief, U.S. Asiatic Fleet, left no room for doubt: "Japan started hostilities govern yourself accordingly." Over the *Republic*'s intercom, Commander Clark made the announcement: "Attention all hands, a state of war exists between Japan and the United States. Pearl Harbor has been attacked. Good luck."

In the next few days the convoy prepared to defend itself. Brown and white superstructures and lifeboats were painted gray. Cargo was searched for deck weapons, since most of the ships had no means of defense. The hold of the *Republic* yielded four British 75-mm. guns, which the men of the 453d lashed to the deck, although there was no ammunition for them. Tension in the convoy mounted when a radio reported a Japanese task force in the Ellice Islands, 300 miles off the starboard quarter. A stop at Suva in the Fiji Islands, ordered by the Navy on 8 December for the purpose of awaiting

[3] (1) Capt. John F. Foy, "The What and Why of Aviation Ordnance," *The Ordnance Sergeant*, II (December, 1941), 372–80. (2) Incls to Ltr, Byrne Manson to Lida Mayo, 15 Feb 55, Manson File.

[4] (1) For the importance at this time of the maintenance of lend-lease trucks on the Burma Road to China, see above, p. 15. (2) For the efforts of the Dutch to bolster their defenses in the Netherlands Indies, including the construction of air bases on Java with trucks and other lend-lease matériel, see Maj. Gen. S. Woodburn Kirby, "History of the Second World War, United Kingdom Military Series," *The War Against Japan*, vol. I, *The Loss of Singapore* (London: Her Majesty's Stationery Office, 1957), pages 72–76, and Leighton and Coakley, *Global Logistics and Strategy, 1940–1943*, page 88.

further orders, made possible a search for additional weapons. The Ordnance men found some American 75-mm. ammunition on the *Holbrook* and improvised gun sights and mounts. They also found a quantity of .50-caliber aircraft guns with ammunition, and improvised pipe stands for them on the boat deck.[5]

On 12 December the American troops aboard the convoy were constituted Task Force South Pacific, under the command of General Barnes. General Barnes appointed Lieutenant Manson Ordnance officer and Lt. W. R. Clarke commander of the Ordnance company. Soon afterward, messages from Washington and from the Philippines made the task force's destination and mission clear. It was to proceed to the east coast of Australia and land at Brisbane, where it would be met by Maj. Gen. George H. Brett, an Air Corps officer then in Chungking. Brett had been directed to establish in Australia a service of supply in support of the Philippines. His assistant was to be Brig. Gen. Henry B. Claggett, who had held an air command in the Philippines and was on his way to Australia from Manila. Upon debarkation at Brisbane, Task Force South Pacific would become United States Forces in Australia (USFIA).

The convoy arrived at Brisbane's outer harbor, Moreton Bay, at noon on 22 December, escorted by Australian and New Zealand warships. From Moreton Bay, a sheet of blue water broken by small green islands and edged by palm-fringed yellow beaches, Brisbane is fourteen miles up the Brisbane River. A harbor boat brought Col. Van S. Merle-Smith, U.S. military attaché, and some Australian Army and Navy officers to Moreton Bay and took General Barnes and a small staff to Brisbane, where they established USFIA headquarters, the first American headquarters in Australia, at Lennon's Hotel late in the afternoon of 22 December. A logistical and administrative command, it came under General MacArthur's United States Army Forces, Far East (USAFFE). That evening General Claggett arrived, assumed command of USFIA, accepted the staff established aboard the *Republic,* and designated Barnes his chief of staff. General Brett, who was completing his tour of the Middle East, India, and China, did not arrive from Chungking until 1 January 1942.

As the *Pensacola* and her convoy steamed upriver, the men at the rails saw cheering crowds along the banks. A city of some 300,000 people, Brisbane is set in an amphitheater of greenish blue hills. It sprawled for miles on either side of the river, the two portions connected by bridges and small darting ferry launches. There were a few tall granite buildings and smoking factories, but the city was somehow reminiscent of a frontier town in the Wild West, with pillared porticoes extending over sidewalks in the business section and low corrugated iron roofs covering warehouse sheds. The men at the rails saw palms everywhere, and strange flowers in the public gardens. Strangest of all, a few days before Christmas it was midsummer in Australia. For Brisbane, halfway down the eastern coast, is subtropical, lying between the sparsely settled tropical north

[5] (1) Ltr, Byrne Manson to Lida Mayo, 2 Jul 56. (2) For indecision in the United States on the fate of the convoy, which had very nearly been ordered back to Hawaii on 9 December, see Morton, *Strategy and Command,* pages 148–51.

and the great cities of Sydney and Melbourne on the more moderate southeastern coast.[6]

The troops debarked on the afternoon of 23 December and were taken to temporary quarters at Amberley Field and two local race tracks. The 453d Ordnance (Aviation) Bombardment Company was assigned to the Doomben race track about six miles from the city. The Australian Army provided tents and messing facilities. By 26 December storage arrangements for Ordnance equipment had been completed in the Hedley Park area, where Class II supplies (weapons and other basic equipment) were stored in a wool warehouse and ammunition in the yard of a local school.[7]

General Claggett's first task was to get the cargoes of the *Pensacola* convoy north to the Philippines in the *Holbrook* and the *Bloemfontein,* the two fastest ships. With the help of Australian stevedores, the U.S. troops reloaded men and supplies and assembled the aircraft, working straight through a warm and sunny Christmas Day, taking time out only for a Christmas dinner of cold bologna sandwiches and milk. By 30 December the ships were loaded and steaming north, but enemy successes in the Philippines and the rapid Japanese advance into the Netherlands Indies made it impossible for them to get through. When General Brett arrived in Brisbane on New Year's Day, he ordered the convoy to put in at Darwin, on the northern coast of Australia.[8]

Last-Ditch Efforts To Aid MacArthur

Beginning in early January, an intensive effort was made to ship rations and ammunition to General MacArthur's troops in the Philippines in small, fast ships that might break the Japanese blockade. At the end of January, forty enlisted men and several officers of the 453d Ordnance Company at Brisbane volunteered to serve as an armed guard for the blockade runner *Don Isidro.* From the enlisted men, fifteen were selected by Clarke, the commanding officer. To determine who would command the unit, the officers tossed a coin, and 2d Lt. Joseph F. Kane won. Kane and his men began to arm the *Don Isidro,* which was a small passenger liner that had operated between islands of the southwest Pacific. Since no other suitable guns or mounts were available, they placed five .50-caliber heavy machine guns on the ship, improvising the mounts with the help of a local manufacturer.

The ship left Brisbane on 27 January. North of Australia she was attacked by Japanese aircraft and after two successive days of bombing and strafing, 19–20 February, was beached on Bathurst Island, north of Darwin. A mine sweeper rescued the survivors. Eight of the 15-man crew from the 453d Ordnance Company were wounded, several seriously. Kane, severely wounded in the leg and foot, died of gan-

[6] (1) *A History of the U.S.S. Pensacola with Emphasis on the Years She Served in the Pacific During World War II* (San Francisco: Phillips and Van Orden Co., Inc., 1946), p. 17. (2) Charles W. Domville-Fife, *Australian Panorama* (Bristol: Rankin Bros., n.d.), pp. 101–10. Pat Robinson, *The Fight for New Guinea, General Douglas MacArthur's First Offensive* (New York: Random House, 1943), p. 13.

[7] (1) History of G–4, USAFIA, 7 Dec 41–Jul 42, pp. 1–2. (2) History of Ordnance Section, USASOS, 23 Dec 41–2 Sep 42, p. 1.

[8] AAF Historical Studies 9, The AAF in Australia in 1942, Air University, Maxwell AFB, p. 13.

grene in an Australian hospital at Darwin. He was the first member of the Ordnance Department killed in the Southwest Pacific; an ammunition depot at Geelong, across the bay from Melbourne, was subsequently named for him. The rest of the men from the *Don Isidro* were attached to a platoon of the 453d that Manson had sent up to Darwin to help establish an air service depot at Batchelor Field in support of air units operating between there and the Netherlands Indies.[9]

Two weeks after the *Don Isidro* left Brisbane another detachment of volunteers from the 453d Ordnance Company was assigned as gun crew to the small freighter *Coast Farmer* for a trip to the Philippines. Sailing from Brisbane on 10 February, the *Coast Farmer* succeeded in reaching Mindanao in the southern Philippines, discharging its cargo, and returning safely. One member of the Ordnance group who had gone ashore to repair some machine guns did not return before the ship sailed and had to be left behind.[10]

[9] (1) History of Ord Sec, USASOS, 23 Dec 41–2 Sep 42. (2) Rad, Melbourne to AGWAR, No. 311, 22 Feb 42, AG 381 (11-27-41) Sec 2C. (3) Rpt of Ord Activities, USAFIA, Feb–May 42, OHF. (4) Official History of Headquarters USASOS, December 1941–June 1945 (hereafter cited as History USASOS), pp. 92–93, and chs. viii–xi. (5) Lieutenant Kane received the Purple Heart posthumously. All of the enlisted men of the 453d Ordnance (Aviation) Bombardment Company aboard the *Don Isidro* also received the Purple Heart for manning their guns until they were put out of action, for extinguishing fires caused by the bomb explosions, and for helping the wounded (some despite their own wounds). GO 28, USASOS SWPA, 11 Oct 42, 98-GHQ1-1.13. These men were among the last to receive the Purple Heart "for a singularly meritorious act of essential service," according to AR 600-45 of 8 August 1932. Change 4 to AR 600-45, 4 September 1942, restricted the award to those wounded in action against the enemy or as a direct result of enemy action.

[10] (1) History of Ord Sec, USASOS, 23 Dec 41–2 Sep 42, pp. 1–2. (2) History USASOS, p. 93. (3) Rpt of Ord Activities, USAFIA, Feb–May 42, p. 1.

Planning the American Base

General Brett saw little hope of sending any effective help to the Philippines. He favored building a base in Australia from which the offensive could eventually be taken through the Netherlands Indies and the islands to the north. Hurrying to Melbourne, which was more nearly the actual center of government than the new capital, Canberra, he established his headquarters there on 3 January in three rooms in Victoria Barracks, the location of Australian military, air, and naval headquarters. Brett immediately began a series of conferences with the Australian chiefs of staffs that resulted in the formation of several joint committees and in the emergence of a general policy on how best the American forces could be used and where.[11]

General Brett's main base would have to be near a port and near a city, for it needed docks, water, power, and good communications; these were not conflicting demands, for all major Australian cities are port cities. The interior of the great continent is arid and undeveloped. The seven million people lived mostly along the eastern and southeastern coast, more than two million of them in Sydney and Melbourne. Sydney was ruled out by the Australian naval chief of staff as an American Army and Air base because of existing demands and an extreme water shortage. The choice of the Australians was Melbourne, which they considered easier to defend than Brisbane and other areas farther north.

General Brett preferred Brisbane. Following instructions from the War Depart-

[11] Craven and Cate, *AAF I*, pp. 231–32.

ment to adapt his logistical plan to strategic requirements, Brett decided to place all of his bases in the north rather than in the south. The primary base depot, for the assembly, repair, and maintenance of all types of aircraft, was to be at Brisbane. There would be a secondary base depot, for the assembly of light aircraft and such repairs and maintenance as were possible, at Townsville, a small resort town some 700 miles up the east coast. The advance depot and main operating and first-line maintenance base would be at Darwin, a little tropical town on the northern coast that had recently become important because it was the nearest jump-off point for the Netherlands Indies—within three and a half hour's flying time to the nearest point in the Indies. The main debarkation point for U.S. troops would be Melbourne, preferred to Brisbane because of the greater facilities available, particularly water supply. At Melbourne a reception and replacement center would be established where organizations could be formed out of the new arrivals and training given if necessary.

While the Americans and Australians were conferring, the British and U.S. Governments established a command that included Burma, Malaya, the Netherlands Indies, and the Philippines. Called the ABDA (American-British-Dutch-Australian) Command, it was under Lt. Gen. Sir Archibald Wavell with General Brett as his deputy. In the second week in January Brett departed for the Netherlands Indies. His successor in Australia was Maj. Gen. Lewis H. Brereton, but within a few days Brereton was made deputy air commander in the ABDA area, which meant that he had to go to Java to command ABDAIR pending the arrival of the commander, Air Marshal Sir Richard Peirse. This made it physically impossible for Brereton to continue command of USFIA, now renamed USAFIA (United States Army Forces in Australia). At Brereton's request, General Wavell asked General Marshall to relieve Brereton of his responsibilities in Australia. Thereupon Marshall authorized General Barnes to assume command of USAFIA. Barnes was now under Wavell's command, and Brett as Wavell's deputy could issue orders to him.



COLONEL HOLMAN. *(Photograph taken after his promotion to brigadier general.)*

At Melbourne, the Ordnance Section of USAFIA was headed by Lieutenant Manson, who had come from Brisbane, leaving Lieutenant Clarke in charge of the Ordnance office there. Only a few officers to form general and special staffs for the new headquarters had arrived, flying to Aus-

tralia via North Africa, but they brought the news that the headquarters group had been "picked with care" by the War Department and was on the way.[12]

The men selected for the USAFIA headquarters were dubbed the "Remember Pearl Harbor" (RPH) Group. Consisting originally of thirteen experienced staff officers ordered to San Francisco from assignments all over the country, the group sailed on the two liners *President Coolidge* and *Mariposa* in the first major convoy sent to Australia after Pearl Harbor. Aboard the *President Coolidge* were the Ordnance members of the RPH Group—five officers and six enlisted men who were to make up the Ordnance Section on the USAFIA Special Staff. The ranking officer was Lt. Col. Jonathan L. Holman, whose most recent assignment had been in the Lend-Lease Administration in Washington. The others were Capts. Bertram H. Hirsch and Elwyn N. Kirsten, 1st Lt. Spencer B. Booz, and 2d Lt. Wallace W. Thompson.[13]

Along with the Remember Pearl Harbor Group the two liners, loaded to capacity, carried pursuit planes and large quantities of bombs, ammunition, and aircraft maintenance equipment and supplies, as well as signal and medical supplies and equipment. Troops aboard the ships included AAF, Engineer, and Signal units, and four Ordnance aviation companies. Most of the passengers and cargo were scheduled to be transshipped to ABDA area ports outside Australia. A great deal of the cargo was intended for troops slated to occupy New Caledonia.[14]

When the *Coolidge* anchored in Melbourne harbor on the afternoon of 1 February, Colonel Holman, standing at the rail of the huge liner, looked down at the dock and saw a small officer anxiously looking up and biting his fingernails. It was Manson. In addition to the heavy responsibilities that had been forced upon him, he had a more recent cause for worry. The 453d Ordnance (Aviation) Bombardment Company had been ordered from Brisbane to Melbourne by train to join the four Ordnance aviation companies aboard the *Coolidge* and the *Mariposa* on the voyage to Java, but had suffered a series of mishaps on the way. Rains following a long period of dry weather had brought floods that prevented the train from getting through. Lieutenant Erickson, who was in command (Clarke had been assigned to the base section at Brisbane), had got the men and equipment off the train and loaded in the company trucks, but by that time the roads were impassable, and they had to return to Brisbane.[15]

The immediate task of Holman's RPH staff and the Ordnance companies in the convoy was to help tackle the problem posed by the cargoes of the *Coolidge* and the *Mariposa,* including about 2,500 tons of bombs and ammunition. Unloading

[12] Ltr, Moore, DCofS to Brett, 19 Dec 41, copy in OCT HB, SWPA Organization File.

[13] (1) Orders and correspondence dealing with the RPH Group are in AG 370.5 (18 Dec 41) (4). (2) Interv, Stanley Falk with Maj Gen Jonathan L. Holman and Lt Col Elwyn N. Kirsten, 8 Oct 54.

[14] (1) Memo, Col C. P. Gross, Chief, Transportation Br, G-4, for CG, San Francisco Port of Embarkation, 31 Dec 41, sub: Vessels to Accompany Convoy to "X." (2) Memo, Gross for CG, SFPOE, 1 Jan 42, sub: Distribution of Space on *Coolidge* and *Mariposa*. Both in AG 400 (12-31-41). (3) Memo, Brig Gen Dwight D. Eisenhower, ACofS WPD, for TAG, 18 Feb 42, sub: Information for CG USAFIA Re Poppy [New Caledonia] Force, AG 381 (11-27-41) Sec 2B.

[15] Interv with General Holman, 12 Apr 56.

and unscrambling the matériel piled on the piers and removing it from the dock area to storage took about ten days. Warehouses were scarce. Ammunition could be stored in the open, and open storage was soon in widespread use throughout Australia because of lack of materials and labor to construct igloos. The men established a temporary dump for bombs, fuzes, and small arms ammunition in the Laverton area of Melbourne and used a shed about a mile from the port for classification and sorting. Kensington, a Melbourne suburb, was selected for the storage of general supply items. After some degree of order was restored, the four Ordnance aviation companies sailed for Java.

Colonel Holman remained in Melbourne only long enough to see that the unloading of Ordnance material was proceeding well and to establish the Ordnance office in the Repatriation Building on tree-shaded St. Kilda Road. He had been ordered north to ABDA Command headquarters on Java. Appointing Captain Hirsch Ordnance officer, he departed for Darwin on 8 February. He arrived on 19 February, only a few hours after the little port had suffered its first Japanese air attack; his immediate job was to help American artillery troops then at Darwin in the difficult task of planning for the salvage and repair of Ordnance equipment from bombed and sunken ships. The enemy raid was portentous, for by that time invading Japanese forces had ended Allied hopes of holding Java. ABDA Command headquarters withdrew from the island. The convoy with the four Ordnance companies, then at sea off the southern coast of Australia, was rerouted to India. Colonel Holman returned to Melbourne where, on 25 February, he became the USAFIA chief of Ordnance.[16]

Port Operations

In the early months of 1942, a great deal of the time of the USAFIA Ordnance Office was devoted to port operations. Between mid-January and mid-April, sixty-one "refugee" ships—ships at sea when the war began, bound for the Philippines, Hongkong, Singapore, or Java—were diverted to Australian ports, with "distress cargoes" amounting to nearly 200,000 tons of rations, ammunition, weapons (mostly machine guns), vehicles, and parts. Late in February the POPPY Force of about 22,000 troops—the largest movement yet attempted—landed in Australia, ultimately bound for New Caledonia. The heavy organizational equipment and other supplies of POPPY Force were shipped separately, and these cargoes had to be unloaded and then reloaded when the force left for New Caledonia. Cargoes had been loaded by hasty, untested methods and were badly scrambled. Manifests were vague, incomplete, or so inaccurate as to make a physical search necessary.[17]

The Australian stevedores available to help unload were usually middle-aged men,

[16] (1) History of Ord Sec, USASOS, 23 Dec 41–2 Sep 42, pp. 2–3. (2) Interv, Falk with Holman and Kirsten. (3) Rpt of Ord Activities, USAFIA, Feb–May 42, p. 1.

[17] (1) James R. Masterson, U.S. Army Transportation in the Southwest Pacific Area, 1941–1947 (hereafter cited as Masterson, Trans in SWPA), Monograph 31, Transportation Unit, Historical Division, SSUSA, October 1949, pp. 255–66, 268–69, OCMH. (2) Rpt of Ord Activities, USAFIA, Feb–May 42. (3) Army Service Forces, Control Division, Development of the United States Supply Base in Australia, the Period of Defense and Build-up (hereafter cited as Dev of U.S. Supply Base in Australia), pp. 24, 55–58, MS, OCMH.

capable of handling not more than 9 tons per hatch per hour, as compared with the 25 tons that the U.S. troops could discharge. Their ways were exasperating. They had a break in the middle of the morning for smoking—called a "smoke-o" —and another in the afternoon for tea, with one man on the pier delegated to keep the water hot for the tea; in this manner, one impatient Ordnance officer noted, they wasted two or three hours a day. They would not work in the rain and observed strict union regulations on hours, refusing to work on Saturday afternoons or Sundays, even though ships were docking with badly needed supplies, and threatening to strike when troops were assigned to do the emergency unloading.[18]

Ordnance officers at the ports found that local laborers and untrained troops could make tragic mistakes in handling military stores, a discovery of this early period that assumed greater importance as overseas operations accelerated all over the world. Lacking Ordnance Standard Nomenclature Lists (SNL's) and technical manuals, often they could not identify weapons, ammunition, and parts. They sometimes overlooked vital parts. The men loading the *Pensacola* convoy ships for the Philippines, for example, had spent days searching for the trigger motors and solenoids that controlled the firing of the guns on the A–24 dive bombers so desperately needed by General MacArthur. Afterward it was discovered that the solenoids, nailed inside the packing crates, had been overlooked and had been burned along with the crates. Replacements had to be rushed by air from the United States.[19]

For port duty the 453d Ordnance (Aviation) Bombardment Company was divided among three ports. The main body of the company (less ninety men) was at Brisbane, with one platoon at Darwin and another at Melbourne. The 453d continued to be the only Ordnance unit in Australia until mid-March, when there began to arrive the first elements of a shipment of nine Ordnance aviation companies; one antiaircraft medium maintenance company (the 25th); and sections of a depot and an ammunition platoon, all sent from the United States in response to a request by General Brett in January for Ordnance troops. He had requested more depot, ammunition, and maintenance men than were sent, but the planners in Washington, intent at the time on reinforcing the British Isles and thinking of Australia as an air base only, had not been able to comprehend the size of the port operations. Moreover, the planners had originally intended to depend heavily on local labor, not realizing that during three years of war the best of Australia's manpower had been drained off to the Middle East and elsewhere. It took the threat of a collapse of ABDA to bring about a change in War Department policy, and the dispatch of

[18] (1) Report, Information Furnished by Colonel Henry, Chief Ordnance Officer, Port of Embarkation, San Francisco, Relative to His Inspection Trip Throughout the South and Southwest Pacific (5/25/43) (hereafter cited as SWPA Rpt (Henry)), Folder, SWPA Report (Col William J. Henry), OHF. (2) Lt. Gen. George R. Brett with Jack Kokoed, "The MacArthur I Knew," *True* (October, 1949), p. 26.

[19] (1) Rads, Australia to AG, No. 723, 16 Mar 42, Maj Gen James A. Ulio, TAG, to CG USAFIA, Nos. 784 and 786, 21 Mar 42, all in AG 471 (10–1–41), Sec 2. (2) Interv with Captain L. B. Coats . . . , 21 Apr 42, AAF, 385-E Methods-Manners-Conducting Warfare. (3) Arnold, *Global Mission*, p. 290.

more Ordnance troops to aid in building up the base in Australia.[20]

[20] (1) Rpt of Ord Activities USAFIA, Feb–May 42. (2) Memo, Eisenhower for TAG, 16 Feb 42, sub: Units and Supplies to be Dispatched to SUMAC, AG 381 (11–27–41) Sec 2B. (3) Ltr, AG to CG American Forces in Australia, 20 Dec 41, sub: G–4 Administrative Order—Plan X, AG 381 (12–20–41). (4) DF's, Maj Gen Brehon B. Somervell to WPD, 15 Feb 42, and to G–3, 18 Feb 42, sub: Tables of Organization for "X," both in G–4/33861.

CHAPTER IV

The Base in Australia

After the bombing of Darwin on 19 February, Japanese air attacks were expected anywhere in Australia, at any time, possibly as a prelude to invasion. Americans felt the tension in the streets of Melbourne, crowded with refugees from Java, Malaya, and Singapore and U.S. Army trucks and soldiers, and darkened at night with a brownout. On the primitive Australian trains, where they dimmed the antiquated gas lamps and lay down on leather benches that pitched and rolled, Ordnance troops felt that they were headed toward combat zones. Raids on Darwin did continue for some time, and several took place on the northwestern coast at Broome and Wyndham. At Broome on 3 March, 35 or 40 people were killed (mostly refugees from the Netherlands Indies) and 20 aircraft were destroyed.[1]

The Japanese, having occupied Rabaul in January, on 8 March moved into Lae and Salamaua on the upper coast of eastern New Guinea, which put them in easy bombing distance of Port Moresby, the chief Australian outpost in New Guinea, about 700 miles across the Coral Sea from Townsville. This was the situation when General MacArthur arrived in Australia from the Philippines on 17 March. That same day he was named by the Australian Government as its choice for Supreme Commander of the Southwest Pacific Area (SWPA) and on 18 April officially assumed command of the new theater. MacArthur filled the top positions on his staff with the men who had come with him from Corregidor and who had served with him in USAFFE. In addition to the existing American commands, consisting of USAFFE (now a shadow command), United States Forces in the Philippines (USFIP), and USAFIA, MacArthur established three tactical commands within SWPA. These were Allied Land Forces under an Australian, General Sir Thomas Blamey; Allied Air Forces under General Brett; and Allied Naval Forces, also under an American, Vice Adm. Herbert F. Leary. American ground forces were assigned to USAFIA but came under General Blamey for operational employment.[2]

[1] (1) Unless otherwise indicated the material in this chapter has been based on the following: History USASOS, cited above ch. III, n9(4); History of Ordnance Section USASOS December 1941–September 1942; Reports of Ordnance Activities, USAFIA, February–May 1942 and June 1942, OHF; Reports of Ordnance Activities, USASOS SWPA, July–October 1942, OHF. (2) Memo, Maj Bertram H. Hirsch for COrdO, 21 May 42, sub: Report of Inspection of Ordnance Services, Establishments and Co-ordination With Other Services (hereafter cited as Hirsch Rpt). (3) Ltr, Hirsch to COrdO, USAFIA, 6 May 42. Last two in AFWESPAC Ord Sec 333 Inspections, KCRC. (4) Dudley McCarthy, *South-West Pacific Area—First Year: Kokoda to Wau*, Series 1 (Army), V, of "Australia in the War of 1939–1945" (Canberra: Australian War Memorial, 1959), 75–77.

[2] Morton, *Strategy and Command: The First Two Years*, pp. 247–55.

With the limited forces at his command, there was little General MacArthur could do for some time to come beyond checking the enemy's advances toward Australia, protecting land, sea, and air communications in the theater, and preparing for later offensives. For the time being, air operations against the Japanese on New Guinea and Rabaul and protection of Australian airfields, coastal cities, and shipping were the main effort. Support of air as well as port operations was the first major task of the USAFIA Ordnance office.[3]

Rounding Up Weapons and Ammunition

Weapons and ammunition were urgently needed to arm aircraft and defend airfields, coastal cities, and ships, but little help could be expected immediately from the United States. The automatic system of Class II and IV supply set up by the first War Department plan for Australia, dated 20 December 1941, was aimed at building up a 60-day level by 1 March 1942 and was raised in early February to a 90-day level, but it soon broke down for lack of shipping and supplies. In any case it would take time for the system to be effective and there was an inescapable time lag involved in the long voyage from San Francisco. From the first, War Department policy called for American commanders in Australia to obtain locally as many items as possible, and for this purpose Holman had brought with him credits for $300,000 in Ordnance funds. Only partially used, and later reimbursed by SWPA, these funds were of major importance in the early days in Australia. Part went into services and materials for storing the ammunition that came in the *Coolidge* and the *Mariposa.* Ammunition, which was supplied automatically for the first six months of 1942, did not present as serious a problem as weapons, though requests were made for more bombs and ammunition for aircraft and ground machine guns, antiaircraft guns, and small arms.[4]

After 21 February 1942 all local procurement was done by the American Purchasing Commission, established by General Barnes to co-ordinate and control all USAFIA purchasing, prevent competition, fix priorities, and work with U.S. naval authorities. The commission was composed of a representative from each technical service and had a Quartermaster chairman. The Ordnance member was Maj. Bertram H. Hirsch. Unfortunately, Australia's resources after three years of war were meager. According to General Brett, "There was plenty of money available to purchase what we wanted, but heartbreakingly little of what we wanted and needed." [5]

[3] (1) Craven and Cate, *AAF I*, pp. 408–19. (2) Interv with Holman and Kirsten, 12 Apr 56. (3) For Australian impressions of MacArthur—"outstanding in appearance and personality"—see McCarthy, *South-West Pacific Area—First Year, Kokoda to Wau*, p. 18.

[4] (1) Ltr, AG to CG American Forces in Australia, 20 Dec 41, sub: G–4 Administrative Order—Plan X, AG 381 (12–20–21). (2) Ltr, TAG to CG Field Forces *et al.*, 22 Jan 42, sub: Supply of Overseas Departments, Theaters and Separate Bases, AG 400 (1–17–42). (3) Memo, Somervell for AG, 1 Mar 42, sub: Ammunition Supply Information for Australia, G–4/33861 sec IV. (4) Barnes Rpt, cited above, ch. III, 2n(1). (5) Incl to Ltr, Maj Gen Jonathan L. Holman (USA Ret) to Brig Gen Hal C. Pattison, CMH, 3 Oct 63 (hereafter cited as Holman Comments 2), OCMH.

[5] (1) Barnes Rpt, app. 19, Historical Record, General Purchasing Agent for Australia, pp. 1–3; app. 15, Account of the QM Section, p. 8. (2) Brett, "The MacArthur I Knew," *True* (October, 1949), p. 27.

The men on Holman's staff had to round up weapons wherever they could. In response to a request by General Brett in March to arm Air Forces ground personnel with rifles and machine guns, Holman got about 10,000 Enfields from distress cargoes and salvaged machine guns from wrecked aircraft, improvising mounts for them. To bolster seacoast defenses, the Australians had some lend-lease 155-mm. guns of World War I vintage. Captain Kirsten, who was an expert on antiaircraft weapons, and M. Sgt. Delmar E. Tucker of Holman's office helped convert these guns into coast artillery by supervising their installation on Panama mounts and instructing Australian personnel in their operation. This was an effort that continued throughout most of 1942. Tucker, a specialist on artillery, was so good in his field that he was offered a commission in Artillery, and so loyal to Ordnance that he turned down the offer. He also made a fine contribution, along with Captain Kirsten, to the early and very important ship arming project.[6]

Ship Arming

Australia had always depended heavily on coastal shipping because its railways and highways were inadequate even in peacetime. Railroads ran along the coast, with feeder lines branching into the vast and mostly uninhabited interior, but there were no through trains in the American sense, for lines linking the populous states of Queensland, New South Wales, and Victoria had different gauges, so that every time a state line was crossed, men and freight had to change trains. Australia had no major highways suitable for long-distance haulage; such roads as existed were fit only for light traffic. Once the Americans began building the logistical bases, coastal shipping between Australian ports became even more important, and after the Japanese threat to Port Moresby in March 1942, ship traffic northward increased immeasurably.[7]

The theater's early need for ships and still more ships was partially met by the temporary retention of transpacific merchantmen arriving from San Francisco, but it very soon became plain that USAFIA would have to acquire a local fleet to move troops, equipment, and supplies within the theater. A beginning was made when twenty-one small Dutch freighters, which had formerly operated in the Netherlands Indies and had taken refuge in Australian ports after the fall of Java, were chartered from their owners, the Koninklijke Paketvaart Maatschappij (KPM). The KPM vessels formed the backbone of the "X" fleet of small freighters on which men and cargoes were carried between Australian ports, north to Port Moresby, New Guinea, and eventually around the southern coast of New Guinea north as far as Cape Nelson. USAFIA also discovered the need for a fleet of shallow-draft vessels that could navigate among coral reefs and use primitive landing places far up the coast of New Guinea and in the outlying islands. For this purpose it obtained from the Australians a miscellaneous collection of luggers.

[6] (1) Interv with Holman and Kirsten, 12 Apr 56. (2) Memo, Maj Elwyn N. Kirsten for Col Holman, 7 Sep 42, no sub, OHF.

[7] (1) S. J. Butlin, *War Economy 1939–1942*, Series 4 (Civil) III, of "Australia in the War of 1939–1945" (Canberra: Australian War Memorial, 1955), 397–98. (2) AAF Study No. 9, pp. 34–36.

rusty trawlers, old schooners, launches, ketches, yawls, and yachts, which became known as the "S" fleet, sometimes called the "catboat flotilla." Both of these makeshift fleets were under Army control and remained so because the U.S. Navy, which theoretically operated all seagoing vessels in theaters of operations, maintained that it did not have the resources to do so in SWPA.[8]

The "X" and "S" fleets sailing out of Australian ports were heading into dangerous waters and had to be armed against enemy action. A large share of this responsibility, as well as the main responsibility for inspecting and servicing ships' guns at the ports, fell on USAFIA Ordnance. The U.S. Navy was unable to help in the early days, and the efforts of the Royal Australian Navy were restricted to vessels assigned to the theater by the British Ministry of Transport, including most of the KPM ships and several others of the "X" fleet, but excluding ships of American registry.[9]

Providentially there arrived in Australia in the spring of 1942 a shipment of weapons that could be used on the USAFIA fleets, particularly on the large and growing "S" fleet. The shipment had been dispatched from the United States in mid-February under the UGR Project initiated shortly after Pearl Harbor by Col. Charles H. Unger for the purpose of arming small vessels to be used in running the Japanese blockade of the Philippines. By the time the shipment arrived the Philippines had fallen. USAFIA's Small Ships Supply Section fell heir to the weapons—fifty 105-mm. howitzers, fifty 37-mm. antitank guns on M4 carriages, five hundred .30-caliber machine guns on Cygnet mounts, and a quantity of miscellaneous equipment.[10]

The 105-mm. howitzers of the UGR Project were intended to be exchanged for 75-mm. guns in the hands of troops already in Australia; the 75's would then be employed in ship armament. Forty-nine 75-mm. guns were rounded up from theater resources. Of these, eight had been on board a ship beached during the Japanese raid on Darwin on 19 February. After being under water for thirty-nine days, the guns were salvaged, completely overhauled under the supervision of Sergeant Tucker, and sent to Melbourne for ship armament. Only sample ship mounts for the 37's and 75's had come from the United States. Holman's staff took the samples to Australian firms, supervised the manufacture of mounts and adapters, and then used Ordnance troops to remove the guns from their carriages and place them on the mounts. Because they considered the Cygnet mount for the .30-caliber machine gun unsuitable, the USAFIA Ordnance men designed a pedestal type of mount that would take either the .30-caliber machine gun or its preferred replacement, the .50-caliber machine gun, and had about 200 manufactured in Melbourne. On the small ship project, Ordnance worked closely with the

[8] (1) Joseph Bykofsky and Harold Larson, *The Transportation Corps: Operations Overseas* UNITED STATES ARMY IN WORLD WAR II (Washington, 1957), pp. 430, 448–53. (2) Memo, Kirsten for Chief Ordn Officer USASOS, 18 Feb 43, sub: Ship Arming (hereafter cited as Kirsten Memo), Folder H-15-S, 13 May 43, OHF. (3) On the question of Army versus Navy operation of the local fleet in SWPA, see Robert W. Coakley and Richard M. Leighton, Global Logistics and Strategy, 1943–1945, a volume in preparation for UNITED STATES ARMY IN WORLD WAR II, ch. XIX, "Shipping in the Pacific War."

[9] Kirsten Memo.

[10] *Ibid.*

group headed by Colonel Unger, who had over-all responsibility for small ship procurement and operation.[11]

The overworked USAFIA Ordnance troops continued to service British, Dutch, and Australian weapons as well as American. Some help came from Australian maintenance experts and from Australian Navy facilities, but this aid was not entirely satisfactory, and an acute shortage of American maintenance units complicated the task.[12]

Ordnance Forces Spread Thin

The main problem of the USAFIA Ordnance officer was manpower—"first, last, and always." [13] To supply Ordnance service at far-flung installations on the rim of the island continent stretched his resources to the utmost. By 3 March 1942 the USAFIA commander had established six base sections: Base Section 1 at Darwin, Base Section 2 at Townsville, Base Section 3 at Brisbane, Base Section 4 at Melbourne, Base Section 5 at Adelaide on the southern coast, and Base Section 6 at Perth on the west coast; and soon afterward, Base Section 7 at Sydney. Acting as service commands and communications zones, the base sections received, assembled, and forwarded all U.S. troops and supplies, and operated ports and military installations. Until early April, when 17 technicians and clerks from the United States reported to Holman's office and ground Ordnance units began to arrive, the technical personnel that could be spared from aviation Ordnance units were placed on special duty to work at the ports.

The nine Ordnance aviation companies that began arriving in mid-March were immediately dispersed to support their combat or air base groups. By the end of April there were air base groups in the Townsville, Brisbane, Melbourne, Sydney, and Darwin areas, and small servicing details at Adelaide and Perth. Combat operations were centered in the north. Moving to the Darwin and Townsville areas, where Royal Australian Air Force (RAAF) airfields were being supplemented by fields constructed by U.S. Engineers, bombardment and pursuit groups took their own Ordnance companies with them. As the groups sent out squadrons to cover the danger areas on the northern coast, Ordnance aviation companies were divided into platoons to accompany them.[14]

The story of the 445th Ordnance (Aviation) Bombardment Company exemplifies the strain placed on aviation companies. Two platoons accompanying the 49th Pursuit Group (the first group to get into operation in Australia) when it moved from Sydney into the Darwin area in mid-March were split up in order to serve squadrons of the 49th at different landing strips. This duty consisted of unbelting, oiling, polishing, and rebelting all ammunition each

[11] (1) *Ibid.* (2) Intervs, Mayo and Falk with Holman and Kirsten. (3) Memo, Somervell for TAG, 15 Feb 42, sub: Armament for Small Ships, G-4/33861. (4) Incl to 1st Ind, General Holman to CofOrd, 15 May 56, Comments on Southwest Pacific Campaign Histories (hereafter cited as Holman Comments 1), OHF.

[12] (1) DF with Memo for Record, Somervell to TAG, 3 Mar 42, sub: Spare Parts and Accessories for Armament of Ships in Convoy Service to X, G-4/33861 sec IV. (2) Kirsten Memo. (3) For an example of the difficulties involved when American maintenance work was turned over to Australian civilians, see Brett, "The MacArthur I Knew," *True* (October, 1949), p. 26.

[13] Interv, Falk with Holman and Kirsten, 8 Oct 54.

[14] AAF Study No. 9, pp. 47–53, 94–95.

night, and stripping, oiling, and polishing all guns every third night. At the beginning of May, one of the platoons was attached to the 71st Bombardment Squadron and sent to operate the ammunition dump at Batchelor Field. This air terminal was forty miles south of Darwin, so far from any port or railhead that Quartermaster supplies could not get through and the men had to obtain much of their meat by hunting. In mid-May a fourth platoon of the 445th was sent to New Caledonia.[15]

Dispersion of Ground Reinforcements

When the first large increment of ground Ordnance troops arrived the second week in April, it also was widely dispersed. The troops had been sent from the United States to support the first ground reinforcements sent to Australia. The reinforcements, dispatched as a result of a mid-February warning message from General Wavell, commander of ABDA, that the loss of Java might have to be conceded, consisted of about 25,000 troops, including the 41st Infantry Division and 8,000 service troops of which 700 were Ordnance—one medium maintenance company, one depot, and two ammunition companies. Early in March, after the collapse of ABDA, a second infantry division, the 32d, was sent to Australia at the request of Prime Minister Churchill, who wanted to avoid bringing an Australian division home from the then critical Middle East battle zone. The 32d Infantry Division brought with it another medium maintenance company. These were the last reinforcements of any size to arrive in Australia for some time to come, despite urgent requests by General Brett for many more ground units, including Ordnance units up to three ammunition battalions, three maintenance and supply battalions, and three depot companies. There were not enough men available in the United States or ships to carry them.[16]

The Ordnance companies that arrived with the main body of the 41st Division at Melbourne the second week in April were the 37th Ordnance Medium Maintenance Company, the 84th Ordnance Depot Company, and the 55th and 59th Ordnance Ammunition Companies. The 84th Depot Company established at Seymour (north of Melbourne) the first Ordnance general supply depot in Australia. Soon the new arrivals were scattered all over Australia. The 37th Ordnance Medium Maintenance and the 55th Ordnance Ammunition Companies were sent to Brisbane to provide service to air and antiaircraft units there and at Base Section 2 at Townsville. The 84th, for many months the only depot company in Australia, furnished an officer and

[15] (1) *Ibid.*, pp. 107, 129–30. (2) Ltr, 2d Lt Morris F. Miller to Col Holman, 22 May 42. (3) Ltrs, Maj Harry C. Porter to Ord Officer, USAFIA, and to Ord Officer, USAAS, 11 Jun 42, sub: Report on Ordnance Activities in North-West Area. (4) Memo, Capt J. C. Werner for Col Holman, 23 Jun 42, sub: General Report on Trip Through Base Sections 3, 2, 1 and 5 (hereafter cited as Werner Rpt). Last four in AFWESPAC Ord Sec 333 Inspections, KCRC.

[16] (1) Rads, AG from Australia, No. 491, 4 Mar 42, and No. 623, 12 Mar 42, AG 381 (11–27–4), sec 3. (2) Memos, Brig Gen John H. Hilldring, ACofS G–1 for TAG, 14 Feb 42, subs: Officer Personnel Requirements to Place the Australian SOS in Operation, and Enlisted Personnel Requirements . . . , both in G–1/16368–42. (3) Memo, Eisenhower for TAG, 7 Mar 42, sub: Request for Additional Personnel and Supplies, AG 381 (11–2–41), sec 3. (4) Memo, Lt Col Clarence H. Schabacker for Col Ott, 5 Mar 42, no sub, in Movement Orders, 4656, AGF, RG 400 A 46-169. (5) Matloff and Snell, *Strategic Planning for Coalition Warfare: 1941–42*, pp. 128–31.

five enlisted men to form the Ordnance Section of Base Section 7 at Sydney, where distress cargoes, chiefly Dutch, were piling up. The 84th also supplied a detachment to operate a general supply depot at Adelaide on the south coast, the headquarters of the 32d Division.[17]

The 118th Ordnance Medium Maintenance Company, commanded by 1st Lt. Frederick G. Waite, arrived with the 32d Division. The company landed without its tools, equipment, repair trucks, or parts, but the young commander managed to acquire some distress cargo tools at the Adelaide port. In the circumstances, Waite remembered later, the job of supporting the division "was not done as well and as thoroughly as we desired, or as the combat troops had a right to expect" but "did get done after a fashion." In addition, he had to send detachments to aid port operations at Sydney, an antiaircraft regiment at Perth, and the task force at Darwin.[18]

It took the most careful planning by Colonel Holman's office to make the best use of the very scarce Ordnance troops. The depot and ammunition sections that had arrived in March were organized into the 360th Ordnance Composite Company, activated on 1 May, and sent about 100 miles north of Adelaide to operate at one of the transshipment points on the overland route to Darwin. Between Darwin and the cities of the eastern and southern coasts there was a gap in the railroad line of as much as 600 miles. This had to be bridged by truck or air transport. The 25th Ordnance Medium Maintenance (AA) Company was given the job of supporting the 41st Infantry Division, but because this company was especially experienced in antiaircraft artillery, it had small detachments at Brisbane, Townsville, and Perth working on fire control instruments and instructing other Ordnance companies in that kind of maintenance. Out of the effort at Townsville grew the very important Townsville Antiaircraft Ordnance Training Center directed by the commander of the 25th, Capt. William A. McCree.[19]

The necessity of splitting Ordnance companies into detachments placed a severe drain on organic unit equipment. A single machine shop truck might be adequate for the work of a medium maintenance company, but when the company was split into detachments operating in four separate areas the men would need four trucks instead of one; an aviation bombardment company would need additional truck cranes; an ammunition company, a larger supply of tarpaulins. All required more messing equipment, and also water trailers for operations in a country where water was scarce. Mobile equipment operating

[17] (1) History of the 84th Ord Depot Co. (2) Hirsch Rpt.

[18] (1) Lt Col Frederick G. Waite, Ordnance Service Support Problems in Tropical Warfare, Paper submitted to the faculty of the Armed Forces Staff College, Norfolk, Va., May 1950, MS, Armed Forces Staff College Library, copy in OHF. (2) History USASOS, chapter on Base Sec 5. (3) Holman considered Waite "an outstanding officer in every way." Holman Comments 2.

[19] (1) On the composite company, see WD LO, 12 Feb 42, to CG's, Hawaiian Dept and USAFIA, sub: Constitution and Activation of Units, in Movement Orders. 5691, AGF, RG 400 A-45-169; and Ltr with Incl, Capt P. H. Mulcahy to Ord Officer USAFIA, 11 Jun 42, sub: Alice Springs. AFWESPAC Ord Sec 333 Inspections. KCRC. (2) Interv with Holman and Kirsten, 12 Apr 56. (3) Rpt, Final Report of Lt Col William A. McCree (hereafter cited as McCree Rpt), in Field Service Key Personnel Rpts, OHF.

over poor roads, or none at all, required an ample supply of spare parts.[20]

A Huge Continent With Poor Transportation

For the first five months of 1942, the one factor primarily affecting supply in Australia was transportation. This is amply illustrated by the story of the early effort to transport ammunition from southern and eastern ports to Darwin. It had to be sent overland because the sea lanes to Darwin were insecure, and the hardships reminded one observer of the attempt to forward supplies over the Burma Road.[21]

From Adelaide the rail line north stopped at Alice Springs, which seemed to one Ordnance officer a comparatively large community for the outback—"actually several houses and even curbs along the street." From there, supplies were carried forward in trucks operated by the Australians. About six hundred miles north, at Birdum—one small building and three tin shacks—there was a railroad to Darwin, but it had small capacity, was antiquated and in poor repair, and was chiefly useful in the rainy season when the dirt road, in some places only bush trail, was washed out.

From Brisbane to Darwin, a distance of 2,500 miles, the railroads ran only as far as Mount Isa, a small settlement that reminded some Ordnance officers of a mining town in Arizona or Nevada. There, supplies were transshipped to Birdum by Australian truck companies. Assuming cargo space was available—not always a safe assumption—a shipment normally took about ten days. In early February one load of 18,000 75-mm. shells was delayed for ten days and finally arrived without fuzes. It took another eight days to find the fuzes and deliver them by air.[22]

Beginning in March regulating stations were established along the routes to Darwin, but the length of time supplies were in transit and the probability of losses en route made necessary extra supplies to fill gaps in the supply line. General Barnes warned Washington that particular attention would have to be given to ammunition shipments from the United States because of the large distribution factor involved in long hauls and poor transportation.[23]

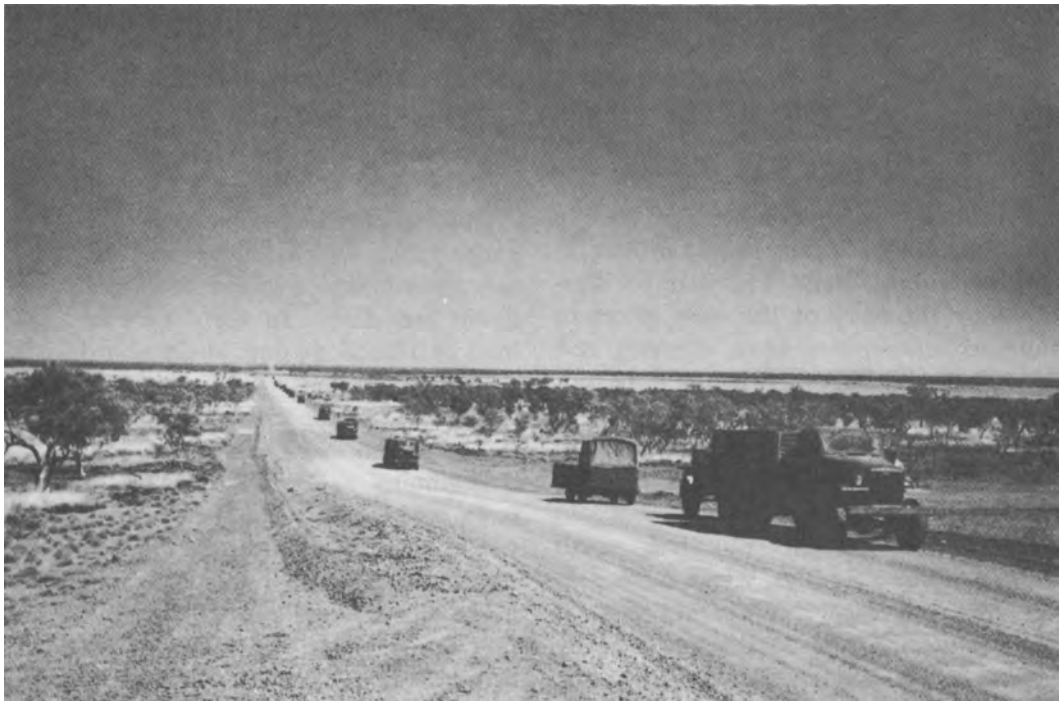
Looking for "lost" Ordnance supplies and troops, reconnoitering for depot and shop sites, the RPH officers who had arrived with Colonel Holman spent weeks at a time in the field, furnishing aid and comfort to harassed officers at remote sta-

[20] (1) These needs were not limited to Ordnance, but reflect difficulties experienced by all the technical services operating in Australia. ASF, Cntrl Div, Dev of U.S. Supply Base in Australia, pp. 50–54. (2) Col Frank A. Henning, Rpt on Supply Operations in Australia, Sep 42 (hereafter cited as Henning Rpt).

[21] (1) Bykofsky and Larson, *The Transportation Corps: Operations Overseas*, p. 481. (2) Cable, Melbourne to AGWAR No. 224, G–1/16368–40 (2–13–42). The observer was Col. Patrick J. Hurley (former Secretary of War and former Ambassador to New Zealand), whom General Marshall had sent to Australia to study blockade-running to the Philippines.

[22] (1) Werner Rpt. (2) Ltrs, Porter to Ord Officer USAFIA and Ord Officer USAAS, 11 Jun 42, sub: Report on Ordnance Activities in North-West Area; Incl 1, Report on Alice Springs, to Ltr, Mulcahy to Ord Officer USAFIA, 11 Jun 42, both in AFWESPAC Ord Sec 333 Inspections, KCRC. (3) Hirsch Rpt. (4) Ltr, Hirsch to COrdO USAFIA, 6 May 42, AFWESPAC Ord Sec 333 Inspections, KCRC.

[23] (1) Rad, Melbourne to AG, No. 161, 5 Feb 42, AG 381 (11–27–41) sec 2A. (2) Because the sea lanes were subject to attacks by the Japanese, water shipments to Darwin were not possible before October 1942. Bykofsky and Larson, *The Transportation Corps: Operations Overseas*, p. 482.



CONVOY OF TRUCKS NEAR MOUNT ISA, QUEENSLAND

tions. "Believe me," Major Hirsch reported to Colonel Holman, "there's nothing these chaps like better than to have a staff officer out in the bush, making passes at the flies on their faces and eating dust with their food." These officers often traversed country so treeless and desolate that by comparison the American desert seemed "a garden of Eden." But sometimes there were diverting adventures. Reconnoitering for an ammunition depot near Rockhampton, Major Hirsch received unexpected help from a bushman who "divined" for water with a forked stick; and on a survey trip from Rockhampton to Coomooboolaroo, Hirsch flushed two kangaroos at which he took a few shots with his .45.[24]

Geelong and the Ordnance Service Centers

Availability of transportation played an important part in the selection of the first important Ordnance installation in Australia. The ammunition that began piling up on the docks at Melbourne in February

[24] (1) Ltr, Hirsch to COrdO USAFIA, 6 May 42. (2) Memo, Hirsch to COrdO USAFIA, 30 Jul 42. Both in AFWESPAC Ord Sec 333 Inspections, KCRC. (3) See also similar reports, same file. from Kirsten, Booz, Thompson, and others.

and was dispersed around the city soon presented such a hazard that a safer place had to be found for it. With the help of the Australian Army's Land Office, Hirsch was able to acquire a site across the bay from Melbourne at Geelong. The location was excellent because ammunition, which was loaded first in ships for better ballast and therefore unloaded last, could simply be retained after the other supplies were unloaded at Melbourne and sent around to Geelong in the same ship. When the 25th Ordnance Medium Maintenance Company (AA) landed in Brisbane in mid-March, the main body of the company (less detachments dispatched to the four corners of Australia in support of antiaircraft units) was sent to Geelong to establish Kane Ammunition Depot.[25]

Out of the Geelong installation grew Holman's concept of the Ordnance service center, which included not only storage (wholesale and retail) but maintenance shops where a great deal of reclamation and salvage work was done: everything possible was saved from wrecked equipment, put into serviceable condition, and reissued. Moreover the center was to become a staging area for Ordnance troops and supplies that came there direct from the ports instead of moving through a general staging area. When Ordnance troops came off the ships they were sent immediately to a service center, where they got a hot meal and a bed. And they could be put to work at the center if their equipment had not come with them, as was often the case. Early in January General Brett had urged that basic essential equipment be sent on the same ship with the units, or at least in the same convoy, but the War Department then, and for six months to come, considered it wasteful of shipping space. The 25th Ordnance Medium Maintenance Company, for example, had arrived without its shop trucks containing its tools and machinery and for that reason had been given the job of starting the ammunition depot.[26]

At an Ordnance service center Holman could organize, train, control, and use Ordnance troops as he thought best. The opportunity for direct control and flexibility was to prove of great value, not only in the early days when Ordnance units arrived slowly and infrequently from the United States but later when small teams such as those for bomb disposal and technical intelligence came in. Instead of being lost in a large general base, they were under Ordnance control from the start and were kept on Ordnance jobs. Geelong became the model for the Coopers Plains Ordnance Service Center at Brisbane, the first well-developed first-class activity of this kind, which set the standard for future operations. The concept was so successful that it remained in effect in the Southwest Pacific throughout the war. After Holman became Chief of Staff, Headquarters U.S. Army Services of Supply (USASOS), in October 1943, he was instrumental in having the service center concept applied to other technical services as well as Ordnance.[27]

[25] (1) Interv with Holman and Kirsten, 12 Apr 56. (2) McCree Rpt.

[26] (1) Interv with Holman and Kirsten, 12 Apr 56. (2) McCree Rpt. (3) Air Corps units were also hampered by the failure to unit load. AAF Study 9, p. 39.

[27] (1) Interv with Holman and Kirsten, 12 Apr 56. (2) Holman Comments 1.

Working With the Australians

Fine co-operation by the Australian Army's Land Office, plus the benefits of reverse lend-lease, made possible the establishment of a number of Ordnance installations by summer 1942. The Australians helped in the location of ammunition depots, which according to the Ordnance supply plan were to be established in the western districts of each base section; after Kane, the most important was the depot at Darra, near Brisbane. In the populous areas around Melbourne, Adelaide, and Sydney, the Australians provided industrial buildings for depots and shops, mostly wool warehouses, some of them with good concrete floors and traveling cranes, and in less industrialized areas, wool sheds, schoolhouses, small automobile shops and warehouses, a rambling frame orphanage, and an old dance hall. Some of these buildings had their disadvantages. In transforming one wool shed into an Ordnance maintenance shop, the Engineers had to shovel their way through a "mixture of dirt, old wool, hides and manure and the place stunk to high Heaven." [28]

Ordnance officers found their opposite numbers in the Australian Army eager to co-operate. They provided not only depot sites but trucking and other services and facilities for training and maintenance. In schools conducted by the Australian Army, men of the three Ordnance medium maintenance companies, for example, received early training in British 40-mm. Bofors antiaircraft guns and fire control equipment, and aviation Ordnance men learned about bomb disposal. In the Brisbane and Townsville areas, where facilities were expanding late in the spring, Australian maintenance shop officers had instructions to do work for Americans under the same system and priority as for Australians. Late in May Colonel Holman was planning to help make up for the lack of a heavy maintenance company, which had been requested from the United States but not received, by using a large fourth echelon repair shop then being built by the Australians at Charters Towers, eighty-three miles inland from Townsville.[29]

When lend-lease Ordnance supplies and equipment began to arrive in quantities in June, Holman's men helped unload and distribute them, instructed Australian troops in maintenance, and provided the technical data requested by Australian Army authorities, who were keenly interested in all U.S. weapons, ammunition, and equipment brought into the theater. By the end of May the USAFIA Ordnance office was planning a definite project for servicing American lend-lease tanks; and experimental work was already under way at Australia's Armored Fighting Vehicles School at Puckapunyal near Seymour.[30]

Throughout the spring, Australian factories, shops, and other possible sources of

[28] (1) Hirsch Rpt and other Inspection Reports, AFWESPAC Ord Sec 333 Inspections, KCRC. (2) Memo, Hirsch for COrdO, USAFIA, 30 Jul 42, AFWESPAC Ord Sec 333 Inspections, KCRC.

[29] (1) Holman Comments 1. (2) Memo, Kirsten for Holman, 3 Jun 42 [report on trip to Base Sections 3 and 7, 26–30 May], AFWESPAC Ord Sec 333 Inspections, KCRC. (3) Hirsch Rpt. (4) McCree Rpt.

[30] (1) Memo, J. L. H. [Jonathan L. Holman], 14 Jun 42, in Henning Rpt, Tab B and p. 16. (2) Memorandum Covering Inspection Trip to Seymour June 2, 1942, 3 Jun 42; (3) Memo, Thompson for Holman, 17 Jun 42, sub: Inspection Trip to A.F.V., Puckapunyal, Vic., 16 Jun 42. Last two in AFWESPAC Ord Sec 333 Inspections, KCRC.

supply were thoroughly explored by the USAFIA Ordnance men. They found a plentiful supply of cleaning and preserving materials, lumber, paints and oils, gas for welding, and fire-fighting equipment; some standard motor parts; and a limited supply of abrasives, cloth and waste, tool steel, and maintenance equipment and tools. Moreover, the Australians were able to manufacture some standard items of Ordnance equipment such as link-loading machines for .30-caliber and .50-caliber ammunition, arming wires and bomb fin retaining rings, leather pistol holsters and rifle slings, machine gun water chests, and cleaning rods and brushes for machine guns and ramrods for larger weapons.

The USAFIA Ordnance Section designed many items and adapted others, such as the gun mounts devised for ship arming and airfield defense, to fit U.S. Army requirements. Jib cranes were developed to facilitate the handling of bombs from railway cars to trucks and at the depots; a scout car for line of communications units was made by fitting a light armored body on the chassis of small Canadian trucks evacuated from the Netherlands Indies. A rapid automatic link loader for machine guns was copied from a U.S. Navy model, and because reports from air units showed that regular ammunition delinking, inspecting, cleaning, and relinking had to be done to insure proper functioning of machine gun feeding, a delinker similar to one designed by a U.S. Air Forces Ordnance officer was manufactured in Australia.

Many of the Ordnance items that the Americans improvised or adapted in the theater were accepted for their own use by the Australians, who seemed to Holman's staff to have great respect for American equipment. Suggestions for inventions poured into the USAFIA Ordnance office from Australian soldiers and civilians; one invention that amused Kirsten was a "disappearing bayonet," which was not visible to the unsuspecting Japanese soldier until it was suddenly sprung on him. With very few exceptions, the inventors' ideas were forwarded to Australian military authorities in accordance with an agreement worked out for the handling of such suggestions.[31]

USAAS Ordnance

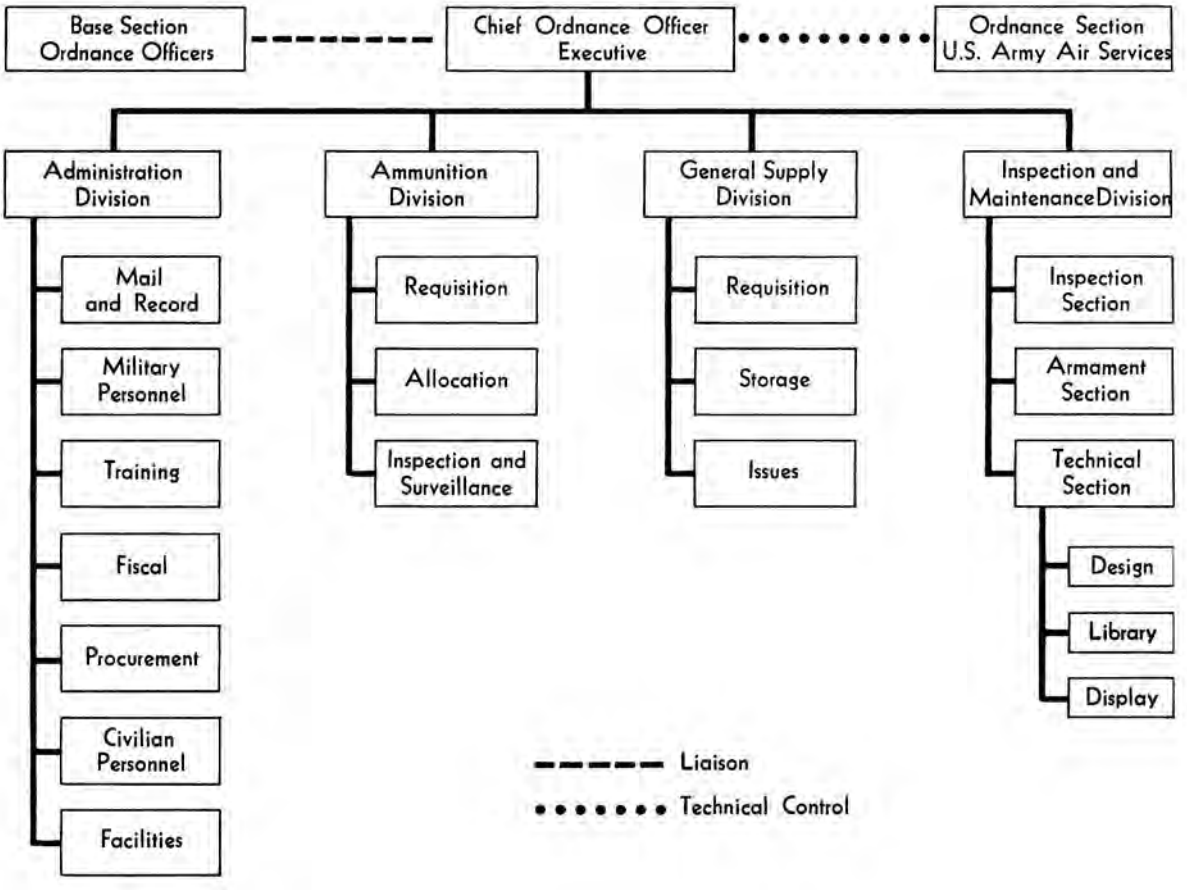
The directive establishing the Southwest Pacific Area under the command of General MacArthur on 18 April 1942 set up separate organizations for Allied Land Forces and Allied Air Forces, the former commanded by Australia's General Blamey, the latter by General Brett. On 27 April the United States Army Air Services (USAAS) was created and placed under the command of Maj. Gen. Rush B. Lincoln. For some time, there was confusion as to its exact responsibility; it was the end of May before USAAS was officially defined as an administrative, supply, maintenance, and engineering command operating under the commander of the Allied Air Forces.[32] (*Chart 1*)

The Ordnance Section of USAAS was staffed with four officers and seven enlisted men from the USAFIA Ordnance office and was headed by Maj. Robert S. Blodgett, chosen for the job by Colonel

[31] (1) Interv with Holman and Kirsten, 12 Apr 56. (2) For inventive improvisations and suggestions see AFWESPAC Ord Sec 070 Inventions, KCRC. (3) The only comment by the official Australian Army historian on American equipment at the time was that it was "adequate—partly of last-war types and partly of later models." McCarthy, *South-West Pacific Area—First Year*, p. 33.

[32] (1) Craven and Cate, *AAF I*, pp. 421–22.

CHART 1—THE U.S. ARMY FORCES IN AUSTRALIA ORDNANCE OFFICE, MAY 1942



Source: USAFIA Ordnance Office, Organization Chart, Inclosure 2 to Report of Ordnance Activities, USAFIA, February–May 1942, USAFIA Organization Chart, Inclosure 14c to Barnes Report.

Holman, who had served with Blodgett in the United States and had a high opinion of his ability. Two of the officers had come south from the Philippines: Maj. Harry C. Porter had flown from Corregidor and Maj. Victor C. Huffsmith had had a perilous sea voyage from Manila to Mindanao, sailing immediately after Pearl Harbor in a small ship with detachments of two Ordnance aviation companies, the 701st and 440th. Ordered to Australia on 29 April, he was on the last flight out of Mindanao before the Japanese took over.[33]

Though the USAAS Ordnance Section was divorced from the USAFIA Ordnance Section, the two offices necessarily worked

[33] (1) Interv with Holman and Kirsten, 12 Apr 56. (2) Ltr, Maj Huffsmith to Brig Gen McFarland, 20 Nov 42, no sub, Folder, Troop Units Reports, Miscellaneous Reports, OHF. For efforts by Huffsmith and the Ordnance men to aid the Visayan-Mindanao Task Force, see below, p. 440.

closely together, since in the early days of SWPA air operations were the primary effort. USAAS obtained its ammunition and Ordnance major items from USAFIA. Later, as the air operations grew and spread over very large areas, the official connection weakened. After Maj. Gen. George C. Kenney on 4 August 1942 took over from General Brett the command of the Allied Air Forces, and the Fifth Air Force was established, USAAS became a part of the Fifth Air Force (in October redesignated Air Service Command, Fifth Air Force). The March 1942 organization by which three major commands were established under the War Department—ground, air, and service—had its effect; and there were presages of the reorganization that was soon to shift control of Ordnance aviation troops to Air Forces commanders. But between Blodgett's and Holman's offices a good deal of informal and very effective liaison continued, a circumstance that Holman attributed to Blodgett's excellent relationship with Kenney and his loyalty to Ordnance.[34]

Midsummer 1942: New Responsibilities

Six months after the *Pensacola* convoy landed with one Ordnance company, Ordnance strength in Australia stood at 145 officers and 3,500 enlisted men. There were four ammunition companies (out of twelve requested); three medium maintenance (out of five requested); one depot (out of five requested); one composite; and fifteen aviation companies—six air base, six bombardment, and three pursuit. With these men, most of whom had been in Australia less than three months, Colonel Holman had staffed five ammunition depots and five maintenance and supply depots, was providing Ordnance service to two divisions and fifteen air groups, and was handling incoming supplies and transshipments at seven ports.[35]

There were still grave shortages in supplies, notably in spare parts, tools, bomb-handling equipment, and technical manuals. Much still remained to be done in segregating stores and training troops; for example, one young ammunition officer complained that all his time was spent in finding out where bombs, fuzes, and arming wires were stored, and teaching his men "what to do, how to fuze and put arming wires on, how to put bombs into bomb bays . . . ." But depots and shops were beginning to operate with some degree of efficiency, especially in the Melbourne, Adelaide, and Sydney areas. At the depot in Adelaide, for example, items were correctly stored in bins and Standard Nomenclature List groups were segregated. Kane Ammunition Depot near Melbourne was becoming "an Ordnance show place." [36]

Transportation and communications between the southern cities and the northern

[34] (1) Interv with Kirsten and Holman, 12 Apr 56. (2) Wesley F. Craven and James L. Cate, eds., "The Army Air Forces in World War II," vol. IV, *The Pacific: Guadalcanal to Saipan, August 1942 to July 1944* (Chicago: University of Chicago Press, 1950), 103 (hereafter cited as *AAF IV*). (3) Maj William P. Fisher, Talk Given . . . Before G-4 Officers WDGS, 20 Mar 42, AAF, 385-E Methods-Manners-Conducting Warfare. (4) Air Ordnance Office, AAF, Ordnance in the Air Forces, MS, May 1946, OHF.

[35] Ltr, Holman, COrdO USASOS to CofOrd, 7 Sep 42, sub: Report of Ordnance Activities, USASOS SWPA, August 1942, in USASOS, Rpt of Ord Activities, Jul 42–Jan 43.

[36] (1) Ltrs, San Francisco POE to Chief Transportation Service WD, 15 Jun 42, 3 Jul 42, sub: Level of Supplies at SUMAC and POPPY, AG400 (1-17-42) (2) sec 2. (2) Rpt, Ord Officer, Horn Island, 6 Jul 42. (3) Memo, Hirsch for COrdO USAFIA, 30 Jul 42. Last two in AFWESPAC Ord Sec 333 Inspections, KCRC.

outposts were slowly improving. Bottlenecks were being eliminated from the road north to Darwin and the use of Australian teletype instead of straight mail from Melbourne to Darwin and Townsville shortened communications time considerably. The Ordnance office at Townsville, which according to Major Hirsch had been leading a "hand to mouth existence . . . mainly because actual information of coming events is either lacking entirely or delayed beyond comprehension," was now "in the throes of growing up." [37]

For the very real accomplishments that spring and summer of 1942 in Australia in the face of meager resources, Colonel Holman was given a large share of the credit by the young officers of his USAFIA Ordnance staff. They admired not only his brains and imagination but his enthusiasm and his positive approach to problems. At USAFIA staff meetings, Kirsten remembered later, "the Quartermaster would be gloomy—couldn't cook with Australian chocolate, etc.; the Engineer officer would be gloomy—couldn't drive nails in Australian hardwood, etc.; but Holman (though Ordnance was as bad off as any) would say we can get this done in such and such a time. Naturally this made such a good impression he could get almost anything he wanted." Also, Holman had the quality of arousing loyalty. He selected capable young officers and then backed them up.[38]

During the first half year in Australia, the efforts of the USAFIA Ordnance office had been devoted mainly to support of air and antiaircraft operations, supplying armament and ammunition to the fighter and bomber groups operating from Australian bases in defense of northern Australia and New Guinea and to the antiaircraft units at the ports and airfields and aboard ships. In July, as the chill damp of an Australian winter settled in Melbourne, the USAFIA Ordnance office began preparations to support the New Guinea prong of the first U.S. offensive in the Pacific, as directed by the Joint Chiefs of Staff on 2 July.

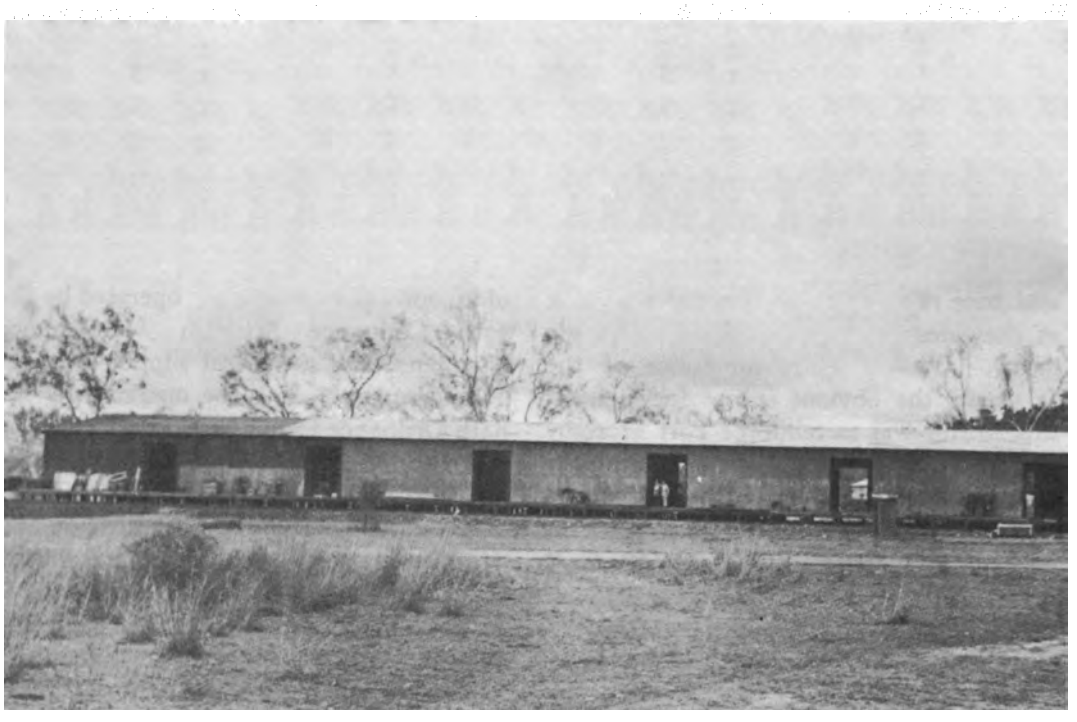
The offensive, an "island-hopping" operation of the kind soon to become familiar, would be in three phases. The first, assigned to Vice Adm. Robert L. Ghormley's South Pacific Area, was the capture of Guadalcanal and other islands in the Solomons; the second, assigned to General MacArthur, was the capture of the remainder of the Solomons and the northeastern coast of the narrow Papuan peninsula in New Guinea, where the Japanese held Lae and Salamaua; and the third, also assigned to MacArthur, was the capture of the Japanese stronghold of Rabaul and adjacent areas in the Bismarck Archipelago. The object was to halt the Japanese advance toward the tenuous line of communications between the United States and Australia and New Zealand. The offensive was restricted to the few ships, troops, weapons, and supplies that could be spared from the preparations for an invasion of Europe.[39]

In Australia, the U.S. armed forces began preparing at once to capture the north-

[37] (1) Ltr, Hirsch to COrdO USAFIA, 2 May 42, AFWESPAC Ord Sec 333 Inspections, KCRC. (2) Werner Rpt.

[38] Interv with Kirsten, 12 Apr 56.

[39] (1) Samuel Milner, *Victory in Papua*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1957), pp. 46–48. (2) John Miller, jr., *Guadalcanal: The First Offensive*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1949), pp. 1, 16–17. (3) Matloff and Snell, *Strategic Planning for Coalition Warfare: 1941–42*, pp. 258–65. (4) Morton, *Strategy and Command: The First Two Years*, pp. 301–04.



ORDNANCE WAREHOUSE, TOWNSVILLE

eastern coast of Papua. The 32d and 41st Infantry Divisions, which along with the 7th Australian Infantry Division were to furnish the ground combat troops, were moved to eastern Australia and started to train for jungle warfare. Until the men were ready, the Army Air Forces was to step up its bombing operations. Engineer troops had been sent to develop new airfields at Port Moresby and at the small but important RAAF base at Milne Bay on the southeastern coast of Papua. These fields would not be enough. For the recapture of Lae and Salamaua, a major airfield on the northeastern coast was necessary. A reconnaissance revealed a good site at Dobodura, about fifteen miles south of Buna, a native village and government station on the northeastern coast of Papua almost opposite Port Moresby, and on 15 July GHQ SWPA directed the launching of operations to occupy the Buna area between 10 and 12 August.

Within a week of this order, a Japanese convoy was discovered moving on Buna. Aided by bad weather that shielded it from Allied air attacks, the enemy force reached the area on the night of 21 July and began landing. Allied bombing and strafing the next morning had little effect; the Japanese were soon securely established at Buna. General MacArthur's G–2, Brig. Gen. Charles A. Willoughby, believed that they merely wanted the same favorable airfield sites that had attracted the Allies. A Japanese advance overland on Port Moresby,

only 150 miles to the southwest, was not ruled out, but it seemed highly improbable, because between the northern and southern coasts of Papua rose the 13,000-foot Owen Stanley Range. Over these mountains there were no roads, only narrow, primitive footpaths that became precarious tracks as they wandered up rock faces and bare ridges, then down rivers of mud as they descended into the heavy jungle below. Whatever the intentions of the Japanese, the obvious course for General MacArthur was to reinforce Port Moresby and Milne Bay. He did so by ordering the 7th Australian Infantry Division to move to these areas immediately. He also sent forward engineers and antiaircraft units.[40]

Preparations To Support the Move Northward

In early July when the New Guinea offensive was directed, Ordnance installations were meager in northeastern Australia, the logical support area for the coming campaign. At Brisbane, designated on 7 August the main base of supply, the 37th Ordnance Medium Maintenance Company was operating in the open air from shop trucks at the edge of Doomben Race Track, and a detachment of the 84th Ordnance Depot Company was setting up a small general supply depot in a converted orphanage building in Clayfield. Until then, general supplies had been stored at Darra, an ammunition dump operated by the 55th Ordnance Ammunition Company with the assistance of about 50 civilian mounted guards and 50 civilian laborers.[41]

By the end of July, when the 32d Division had moved to Camp Cable, 30 miles south of Brisbane, and the 41st had arrived at Rockhampton, 400 miles to the north, the USAFIA Ordnance office had secured a tract at Coopers Plains south of Brisbane. Here it began to build a large Ordnance service center to house a maintenance shop of 10,000 square feet, to be operated by the 37th Ordnance Medium Maintenance Company, and a general supply depot of 20,000 square feet, to be operated by the 84th Ordnance Depot Company. The base commander, Col. William H. Donaldson, and his Ordnance officer, Lt. Col. William C. Cauthen, managed to get both shop and depot completed in September, and during the fall the space was more than tripled. At Rockhampton a maintenance shop and a small general supply depot were being established to service the 41st Division. New ammunition depots were established at Wallaroo, west of Rockhampton, and Columboola, west of Brisbane; Darra was enlarged. A transshipping warehouse was built at Pinkenba from which weapons and ammunition could be forwarded to Townsville and points north.[42]

At Townsville the Ordnance job became heavier because of the transshipping operation, the concentration of antiaircraft units in northern Australia and New Guinea, and the need to support stepped-up bombing operations. The 25th Ordnance Medium Maintenance Company arrived there on 12 July to distribute and maintain sixty new

[40] Milner, *Victory in Papua*, pp. 56–58, 70–73.

[41] (1) Memo, Capt Spencer B. Booz for Col Holman, 1 Jul 42, AFWESPAC Ord Sec 333 Inspections, KCRC. (2) Werner Rpt.

[42] (1) Memos, Hirsch for COrdO, 30 Jul 42, 3 Aug 42, AFWESPAC Ord Sec 333 Inspections, KCRC. (2) Ltr, Cauthen to COrdO USASOS, 2 Nov 42, sub: Report of Operations, October, 1942, with Incl, Ordnance Department Warehouse Space—Covered, Brisbane Area, AFWESPAC Ord Sec 370.2 Monthly Rpt of Opns B.S. 3, KCRC.

40-mm. Bofors antiaircraft guns. The men found that many of the guns, either defective to begin with or damaged in shipping, had to be rebuilt. In addition to this task the company operated an Ordnance shop and depot—in a building formerly used to manufacture windmills—serviced ships' guns at the port, and sent detachments to isolated units of Coast Artillery. Reinforced by a small detachment of the 59th Ordnance Ammunition Company, the 55th Ordnance Ammunition Company, which had already furnished a detachment of thirty men for Port Moresby, handled ammunition at the wharf and operated the Kangaroo Transshipment Depot, on the north coast road to Cairns. Transshipment by rail or boat to Cairns, a small port north of Townsville, became important as the supply system to the combat zone evolved. Cairns became a center for small ships into which ammunition was reloaded for the run to New Guinea and points on the Cape York Peninsula. This system was developed to relieve the congestion at Townsville; also smaller and more frequent shipments of ammunition were thought to provide better service with fewer losses. An ammunition storage area was developed at Torrens Creek (180 miles west of Townsville) to support both New Guinea and Darwin should the Townsville-Cairns area be cut off, but it served for only a few air missions and shipments and never became fully operational.[43]

In the general preparations for the Papua Campaign, General MacArthur's headquarters moved from Melbourne to Brisbane. On 20 July USAFIA was discontinued and United States Army Services of Supply, Southwest Pacific Area (USASOS SWPA), was created and placed under the command of Brig. Gen. Richard J. Marshall, to whom were transferred all USAFIA personnel and organizations.[44] Maj. Gen. Robert L. Eichelberger arrived in August with Headquarters, I Corps, to which were assigned the 32d and 41st Divisions.

These changes affected Ordnance service to some extent, but no theater reorganization could compare in effect on Ordnance with a War Department reorganization that took place that summer. Early in August 1942 a cable from Washington to the Commander in Chief, SWPA, announced that responsibility for the supply and maintenance of all motor vehicles was to be transferred from the Quartermaster Corps to the Ordnance Department. USASOS received the news on 15 August, only two weeks before the changeover was to become effective, 1 September 1942.[45]

Responsibility for Motor Vehicles

The USASOS Ordnance office inherited from Quartermaster about 22,000 vehicles, of which some 15,000 were trucks, ranging in size from the ¼-ton jeep to the 4-ton 6x6; 3,000 were trailers; and 2,500 were sedans. The rest were ambulances,

[43] (1) McCree Rpt. (2) Rpts, Maj William A. Weaver to COrdO USASOS [Reports of Operations for Months of Jul 42 and Aug 42], AFWESPAC Ord Sec 370.2 Monthly Rpt of Opns B.S. 2, KCRC. (3) Memo, Kirsten for Holman, 10 Sep 42, AFWESPAC Ord Sec 333 Inspections, KCRC. (4) Holman Comments 1.

[44] (1) GO 17, GHQ SWPA, 20 Jul 42. (2) GO 1, Hq USASOS SWPA, 20 Jul 42.

[45] (1) WD Cir 245, 25 Jul 42. (2) For Pacific area reaction, see file AFWESPAC Ord Sec 020 Correspondence Relating to Transfer of Motor Vehicle Activities from QM to Ord, KCRC. (3) For background on the transfer in the United States, see Thomson and Mayo, *The Ordnance Department: Procurement and Supply*, pp. 282–84. (4) Holman Comments 1.

motorcycles, and miscellaneous types. More than 6,000 of the total, including most of the sedans, had been purchased in Australia or obtained from Dutch distress cargoes. Along with the vehicles, Ordnance inherited problems.[46]

First was the familiar problem of personnel. By agreement between Colonel Holman and Col. Douglas C. Cordiner, the USASOS chief quartermaster, the Quartermaster motor transport officers were told that they must remain with Ordnance for a period of six months or a year (to be released to Quartermaster at the end of the period if they wished). But there were only ten of them at Headquarters, USASOS, two of whom were in ill health, and only seven at the various base section headquarters. The Quartermaster units concerned with motor transport were assigned to Ordnance as of 1 August, but they were few. Only four were in Australia: Company A, 86th Quartermaster Battalion (Light Maintenance), and the 179th Quartermaster Company (Heavy Maintenance), stationed at Mount Isa; Company C, 86th Quartermaster Battalion (Light Maintenance), stationed at Townsville; and Company A, 72d Quartermaster Battalion (Light Maintenance), at Brisbane. In the cities a large proportion of the repair work was being done under contract by commercial automobile companies, which also stored and distributed spare parts.[47]

The greatest need for repairs was often far from cities and could only be met by maintenance troops. Additional companies had been requested by the USASOS quartermaster, but he had been told that they would not be available before 1943; they were not forthcoming even after Colonel Holman on 10 September urged USASOS to inform Washington that the vehicle maintenance situation was fast approaching the critical stage. Throughout the fall the heavy trucking operation in the Mount Isa–Darwin area, carried on over rough roads in clouds of dust, continued to tie up a large portion of Holman's motor maintenance men. The arrival in Townsville of shiploads of unassembled vehicles made necessary the assignment of mechanics to an assembly plant there, since no commercial assembly plants existed north of Brisbane.[48]

When Ordnance took over motor vehicles, shortages existed in certain types of trucks, especially the versatile jeeps, which could go anywhere and were particularly valuable as staff cars. There were only about 2,000 in the theater, and they were beginning to be considered by everyone "an absolute necessity"—so much so that

[46] Rpt, Lt Col Harry A. Cavanaugh, Motor Supply Parts and Maintenance Division, Procurement and Distribution of Motor Vehicles Branch, 21 Aug 42 (hereafter cited as Cavanaugh Rpt), AFWESPAC Ord Sec 020 Corres Re Trsfr of Motor Vehicle Activities, KCRC. Colonel Cavanaugh had been General Motors representative in Australia. Barnes Rpt, p. 65.

[47] (1) Holman Comments 1. (2) Cavanaugh Rpt.

[48] (1) Cavanaugh Rpt. (2) Memo, COrdO for G–4 *et al.*, 10 Sep 42, no sub; Memo, J. L. H. to G–3, 30 Sep 42, sub: Transfer of Organizations; Ltr, COrdO to Motor Maintenance Officer, Rail Head, Base Section 1, 6 Oct 42, sub: Transfer of One Platoon of Company "C," 86th Ord Bn (Q) to Base Section 1, for Temporary Duty; Ltr, Maj Gen Marshall to CO Base Section 2, 14 Nov 42, sub: Assembly of Motor Vehicles; all in AFWESPAC Ord Sec 200.3 Assignment of Personnel. KCRC. (3) Memo, J. L. H. for G–3, 23 Jun 43, sub: Motor Vehicle Assembly Companies, AFWESPAC Ord Sec 320.2 Strength, KCRC.

The automotive maintenance units transferred to Ordnance from Quartermaster carried the designation "(Q)." Later, "automotive" became part of the unit name and the "(Q)" was dropped.

they were freely stolen by one organization from another. One day a jeep assigned to Capt. John F. McCarthy, Ordnance officer of Base Section 2, disappeared from the street in Townsville where he had parked it and was next seen tied down on an Australian flatcar scheduled to head west with an Australian unit. Colonel Holman commented, "This is the payoff." During the build-up at Port Moresby it was not safe to leave a jeep parked with the keys in it. The shortage was so acute that officers often had to thumb rides or walk for miles.[49]

For most of the vehicles, particularly jeeps, there were not enough spare parts. The shipping shortage had made it impossible to build up a reserve stock (the ideal was a 90-day reserve supply) and some items were entirely lacking. When Maj. Gen. LeRoy Lutes, deputy commander of Services of Supply, visited Australia in October he noted that the spare parts situation was critical. Since San Francisco records showed that shipments had been made, and since he believed "no doubt many were bogged down on unloaded ships," the fault lay in maldistribution. Because of the poor railroad facilities it had been hard to distribute parts to outlying units from the large bulk storage U.S. Army General Motors Warehouse on Sturt Street, Melbourne. The answer was to carry a complete stock at the base section depots, but this would not be possible until large stocks arrived from the United States, a most unpredictable event because the motor vehicle changeover had caused an upheaval in the Ordnance distribution system.[50]

In assuming his new responsibilities, Holman saw to it that the Quartermaster officers and units that came over were instructed in Ordnance procedures and that his own Ordnance men learned motor transport maintenance. A significant change in the Ordnance system of maintenance came about that fall on instructions from Washington. Since the 1930's, Ordnance had employed three levels of maintenance: first echelon, performed by the line organization; second echelon, performed by Ordnance maintenance companies in the field; and third echelon, performed in the rear. Influenced by the Quartermaster system, which used four echelons, Ordnance planners instituted a five echelon system. First and second echelon work, now lumped together and called organization maintenance, was done by the using organization. Third echelon, sometimes called medium maintenance, was now done in the field in mobile shops. It involved replacement of assemblies, such as engines and transmissions, as well as general assistance and supply of parts to the using troops. Fourth echelon, commonly referred to as heavy maintenance, was done in the field in fixed or semifixed shops. Fifth echelon, the complete reconditioning or rebuilding of matériel and sometimes the manufacturing of parts and assemblies, was done in base shops.[51]

[49] (1) Hirsch Rpt. (2) Werner Rpt. (3) Memo, Capt W. A. Brown for COrdO, 11 Oct 42, sub: Report of Survey of Motor Vehicles, Parts Supply and Maintenance at MAPLE, Base Sections 2 and 3, AFWESPAC Ord Sec 333 Inspections, KCRC.

[50] (1) Lt. Gen. LeRoy Lutes, "Supply: World War II," *Antiaircraft Journal*, LXXXXV (September–October, 1952), p. 4. (2) Cavanaugh Rpt. (3) Barnes Rpt, p. 65. (4) Henning Rpt. (5) For the upheaval in the United States, see Thomson and Mayo, *Procurement and Supply*, pp. 399–402.

[51] (1) Holman Comments 1. (2) Thomson and Mayo, *Procurement and Supply*, pp. 448–49.

By October 1942 the four Quartermaster motor maintenance companies had been redesignated, three of them becoming Ordnance medium maintenance (Q) and the fourth, heavy maintenance (Q). The Quartermaster bulk parts storage depot in Melbourne became Sturt Ordnance Depot, and to it were transferred Ordnance parts for scout cars, half-tracks, and other Ordnance vehicles, in order that all vehicle requisitions could be filled in one place. In the Brisbane and Sydney areas, where parts had been stored and maintenance mainly done in commercial shops, Colonel Holman was planning to mesh motor transport installations with Ordnance supply and maintenance activities when facilities and personnel permitted. At Brisbane, Colonel Cauthen worked out better methods for assembling crated vehicles, using an outdoor assembly line supervised by Ordnance but operated by combat troop labor provided by the receiving organization. At Townsville motor maintenance, weapons maintenance and depot units, civilian-operated motor parts depots, and tire retreading plants were rapidly consolidated into an Ordnance service center, its most important mission the supply and maintenance of troops en route to New Guinea.[52]

[52] (1) Holman Comments 1. (2) Rpt, Hirsch to COrdO, 30 Sep 42, sub: Report of Ordnance Activities, Base Section 4, AFWESPAC Ord Sec 370.2 Monthly Rpt of Opns B.S. 4, KCRC. (3) Ltr, Kirsten to COrdO, 29 Aug 42, sub: Inspection of Quartermaster Motor Transport Installations, AFWESPAC Ord Sec 020, Corres Re Trsfr of Motor Vehicle Activities, KCRC. (4) Ltr, Weaver to COrdO, 10 Oct 42, sub: Report of Operations for Month of September 1942, AFWESPAC Ord Sec 370.2 Monthly Rpt of Opns B.S. 2, KCRC.

CHAPTER V

Supporting the Papua Campaign

The coast of New Guinea comes into view after a three-hour flight north over the Coral Sea from Townsville, Australia —the huge island stretching out below the air traveler "like a monstrous creature slumbering in the tepid equatorial sea." [1] On the map New Guinea looks like a bird-shaped monster that is about to perch on a slender peninsula jutting up from the northern coast of Australia, the head looking toward the Philippines, the bony tail extending to a point south of the Solomon Islands. The tail, bearing the towering Owen Stanley Range, is the easternmost part of Australia's Territory of Papua. At the tip is a deep forked indentation, Milne Bay. About halfway down the under side of the tail is Port Moresby, the tiny copra port that Australians in 1942 called "the Tobruk of the Pacific."

Preparations were made in the summer of 1942 for dislodging the Japanese from Buna, on the northeast coast of Papua, and General MacArthur on 11 August 1942 designated Port Moresby—code name MAPLE—the U.S. Advanced Base. At the time, the defense force consisted mainly of Australians—a Royal Australian Air Force squadron and about 3,000 infantrymen sent up from Australia early in 1942 as a consequence of the Japanese occupation of Rabaul, Lae, and Salamaua. The Americans on the scene in August 1942 were air, antiaircraft, or service units. In late April 1942 two American fighter groups had been dispatched to relieve the weary RAAF units, and they were followed by an antiaircraft battalion, several Engineer units to improve the two existing airstrips and build new ones, and some Ordnance troops, including, by July, an Ordnance aviation (air base) company, the 703d, an 11-man detachment of the 25th Ordnance Medium Maintenance Company to service the antiaircraft guns, and detachments of two ammunition companies, the 59th and 55th.[2] Along with the Australians, the Americans came under New Guinea Force (NGF), created in mid-April 1942 by General Sir Thomas Blamey, the Australian appointed by General MacArthur to command Allied Land Forces. At first New Guinea Force

[1] Geoffrey Reading, *Papuan Story* (Sydney and London: 1946), p. 7.

[2] (1) Milner, *Victory in Papua*, pp. 27, 75. Unless otherwise indicated Milner's book has been used throughout in the preparation of this chapter. Other sources consulted, although not always cited in detail include: Reports of Ordnance Activities USASOS SWPA, November 1942–February 1943, OHF; Report of the Commanding General Buna Forces on the Buna Campaign, December 1, 1942–January 25, 1943, OCMH. (2) Ltr, Lt Col Frederic H. Smith, Jr., to Director of Pursuit, Allied Air Forces, AAF, 385–E, Methods—Manners—Conducting Warfare. (3) Memo, Kirsten for Holman, 3 Jun 42. (4) Memo, Capt S.B. Booz for Holman, 1 Jul 42, (5) Ltr, Weaver to Holman, 1 Jul 42, sub: Report on Ordnance Situation at MAPLE. Last three in AFWESPAC Ord Sec 333 Inspections, KCRC.

was commanded by Maj. Gen. Basil Morris, head of the Australia–New Guinea Administrative Unit (ANGAU), the service that supplanted civil government in Papua when white residents were evacuated or called into military service. In mid-August New Guinea Force came under another Australian, Maj. Gen. Sydney F. Rowell, who was in command until 24 September, when General Blamey took over. General Blamey created Advance New Guinea Force and placed it under the command of Australian Lt. Gen. Edmund F. Herring.[3]

Rowell's New Guinea Force had been considerably augmented the third week in August by the arrival of elements of the 7th Australian Infantry Division, a unit called back to Australia from the Middle East and ordered by MacArthur to New Guinea after the Japanese landings near Buna in late July. Of the two brigades ordered to Port Moresby, one arrived 19 August and immediately began moving up the trail over the Owen Stanleys to reinforce the troops attempting to deny the trail to the Japanese advancing from Buna. Another brigade was landed on 21 August at Milne Bay where a force was being built up, including American engineer and antiaircraft troops, to improve and protect airfields.

The two Australian brigades of veterans from the Middle East arrived just in time. The Japanese, strongly reinforced at Buna from Rabaul, launched an offensive across the mountains toward Port Moresby on 26 August and at the same time landed a sea-borne force, dispatched from Rabaul, at Milne Bay.

The Ordnance Officer Arrives at Port Moresby

A few days after this alarming development, the Ordnance officer of the new U.S. Advanced Base arrived at Port Moresby by air. He was Capt. Byrne C. Manson, selected by Colonel Holman for this important job because of his fine record as Ordnance officer of Base Section 4 at Melbourne. He was destined to pioneer in New Guinea as he had pioneered in Australia in the early days. On a morning in late August Manson arrived at Port Moresby, coming down at one of the airstrips on a dusty plain several miles inland. He rode in a jeep down arid brown hills to the waterfront, where corrugated iron roofs of stores and shipping offices were blazing in the sun, and everywhere Manson saw the effects of the Japanese air raids that had been battering the small port since February: broken windows in the empty bungalows in the hills and the stores along the harbor, bomb craters and slit trenches in the dirt roads that passed for streets.[4]

The most immediate Ordnance problem at Port Moresby was to increase the supply of ammunition. Bombers and fighters trying to stop the Japanese advance and cut off Japanese supplies at Buna depended on Ordnance dumps. Demands were heavy: in two days 35 tons of bombs and 33,000 rounds of ammunition were used up over Buna. Ammunition for American ground troops—chiefly antiaircraft units—was not as critical, but reserves had to be built up. Stocks of weapons and weapons

[3] McCarthy, *South-West Pacific Area — First Year: Kokoda to Wau*, pp. 42–43, 105, 236–39.

[4] (1) Manson File. (2) John Lardner, *Southwest Passage* (New York, 1943), pp. 170, 175–77.



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parts Manson found "so low and unbalanced as to be of no consequence." On his way north he had placed requisitions at Brisbane for a 90-day supply of maintenance spare parts and major item replacements and a 30-day supply of cleaning and preserving materials, all to be shipped immediately. Motor maintenance parts were sufficient for the moment, but more would have to be ordered from Brisbane because there were more vehicles at the base than had been estimated and larger reserves were desirable.[5]

The shortage of Ordnance personnel was reminiscent of the early days in Australia, when of necessity the men available did the work that had to be done, regardless of their specialties. Because Manson had no depot troops, he planned to use his antiaircraft maintenance detachment—nearing the end of its assigned task—as depot troops to receive and sort the expected shipments of supplies. A 72-man motor maintenance platoon, which came in by ship on 8 September but was unable to set up a shop because its tools and equipment were still en route, was put to work handling bombs and burning off areas around ammunition dumps. Because Papua was then in the midst of the dry season, the danger of fire was ever present. At the most important dump, the Central

[5] Ltr, Manson to COrdO USASOS SWPA, 13 Sep 42, sub: Ordnance Field Service Report of Operations—Initial Report (hereafter cited as Manson Rpt), AFWESPAC Ord Sec 370.2, Monthly Rpt of Opns Adv Base N.G., KCRC.

Dump at Four-Mile Airdrome serving three airfields, some fire-fighting equipment was available, but it was primitive—barrels containing water, and burlap bags to use in smothering flames.[6]

On 15 September a grass fire spread to the Central Dump. The flames moved rapidly, sending up dense black clouds and detonating bombs and ammunition with thundering roars. Braving the intense heat and great danger, more than a score of Ordnance men attempted to extinguish the flames with wet burlap bags; failing, they tried to haul bombs and ammunition cases to safety, risking their lives. Despite their efforts, large quantities of bombs, fuzes, fins, and arming wires, as well as 155-mm., 37-mm., 20-mm., .50-caliber, and .45-caliber ammunition were lost.[7] This loss of the ground ammunition was particularly unfortunate because it occured on the very day the first U.S. combat troops arrived in New Guinea.

The Crisis in Mid-September

At the end of the first week in September the Japanese amphibious operation had been repulsed at Milne Bay but the Japanese overland forces had advanced far along the Kokoda Trail and were coming uncomfortably close to Port Moresby. The timely arrival of the third brigade of the 7th Australian Infantry Division on 9 September, however, and its prompt dispatch up the Kokoda Trail, gave reassurance that the Japanese attack would be stopped. In an effort to hasten the enemy's withdrawal by cutting in on his flank, MacArthur ordered to New Guinea the 126th Infantry of the U.S. 32d Infantry Division. The first men arrived by air on 15 September, their fatigues still wet from the green "jungle dye" applied the night before in Brisbane.

Meanwhile, the Australians continued to fall back before the Japanese onslaught down the Kokoda Trail. They believed that they could still contain the enemy, and assured GHQ in Australia that the best course was to withdraw to good defensive positions nearer their base on the coast. Yet at MacArthur's headquarters alarm mounted as the Japanese continued to advance. By 16 September the Japanese were at Ioribaiwa, only thirty-five miles north of Port Moresby. In the hills behind the port men were digging trenches and stringing barbed wire around "centers of resistance"; at the airfields, crewmen working on airplanes were wearing pistols. MacArthur decided to send the 32d Division's 128th Infantry to Port Moresby immediately. The entire regiment was transported by air between 18 and 23 September—the greatest mass movement of troops by the Air Forces up to that time.[8]

The threat to Port Moresby was soon over. In the last days of September the Australians, bringing up two 25-pounders

[6] (1) Memo, Kirsten for Holman, 7 Sep 42, sub: Situation at MAPLE, 31 Aug to 6 Sep, Kirsten Personal File, OHF. (2) Manson Rpt. (3) Unit History of the 3425th Ordnance Medium Maintenance Company (Q) (redesignation of Co A, 72d Ord Medium Maint Bn (Q)), pp. 5–6.

[7] (1) Proceedings of a Board of Officers Convened at Port Moresby . . . to Investigate . . . the Damage to, and Loss of, Ordnance Property Located at Central Dump . . . , Manson File, OHF. (2) Robinson, *The Fight for New Guinea*, pp. 124–25.

[8] For MacArthur's decision and the reaction of the Australians, see McCarthy, *South-West Pacific Area—First Year: Kokoda to Wau*, pp. 234–35, 242.

and blasting the position at Ioribaiwa, discovered that the Japanese had withdrawn. At the time it seemed that the enemy had found it impossible to bring up enough supplies over the Kokoda Trail, but, in fact, the withdrawal was closely tied in with Guadalcanal. Defeated there by the U.S. Marines on the night of 13–14 September, the Japanese had decided to subordinate the Papua venture to the retaking of Guadalcanal and to withdraw for the time being to their Buna beachhead.

To destroy the Japanese at Buna then became the most pressing task for the Allies. MacArthur planned a pincers movement. The Australians were to continue to advance over the Kokoda Trail, supplied by native carriers and airdrops. The Americans were to advance by two routes—one inland and one up the northern coast of Papua. The inland trail, the mountainous Kapa Kapa–Jaure track, was to be used by the 126th Infantry, the coastal plain south of Buna was to be the route of the 128th Infantry. The movement of the U.S. troops began in mid-October. As it turned out, only one battalion went over the difficult and precipitous Kapa Kapa–Jaure track. The discovery of adequate sites for airfields on or near the coast, notably at Wanigela—a little better than halfway between Milne Bay and Buna—made it possible to transport most of the Americans by air over the Owen Stanley Range to the north shore of Papua. How they were to be supplied after they got there was another matter.

The Sea Route to Buna

As General MacArthur acknowledged at the outset of the campaign to retake Buna, "the successful employment of any considerable number of troops on the north shore . . . was entirely dependent upon lines of communication." The logisticians responsible for establishing effective lines of communication might well have been appalled by the task. The great mountain barrier ruled out an overland supply route. Supply by air would have to await the capture and development of airfields closer to the front; moreover, air transport at the time was being strained to the utmost to support, mostly by airdropping, the Australians on the Kokoda Trail and the Americans on the inland track. The only answer was supply by sea—an extremely hazardous undertaking. The shores between Milne Bay and Buna are washed by some of the most dangerous waters in the world, foul with coral reefs, for which no adequate charts then existed. On that primitive coast, piers or jetties could not be depended upon; the names on the map—Wanigela, Pongani, Mendaropu, Embogo, Hariko—do not indicate ports, but native villages consisting of a few thatched huts surrounded by coconut palms.

No landing craft of the kind that were later to make island-hopping feasible were then available to General MacArthur. He had to depend on small, shallow-draft fishing vessels that could navigate the reefs and approach close enough to the shore for supplies to be lightered through the breakers. For months the Small Ships Section of USASOS SWPA had been acquiring such craft from the Australians. Its so-called catboat flotilla could boast 36 at the beginning of July 1942: 19 trawlers, 4 harbor boats, 4 steamers, 2 speed boats, 2 ketches, 2 motorships, 1 cabin cruiser, 1 schooner,



PART OF THE TRAWLER FLEET, PORT MORESBY

and 1 powered lighter. In early September the Small Ships men were establishing an operating base at Port Moresby from which their ships could carry ammunition up and down the southern coast of Papua, mainly from Port Moresby to Milne Bay. Plans for the attack on Buna made it necessary to extend this operation to the northern coast and to expand it considerably.[9]

The Coastal Shuttle

Rations and ammunition for the troops being flown over the Owen Stanley Range to Wanigela in mid-October were loaded on eight small trawlers at the Port Moresby dock on 11 October under the supervision of Lt. Col. Laurence A. McKenny, the 32d Division's quartermaster, who was responsible for getting the supplies forward. The trawlers carried in addition to their Australian or Filipino crews a detail from the 32d Division's Quartermaster company (the 107th), two or three men to a trawler,

[9] (1) Masterson, Trans in SWPA, cited above ch. III, n17(1). (2) Memo, Kirsten for Holman, 7 Sep 42, sub: Situation at MAPLE, 31 Aug to 6 Sep, Kirsten Personal File, OHF.

and two Ordnance men from 32d Division headquarters, 1st Lt. John E. Harbert and Technician 3 William C. Featherstone. Getting under way next day, the two trawlers in the lead, the *King John* (with Colonel McKenny aboard) and the *Timoshenko* docked on 14 October at Milne Bay, a harbor that was very important in the plans for the coastal shuttle because it was to be the main transshipment point—the place from which supplies brought by freighters from Australia were to be carried forward in the small ships. At the head of the bay, where in peacetime Lever Brothers had operated one of the largest coconut plantations in the world, dock and port improvements were proceeding rapidly, in spite of swampy ground and mosquitoes that earned for Milne Bay the reputation of being a malarial pesthole. On the afternoon of 15 October the trawlers sailed for Wanigela with an important new passenger—1st Lt. Adam Bruce Fahnestock, head of the Small Ships Section, who had been, before the war, a well-known South Seas explorer.[10]

At Wanigela Colonel McKenny received something of a shock. Brig. Gen. Hanford MacNider, commander of the 32d Division's coastal task force, told him that some of the troops had had trouble trying to march overland and would have to be carried up the coast in the trawlers and landed at Pongani. About a hundred men of the 128th Infantry came aboard the two trawlers, divided almost evenly between them. The *King John* also took on a New York *Times* correspondent, Byron Darnton. Safely skirting the treacherous and uncharted reefs around Cape Nelson, with the aid of native guides stationed at the bows to spot the reefs, the two trawlers were preparing to land at Pongani on the morning of 18 October when a bomber (later determined to be an American B–25) circled overhead and dropped bombs that killed Fahnestock and Darnton and wounded several men. The rations and ammunition were saved and carried ashore in the first landing on the coast behind the Buna front.

By early November the coastal operation had improved considerably. The Australians had charted the waters around Cape Nelson and found that larger vessels (100 to 120 tons) could negotiate the reefs around the cape. This discovery made it possible to bring sizable shipments to a transshipment point on the north shore of the cape, Porlock Harbor, where the trawlers took over. The larger boats, which were operated by the Combined Operational Service Command (COSC), a consolidation of Australian and U.S. supply services effected on 5 October 1942, brought in some Australian artillery—two 3.7-inch (94-mm.) pack howitzers (similar to the American 75-mm. howitzer) and four 25-pounder guns, of about 3.5-inch caliber, firing a shell weighing 25 pounds. These pieces were to be transported from Porlock Harbor up the coast in a motor-driven Japanese barge that had been left behind when the Japanese were repulsed at Milne Bay. By 16 November when the attack on Buna was scheduled to begin,

[10] (1) Activities of 107th QM Det at Dobodura (Papua), New Guinea, 27 Nov 42–5 Jan 43. Unless otherwise indicated, the account of the small ships operation, 12 October–17 November 1942, is taken from this source as well as from Milner's *Victory in Papua*. (2) For the expeditions of the Fahnestock brothers, Bruce and Sheridan, see their book, *Stars to Windward* (New York: Harcourt, Brace and World, Inc., 1938), and *Time*, vol. 38 (October 6, 1941), p. 58.

dumps had been established north of Pongani at Mendaropu, where Maj. Gen. Edwin F. Harding, commanding general of the 32d Division, had set up his command post, at Oro Bay, and at Embogo; an advance dump was planned for Hariko, where General MacNider was getting ready to jump off.

Disaster at Cape Sudest

Between 1700 and 1800 on 16 November, three small ships and the Japanese barge left Embogo for Hariko with the bulk of the supplies for MacNider's attack on Buna. The two-masted schooner *Alacrity* departed first, then the trawler *Minnemura,* followed by the barge; the trawler *Bonwin* brought up the rear. Though hostile planes had been reported up the coast, the little flotilla had no air cover—the American and Australian fighter planes had left for Port Moresby in order to get back to their bases before dark. Deck-mounted machine guns were the ships' only protection against aircraft.

Lieutenant Harbert, the Ordnance officer of the coastal force, was in charge of the *Alacrity.* Considerably larger than the *Minnemura* and the *Bonwin,* she carried all the reserve ammunition of the 128th Infantry's 1st and 2d Battalions, about 100 tons, and forty native Papuans to help offload the matérial into outrigger canoes and then transport it inland. The *Alacrity* also had the men and equipment of the 22d Portable Hospital and was towing a steel barge carrying ammunition and a reconnaissance platoon of the 126th Infantry. The *Minnemura* had aboard General Harding, on a visit to General MacNider's command post; Col. Herbert B. Laux, an Army Ground Forces observer; and an Australian war correspondent, Geoffrey Reading. On the Japanese barge was Brig. Gen. Albert W. Waldron, the 32d Division Artillery officer, accompanied by Col. Harold F. Handy, another AGF observer. General Waldron was making his second trip to the front. The preceding night he had brought up the two Australian mountain howitzers and he now had on the barge two 25-pounders, together with their Australian crews and ammunition. Bringing up the rear was the *Bonwin,* loaded with oil drums and carrying a few passengers, including Colonel McKenny, two Australian news cameramen, and several natives.[11]

Rounding Cape Sudest (about a mile south of Hariko) at 1830, the *Alacrity* had just dropped anchor in response to a signal from the shore when her passengers saw a formation of seventeen Japanese Zeros flying very high and heading south. The Zeros turned, swooped down in groups of threes, and, using incendiary ammunition—described by one of the Australian gunners on the barge as a "bright coloured rain of death" [12]—strafed and bombed the little flotilla. Soon the *Bonwin* and the barge were sinking and the other two ships were burning. The captain of the *Minnemura* tried to run his ship inshore, but after the Papuan native in the bow dived overboard, swimming for the jungle-fringed beach, the trawler was soon

[11] (1) Ltr with Incls, Maj Gen Edwin F. Harding (USA Ret) to Lida Mayo, 9 Jul 63. (2) Ltrs, Col Maxwell Emerson (USA Ret) to Lida Mayo, 10 Oct 64, 20 Oct 64 (with Incls). (3) Ltr, Col John E. Harbert to Lida Mayo, 26 Oct 64. All in OCMH.

[12] John W. O'Brien, *Guns and Gunners* (Sydney and London, 1950), p. 171.

hung up on a reef, a sitting duck for the Zeros. General Harding swam safely to shore from the *Minnemura,* as did General Waldron from the barge, but Colonel McKenny was killed; twenty-three others were killed or drowned, and about a hundred men were wounded. Some survivors who could neither swim to land nor get into the ships' dinghies were picked up by rescue parties sent out from shore. During the night the *Alacrity* and the *Minnemura* burned to the water line. For hours their ammunition provided an impressive display of pyrotechnics—shells, rockets, and Very lights shooting into the tropical night like Fourth of July fireworks.[13]

The only cargo saved was the ammunition on the barge being towed by the *Alacrity,* and it might also have been lost except for heroic action by Lieutenant Harbert, who organized a party to pull the barge to shore. He remained on the barge in spite of repeated strafing, throwing overboard the flaming fragments that fell from the schooner and extinguishing the fires that started. His calmness steadied men who had taken cover and his courage inspired them to resume work and save the badly needed ammunition. For his extraordinary heroism he was awarded the Distinguished Service Cross, along with ten men of the two shore rescue parties who also braved enemy fire.[14]

Because of the loss of the cargoes on the small ships, General MacNider's offensive had to be postponed until 19 November, and even then it was difficult to bring the supplies up to the front. Japanese bombings and strafings at Embogo and Mendaropu on 17 November put the remaining trawlers out of commission, and the new trawlers that arrived on 21 November also suffered enemy air attacks. With the disruption for the time being of the small ships operation, supplies were airdropped. This method of supply had serious drawbacks. The difficulty of placing packages at the desired point is revealed by the report of one 32d Division unit whose supplies fell half a day's march away from the place where they were expected: "With a day's search using 40 natives we may find 20%." Fragile Ordnance supplies such as .30-caliber ammunition or 81-mm. mortar shells were also damaged in the drop. After an airstrip at Dobodura, in the neighborhood of Buna, was opened on 21 November, supplies could be landed, but the lift of the largest cargo plane then available, the C–47, equaled only the pay load of the 2½-ton truck. Moreover, the weather, the high mountains, poor landing conditions, loading problems, and enemy fighter attacks on the slow, unarmed transports always limited air shipments. The best supply route to the Buna front was by sea, and the disruption of the trawler operation was to have serious consequences.[15]

The Attack Begins—and Stalls

On the rainy morning of 19 November

[13] For a vivid account of the attack on the *Minnemura,* see Reading, *Papuan Story,* pp. 146–56.

[14] (1) GO 64, GHQ SWPA, 28 Dec 42. (2) GO 1, GHQ SWPA, 1 Jan 43.

[15] (1) AAF Historical Studies 17, Air Action in the Papuan Campaign, 21 July 1942–23 January 1943, pp. 68, 75, MS, Air University, Maxwell AFB. (2) Craven and Cate, *AAF IV,* pp. 116–17. (3) History of the 9th Ordnance Maintenance Battalion, ch. ii, pp. 4–6, and app. 3. (4) 32d Div, G–4 Sec Rear Echelon, Recapitulation of Air Shipments, 13 Nov 42 to 20 Jan 43, Record of Air Shipments (hereafter cited as 32d Div, G–4. Air Shipments).

about two thousand men of the 32d Division began to move on foot through the jungle to attack the Japanese entrenched on a coastal perimeter about three miles long, extending from Buna Village to a coconut plantation at Cape Endaiadere. The Americans were divided into two forces, the left flank advancing toward the Buna Village–Buna Mission area and the right flank advancing toward the Cape Endaiadere area. The two flanks were only two or three miles apart, but were separated by a swamp that took six or seven hours to cross on foot. The forces were armed with .30-caliber M1 and M1903 rifles, Browning automatic rifles (BAR's), Thompson .45-caliber submachine guns, and pistols. Their heavy weapons companies depended mainly on light .30-caliber machine guns and 60-mm. mortars. Other weapons for the attack were 81-mm. mortars and 37-mm. antitank guns. Artillery support consisted of seven Australian weapons—three 3.7-inch pack howitzers and four 25-pounders.[16]

As the infantrymen moved forward they were accompanied by Ordnance troops to keep their weapons in repair. A few came from the 32d Division's Ordnance Section (the 32d's Ordnance company had been moved out when the division was triangularized in December 1941);[17] most had been obtained from the 37th Ordnance Medium Maintenance Company. The left flank was served by 1st Lt. Paul Keene, 10 men from the 37th, and 3 division mechanics. Lieutenant Harbert, 8 men from the 37th, and 2 division mechanics were with troops on the right flank. In the opinion of the 32d Division commander, Keene and Harbert were to demonstrate "amply . . . the capability of young ordnance officers to operate continuously under fire and under adverse conditions." [18]

Lt. Col. Tyler D. Barney, the 32d Division Ordnance officer who was soon to arrive at the Dobodura airhead from Port Moresby, recorded: "Perhaps at no time in recent military history was ordnance service rendered under so adverse and confused conditions." [19] From the very beginning, the combat troops had to fight the jungle as well as the Japanese. They had to wade through swamps that were sometimes neck-deep; when they came out, their rifles and machine guns were full of muck and their ammunition was wet. Tropical storms cut off air support, the supply of food and ammunition ran low, and the men were soon depleted by heat, malaria, dengue fever, and dysentery. They had not been adequately trained for jungle warfare and were demoralized by strange jungle noises and Japanese sniping tactics.

Worst of all, the 32d Division troops had not been prepared for the strong defenses they encountered at Buna. Instead of finding the tired, emaciated remnants of a Japanese force that had expended itself in the attack over the Owen Stanley Range, they found the fresh, well-armed *Special Naval Landing Forces*. They were entrenched in strong bunkers constructed of foot-wide coconut logs, impervious to in-

[16] (1) Report, Force Ordnance Officer to Hq 32d Div, Ordnance Buna Operation (hereafter cited as 32d Div Ord Rpt, Buna), p. 2b. (2) Rpt of CG Buna Forces, p. 10, and Annex 3, Incl A, Field Artillery Rpt, pp. 74–75.

[17] Final Rpt of Lt Col Tyler D. Barney, in Field Service Key Personnel Rpts (hereafter cited as Barney Rpt), OHF.

[18] 32d Div Ord Rpt, Buna, p. 4a.

[19] (1) Barney Rpt. (2) History 9th Ord Maint Bn, ch. ii, p. 16.



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fantry weapons, bunkers so cleverly camouflaged with grasses and tree branches that aircraft could not spot them. Even if Army Air Forces planes had spotted them, bombing and strafing in the dense jungle would have endangered nearby friendly troop concentrations. General Harding quickly realized that tanks might be effective, but his efforts to obtain some of the lend-lease Stuarts at Milne Bay were defeated by the transportation problem. When the first tank was loaded on one of the captured Japanese barges, the barge sank. The only answer was artillery, but the bunkers were so close to the ground that the Australian 25-pounders were usually ineffective.[20]

The 32d Division had arrived in New Guinea without artillery because American planners had doubted whether artillery could be successfully used in jungle warfare. General Kenney had emphatically stated that heavy artillery had "no place in jungle warfare. The artillery in this theater flies." [21] Planners believed that mortars, aircraft, and the few Australian

[20] (1) Ltr, Colonel Harbert to Lida Mayo, 26 Oct 64, OCMH. (2) McCarthy, *South-West Pacific Area—First Year: Kokoda to Wau*, p. 363.

[21] AAF Study 17, p. 72.

weapons could provide adequate support for the infantry. Nevertheless, as an experiment, on 13 November a single 105-mm. howitzer of Battery A, 129th Field Artillery, 32d Division, was broken down, and together with a gun crew, an Australian tractor, and about twenty-five rounds of ammunition was flown to Port Moresby from Brisbane. On 26 November, in support of General Harding's Thanksgiving Day offensive, the howitzer with its crew, tractor, and 100 rounds of ammunition was flown to Dobodura in three DC-3 transport planes and put into position at the front under the code name DUSTY.[22]

DUSTY was soon highly prized. When it was fired with an HE projectile using an M48 delay fuze it could destroy Japanese bunkers. Considered by General Waldron, the 32d Division artillery officer, "a superb weapon, durable, accurate, and with great firepower, . . . better by far than anything the Japs had to bring against us," [23] the howitzer rendered excellent service—until its ammunition gave out. In the first few days the initial shipment was increased to nearly 400 rounds, all apparently HE. This was fired rapidly and in about a week all the shells in Papua had been expended. No adequate supply was to be available until late in December. One explanation was that Advance New Guinea Force, which controlled the supply of all artillery ammunition and was under an Australian commander until 13 January, had given priority to the Australian 25-pounder ammunition; but the underlying reason was that transportation, by air or sea, was unequal to demands. Because of the lack of ammunition, DUSTY was silent when most needed; and for the same reason, the remaining three 105-mm. howitzers of Battery A, 129th Field Artillery, flown to New Guinea by 22 November, were not sent to the front but remained at Port Moresby throughout the Papua Campaign.[24]

I Corps Takes Over

By the end of November the 32d Division's attack on Buna had bogged down. General MacArthur, having set up his headquarters at Port Moresby on 6 November, was, in the words of an Australian historian, "in the grip of great disquiet." [25] He sent to Australia for Lt. Gen. Robert L. Eichelberger, commanding general of I Corps, and, in a dramatic interview on 1 December, ordered him to take over command of all U.S. troops in the Papua Campaign.

The change brought to Port Moresby Col. Marshall E. Darby, Ordnance officer of I Corps and commander of the 9th Ordnance Maintenance Battalion, which had arrived in Australia in October. Darby was placed in command of the rear detachment for Buna Force (Buna Force was the new name for the American forward tactical command—a combination of I Corps and 32d Division headquarters) and thus had command of all troops under

[22] (1) Rpt of CG Buna Forces, Annex 3, Incl A, Field Arty Rpt, pp. 74–75. (2) History 9th Ord Maint Bn, ch. ii, pp. 7, 9, 21. (3) General George C. Kenney, *General Kenney Reports* (New York: Duell, Sloan and Pearce, 1944), pp. 140–41, 151.

[23] Maj. Gen. Albert W. Waldron, "Ordnance in Jungle Warfare," *Army Ordnance*, XXVI (May–June, 1944), 520.

[24] (1) History 9th Ord Maint Bn, ch. ii, apps. 5, 7. (2) 32d Div, G–4, Air Shipments. (3) Robert L. Eichelberger, *Our Jungle Road to Tokyo* (New York: The Viking Press, 1950), pp. 40–45.

[25] McCarthy, *South-West Pacific Area — First Year: Kokoda to Wau*, p. 371.

the administrative control of I Corps in the Port Moresby area. His small staff, never exceeding four officers and six enlisted men, included men from other corps staff sections as well as Ordnance. Ordnance matters, which primarily concerned ammunition, were of major importance, but Darby could not give his full time to them. Also, he had many headquarters to deal with—GHQ, Advance New Guinea Force, the Fifth Air Force, and the Advanced Base Section, New Guinea—from his point of view, "a SNAFU mess . . . Battling with GHQ—NGF—5th Air Force—Base Sect—all wanting to run the war." [26]

Sometimes in order to get action Darby felt he had to appeal directly to Base Section 3. On 2 December he bypassed normal channels—Advanced Base and GHQ Advance Section—to radio directly to the Ordnance officer at Base Section 3 for 800 rounds of 105-mm. ammunition by the first air priority, pending the arrival of a sea-borne supply. His reason for going outside channels was that at the moment the ammunition shipment "was the most important thing in the world" and he "couldn't trust anyone with it except the Ordnance Department." When no ammunition had arrived by 6 December he sent a sharp message to corps headquarters in Australia explaining his needs and what he had done, requesting the corps "to raise a little hell" about the ammunition, and pointing out that General Eichelberger had "asked for 100 rounds per day for 10 days starting 5 December and there isn't a single damned round here." Nevertheless, weeks went by before a steady flow of 105-mm. ammunition reached the front; and in the meantime, Darby was plagued at times by shortages of other types as well.[27]

Ammunition Supply to Buna Force

In theory the ammunition plan for the Papua Campaign calling for ten units of fire—five in USASOS dumps at Port Moresby and five in forward dumps—was adequate; but transportation difficulties made for a variable and irregular supply in the forward areas. About 10 December Buna Force attempted automatic supply from SOS to forward dumps, but abandoned it a week later as impractical because of frequent changes in needs, air priorities, weather, and other factors. Troops expended ammunition by round and required replenishment by rounds of specific types. After 17 December supply was strictly on the basis of a daily radio sent by Colonel Barney from Dobodura to Port Moresby.[28]

Theater Ordnance officers tried to correlate issues at bases, losses through shipments, and expenditures by troops, but it was exceedingly difficult to get expenditure reports from the combat units because of dispersion and the paper work involved. One big unknown factor was always the quantity lost in the jungle or bypassed at small supply points when the fighting deviated from the supply plan. From the best information available, the highest expenditures in the campaign were of .30-

[26] History 9th Ord Maint Bn, app. 1.

[27] (1) Extracts, Ltrs, **Rear** Det to DCofS I Corps, 6 Dec 42; Rear Det to AG I Corps, 11 Dec 42. Both in History 9th Ord Maint Bn, ch. ii, app. 7. (2) 32d Div, G–4, Air Shipments. (3) Chronicle Record of Events, Advanced Echelon, Hqs I Corps, Since 30 Nov 1942, p. 3, 314.7 History–Buna Forces, in I Corps, AG Sec, KCRC.

[28] (1) Barney Rpt, p. 2. (2) History 9th Ord Maint Bn, ch. ii, pp. 6–7, and app. 8, Ordnance Lessons of the Buna Campaign, p. 2.

caliber ball ammunition for the M1 rifle, .45-caliber ammunition for the submachine gun, and HE ammunition for the 81-mm. mortar, which was unexpectedly employed as a substitute for artillery.[29]

The high expenditure of .45-caliber rounds for the submachine (Tommy) gun was partly caused by the 32d Division infantrymen's preference for the Tommy gun over the BAR. In contrast to the marines on Guadalcanal, who swore by the BAR (and objected to the Tommy gun because it sounded like a Japanese weapon and drew friendly fire), the Army troops in Papua considered the BAR too heavy and clumsy for quick use in the jungle and too hard to keep in repair. High expenditures of ammunition for the submachine gun, as well as for the popular .30-caliber light machine gun and M1 rifles, were also caused by the fact that the 32d Division troops had been inadequately trained for the campaign—their first experience in combat—and often failed markedly to exercise fire discipline and control, firing many more rounds than were either anticipated or necessary. Firing was often "wild and prolonged," reported the I Corps G–3, "at imaginary targets or no targets at all." The Japanese, who themselves displayed excellent fire discipline, noted the poor habits of the American soldiers. "The enemy is using ammunition wildly," noted one Japanese in his diary. To another it seemed that the Americans shot "at any sound due to illusion," firing light machine guns and throwing hand grenades "recklessly." A third remarked that the Americans were "in the jungle firing as long as their ammunition lasts. Maybe they get more money for firing so many rounds." A possible shortage of .30-caliber machine gun ammunition was averted by taking the .30-caliber rounds for the little-used BAR's from the 20-round magazines and reloading them into fabric belts for the machine guns.[30]

Larger quantities of 81-mm. mortar ammunition than had been anticipated were needed because of the lack of 105-mm. howitzer ammunition. The relatively small area of the battlefield allowed the 81-mm. mortar, often fired in batteries of six or more pieces, to cover large portions of enemy territory, and the slowness of the advance permitted the mortars to move forward fast enough to support the infantry. Reports of duds in the 81-mm. heavy rounds (M56) were probably due to the fact that the rounds were being fired with a short delay fuze that permitted the projectile to bury itself far enough in mud or swamp water to smother the detonation, leaving no crater. When the round was fired with an instantaneous fuze and hit on solid ground, a fine "daisy cutter" effect was achieved. Though it could not destroy the stronger Japanese bunkers, the mortar was still greatly feared by the enemy and was considered by the commanding general of Buna Force as probably the most effective weapon used during the campaign.[31]

At the end of the first week in December a thousand rounds of 37-mm. canister am-

[29] (1) Holman Comments 1. (2) Rpt of Ord Activities USASOS SWPA, Jan 43.

[30] (1) Rpt of CG Buna Forces, pp. 61, 65–66, 70. (2) 32d Div Ord Rpt, Buna.

[31] (1) Memos, Holman for Manson, 9 Jan 43, no sub; Manson for Holman, 14 Jan 43, no sub. Both in Manson File, OHF. (2) History 9th Ord Maint Bn, ch. ii, pp. 11–12. (3) 32d Div Ord Rpt, Buna, p. 6. (4) SWPA Rpt (Henry), cited above, ch. III, n17(1).

munition arrived unexpectedly at Port Moresby by air and sea, transshipped via Brisbane from the marines at Guadalcanal, who had received large quantities in September. A projectile that dates back to the Civil War, a canister is a metal cylinder containing metal fragments. When fired, it splits open, scattering its contents. Colonel Barney radioed Australia for information on how to fire the canister and was told to shoot it and find out. While experimenting, several men were wounded, but after they had learned how to handle and fire it the canister proved highly effective. Making possible the employment against troops of the 37-mm. antitank gun —hitherto of limited use because the Japanese were not using tanks and because its antitank round was not powerful enough to destroy the thick Japanese bunkers—the 37-mm. canister ammunition discharged its pellets with lethal, shotgun effect on troops in the open and on those protected only by brush or undergrowth.[32]

No American hand grenades reached the front until mid-December because of difficulty with the fuzes. Until then the troops used Australian fragmentation grenades, which in some cases were preferred to the American as being more powerful, more dependable, and quicker to explode so that the enemy had less time to pick up the grenade and hurl it back. In other cases the American was preferred in spite of its tendency to emit sparks and give away the position of the thrower at night.[33] Neither was effective against Japanese in bunkers, nor was the antitank grenade (M9) of any use against them. The Australians had rifle grenades that could be fired through the slit openings of the bunkers with devastating effect, but although the Americans requested rifle grenades from Australia early in the operation, they did not receive any at the front during the Papua Campaign. An offensive hand grenade that would kill or incapacitate all the defenders in a given bunker by its blast effect would have been of great value. To fill the need, the Australians contrived an effective "blast bomb" out of an Australian hand grenade, two pounds of loose ammonal, a tin container, and some adhesive tape.[34]

The supply of bombs to the Fifth Air Force from Major Manson's dumps at Port Moresby was hampered at times because Manson's crew could not always inventory its stocks properly. This was especially serious in the case of the fragmentation bombs. General Kenney had discovered that small bombs of this type equipped with a supersensitive fuze that would detonate them instantaneously on contact even with foliage were most effective in the jungle. He had used them in an attack on Buna on 12 September, and they were very much in demand as the Papua Campaign drew to a close early in January 1943. It was thought that there were none left in New Guinea, until a search

[32] (1) Barney Rpt. (2) History 9th Ord Maint Bn, ch. ii, pp. 10–11. (3) Miller, *Guadalcanal: The First Offensive,* p. 123.

[33] (1) 32d Div Ord Rpt, pp. 3a, 6. (2) 32d Div, G–4, Air Shipments. (3) Ltr, 1st Lt J. J. Phillips, Jr., 703d Ord Co, to Ord Officer USASOS, 19 Dec 42, sub: Report of Ordnance Situation on the Buna Front, AFWESPAC Ord Sec 333 Inspections, KCRC. (4) Rpt, Col Harry T. Creswell and Maj Charles W. Walson, Observer's Report South and Southwest Pacific, Team 4 (hereafter cited as Observers Rpt Team 4), p. 59, Armored School Library, Fort Knox.

[34] (1) Notes, 26 Oct 42, Ordnance Conference 25 Oct 42 at Base Sec 3, p. 1, AFWESPAC Ord Sec 337, KCRC. (2) 32d Div Ord Rpt, Buna, p. 6. (3) Observer's Rpt Team 4, p. 131.

through the USASOS dumps revealed about 400 clusters on which there was no record. The discovery came too late for the bombs to be used in support of ground operations in the Buna action.[35]

Maintenance in the Jungle

Working in oppressive heat—sometimes in several feet of water—depleted by disease, and lacking any repair equipment other than the hand tools they carried, the maintenance detachments under Keene and Harbert "did a splendid job," reported one Ordnance observer, "never more than five or ten minutes behind the lines, with no difficulty keeping up parts and making repairs." [36]

Parts most in demand were main recoil springs for submachine guns, rear sight and bolt assemblies for M1 rifles, driving springs and cocking levers for light machine guns, and firing pins for 60-mm. and 81-mm. mortars, and to obtain them the crews cannibalized arms and equipment left on the battlefield. Cannibalization was wasteful and was vigorously opposed by Colonel Holman, who advocated the evacuation of damaged weapons and vehicles to Ordnance service centers so they could be torn down and rebuilt. In later campaigns in the Pacific Holman was able to put this procedure into effect but in Papua cannibalization was often the only way to get parts. Weapons parts had been extremely scarce in Australia ever since the 32d Division landed in May 1942. There was also the problem of bringing up supplies. In early December, when the first attacks by Buna Force took place, only seven jeeps and three 1-ton trailers had been flown into Dobodura and were available (when roads permitted) for carrying supplies to the front. Most of the supply burden was borne by carrier lines of Papuan natives, laden mainly with rations and ammunition.[37]

Salvage represented about 90 percent of the Ordnance maintenance task at the front.[38] Sometimes it was dangerous work. There were times when maintenance men braved enemy fire to retrieve weapons that might otherwise have fallen into the hands of the enemy. On one occasion, for example, Technician Featherstone, who had participated in the earliest trawler operation, "with utter disregard for his own personal safety, volunteered and went forward under heavy enemy fire to retrieve weapons on the front lines which had been abandoned by the dead and wounded." For this and other instances of gallantry in action near Buna between 16 November 1942 and 3 January 1943, he was awarded the Silver Star.[39] More weapons could have been saved if Keene and Harbert had had more men to spare for the job. Additional Ordnance men were requested by the 32d Division chief of staff early in December, but it was 3 January 1943 before they arrived. For lack of salvage men,

[35] (1) Ltr, Maj Robert S. Blodgett to Col Holman, 13 Jan 43, no sub, AFWESPAC Ord Sec 333 Inspections, KCRC. (2) Kenney, *General Kenney Reports*, pp. 12–13, 76, 93–94, 98. (3) Craven and Cate, *AAF IV*, p. 106. (4) Green, Thomson, and Roots, *The Ordnance Department: Planning Munitions for War*, pp. 459–61.

[36] SWPA Rpt (Henry), p. 4.

[37] (1) Holman Comments 1. (2) History 9th Ord Maint Bn, ch. ii, p. 17. (3) SWPA Rpt (Henry), p. 4. (4) Barney Rpt, p. 2. (5) Memo, 15 Dec 42, sub: Ordnance Problems in Jungle Operations, p. 2, AFWESPAC Ord Sec 438 Cleaning and Preserving Material, KCRC.

[38] Rpt of CG Buna Forces, Annex 4, p. 87.

[39] GO 12, Hq U.S. Forces Buna Area, 18 Jan 43.

many rifles and machine guns abandoned on the battlefield were damaged by rust beyond repair. The importance of battlefield salvage was one of the main Ordnance lessons of the Papua Campaign.[40]

Materials to clean and oil the small arms that had been carried through the swamps were much in demand. Cleaning and preserving (C&P) materials had been in short supply to begin with. Many of the M1 rifles had been issued without oil and thong cases. Often when the men had the cases they simply threw them away to lighten the load they were carrying. By 3 December the shortage of gun oil, small individual containers for oil, brushes, cleaning rods, and other C&P items was serious enough to affect operations. One combat officer, observing that the first thing the men stripped from the Japanese dead or wounded was the neat bakelite oil case they carried, reported that gun oil was "very precious and always short." Urgent messages characterized the condition of small arms at the front as "deplorable" and "terrible." [41]

The cleaning and preserving items were not available at Port Moresby. Twenty-five tons that had been awaiting shipment on the docks at Brisbane had gone forward by water in mid-November but were still en route at the beginning of December. One portion of this cargo especially needed at the front consisted of 4,000 4-ounce metal cans for gun oil, to be carried by the individual soldier. On an urgent, first priority requisition from Colonel Darby to Brisbane, a new shipment of containers went off immediately by air from Townsville. By the time it arrived additional quantities were needed and Darby requested that 3,000 be shipped by air. Because planes out of Brisbane were grounded, the containers had to go to Townsville by passenger train and did not arrive until five days after Darby's request, a delay that evidenced some of the difficulties of supply by air. Nevertheless, air was the only recourse in an emergency. Air delivery of at least thirty gallons of gun oil and six bales of patches, the shipment to be duplicated every forty-eight hours, was requested on 18 December. At that time the stock of oil and patches in the fighting area was reported to be zero. The men at the front used Quartermaster motor oil and captured Japanese C&P items and in the jungle when these were unavailable greased their small arms with candles, graphite pencils, and ordinary Vaseline.[42]

By the end of December as sea transportation improved, increasing supplies of cleaning and preserving materials began to reach the front. But to those responsible in Australia the situation was still critical. Strenuous efforts were being made to improve the supply to Papua and to insure that shortages of cleaning and preserving materials would not recur. When the supply of metal oil containers (demanded in much larger quantities than had been foreseen) was exhausted, Colonel Holman drew on the Australian Army for 2-ounce

[40] (1) Advanced Base USASOS SWPA Ordnance Report of Operations, p. 2, AFWESPAC Ord Sec 370.2 Monthly Rpt of Ord Opns Adv Base N.G., KCRC. (2) Holman Comments 1.

[41] (1) History 9th Ord Maint Bn, ch. ii, pp. 15–16, and app. 8, p. 3. (2) 32d Div Ord Rpt, Buna, p. 5. (3) Notes, 26 Oct 42, Conf 25 Oct 42 Base Sec 3. (4) Monthly Rpt of Opns, Nov 42, Base Sec 3, USASOS SWPA, AFWESPAC Ord Sec 370.2, KCRC. (5) Odell Narrative, Dec 42, 12 Station Hospital, Australia, in Milner Notes.

[42] (1) History 9th Ord Maint Bn, ch. ii, pp. 15–16, and app. 7. (2) Barney Rpt, p. 2. (3) 32d Div Rpt, Buna, p. 5.

plastic containers. He also attempted to have oil and thong cases manufactured locally. His staff experimented with different types of rust preventives for small arms in the damp jungles and after six months of tests came up with a lubricant containing lanolin that withstood corrosion under the severest conditions. The Papua Campaign ended before the new lubricant could be introduced for more than field tests in combat, but it offered hope for better maintenance in future jungle campaigns.[43]

The Forward Bases

In mid-December four lend-lease Stuart tanks were landed by sea at Hariko, only a few miles from the battlefield, an "amazing achievement" in the opinion of General Herring, commanding general of Advance New Guinea Force. These tanks, and those following a few days later, had little effect on the battle for Buna; the light, fast Stuarts, slowed by swamp mud choked with kunai grass, were, in the words of the Australian historian of the battle, "like race horses harnessed to heavy ploughs"; moreover, they were "almost blind" because tank vision, restricted at the best of times, was shut off by the tropical growth.[44] Yet the fact that the tanks could be landed on that coast at all, only a month after General Harding's ill-starred effort to bring them up by barge from Milne Bay, showed how far the sea supply operation had progressed in a very short time.

Sizable ships could now come into Oro Bay, a harbor about fifteen miles southeast of Buna. The 3,300-ton Dutch freighter *Karsik* on the night of 11–12 December brought the tanks from Port Moresby into Oro Bay. Unloading was supervised by Maj. Carroll K. Moffatt of Combined Operational Service Command, who had just arrived in the area with the first landing craft to reach the combat zone—six Higgins boats (LCVP's) and two Australian barges. The tanks were transferred to the barges, which were towed by motor launches, and carried up the coast through the reefs to Hariko. There the tank crews drove them over the side of the barges onto the beach.[45]

The establishment of an effective line of supply by sea made it necessary to increase Ordnance service at Oro Bay as well as Milne Bay. For these forward bases Maj. Byrne C. Manson recommended composite companies of 6 officers and 180 men each, including headquarters, ammunition, depot, weapons maintenance, and motor maintenance men, but this was merely a hope for the future.[46] For the present he had to send piecemeal detachments. At Milne Bay a depot company began to arrive on 26 November, but no effective motor maintenance was possible until mid-December when Manson sent to Milne Bay a detachment of his Port Moresby company, now redesignated the 3425th Ordnance Medium Maintenance Company

[43] (1) Memo, USASOS COrdO, R.H.E. [Maj R. H. Einfledt] for Manson, no sub, 10 Jan 43. (2) Memo, Manson for Einfledt, no sub, 14 Jan 43. Both in Manson File, OHF. (3) Monthly Rpt of Opns, Jan 43, Base Sec 3, USASOS SWPA, p. 1, AFWESPAC Ord Sec 370.2, KCRC.

[44] McCarthy, *South-West Pacific — The First Year: Kokoda to Wau*, pp. 462, 517.

[45] *Ibid.*, pp. 452–53.

[46] Manson to COrdO, 22 Nov 42, sub: Report of Operations, November 1942, AFWESPAC Ord Sec 370.2 Monthly Rpt of Opns Adv Base N.G., KCRC.

(Q). At Oro Bay he could provide during the Papua Campaign only small detachments of headquarters, maintenance, and depot troops, a number inadequate to support growing operations. Even clerks had to double as ammunition handlers. Toward the end of the campaign the Oro Bay Ordnance officer was "frantically calling for help and with good reason."[47]

The problem of motor maintenance arose at Oro Bay in early December when tracks for jeeps from Hariko and Dobodura to the front were finally completed. From dumps or open beaches, jeeps pulled their 1-ton trailers over primitive roads corduroyed with coconut logs and interspersed with mudholes that played havoc with springs, shock absorbers, and brake cylinders. The jeeps proved to be sturdily built —no other motor vehicles could have operated under such conditions—but even the jeeps had difficulty in the mud. When tropical rains turned many areas into quagmires, oversized command car tires were mounted on the jeeps, or, better yet, dual wheels using standard tires were constructed for the rear axles of the vehicles. The initial job of conversion to six wheels was done almost overnight by half a dozen men of the 3425th Ordnance Medium Maintenance Company (Q) at Milne Bay. Once this conversion proved workable, the 6-wheeled jeeps were prepared in Australia for Papua.[48]

The Shortage of Base Personnel and Supplies

To provide Ordnance service at three major bases—Port Moresby, Milne Bay, and Oro Bay—and at several minor bases, Major Manson had only 650 men during the entire campaign. The acute manpower shortage began in October, when the arrival of the 32d Division troops greatly increased the Ordnance load and at the same time pre-empted the shipping needed to transport base personnel. An 8-man detachment of the 360th Composite Company and a 70-man detachment of the 55th Ordnance Ammunition Company arrived in October, but the rest of the ammunition company and the maintenance men—the 37th Ordnance Medium Maintenance Company and the remainder of Company A, 72d Ordnance Medium Maintenance Battalion (Q)—did not arrive until late November or early December. Supply shipments were also affected. For three weeks in October not a single cargo ship moved from Brisbane to New Guinea. There was some improvement in November, and small air shipments helped, but it was early January before a regular sea-and-air shipping schedule for Ordnance matériel was established and large stocks could be forwarded.[49]

[47] (1) Unit History, 818th Ord Depot Co. (2) History 3425th Ord Medium Maintenance Co. (3) History USASOS, ch. xvii, Base B at Oro Bay, New Guinea, December 1942 to March 1944, pp. 74–75.

[48] (1) Ltr, Phillips to COrdO, USASOS, 19 Dec 42, sub: Rpt of Ord Situation on Buna Front. (2) Rpt, Col Cavanaugh, 15 Feb 43, sub: Report on Inspection Trip (hereafter cited as Cavanaugh Rpt 15 Feb). Both in AFWESPAC Ord Sec 333 Inspections, KCRC. (3) History USASOS, ch. xvii, pp. 37–38. (4) Memo, Manson for T/3 James A. Tuthill *et al.*, 3425th Ord Medium Maint Co, 15 Jan 43, sub: Letter of Commendation, in History 3425th Ord Medium Maint Co.

[49] (1) For the personnel shortage see file, AFWESPAC Ord Sec 200.3 Assignment of Personnel, KCRC, correspondence from September 1942–January 1943, particularly, Ltrs, Manson to COrdO, 28 Sep 42, sub: Ammunition Personnel, and 27 Nov 42, sub: Ordnance Personnel. (2) Ltr, Maj Nathan J. Forb to Col Cavanaugh, 5 Dec 42, sub: Staff Visit MAPLE, AFWESPAC Ord Sec 333 Inspections, KCRC.

The motor maintenance problem, not only new to Ordnance but new to the Army under combat conditions, was staggering. The fleet of 845 vehicles at Port Moresby in October had grown by mid-December to 2,500, and was increasing by 100 a week. An average of 4,000 tons of cargo, Australian and American, was being hauled every day from the docks, in addition to the hauling within the base of men, water, rations, and ammunition. Over roads badly corrugated, alternately very dusty and very muddy, trucks operated twenty-four hours a day with very little first or second echelon maintenance. One unit reported, "We are too busy hauling to stop and grease the trucks." Many of the vehicles had arrived from Australia in poor condition, damaged, sometimes demolished, en route; some came with smooth tires, some lacking ignition keys, and many without tools.[50]

Spare parts were scarce until January, when heavy shipments began to come in. By then it had become evident that no matter how many parts were sent, there would never be enough as long as drivers continued to neglect first and second echelon maintenance. Manson detailed an inspection team of one officer and three enlisted men to visit motor pools, report on the condition and state of maintenance of each vehicle inspected, and teach drivers the danger of reckless driving and overloading. The team brought about some improvement, but the base continued to be "littered with broken down vehicles." The only answer was more maintenance troops, including a heavy maintenance company, but none were available.[51]

Heat, Disease, and Hunger

The shortage of Ordnance men at the bases in Papua was aggravated by the hard working conditions. An observer noted that the heat made everyone "about 50% efficient";[52] many of the men suffered from recurring attacks of malaria and other diseases. Along with most of the other troops in New Guinea, they did not have enough food because of the shipping shortage. At Port Moresby one inspection officer saw "hungry men working themselves beyond their capacity seven days a week in an effort to provide Ordnance service to troops whose numbers would have ordinarily required five times the Ordnance personnel available."[53] Refusing "to wring the last ounce of energy from the men under my control merely to show how much can be done with so few men," Manson sent strongly worded requests to Colonel Holman for more personnel. Be-

[50] (1) Memo, Maj Spencer B. Booz for COrdO, USASOS, 19 Dec 42. (2) Cavanaugh Rpt 15 Feb. (3) Ltr, Forb to Cavanaugh, 5 Dec 42. All in AFWESPAC Ord Sec 333 Inspections, KCRC.

[51] (1) Monthly Rpt of Opns, Jan 43, Base Section 3, USASOS SWPA, p. 1, 370.2 AFWESPAC Ord Sec, KCRC. (2) Cavanaugh Rpt 15 Feb. (3) Memo, Manson for CG U.S. Advanced Base, 7 Jan 43, no sub. (4) Incl to Memo, Manson for COrdO USASOS, 8 Jan 43, sub: Motor Maintenance. (5) Ltr, Manson to Holman, 11 Jan 43, no sub. Last three in 200.3 Assignment of Personnel AFWESPAC Ord Sec, KCRC.

[52] (1) Ltr, Cavanaugh to Holman, 24 Jan 43. (2) Ltr, Manson to Holman, 11 Jan 43, AFWESPAC Ord Sec 200.3 Assignment of Personnel, KCRC. (3) Reports for period in file, AFWESPAC Ord Sec 333 Inspections, KCRC. (4) For the disease rate see Memo, 32d Div Surgeon for CG Buna Force, 15 Jan 43, sub: Health of Command, Final Report, in History 9th Ord Maint Bn, ch. ii, app. 13.

[53] Ltr, Byrne C. Manson to Lida Mayo, 31 May 66, Manson file.

yond a few depot men and a handful of staff officers, Holman could do little, for the men were not available.[54]

Under these circumstances, Major Manson did an outstanding job for which he received the Legion of Merit. He kept the flow of Ordnance supplies moving up front; made inspection trips to forward bases covering every road and installation in New Guinea; planned intelligently; and sent valuable reports and recommendations back to Australia. All this was accomplished under great pressure, sometimes when he himself was ill. By the last week in January the I Corps medical officer was afraid that Manson would "crack" unless he was given more help and granted leave to Australia.[55]

Captured Japanese Matériel

Toward the end of the campaign Major Manson had to organize a technical section on enemy munitions. Since September 1942 the Ordnance Department in Washington had been requesting captured Japanese matériel. Colonel Holman had been able to send only a few bombs and fuzes, some obtained from an Australian bomb disposal section at Port Moresby, others from the Ordnance officers at Milne Bay and Townsville. In the early stages of the Papua Campaign, Advance New Guinea Force—the Australian command under which all Allied forces operated—had responsibility for all Japanese matériel sent into the Port Moresby area, including that captured by Americans. The Australians were willing to furnish the Americans reports, evaluations, and photographs, but the weapons themselves went to an Australian Imperial Forces museum in Melbourne, and reports on important items, such as a Japanese bullet that appeared to be of an explosive or dum-dum type, were sometimes very slow in arriving at American headquarters. The procedure was obviously unsatisfactory, and during the autumn of 1942 Colonel Holman worked out a new system with the Australians: if Americans captured the items they got the first piece, the Australians the second, and vice versa. By January 1943 this new procedure was in effect, and a 6-man detachment from a small Ordnance technical intelligence unit that had just arrived in Australia was earmarked for Port Moresby.[56]

"A Poor Man's War"

With the aid of better transportation to the front, bringing in fresh troops and more effective ammunition to batter down Japanese bunkers, the victory came at Buna on

[54] (1) Ltr, Manson to Holman, 11 Jan 43, AFWESPAC Ord Sec 200.3 Assignment of Personnel, KCRC. (2) Holman Comments 1.

[55] (1) Ltr, Blodgett to Holman, 13 Jan 43, no sub, AFWESPAC Ord Sec 333 Inspections. (2) Ltr, Cavanaugh to Holman, 24 Jan 43; Memo, Col Clinton J. Harrold, S-4 U.S. Advance Base, for CG Advance Base, 25 Feb 43, sub: Commendation. (3) GO 42, USAFFE 29 Jul 43. All in Manson File. It was not until mid-April that Manson was transferred to Australia. (4) Interv with Holman and Kirsten, 12 Apr 56

[56] (1) Rad 1780, Washington, D.C. to USASOS, 17 Sep 42. (2) Ltr, Holman to CofOrd, 14 Nov 42, sub: Samples of Japanese Munitions. (3) Memo, J. L. H. for G-4 Supply, 4 Jan 43. All in AFWESPAC Ord Sec 386.3 Captured Enemy Ordnance and Ammunition, KCRC. (4) Memo, Holman for Manson, 9 Jan 43; Ltr, Manson to Holman, 14 Jan 43. Both in Manson File. (5) History 9th Ord Maint Bn, ch. ii, pp. 12–13, and app. 8, p. 3. (7) Interv with Holman and Kirsten, 12 Apr 56.

3 January. By 22 January all organized Japanese resistance in Papua had ended and "the long, heartbreaking campaign was done." Fought in the "Green Hell" of the jungle that took a heavy toll of men and weapons, the campaign had been siege warfare—the bitterest, most punishing, and most expensive kind. And yet it had been "a poor man's war." [57] There were never enough men, and the amount of supplies that could be brought forward from Australia to Port Moresby and from Port Moresby to the front was restricted by the scarcity of ships and aircraft. It was also pioneer warfare. There had been little experience with either Japanese tactics or with the Southwest Pacific climate and terrain to guide planning.

The weapons carried by the Americans were standard equipment, none of it designed especially for jungle warfare; the jungle kit developed in the summer of 1942 consisted mainly of Quartermaster items. General MacArthur, undoubtedly influenced by the Japanese use of lightweight weapons, had asked the War Department in August 1942 for special items to equip his troops for jungle warfare in New Guinea—light machine guns, small tractors, folding bicycles, pack horse equipment, and miscellaneous items. He also wanted to use 60-mm. mortars instead of 105-mm. howitzers in his infantry cannon companies and to replace the 105-mm. howitzers in his artillery with 81-mm. mortars and 75-mm. pack howitzers. The War Department made great efforts to comply with these requests, but the few special items that reached SWPA came too late to be used in the Papua Campaign.[58]

Bayonets and jungle knives, desired before the campaign, were not employed except for such down-to-earth tasks as opening ration cans and scraping mud from combat boots. In the heavy weapons companies, the light .30-caliber machine guns replaced the more cumbersome heavies, and 60-mm. mortars were sometimes substituted for the heavier 81-mm. pieces. The few .50-caliber machine guns were usually installed in semipermanent mounts for antiaircraft defense of airstrips, supply dumps, and other installations.[59] In the category of hand and shoulder weapons perhaps the greatest complaint of the 32d Division was the lack of carbines, the light .30-caliber weapon developed as a substitute for the .45-caliber pistol. General Harding began asking for them almost as soon as his unit reached Australia, but large-scale production did not begin until the summer of 1942 and the demands of other theaters prevented any shipments to SWPA in time for use around Buna.[60]

For the infantrymen, the need had been not so much for new lightweight weapons

[57] Eichelberger, *Our Jungle Road to Tokyo*, pp. 18, 51, 61.

[58] (1) Leighton and Coakley, *Global Logistics and Strategy, 1940–1943*, pp. 410–11. (2) Waldron, "Ordnance in Jungle Warfare," *Army Ordnance*, XXVI (May-June, 1944), 520.

[59] 32d Div Rpt, Buna, pp. 3, 5, and Annex, Data on Armament Taken to and Brought Back from New Guinea, Schedule 2.

[60] Ordnance officers differed in their opinions as to the value of the carbine. General Holman has observed that the carbine was well received when it finally did arrive in the Pacific area. Holman Comments 1. Brig. Gen. Robert W. Daniels, the AGF Ordnance officer from 1942 to 1944, believed the Army was oversold on the carbine. The Army needed a light, powerful weapon, but in General Daniels' opinion the carbine turned out to be about as powerful as a pistol and about as handy as a rifle. Interv with Brig Gen Robert W. Daniels, 5 Jun 63.

as for greater quantities of certain supplies already available, notably cleaning and preserving materials. Combat in New Guinea and Guadalcanal proved that in the main the standard heavy equipment of the infantry division was far more effective, reliable, and durable than equivalent lightweight matériel. Army units fought over whatever terrain they encountered without noticeable change, using only a few items of special equipment.[61] The only special Ordnance items developed in the theater in 1942 were a light, 2-wheeled, jungle cart for carrying ammunition from jeepheads forward; a modification kit to convert a jeep into a field ambulance in the jungle; and a small ship or floating depot to carry weapons, parts, and cleaning and preservation materials to combat troops at advance bases.[62]

Many of the maintenance problems that plagued Ordnance officers in this early campaign were to recur not only in the Pacific but in other parts of the world. This was especially true of the motor maintenance problems. Planners in the fall of 1942 had not yet grasped the magnitude of the task of supplying motor vehicles and keeping them operating, a task transferred from the Quartermaster Corps to the Ordnance Department by Lt. Gen. Brehon B. Somervell, commanding general of Army Service Forces, at a time when offensives were soon to be launched from the base in Australia and from the base in the British Isles. The transfer was strongly opposed by Maj. Gen. Levin H. Campbell, Jr., Chief of Ordnance, because he knew that there would not be time to train Ordnance men to handle this tremendous job. He immediately appealed to all automobile manufacturers and dealers to supply trained men. They did so and, in his opinion, saved the day for Ordnance.[63]

The Papua Campaign clearly showed that automotive maintenance men as well as automotive spare parts would be required in greater numbers than had ever been anticipated. Another important lesson, applicable to all types of supplies, was that packaging and methods of handling would have to be improved. The campaign had demonstrated, moreover, the danger of sending combat troops forward without sufficient support at advance bases.

Lessons learned in the Papua Campaign were too late to be applied to the first offensive in the war against Germany, the invasion of North Africa in November 1942. It was on a far grander scale than the early Pacific campaigns, and the planning factors were different. In the Pacific, planning had been conditioned by the direction of the Japanese advance and the necessity for a far-flung holding operation at the same time. In the Atlantic, preparations in the spring of 1942 were undertaken in the midst of "vast confusion and uncertainty" as to when and where to attack.[64]

[61] Leighton and Coakley, *Global Logistics and Strategy, 1940–43*, p. 411.

[62] (1) Rpt of Ord Activities USASOS SWPA, Nov 42, Jan 43. (2) Memo, J. L. H. for G–4, 23 Sep 42, sub: Status of Development of Items for Jungle Warfare, AFWESPAC Ord Sec 381 Preparations for War, KCRC. (3) Holman Comments 1.

[63] Ltr with Incl, Lt Gen Levin H. Campbell, Jr. (USA Ret) to Brig Gen Hal C. Pattison, 30 Sep 63 (hereafter cited as Campbell Comments), OCMH. For the arrival in the Middle East in November 1942 of the first increment of the four field maintenance regiments recruited with the aid of the National Automobile Dealers Association, see above, p. 22.

[64] Matloff and Snell, *Strategic Planning for Coalition Warfare: 1941–42*, p. 294.

CHAPTER VI

The Base in the British Isles

For six months after the attack on Pearl Harbor the military planners in the United States were so preoccupied with the war in the Pacific that, as General Eisenhower expressed it, "the very existence of the London group was all but forgotten." In accordance with the prewar decision that if the United States entered the war the Special Army Observer, London, would assume command of the first U.S. Army forces sent to the British Isles, General Chaney on 8 January 1942 was designated Commander, United States Army Forces in the British Isles (USAFBI), and members of SPOBS, sending home for their uniforms, became an Army headquarters.[1]

The new headquarters was not sufficiently informed by the War Department either of the details of the immediate plans made in Washington at the ARCADIA Conference late in December 1941, or, as time went on, of the War Department's long-range plan for making the British Isles a great operating military base. When General Eisenhower went to London in mid-May 1942, he reported to Washington that the USAFBI staff members were "completely at a loss in their earnest attempt to further the war effort." [2]

In the summer and fall of 1941 the planning of Colonel Coffey and other members of SPOBS had been founded on the ABC reports, which contemplated the bombing of Germany as the first U.S. combat effort from a United Kingdom base. The War Department's RAINBOW 5 plan of April 1941, founded on the ABC–1 Report, provided that the only ground forces to be sent to the United Kingdom immediately after a declaration of war would be 44,364 troops to defend naval and air bases in Scotland and Northern Ireland, and a "token force" of 7,567 men for the defense of the United Kingdom, based in England.[3]

The ARCADIA Conference, the first wartime meeting of Prime Minister Churchill and President Roosevelt, gave the ground forces a new mission. President Roosevelt agreed to assume at once the responsibility for garrisoning Northern Ireland. The

[1] (1) Quote from p. 50 of *Crusade in Europe*, by Dwight D. Eisenhower, copyright 1948 by Doubleday & Company, Inc., reprinted by permission of the publisher. (2) Matloff and Snell, *Strategic Planning for Coalition Warfare, 1941–42*, pp. 42, 111. Unless otherwise noted, this chapter is based on Matloff and Snell, also on Ruppenthal, *Logistical Support of the Armies*, vol. I, and Leighton and Coakley, *Global Logistics and Strategy, 1940–43*. (3) Cable, USAFBI to AGWAR for WARGH, No. 37, 29 Jan 42, sub: Shipment of Officers' Baggage, Admin 388, SPOBS–Troops–Cables.

[2] Eisenhower, *Crusade in Europe*, pp. 49–50.

[3] (1) Annex 7 (Ordnance) to Basic Plan for Token Force, Folder "Token Force," OPD–GHQ. (2) Ltr, Chaney to TAG, 17 Dec 41, sub: Construction Program for U.S. Forces in the United Kingdom, OPD–GHQ (Dr 2), Book one MAGNET Miscellaneous Data. (3) Ltr, Gen Charles L. Bolté (USA Ret) to Lida Mayo, 16 Jul 58.

first consideration was to release British troops for service in the Middle and Far East, the second was to encourage the British people and to improve relations with Ireland, an obvious danger spot should the Germans invade England. The U.S. force would have to be large. The original plan for the Northern Ireland Sub-Theater provided for three infantry divisions and one armored division, with supporting and service troops and air forces, in all about 158,700 men. The troop movement was code-named MAGNET. The figures for ammunition supply, expressed in units of fire (the specified number of rounds to be expended per weapon per day in the initial stages of an operation), were high: 30 units of fire for antiaircraft weapons, armored units, and antitank units, and 20 units of fire for all other ground weapons. They reflected the anxieties of the time.[4]

The first information the USAFBI officers had on MAGNET came in a War Department cable of 2 January. They later learned from MAGNET officers that the War Department had been working on the plans before 20 December 1941 and at least one SPOBS officer considered the failure to give General Chaney earlier warning "hard to explain." None of them saw the MAGNET plan until 20 February, when Brig. Gen. Ira C. Eaker brought a copy to London.[5]

The 2 January cable provided a certain amount of data for the Ordnance officer of USAFBI. The British would furnish antiaircraft protection for the time being, and some armament. To save shipping space and ease the drain on short supply, the MAGNET light artillery units would not bring their 105-mm. howitzers, but would be furnished by the British with comparable 25-pounders. For help in determining the necessary adjustments and instructions on the British gun sight, with which American troops were unfamiliar, General Chaney borrowed from the U.S. military attaché in London two artillery experts, who wrote a field manual and maintenance handbook to be studied by U.S. artillerymen on the voyage.[6] In Washington the Ordnance Department was called upon to furnish standard U.S. panoramic telescopes, graduated in millimeters, together with newly designed adapters that were necessary to place the telescopes on the 25-pounder sight mounts. The British would provide ammunition, 1,500 rounds per gun, but Ordnance maintenance units in MAGNET would bring spare parts and

[4] (1) Memo, Lt Col F. L. Parks, Secy Gen Staff, for Gen and Spec Staffs GHQ, 6 Jan 42, sub: Operations Plan, Northern Ireland Sub-Theater, OPD, G-3 370.09. (2) G-4 Plan, Folder, Draft Annex 8 to Opn Plan MAGNET, Ordnance Plan, Iceland OPD A2997 (hereafter cited as G-4 Plan MAGNET). (3) The unit of fire varied with the types and calibers of weapons; for example, it was 125 rounds for the 105-mm howitzer and 75 rounds for the 155-mm howitzer.

[5] Incl to Memo, Col Homer Case (SPOBS G-2) for Hist Div WDSS, 19 Jul 46, and Memo, Maj Gen J. E. Chaney for Maj Gen Edwin F. Harding, Chief, Historical Div, 23 Jul 46, sub: Comments on the Manuscript "The Predecessor Commands" (hereafter cited as Chaney Comments), Incl in folder United States Army in World War II—European Theater of Operations—Logistical Support of the Army. SPOBS Letters 1946, OCMH.

[6] (1) Cable, CGFF to Special U.S. Army Observer in London, England, 2 Jan 42, OPD-GHQ G-3 370.5 Troop Movements (MAGNET). (2) Cable, U.S. Observer in London to Adj Gen, No. 352, 5 Jan 42, OPD-GHQ G-3 413.68 Range Finding and Fire Control Equipment (Northern Ireland) (hereafter cited as MAGNET 25-Pounder file). (3) The Predecessor Commands, SPOBS and USAFBI, pp. 114-15, MS, OCMH.

special repair tools.[7]

At the time General Chaney learned of the MAGNET force, the first increment of troops was estimated at 14,000, but ten days later it was reduced to 4,000 in order to accelerate troop movements to the Pacific area. Changes in troop strengths caused by strategic as well as logistic considerations and lack of accurate and timely information made planning difficult for General Chaney's small staff of only twenty-four officers and eighteen enlisted men—a headquarters smaller than that allotted to a regiment. The Ordnance Section in early January consisted of Colonel Coffey and 2d Lt. John H. Savage, a young tank expert who had arrived in London in late November on detached service from Aberdeen Proving Ground. Most of the staff sections had but one officer and one enlisted man. Since late fall of 1941, when new duties had been assigned to SPOBS, General Chaney had been submitting urgent requests for more men, including an Ordnance officer for aircraft armament, but he had not received them. The inability of his overworked staff to handle added tasks was already creating "an extremely grave situation" at the time he learned of the MAGNET plans.[8]

On 7 January 1942 he asked for fifty-four officers and more than a hundred enlisted men to form a nucleus USAFBI headquarters, all to be dispatched at once because of MAGNET, and all in addition to his earlier requests. This number was the minimum needed immediately. He estimated that the theater headquarters detachment, required eventually to serve the United Kingdom, would need 194 officers and 377 enlisted men.[9]

The War Department's response to these requests was meager indeed. Though a USAFBI headquarters force had been organized at Fort Dix, New Jersey, in early February, the first increment, six officers, did not arrive in England until 3 April. The second increment, sixteen officers and fifty enlisted men, did not come until 9 May. Brig. Gen. John E. Dahlquist, who was Chaney's G–1, afterward considered that the failure of the War Department to provide personnel for the USAFBI headquarters was "probably the most significant fact about the entire period from Pearl Harbor to ETOUSA." To General Chaney, the lack of personnel was "one of the vital questions in any discussion of USAFBI."[10]

Colonel Coffey fared little better than other members of USAFBI. He received no additions to his staff from the United States until May, when three officers and nine enlisted men arrived, part of the Fort Dix force. In the meantime he had obtained two officers in London, one a young

[7] (1) Ltr, Lt Col Robert W. Daniels, Ord Officer GHQ, to CofOrd, 3 Jan 42, sub: Adapters for Sight Mounts for British 25 Pounder Field Guns; Ltr, 8 Jan 42, sub: British Field Artillery Equipment for Force MAGNET. Both in MAGNET 25-Pounder file. (2) 1st Ind, CofOrd to Ord Officer GHQ, Army War College, 20 Jan 42, O.O. 475/2722.

[8] (1) The Predecessor Commands, SPOBS and USAFBI, p. 85. (2) Office of Technical Information, Office of Theater Chief of Ordnance European Theater, Ordnance Diary ETO, 29 May 41 to 14 Sep 45 (hereafter cited as ETO Diary), MS, OHF. (3) Cables, SPOBS to AGWAR, No. 177, 25 Nov 41; and No. 429, 16 Jan 42. Both in Admin 388 SPOBS-Cables-Troops.

[9] Cables. SPOBS to AGWAR, No. 368, 7 Jan 42; SPOBS to WARGH, No. 12, 17 Jan 42. Both in Admin 388 SPOBS-Cables-Troops.

[10] (1) Memo, Gen Dahlquist for Maj Gen Charles L. Bolté, 22 Apr 46, in SPOBS Letters 1946, OCMH. (2) Incl to Memo, Chaney for Harding, Chief, Historical Div, 23 Jul 46, sub: Comments on the Manuscript "The Predecessor Commands," SPOBS Letters 1946, OCMH.

reservist called to active duty, the other an officer from the U.S. Embassy, Lt. Col. Frank F. Reed. Colonel Reed could not at first give his full time to USAFBI headquarters since he had to continue for several months to gather technical information for the military attaché, who was also short of personnel. The lack of adequate coverage in the Ordnance technical intelligence field was a cause of concern to both Reed and Coffey.[11] In addition to new responsibilities, the important work of liaison and co-ordination with the British, begun under SPOBS, was continued. For example, Coffey and Reed spent two days in February at the Training Establishment of the Royal Army Ordnance Corps studying the RAOC, and obtained copies of lectures to send back to the United States to be used in training Ordnance officers who were going to sectors where their functions were likely to be controlled by the British.[12]

Ordnance Troops in Magnet

Close co-ordination with the British was essential in Colonel Coffey's plans for MAGNET, for it was expected that American troops would use the shops and depots near Belfast that were already serving the British Troops in Northern Ireland. The most important were a base depot and shop at Kinnegar, and an ammunition depot on a large, stone-walled estate, Shane's Castle, at Antrim.[13]

The advance party of the first MAGNET contingent arrived in London on 20 January. It consisted of officers of the 34th Division, a National Guard unit commanded by Maj. Gen. Russell P. Hartle, and included Hartle's divisional Ordnance officer, Lt. Col. Grayson C. Woodbury. Woodbury was briefed by Colonel Coffey and other members of the USAFBI staff in two days of conferences before he departed for Belfast, wearing, in the interest of security, civilian clothing borrowed from Londoners. On 24 January an official announcement was made of the command, which was to be called United States Army Northern Ireland Force (USANIF).[14]

The first 4,000 MAGNET troops landed in Belfast two days later on a murky, chill, winter day. They were welcomed with flags and bunting, bands, and speeches. They were told by the British Air Minister that they were entering a combat zone, and they were made aware of the fact as they went ashore. Above the sound of marching feet, the cheers, the strains of "The Star Spangled Banner," they heard the crump of antiaircraft batteries firing on German reconnaissance aircraft. For the people of Belfast it was a stirring occasion. Some were reminded of the arrival in

[11] (1) Monograph, Planning and Organization, in series of MS volumes, Ordnance Service in the European Theater of Operations (hereafter cited as Ord Serv ETO), p. 9, OHF. (2) Monograph, Personnel and Public Relations, same series, Annex 3, p. 3, OHF. (3) ETO Diary, p. 2, OHF. (4) Cable, SPOBS to AGWAR, No. 177, 25 Nov 41, in Admin 388, SPOBS–Troops–Cables.

[12] (1) Mil Attaché Rpt, London, No. 46426, 2 Feb 42, sub: Ordnance Training, OKD 352.11/7. (2) Ord Serv ETO, Planning and Organization, p. 10.

[13] (1) Ltr, Capt W. H. Brucker to CG USAFBI, 7 May 42, sub: Training Aids and Facilities, Northern Ireland, OPD–GHQ G–3, Training Aids and Facilities Northern Ireland. (2) The Predecessor Commands, p. 98, MS, OCMH.

[14] (1) Ord Serv ETO, Planning and Organization, pp. 90–91. (2) Cable, SPOBS (Chaney) to WARGH, No. 29, 23 Jan 42, in Admin 388 SPOBS–Troops–Cables. (3) Lt Col Leonard Webster, A History of United States Army Forces in Northern Ireland (USANIF) from January 1, 1942 to May 31, 1942, MS, in North Ireland–Histories.

Northern Ireland of the American Expeditionary Forces troops in 1918.[15]

The uniforms of the American troops added to the illusion. The men wore the old "tin hats" of World War I. New helmets of the World War II type, an Ordnance item, had been available when the men were equipped, but at General Chaney's suggestion the War Department had provided only the old model 1917 steel helmets because there was a possibility that men wearing the new type, which resembled the German helmet, might be mistaken for enemy troops by Northern Ireland home guard night patrols.[16]

The possibility of an enemy invasion, probably through neutral Eire, could not be discounted. The operations plan for MAGNET provided a "striking force" to be composed of the 36th and 45th Infantry Divisions and the 1st Armored Division, and a "static," or holding force, composed of the 34th Infantry Division, all under V Corps. Later the 36th and 45th were dropped and the striking force consisted of V Corps troops, the 34th Division, and the 1st Armored Division, under the operational control of the commanding general of the British Troops in Northern Ireland.[17]

No Ordnance troops arrived with the first contingent, for they had been cut out by GHQ when the first increment was reduced from 14,000 to 4,000, "a serious mistake," according to the GHQ Ordnance officer, Lt. Col. Robert W. Daniels.[18] Almost as soon as the first increment landed, the problem of sorting and storing Ordnance supplies led General Chaney to cable for a depot detachment. The movement orders for the second MAGNET contingent departing in February gave a high priority to the 79th Ordnance Depot Company, but the company ran into bad luck when its ship, the USAT *American Legion,* developed engine trouble at Halifax and had to turn back.[19] The only Ordnance troops that came in with the second MAGNET contingent of 7,000 men were those of the 14th Medium Maintenance Company, which was part of V Corps troops, and a 12-man detachment from the 53d Ammunition Company. They had to support the entire MAGNET force, which had now swelled to more than 10,000 men, for more than two months.[20]

[15] (1) *Belfast Telegraph,* January 27, 1942. (2) History 34th Div, ch. VIII.

[16] (1) G–4 Plan MAGNET. (2) Cable, Chaney to AGWAR, No. 362, 6 Jan 42, sub: Reference MAGNET, AG 381 (1–6–42) MSC. (3) Ltr, Secy War to CG NYPE and QMG, 9 Jan 42, sub: Supplies for Shipments 4525, 4558, and 5625, AG 370.1 (1–9–42) MSC-D-M. (4) 324,000 new type helmets had been produced in 1940–41. Procurement, prepared by Richard H. Crawford and Lindsley F. Cook, in Theodore Whiting, The United States Army in World War II, Statistics, 9 Apr 52, p. 47, Draft MS, OCMH.

[17] (1) Cables, Marshall to SPOBS, No. 488, 7 Feb 42; Marshall to Chaney, 8 Apr 42; in Admin 225, Northern Ireland Base Command (Directives), Cables, North Ireland. (2) Cables, Chaney to CG USANIF, No. 465, 30 May 42, sub: Relief of British Troops in Northern Ireland; Chaney to AGWAR, No. 1894, 5 Jun 42, sub: Revision of Northern Ireland Sub-Theater Plan; in Admin 388, SPOBS–Cables–Troops.

[18] Memo, Daniels for Col Paul, G–4 GHQ, 14 Jan 42, sub: Ordnance Service, First Contingent (MAGNET), OPD–GHQ G–3 320.2 Organization. Units Strength (North Ireland).

[19] (1) Cable, USAFBI to AGWAR for WARGH, No. 55, 31 Jan 42, sub: Second Contingent MAGNET, Admin 388 SPOBS–Cables–Troops. (2) Ltr, CGFF to ACofS WD, 28 Jan 42, sub: Troop Movement to MAGNET, OPD–GHQ G–3 370.5 Troop Movements (MAGNET). (3) History 34th Div, ch. VIII. (4) Cable, Marshall to CG USAFBI, 24 Feb 42, OPD–GHQ (Dr 1) G–3 311.23 Rads, Outgoing (USAFBI).

[20] (1) Troop List, OPD–GHQ G–3 370.5. Troop Movements (MAGNET). (2) Cable, USANIF to USAFBI, No. S 30, sub: Location Troop Units—Second MAGNET Contingent, Admin 388 SPOBS–Cables–Troops.

The 79th Ordnance Depot Company and another medium maintenance company, the 109th, arrived in Northern Ireland less than a week before the largest of all the MAGNET increments came in—the bulk of the 1st Armored Division aboard the *Queen Mary*—on 18 May. With the 1st Armored Division, Old Ironsides, and additional units of the 34th Division and V Corps that came in the two May convoys, the number of U.S. forces in Northern Ireland was more than tripled, rising to 32,202. To provide a base should the V Corps be assigned a tactical mission, the Northern Ireland Base Command (NIBC) was organized on 1 June 1942, and all of the Ordnance units were assigned to it except the 109th Medium Maintenance Company, which was assigned to the USANIF (V Corps) striking force, and the maintenance battalion that was organic to the 1st Armored Division.[21]

By 1 June 1942 ammunition depot stocks held approximately five units of fire of all types except armored division. Ordnance organizational equipment was approximately 100 percent complete. Weapons of the 1st Armored Division were being unloaded daily, and by 13 June all of the division's tanks had arrived. Storage facilities were becoming cramped because the British had not departed as expected, but there was plenty of tentage and every day new Nissen huts were taking up more space in the green Irish countryside and on the grounds of ancient estates.[22]

Planning for Bolero

As of 31 May 1942 most of the U.S. Army ground forces in the British Isles were in Northern Ireland: 30,458 out of a total of 33,106 enlisted men in the British Isles were in USANIF, as were 1,744 out of a total of 2,562 officers.[23] However, planning was already under way in Washington for a mammoth build-up in England. In April General Marshall had gone to London and obtained the consent of the British Prime Minister and Chiefs of Staff for a major offensive in Europe in 1943 or for an emergency landing, if necessary, in 1942. The former bore the code name ROUNDUP, the latter was called SLEDGEHAMMER, and the detailed, long-range planning by the Washington staffs for the concentration of American forces in the British Isles was called BOLERO. Until then, Washington planners had been "thrashing around in the dark," as General Eisenhower put it, and plans for the British Isles had gone no further than the garrisoning of Northern Ireland and the establishing of air bases in England for the bombardment of Germany. Now the United Kingdom was to be the main war theater. BOLERO provided for the arrival of a million U.S. troops in the United Kingdom by 1 April 1943.

When Marshall returned to the United States from London he told Eisenhower that General Chaney and other American

[21] (1) Memo, CGFF for ACofS G–3 WD, 27 Feb 42, sub: March Contingent of Forces for British Isles. (2) Ltr, Secy War to CG NYPE, 28 Feb 42, sub: Priority for Shipment of Units Overseas. Both in OPD–GHQ G–3 Book Two MAGNET, Misc. (3) Ltr, Hartle to CG USANIBC (Prov), 1 Jun 42, sub: Directive. (4) USANIF Station List. Last two in Admin 224 Northern Ireland. (5) History Northern Ireland Base Command (Prov) and Northern Ireland Base Section, 1 Jun 42–20 Dec 42, p. 3, Admin 597 North Ireland Base Command Histories.

[22] G–4 Reports, USAFBI, 1 May–31 May 42, AG 319.1 Periodic Rpts, Admin 323 SPOBS.

[23] Cable, Chaney to AGWAR, No. 1898, 5 Jun 42, sub: Strength Report, Admin 389, SPOBS–Air Force.

officers on duty in London "seemed to know nothing about the maturing plans that visualized the British Isles as the greatest operating military base of all time." Marshall sent Eisenhower to London to outline plans and to bring back recommendations on the future organization and development of U.S. forces in Europe. After an interview with Chaney, Eisenhower concluded that Chaney and his small staff "had been given no opportunity to familiarize themselves with the revolutionary changes that had since taken place in the United States . . . They were definitely in a back eddy, from which they could scarcely emerge except through a return to the United States." [24]

It might also be said that in Washington there was widespread ignorance, even at upper levels, as to the true nature of General Chaney's mission in London. General Eisenhower referred to him as a "military observer," [25] and General Eisenhower's naval aide, Capt. Harry C. Butcher, referred to the work of the Special Observer as "essentially a reporting job," rather than "an action responsibility." [26] Brig. Gen. Charles L. Bolté, Chaney's chief of staff, said later that he actually grew to hate the name Special Observer Group, and added, "I do not think that too much emphasis can be laid on the fact that many of the difficulties . . . arose from the misconception that SPOBS was an information-gathering agency, whereas it was really designed as the nucleus for the headquarters of an operational force which might or would materialize if the United States entered the war." [27]

Ordnance planning for BOLERO was soon to be taken over by an organization other than Colonel Coffey's staff. General Marshall and General Somervell had decided to establish in England a Services of Supply organization paralleling that in the United States. The officer selected to command it, Maj. Gen. John C. H. Lee, was not given as much power as he wished, but following a long controversy between SOS and USAFBI, complicated by cloudy directives from the United States, he was given the main job of building up stocks of munitions in the British Isles. He selected as his Ordnance officer Col. Everett S. Hughes, who had held for two years the very important job of chief of the Equipment Division, Field Service, in Washington. Hughes arrived in London by air on 8 June with his procurement officer, Col. Gerson K. Heiss, and opened the Ordnance Section at SOS headquarters, 1 Great Cumberland Place. His chief of General Supply, Col. Henry B. Sayler, his maintenance officer, Col. Elbert L. Ford, and his chief of Ammunition Supply, Col. Albert S. Rice, arrived from the United States later in the month.[28]

When the European Theater of Operations, United States Army (ETOUSA), was established on 8 June 1942, Colonel Hughes as senior Ordnance officer in the theater became the Chief Ordnance Of-

[24] Eisenhower, *Crusade in Europe*, pp. 49–50.

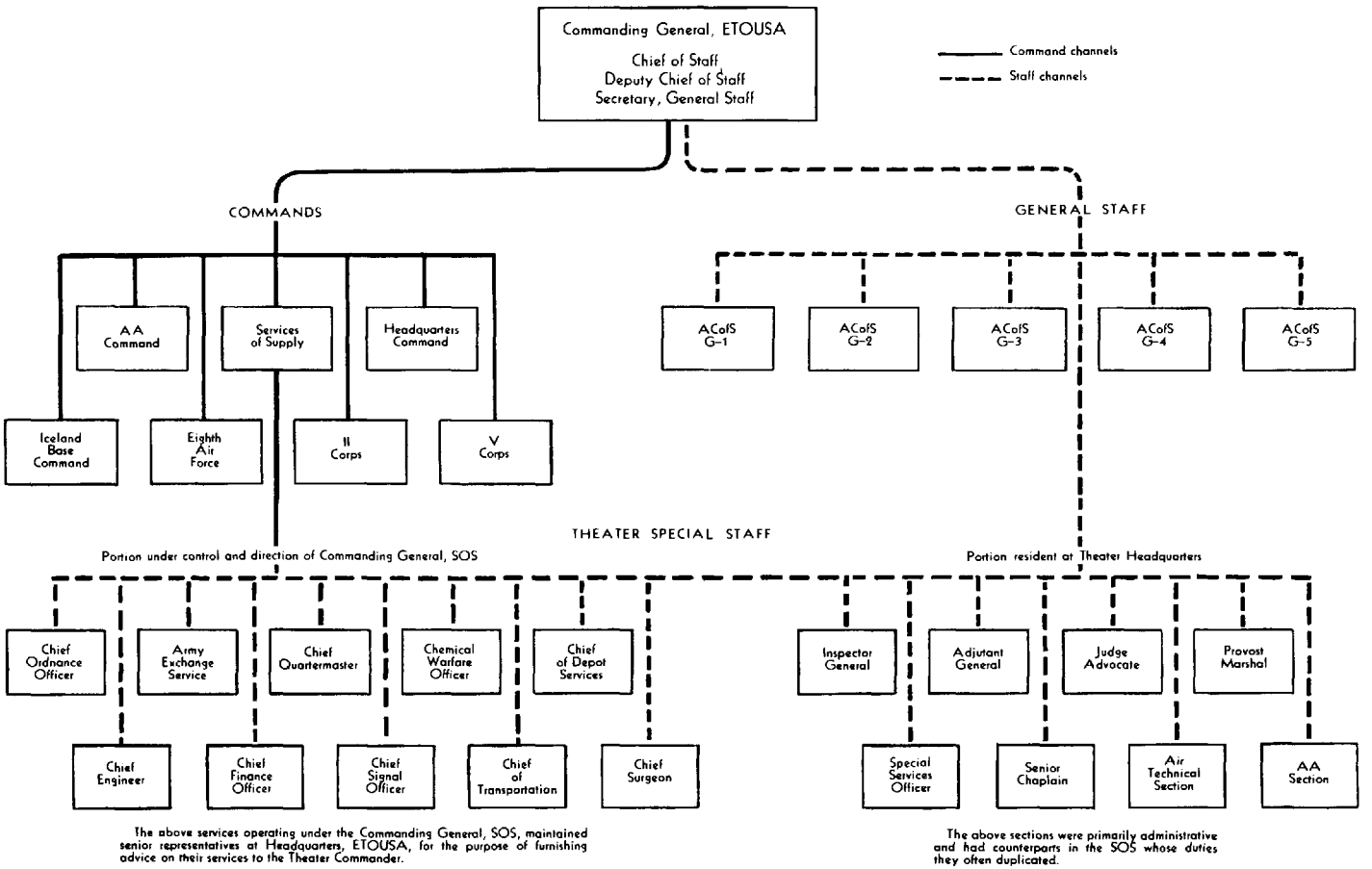
[25] *Ibid.*, p. 49.

[26] Capt. Harry C. Butcher, *My Three Years With Eisenhower* (New York: Simon and Schuster, 1946), p. 6.

[27] Interv with Maj Gen Charles L. Bolté, 4 Oct 45, quoted in The Predecessor Commands, p. 262.

[28] (1) For the controversy over Lee's authority see Ruppenthal, *Logistical Support of the Armies*, vol. I, pp. 31–44. (2) For the SOS Ordnance staff see Historical Monograph 117.1, Key Ordnance Military Personnel, pp. 47, 82–83, 146, OHF.

Chart 1—Early Command and Staff Organization of ETOUSA Established by ETO General Order 19, 20 July 42.



The above services operating under the Commanding General, SOS, maintained senior representatives at Headquarters, ETOUSA, for the purpose of furnishing advice on their services to the Theater Commander.

The above sections were primarily administrative and had counterparts in the SOS whose duties they often duplicated.

ficer, ETOUSA. (*Chart 2*) After the establishment of SOS, the Ordnance Section at Headquarters, ETOUSA, was concerned only with planning, technical advice, and liaison, and as Colonel Hughes was mainly occupied with the far greater responsibility at SOS, he appointed Colonel Coffey his special representative at ETOUSA headquarters. Most of Coffey's staff went over to the Ordnance Section of SOS. The two headquarters were soon to be separated by about ninety miles. General Lee had early in June decided to move SOS to Cheltenham, where the British could offer two extensive blocks of buildings, built to accommodate the War Office in the event London had to be evacuated. The additions to the Ordnance SOS staff that came from the United States in mid-July went direct to Cheltenham, Gloucestershire.

General Chaney served as theater commander less than two weeks and General Eisenhower succeeded him on 24 June. In the following month an important change occurred in the Ordnance organization. Colonel Hughes departed for the United States on 10 July, returning to England after a few weeks to become General Lee's chief of staff. His successor at SOS was Col. Henry B. Sayler. Eisenhower's General Order 19 of 20 July 1942 made Colonel Sayler also the Chief Ordnance Officer, ETOUSA.[29]

Storage for Weapons and Ammunition

The first concern of Ordnance Service, SOS, was the storage of weapons and other general supplies, since it had been decided that for the time being ammunition would be shipped to British depots. The depot system established by General Lee's staff provided two types of depots—general depots that stored supplies of more than one technical service, and branch depots for each service. General depots were mainly for receiving large shipments from the United States, storing them in their original packages, and shipping them in bulk to the technical branch depots for issuance to troops. This was not a hard and fast rule; some general depots issued direct to troops. Branch depots received matériel not only from general depots but also from the zone of interior and from local procurement, and sometimes they served as bulk depots. An important planning consideration was the fact that existing British installations would have to be used because there was little prospect for new construction before 1 January 1943.[30]

The first Ordnance general supplies to arrive and the only Ordnance SOS depot company that landed in England that summer went to Ashchurch, eight miles from Cheltenham, the largest and most modern of the five U.S. general depots activated on 11 July 1942. Recently built for the British Royal Army Service Corps as a depot for automotive supply and maintenance, it was situated in fertile Evesham Valley at the foot of the Cotswold Hills, fifty-one miles from the Bristol channel ports, through which most of the American supplies were expected to flow. Ten large hangar-type warehouses and five smaller ones provided a total closed storage space of 1,747,998 square feet, of which Ordnance was assigned 378,200, an area second only

[29] Maj J. G. Detwiler, Historical Record of the Ordnance Section, 2 Sep 42, Ord Serv ETO, Planning and Organization, Annex 45.

[30] Ord Serv ETO, Ordnance Class II and IV Supply, pp. 51–56, and Annex 5.



AMMUNITION STORED IN HUTMENTS BY AN ENGLISH ROADSIDE

to the 1,014,200 square feet allotted to Quartermaster's Motor Transport Service. The major warehouses were of brick, with gabled roofs and overhead roller suspension doors. They were connected by macadam roads that were lined with fences painted with yellow and black stripes for better visibility during blackouts. Mists settling over the valley aided camouflage but gave the whole installation a tone that was "peculiarly sombre." [31]

A decision on the site of the first Ordnance branch depot in England was made early in the summer. On 1 June Lt. Col. David J. Crawford, who had arrived from the United States late in May to reconnoiter for shop and storage space, reported favorably on Tidworth, in southern England, the region from which the British had agreed to withdraw their own troops in order to make way for the Americans. Tidworth was at the southeastern edge of Salisbury Plain, the great chalk downs that served as the main peacetime maneuver area of the British Army. Site of a former British tank and artillery shop, Tidworth had a depot with 133,000 square feet of shop space and 50,000 feet of storage space in two buildings. There were good rail and highway connections and a consider-

[31] (1) History of G–25 . . . Ashchurch, England, 11 July 1942–6 June 1944 (hereafter cited as History G–25), pp. 2–6, Admin 512. (2) History 80th Ord Base Depot Co, 14 Jul 42–31 Dec 43. (3) Col N. B. Chenault, Jr., History General Supply Division, Annex to ETO Ord Serv, Class II and IV Supply (hereafter cited as Chenault History), OHF. (4) Memo, ACofS G–4 for Chief of QM Serv *et al.*, 1 Sep 42, and incls, ETO 319.1 Rpts, vol. I, 1942–43, KCRC.

able amount of open shed and garage space. On 22 July Tidworth Ordnance Depot, designated O–640, was activated. Until September, when the 45th Ordnance Medium Maintenance Company arrived, it was operated entirely by British civilians.[32]

The Salisbury Plain area also contained two of the three British ammunition supply dumps (ASD's) first used for ammunition shipments from the United States—Savernake Forest and Marston Magna. The Third, Cinderford, was in the Forest of Dean near the Bristol ports. The British ASD's were simply areas containing adequate road nets and enough villages to provide railheads. Since the English countryside was too thickly settled to permit depots in the American or Australian sense, the British had stacked ammunition along the sides of roads. If the roads ran through an ancient forest or park with tall trees to hide the stacks from enemy bombers, so much the better; in any case roadside storage made the ammunition easily accessible, an important consideration at a time when fear of German invasion was always present. Each stack of artillery and small arms ammunition was covered by a portable corrugated iron shelter, or hutment, that was usually camouflaged by leaves poured over a wet asphalt coating. Bombs were stored in the open at Royal Air Force (RAF) depots.[33]

The first U.S. ammunition depots were activated on 2 August 1942 at Savernake Forest (O–675), capacity 40,000 tons, and Marston Magna (O–680), 5,000 tons. At both, troops were to be billeted in whatever buildings were available—the Marquess of Aylesbury's stables, farmhouses, a cider mill, and Nissen huts. But for some time to come, all U.S. ammunition depots had to be operated mainly by British RAOC troops. When large shipments of ammunition began to arrive in late August, more depots were needed. A site surveyed by the British but not yet used was found in the Cotswolds, northeast of Cheltenham. Activated as Kingham (O–670) on 11 September, this depot became by early 1943 the largest U.S. ammunition depot in England. On the same day that Kingham was activated, a fourth depot, O–660, was activated at the British ASD at Cinderford and soon became the second largest U.S. ammunition depot. The sites for these four depots were selected with ground force ammunition in mind. For air ammunition, three main depots of about 20,000 tons capacity each were required in the first BOLERO plan. Two were established in the Midlands, near Leicester and air bases—Melton Mowbray (O–690) and Wortley (O–695), both activated 30 September. The third was Grovely Wood (O–685) in southern England, activated 2 September. In the meantime, SOS began to store bombs and other air ammunition at Savernake, Cinderford, Kingham, and Marston Magna, which then became composite, rather than ground force, depots.[34]

[32] (1) Memo, Col E. L. Ford for Chief Ord Officer SOS for G–4 SOS, 23 Jul 42, sub: Ordnance Maintenance Facilities, ETO 400.242 Equipment—Storage, KCRC. (2) Hq SOS ETO, GO 11, 22 Jul 42, Admin 315, Southern Base Section—General. (3) Station List, 4 Sep 42, p. 21, in ETO 319.1 Rpts, vol. I, 1942–43, KCRC.

[33] Memo, Lt Col Neil H. McKay, Ammunition Supply Br, Field Serv, for Chief of Field Serv, 5 Apr 43, sub: Report on Ammunition Supply in ETO (hereafter cited as McKay Rpt, 5 Apr 43).

[34] (1) SOS ETO, GO's No. 15, 2 Aug 42, and No. 31, 11 Sep 42, General Orders SOS ETO 1942, in ETO Admin 315 Southern Base Sec—General. (2) Depot histories in sec. VII, History Ordnance Service SOS ETO, ETO Ord Sec,

Motor Vehicles

The assignment to Ordnance of responsibility for motor vehicles on 25 July 1942, effective 1 September, enormously increased the work of the General Supply Division. At the time it was hard for Ordnance officers in the European Theater of Operations to grasp the magnitude of the new job; compared to weapons, combat vehicles, and fire control instruments, soon to be referred to as "old Ordnance," the very much simpler mechanism of trucks did not at first seem to present much of a problem, especially since Ordnance men were already familiar with parts and maintenance considerations on combat vehicles. Later these officers learned that while general purpose vehicles involved comparatively simple technical problems, the great number of trucks as compared with the number of tanks and Ordnance special vehicles and the incomparably rougher usage automotive equipment received placed a very heavy drain on manpower. In terms of man-hours, automotive equipment was eventually estimated to constitute approximately 80 percent of the whole Ordnance job in the ETO.[35]

Most of the motor vehicles that had been coming in since late spring had been shipped partly disassembled and crated in order to save shipping space and had been turned over to the British Ministry of Supply for assembly because the theater had no American assembly plants and mechanics to do the work. Two methods of crating were used. The simplest was that which kept each vehicle in its own crate, with the wheels removed. These were called "boxed" vehicles. The crates could be easily stacked and bolted together, as uncrated wheeled vehicles could not. The second method required much more assembly work. It involved two kinds of packing, either one vehicle in one or two boxes, known as the single unit pack (SUP), or two vehicles in from one to five boxes (most commonly, one crate containing two chassis, the second two cabs, the third, axles), known as the twin unit pack (TUP). The SUP and TUP types were called "cased" vehicles.

The TUP method, which saved about two-thirds of the space required for an uncrated vehicle, was far more economical in space than the SUP method and came to be preferred, especially for the ¾-ton, 1½-ton, and 2½-ton types. However, the TUP method of crating contributed to early confusion on how many vehicles there were in the theater, of what types, and where they were located. Often all three crates did not come on the same ship: one vessel would carry the cabs and chassis and another would carry the axles; and the two ships might dock at different ports. Sometimes the crates were not marked and had to be sent to an assembly plant and opened before their contents could be determined. Then they would have to be rerouted to the assembly plant designated to handle the particular type of vehicle.[36]

KCRC. (3) Ammunition Supply Division History Pre-D-day, in History Ord Service SOS ETO. (4) British Paper, Southern Command Q(L), Paper 4, Storage Space, 28 Jun 42, ETO 400.242 (Storage Space), KCRC. (5) McKay Rpt, 5 Apr 43.

[35] (1) Interv with Brig Gen Urban Niblo by Lida Mayo, 28 Sep 55. (2) Interv with Maj Gen Henry B. Sayler by C. Bradford Mitchell, 26 Sep 49, Mitchell Notes, OHF. (3) Chenault History. (4) Ord Memo 9, 1 Sep 42, Annex 29 to Ord Serv ETO, Planning and Organization, p. 3.

[36] (1) Production Service Division, Industrial Service, OCO, ASF, Packaging, Development of in the Ordnance Department, 1941–1945, Project

The vehicles were assembled in British civilian plants under the direction of the British Ministry of Supply, an arrangement that had been made when vehicles were a Quartermaster responsibility. The code name for the assembly work was TILEFER. By 11 July 1942 the Ministry's TILEFER organization had two assembly plants in the Liverpool area, the Ford Motor Company at Wigan and Pearson's Garage in Liverpool, and plans for others were under way. After cased and boxed vehicles were assembled and the few wheeled vehicles that arrived (only about 20 percent of the total) were reconditioned, the British drove them to large parking lots, which they called vehicle parks, to form pools from which troops could be supplied. Two of these parks, Aintree Racecourse and Bellevue, were near Liverpool. A third was at Ashchurch (G–25).[37]

Ashchurch suddenly became important to Ordnance planners when they learned that motor vehicles were to be added to other Ordnance responsibilities. Quartermaster's Motor Transport Service had planned to make Ashchurch a primary overseas motor base, operated by three regiments—a depot regiment, a supply and evacuation regiment, and a base shop regiment. The first unit of this large organization, which had been recruited from automobile plants, steel mills, and machine shops in the United States, arrived on 19 August, but since its equipment did not arrive until December, the men were assigned various duties, the most important of which was operation of the vehicle park. A tire repair company, the first of its type to be organized, also arrived at Ashchurch during August without equipment. It was given the job of operating the three gas stations and grease racks.[38]

The vehicle parks already in existence at Ashchurch and in the Liverpool area were adequate in the early summer. Few vehicles were coming into the ports, and those that did arrive were likely to be held up in assembly plants that were not yet in full operation. Only 526 general purpose vehicles were assembled by the British in July. Yet more vehicle parks would soon be needed. General Eisenhower had informed General Lee that the War Department was contemplating shipping approximately 160,000 knocked-down vehicles in the early fall.[39] While this figure was overoptimistic, the rate of arrival and assembly did rise sharply in late August and early September. By the end of 1942 the Ministry of Supply had assembled a total of 33,362 vehicles. Twelve vehicle parks with a total of 23,000 vehicles had been activated: in the Liverpool, Bristol, and Glasgow port areas as near TILEFER assembly plants as possible; in the east of England near air installations; and in the south of England where ground troops were concentrated. They were located on estates, on race tracks, and on other open areas that had enough space and adequate camouflage. Little or no construction was possible at any of the sites

Supporting Paper No. 58, pp. 126–27, OHF. (2) Rpt, Sayler to CofOrd, 9 Nov 42, sub: Special Report on Ordnance General Supplies (hereafter cited as Sayler Rpt), and Incl No. 4. Both in Ord Serv ETO, Class II and IV Supply, Annex 5, OHF. (3) Chenault History.

[37] (1) Ord Serv ETO, Planning and Organization, p. 45. (2) Ord Serv ETO, Class II and IV Supply, pp. 70, 125, 140.

[38] Hist of G–25, pp. 59–61, 66–67. (2) Ord Serv ETO, Planning and Organization, Annex 2, Historical Record of Ord Sec Hq SOS (hereafter cited as Hist Ord Sec SOS), OHF.

[39] Ltr, Lt Gen Dwight D. Eisenhower to CG SOS *et al.*, 13 Jul 42, sub: Assignment of Motor Vehicles, Admin 236 Ord—Motor Vehicles.

because neither the Engineer Corps nor local labor was available and for some time operations would depend almost solely on British personnel, military and civilian.[40]

The officers to command the vehicle parks were six men of Motor Transport Service's TILEFER Section, who were transferred to Ordnance on 1 September when a total of 14 motor transport officers and 27 enlisted men came into the Ordnance Service, SOS. These six men, particularly those who had been trained in the TUP program, were considered by the Ordnance Section to be some of the best officers in the theater. But they were few in number —three officers commanded two vehicle parks each. Four of the parks were for some time to come commanded by British officers.[41] Besides the Quartermaster motor base and tire repair companies at Ashchurch, Ordnance received eleven Quartermaster companies and the large motor transport depot at Rushden, Northamptonshire, serving air installations. Rushden was designated O–646, becoming, with Ashchurch and Tidworth, one of the three primary Ordnance installations.[42]

At the time Ordnance received responsibility for motor vehicles in the theater, the shortage of commissioned officers, which had been a problem since SPOBS, was becoming acute. Ordnance officers were needed not only at depots, shops, and schools in the United Kingdom but also at ports and at three of the four base sections that were just being established: the Northern Ireland Base Section, which took over from the Northern Ireland Base Command; the Western Base Section, which included the ports of Glasgow and Liverpool; and the Southern Base Section, the concentration point for ground forces units in southern England. The Eastern Base Section, mainly concerned with services to the air forces, had no Ordnance section for some time.[43]

Preparations for Torch

While base sections, depots, and shops were passing from the planning to the operating stage, with their efforts directed toward BOLERO, decisions were being made in London and Washington that were suddenly to change the direction of the effort and to accelerate tremendously the pace of the operations. By 25 July pressure on the Allied Powers to establish a second front before the spring of 1943—the date set for BOLERO—had led to an agreement by the Combined Chiefs of Staff to undertake an invasion of North Africa in 1942, an operation to be known as TORCH.

Weeks of discussion followed on where and when the landings would take place. By 5 September the decision was reached to make three simultaneous landings: one at Casablanca by a Western Task Force, mounted and shipped from the United States; another at Oran by a Center Task

[40] (1) Ord Serv ETO, Class II and IV Supply, pp. 65, 125–26. (2) Sayler Rpt and Incl 4 (map). (3) Chenault History, p. 7. (4) Hist Div USFET, The Administrative and Logistical History of the ETO, 1946, pt. III, pp. 261–62, MS, OCMH.

[41] (1) Hist Ord Sec SOS. (2) Ord Serv ETO, Class II and IV Supply, p. 65. (3) Ltr, Col S. L. A. Marshall to Chief Ord Officer, USFET, 13 Jul 45, sub: Request for Historical Data Relating to Ordnance General Purpose Vehicles and Incl, Admin 563 Ord-Histories.

[42] (1) Hq SOS ETOUSA, GO No. 36 and No. 52, 16 Sep and 9 Oct 42, Admin 315 Southern Base Sec—General. (2) History G–25, p. 33.

[43] (1) Hist Ord Sec SOS. (2) Admin and Log History of ETO, pt. II, vol. I, pp. 109–12, 113–14. (3) Ord Serv ETO, Planning and Organization, pp. 106–07, 135–36.

Force, predominantly II Corps; and a third at Algiers, by an Eastern Task Force, mainly British. Center and Eastern Task Forces were to be mounted from the British Isles. The target date was unsettled for some time, varying from mid-October to early November. By the time the tactical plans were firm enough to furnish a definite troop basis, there were only about two months to plan, organize, collect supplies, process troops, train for amphibious landings, and embark.[44]

General Eisenhower was made commander in chief of the expedition. At Allied Force Headquarters (AFHQ), which was in charge of both logistical and operational plans, a British officer, Maj. Gen. Humfrey M. Gale, was to control logistical planning. His deputy, Colonel Hughes, became responsible for the U.S. supply program for TORCH in the British Isles. Colonel Ford, Sayler's maintenance officer, became Ordnance officer of AFHQ and took with him several members of the SOS staff, including his assistant, Colonel Crawford. Headquarters, ETOUSA, lost a valuable officer to the Mediterranean operation when Colonel Coffey left for the United States to help prepare Western Task Force. Center Task Force Ordnance planning was in the hands of Col. Urban Niblo, who had arrived in England that summer as Ordnance officer of II Corps, then commanded by Maj. Gen. Mark W. Clark. Later, Clark became Eisenhower's deputy and relinquished command to Maj. Gen. Lloyd R. Fredendall (II Corps' old commander), who joined the planning group on 10 October.[45]

Planning began in London in August in an atmosphere of great secrecy. The staff was literally locked up in Norfolk House; officers could leave the building, but enlisted men, both British and American, were confined to the building until the landing was made. The chiefs of technical services received little or no information on the size of the force or the location of the operation. Strenuous efforts were made to maintain security and mislead the enemy. For example, the British in attempting to indicate that the first convoys were going to India ordered typhus and cholera vaccine, which British forces used only in India, and made a point of losing one or two of the vaccine shipments so that the losses were known. The effort to confine knowledge of the "Special Operation" to as few persons as possible also had undesirable effects. It deprived Ordnance planners of staff help that they needed. Lacking staff men to check their requisitions back to the zone of interior, Colonel Hughes and Colonel Niblo inadvertently requisitioned ammunition for the old French gun of World War I, the 155-mm. GPF, instead of the 155-mm. M1 with which II Corps was equipped. As a result, the 155-mm. M1 guns had to be left behind in England and could not be used in

[44] For a detailed account of the effect of indecision on logistical planning, see Coakley and Leighton, Global Logistics and Strategy, 1943–45, ch. XVI, "The Descent on North Africa."

[45] (1) Intervs with Col Russell R. Klanderman, 7 Dec 55, and Gen Niblo, 28 Sep 55. (2) Memo, Chief Ord Officer AFHQ for CofOrd, 6 Jan 43, sub: Historical Record of Ordnance Section AFHQ, Incl, Historical Record (hereafter cited as AFHQ Hist Ord Sec), O.O. 350.05/2260. (3) George F. Howe, *Northwest Africa: Seizing the Initiative in the West,* UNITED STATES ARMY IN WORLD WAR II (Washington, D.C., 1957), pp. 46–47.

the initial phases of the North African campaign.[46]

In the Center Task Force and the small U.S. contribution to Eastern Task Force there would be 80,820 American troops, including the 1st Infantry Division, then in southern England, and the 34th Infantry and 1st Armored Divisions, in Northern Ireland. The job of equipping this force fell to SOS headquarters at Cheltenham. The base sections were as yet hardly more than skeleton organizations. No accurate figures on supplies existed, for there had not been time to catalogue the mountains of equipment that had been dumped in the British ports during the summer. It was known, however, that some Ordnance items such as spare parts for tanks and some calibers of ammunition were not available. And it was probable that there were not enough spare parts for motor vehicles. Nobody knew how many trucks were in England.[47]

On 8 September General Eisenhower sent the War Department a requisition for 344,000 ship tons of material for the North African operation, most of it to be shipped to the United Kingdom by 20 October. In Washington General Lutes of SOS, who had visited England in the late spring and had been concerned about the lack of U.S. service troops there to receive, sort, and identify U.S. material, believed that most of the II Corps equipment was already in the United Kingdom, but was scattered throughout England and unidentified. Dismayed at the prospect of having to duplicate shipments that he was convinced had already been made, he urged the SOS staff in the ETO to "swarm on the British ports and depots and find out where these people have put our supplies and equipment." [48]

While undoubtedly some Ordnance items had been "lost" because of misrouting or improper marking, it is unlikely that Ordnance matériel in sufficient quantity would have been uncovered even if there had been enough trained depot men to "swarm" efficiently. The Ordnance SOS staff believed that there were not enough Class II and IV supplies in the United Kingdom to support the first phase of TORCH. Most of the BOLERO cargo shipped to England in July and August of 1942 consisted of Quartermaster items (including boxed vehicles) and construction equipment and special vehicles for the large contingent of Engineer troops sent to build airfields, camps, and depots. There was also a considerable backlog of Army Air Forces matériel for units shipped early in June. Requisitions forwarded to the New York Port of Embarkation by the SOS Ordnance Service in July to build up the level of supply had been canceled in view of the current task force movements; the only Ordnance Class II and IV material arriving in the summer consisted of automatic shipments of 180 days of maintenance supply, based on the addendum and the number of major items shipped to the ETO with the early units. Until the 1st Infan-

[46] (1) Col. A. T. McNamara, QMC, "The Mounting of 'Torch' from England," *Quartermaster Review*, XXVII (July–August, 1947), pp. 12–13. (2) Niblo Interv, 28 Sep 55.

[47] (1) Howe, *Northwest Africa*, p. 679. (2) Healey Memoir, p. 28, ETO Adm 510. (3) Butcher, *My Three Years With Eisenhower*, pp. 87, 88 (notes for 5 and 6 Sep 42). (4) Chenault History.

[48] Lt. Gen. Leroy Lutes, "Supply: World War II. The Flight to Europe in 1942," *Antiaircraft Journal*, vol. 95 (May–June, 1952), pp. 8–10.

try Division arrived early in August, there had been no ground combat forces in England. The division's weapons were not preshipped; at the time, vehicles were the only item of organizational equipment preshipped in sizable numbers.[49]

When the call came to support TORCH, the 1st Division had not received any of its field artillery and had only fractional allowances of machine guns and special vehicles. The fault lay in the system of sending men on transports and their organizational equipment on cargo ships, sometimes in different convoys, sometimes arriving at different ports. The problem of marrying units with equipment was not a simple one at best, as the experience in Australia had shown. In the case of TORCH, where time was all-important, the situation bordered on chaos. Two ships that had set out from the United States with 105-mm. howitzers for the 1st Division had failed to arrive; one went aground in Halifax Harbor, Nova Scotia, and the second, sent to replace the first, had to put in at Bermuda because of shifting cargo. On 12 September General Clark told Colonel Hughes that something would have to be done quickly or "those men will be going in virtually with their bare hands." Of the ground forces in Northern Ireland, the 34th Infantry Division had only old-style howitzers and lacked antiaircraft equipment and tanks; the 1st Armored had only the old model Grant M3 tanks.[50]

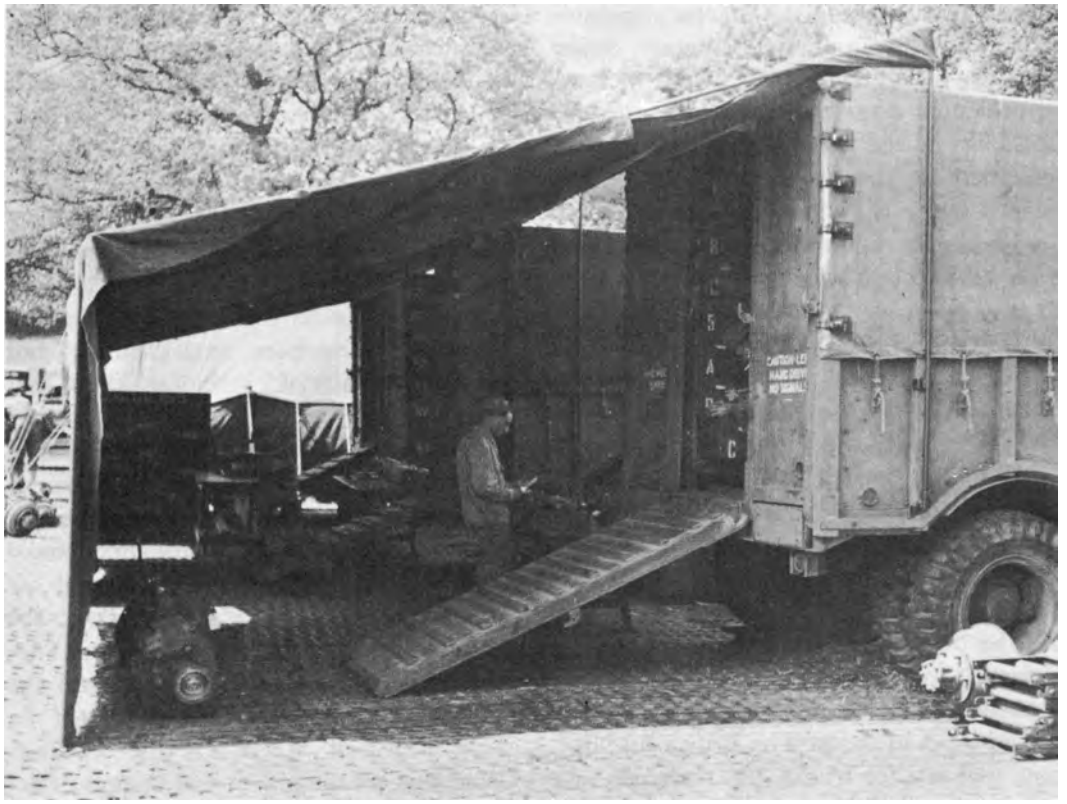
Even if there had been enough guns, it was doubtful whether enough ammunition had been provided. At the end of August only 21,040 long tons of ground force ammunition were in the theater and on 14 September Colonel Hughes was forced to admit that he had no assurance of an adequate ammunition supply for TORCH. A very large proportion of the early ammunition shipments had been bombs. A great deal of the artillery ammunition had arrived so damaged, because of poor packing, stowing, and handling at shipside, that it was unserviceable; moreover, in the ammunition depots the manpower problem was as acute as it was in the general supply depots. Only two ammunition companies arrived in August, the 58th and 66th. Both stationed at Savernake, they were undermanned because they had to furnish detachments for other depots. In addition, their men had not been sufficiently instructed in renovation, roadside storage, and operating at night under blackout conditions. Between 12 September and 20 October a few Quartermaster motor transport men and about 2,500 Engineers were assigned to help, but without the trained RAOC men, issue and supply would have been almost impossible.[51]

In attempting to fill the huge requisition of 8 September and subsequent ones, the SOS staff in the zone of interior was hampered not only by lack of ships but by the need to supply the very large Western Task Force then being mounted from the United

[49] (1) Sayler Rpt. (2) Chenault History.

[50] (1) Healey Memoir, p. 30; (2) Butcher, *My Three Years With Eisenhower*, p. 111; (3) Clark, *Calculated Risk*, pp. 34, 55.

[51] (1) Ord Serv ETO, Ammunition Supply, p. 13. (2) McKay Rpts, 5 Apr 43, 19 Oct 42, ETO 319.1, Spec Rpts Ord, KCRC. (3) SOS GO No. 32, 12 Sep 42, No. 49, 4 Oct 42, No. 56, 20 Oct 42. All in Admin 315 Southern Base Sec General. (4) Ltr, Lt Col S. A. Daniel, Chief Ammunition Supply Div Ord Sec SOS, to Lt Col G. W. Powell, OCO, 2 Jan 43, sub: Ordnance Service in U.K., O.O. 350.05/2253.



TRAILER SUPPLY UNIT IN ENGLAND

States. Working night and day in the effort to fill General Eisenhower's needs, SOS USA was able to send 131,000 ship tons of equipment to England and to add eight fully loaded cargo ships to the convoys by the time they sailed for North Africa late in October. It was 1 October before the first of the freighters sailed. In the meantime, the Ordnance Section at SOS ETOUSA did its best to supply the alerted TORCH units from stocks in the theater.[52]

All depots were combed for Ordnance supplies. They were found in Quartermaster, Engineer, and Medical depots, mixed with all sorts of other material. In one instance, two 90-mm. guns were found in a Quartermaster depot. The depots worked 24-hour shifts, since manpower was still spread thin. A second Ordnance depot company, the 78th, assigned to II Corps, arrived in mid-September and was divided between Tidworth and Ashchurch, but it never received any of its table of basic allowances equipment and could not be used to best advantage. Working against time, the depot men found enough

[52] (1) Lutes, "Supply: World War II, The Flight to Europe in 1942," pp. 10–11. (2) Hist Ord Sec SOS, p. 8.

replacement spares in the theater's maintenance stocks to supply major items. Spare parts, for which there was a constant clamor, presented a far more difficult problem, especially in the case of general purpose vehicles. At the time, spare parts were shipped overseas in boxed lots, that is, they were boxed in quantities that were thought to be sufficient to supply a hundred trucks for the first year. The contents varied and sometimes did not contain enough fast-moving parts, such as spark plugs. For some vehicles there were not enough boxed lots. To supply the thousands of 2½-ton trucks in the theater, less than one boxed lot was received by the end of 1942. The only solution was the dismantling of new 2½-ton trucks in TUP boxes. Approximately 75 were dismantled at Tidworth and the parts boxed and shipped to North Africa.[53]

Almost all of the uncrated vehicles had arrived short of tools. The British supplied some tool sets for trucks, but their use was limited because tools were based on British vehicles, which used many nuts and bolts of sizes different from those used in American trucks. Tools for the repair of "old Ordnance" matériel were even harder to obtain, and those that arrived were often pilfered. Ordnance shop trucks arrived assembled, and, entrusted to British drivers on the journey from port to depot, were frequently rifled. The commanding officer of the 105th Ordnance Medium Maintenance Company estimated that 22 out of 23 shop trucks received in the first six weeks after the company's arrival in the theater had been "effectively robbed"; and this was only one of many such reports. The Ordnance Procurement Division did obtain some other supplies from the British, but local procurement was limited mostly to hardware, target material, some parts common, and cleaning and preserving material, including that used for waterproofing.[54]

The new problem of waterproofing material to enable trucks and tanks to swim to the shore after they left the ramps of landing craft became increasingly important as preparations accelerated for a major amphibious landing. Here the British helped greatly, for they had developed a compound that would seal the vital parts of vehicles and yet could be easily stripped off after the landing. Using this compound to seal engines, electrical systems, and running gear, and affixing metal and rubber tubing to extend exhaust and intake outlets above the water, Capt. Madison Post of the newly established Ordnance Engineering Division, SOS ETOUSA, by 20 October evolved a means of operating trucks in three feet of salt water for a short period. Waterproofing tanks seemed simpler to the combat forces, because the enveloping hull of the tank made it unnecessary to waterproof each individual component, but Ordnance officers thought it considerably more complicated, since the hull had to be made

[53] (1) Sayler Rpt. (2) History 78th Ordnance Depot Co. (3) Notes on Staff Conference 16 November 1942, Admin 453 Staff Conference Notes, 1942. (4) Chenault History. (5) Memo, G–4 for Chief Ord Serv, 23 Oct 42, sub: Memorandum No. W850-5-42, dtd 24/8/42, re: Automotive Parts Policy, and 2d Ind, ETO 451.01 Vehicle Parts and Accessories 1942, KCRC.

[54] (1) Sayler Rpt. (2) Chenault History. (3) Ord Serv ETO, Planning and Organization, pp. 44–45.

watertight, and it had many openings. To keep the engines from being flooded, metal "fording stacks" extending above the water had to be fitted on the exhaust pipes. Because the stacks interfered with the traverse of the turret they had to be quickly jettisoned after the landing so that the tanks could go in shooting. Working closely with the British, Ordnance officers rounded up large quantities of waterproofing material—metal tubing, rubber garden hose, sealing compounds, and a few British waterproofing kits—and arranged for shipment of the material to Ballykinler, Ashchurch, Tidworth, and other places where American troops were preparing for the North African landings.[55]

The North African venture began from the United Kingdom on 22 October 1942, when a cargo convoy of 46 vessels left British ports with supplies for the Center and Eastern Task Forces. On 24 October a second cargo convoy of 51 vessels sailed, and on 26 October and 1 November the first two troop convoys, of 41 and 17 vessels, respectively, departed with 68,463 American and 56,297 British troops. After that, convoys left the base in the British Isles at intervals of approximately one a week through December. The first ten cargo convoys carried among them 288,438 long tons of cargo, of which more than a third was Ordnance matériel. Food and clothing and similar Quartermaster supplies constituted the largest amount of tonnage, 35.2 percent of the whole; vehicles were next, 28.2 percent. Engineer supplies accounted for 12.8 percent, "old Ordnance" for 11.1 percent, gas and oil, 7.9 percent. Other technical services—Medical, Signal, and Chemical Warfare—had less than 1 percent each.[56]

As the first assault elements headed out into the Atlantic in a high wind and heavy sea, zigzagging south in a wide arc, Colonel Sayler in London began to assess the Ordnance effort in mounting TORCH. There were two serious causes for concern—vehicles and spare parts. The troops did not have their full table of equipment complement of trucks because it took too much shipping space to transport wheeled vehicles. The units could take only about 60 percent, with the promise that the other 40 percent would be shipped to North Africa in crates and assembled there. They did not have enough spare parts of certain kinds. The supply of automotive spare parts in the theater had been unbalanced: there had been sufficient for some makes of vehicles and practically none for others. To a certain extent the shortage was caused by shortages in the United States, but it was also attributable to confusion at the New York Port of Embarkation. Enough

[55] (1) Intervs, Brig Gen Paul M. Robinett, 8 Nov 55, and G. L. Artamonoff, 14 Feb 56. (2) 1st Ind to Ltr, CG SOS, 20 Oct 42; Memo, AG for Ord, 7 Oct 42, sub: Waterproofing Motor Vehicles, and 1st Ind; Ltr, Capt Madison Post to Chief Engrg Div, 3 Nov 42, sub: Report of Contact with Experimental Station at Westward Ho!, and other documents in ETO 451.01 Vehicle Parts and Accessories 1942, KCRC. (3) ETO Ordnance Office Order 2, Change 1, 1 September 1942 established an Engineering Division to handle technical information and prepare bulletins on modifications and repair methods evolved in the theater. Ord Serv ETO, Planning and Organization, Annex 29.

[56] MS TORCH—Its Relations With the European Theater of Operations, pp. 39, 52–58, Admin 532—TORCH Opn.

major items for maintenance purposes had been furnished (on a 45-day basis, however) and on the whole, though some major items had been cannibalized to provide spare parts, Colonel Sayler thought the forces departing for North Africa were well equipped with Ordnance general supplies.[57]

Ammunition supply officers believed that units of the Center and Eastern Task Forces had been supplied with sufficient ammunition from British depots. Shortages of certain types, notably antitank mines, hand grenades, and pyrotechnics, had been filled by procurement from the British.[58]

In supplying arms, vehicles, and ammunition for TORCH, Colonel Sayler's main problem, like that of Colonel Holman in Australia, had been lack of enough men to do the job. At headquarters the staff had to work far into the night, or all night, to meet the time schedule since it was 50 percent understrength in officers, and the depots and shops were in the same condition. In the field, where autumn rains made seas of mud out of vehicle parks and ammunition depots, Ordnance troops of all kinds worked at whatever jobs had to be done. From Rushden in late September and early October a depot company and a maintenance company were sent to unload ammunition at Braybrooke; at Ashchurch a weapons maintenance company worked on motor transport. Engineer troops and, later, field artillery troops had to be borrowed to help the TILEFER organization operate vehicle parks. The British Army continued to help. As preparations quickened in late September, for example, 50 skilled packers and craters were sent from the Hilsea RAOC depot to help with the work at Ashchurch. Ordnance officers gratefully acknowledged the debt they owed the men of the Royal Army Ordnance Corps for help on general supplies and on ammunition.[59]

The cables and letters sent from the British Isles in the fall of 1942 had a familiar ring to Ordnance officers in the United States, for in many respects they dealt with the same problems that were stressed in cables and letters from Australia. They had the same urgency and often showed the same lack of comprehension of the problems at home—the demands of many theaters for limited stocks, the upheaval caused by the new responsibility for motor transport, the creaks and strains of a war machine just getting into gear. It was perhaps inevitable that theater commanders were affected by what General Marshall called "localitis"—a local instead of a global view of the war. To commanders in North Africa early in 1943 Marshall talked of Americans fighting in water to their waists in the swamps of Guadalcanal and New Guinea. His listeners were sure that when he flew to the Southwest Pacific he would emphasize the "tough going" Americans were encountering in North Africa.[60]

[57] (1) Sayler Rpt. (2) Notes on Staff Conference 16 Nov 42, ETO Admin 453 Staff Conference Notes, 1942. (3) Chenault History.

[58] (1) McKay Rpt, 19 Oct 42. (2) G–4 Periodic Report, ETO (Quarter Ending 31 Dec 42).

[59] (1) Sayler Rpt. (2) McKay Rpt, 19 Oct 42. (3) Ord Serv ETO, Class II and IV Supply, pp. 25–27. (4) Hist Ord Sec SOS, p. 8. (5) Hist G–25, p. 11.

[60] Butcher, *My Three Years With Eisenhower*, p. 324.

CHAPTER VII

Oran and the Provisional Ordnance Group

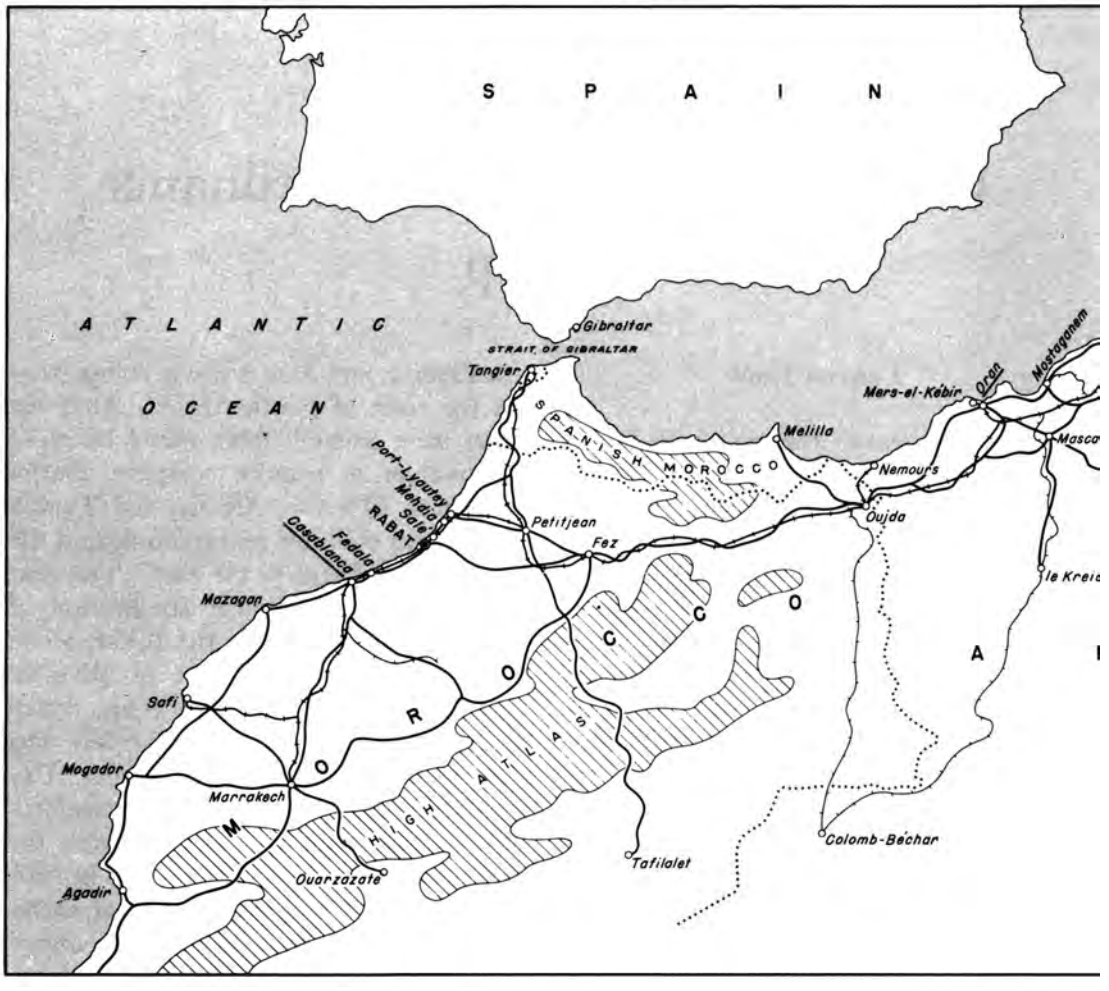
Tactical Plans

When the assault convoy of the Center Task Force headed into the cold Atlantic on 26 October 1942, many of the men aboard thought they were bound for the USSR or Norway or Iceland. A few thought they were returning to the United States. Then the great armada turned south. On the fifth day out, after the ships had come into calm seas and sunshine, the men were told that they were going to North Africa. Throughout the convoy, officers were summoned to the lounges of converted liners and the wardrooms of merchantmen and warships, and the briefings began. The Center Task Force would go ashore at three beaches in the vicinity of Oran on 8 November at 0100, the exact hour when the Western Task Force coming from the United States was to land at Casablanca and the Eastern Assault Force, mostly British, was to touch down at Algiers.[1]

The purpose of the landings at Oran, Casablanca, and Algiers was to secure bases on the coast of North Africa. After the bases were secured, there would be rapid exploitation to acquire complete control of French Morocco, Algeria, and Tunisia and extend offensive operations against the rear of Axis forces to the east. The next object was the complete annihilation of the Axis forces opposing the British forces in the Western Desert. At El 'Alamein Montgomery had launched his attack against Rommel three days before the TORCH convoy sailed from England. Undoubtedly Hitler would try to reinforce Rommel through Bizerte and Tunis; the best ports available to the Germans in Africa; therefore, the speedy capture of northern Tunisia was the main strategic purpose of the Allied invasion of North Africa. However, the Allied forces could not ignore the danger of German intervention through Spain, which would cut the Mediterranean supply line. For this reason the Americans at Casablanca and Oran were to protect the rear in Morocco while the British at Algiers rushed forward to Tunisia.[2] (*Map 1*)

[1] (1) Ernie Pyle, *Here Is Your War* (New York: H. Holt and Company, 1943), p. 5. (2) H. R. Knickerbocker *et al., Danger Forward: The Story of the First Division in World War II* (Washington: The Society of the First Division, 1947), p. 37. (3) Lowell Bennett, *Assignment to Nowhere* (New York: Vanguard Press, 1943), p. 26.

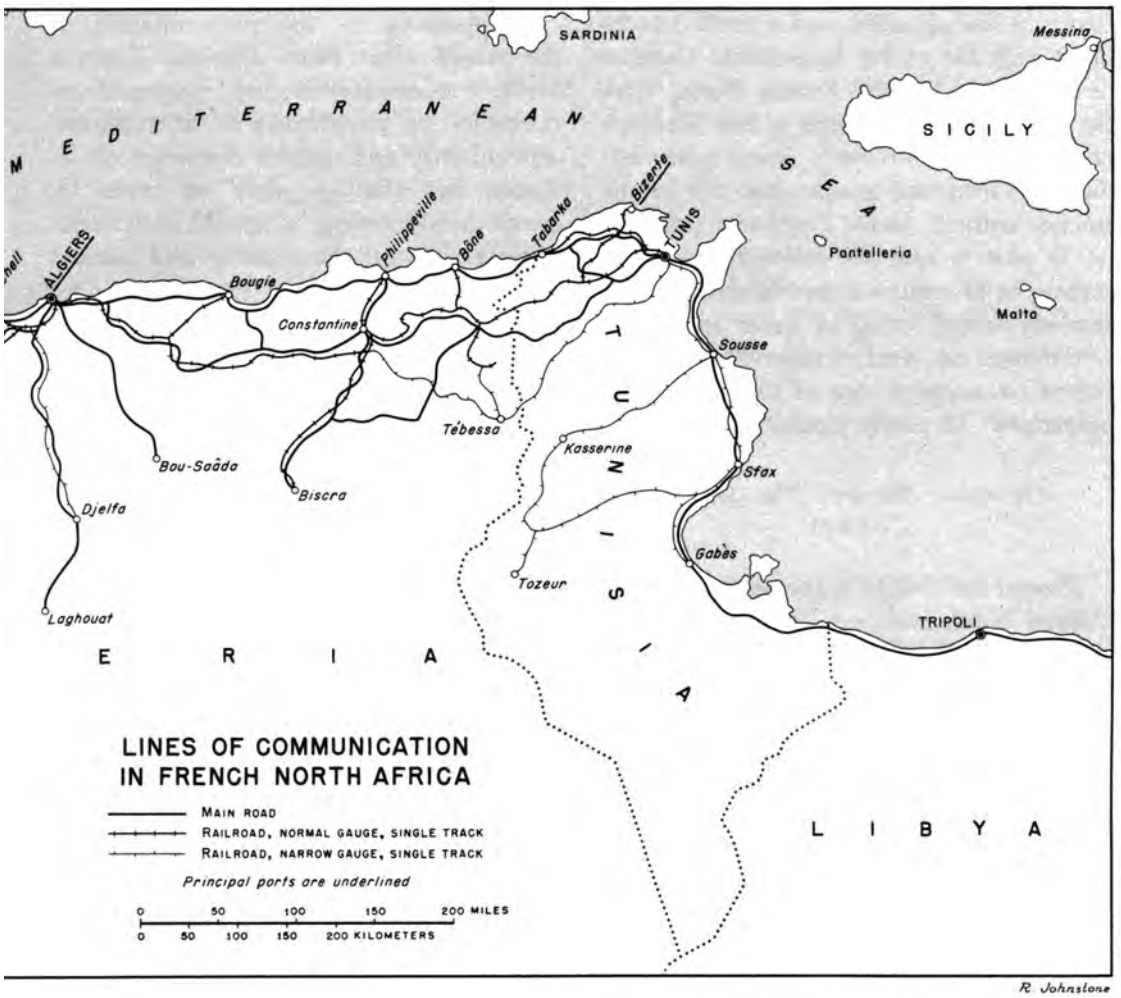
[2] (1) Eisenhower, *Crusade in Europe*, pp. 106, 116, 121–22. (2) Samuel Eliot Morison, "History of the United States Naval Operations in World War II," *Operations in North African Waters*,



MAP 1

During the Center Task Force briefings on shipboard, pointers moving over large detailed maps showed where the Oran landings were to take place. The most important was in the Gulf of Arzew, twenty-five miles east of the city, where there were two coastal batteries and a French garrison. A company of Rangers was to spearhead the assault, followed by the 16th and 18th Regimental Combat Teams (RCT's) of the 1st Infantry Division and most of the tanks of Combat Command B, 1st Armored Division. Simultaneously with the landing at Arzew, the 26th Regimental Combat Team, 1st Infantry Division, was to go ashore at Baie des Anda-

October 1942–June 1943 (Boston: Lttle, Brown and Company, 1954), p. 16, quoting Combined Chiefs of Staff Directive for Commander in Chief Allied Expeditionary Force.



louses, twelve miles west of Oran and, with the 16th and 18th RCT's from Arzew, form a pincers movement on Oran. The remaining tanks of Combat Command B were to land fifteen miles west of Andalouses at Mersa Bou Zedjar. The two mobile columns, consisting of light tanks, armored infantry, engineers, and tank destroyers were to strike inland and capture airfields, which were to be held by parachutists until the aircraft of the Twelfth Air Force could arrive.[3]

The flying columns had the bulk of the Ordnance support of the Oran landings—two companies of the 123d Ordnance Maintenance Battalion, which was organic to the 1st Armored Division. These com-

[3] Howe, *Northwest Africa,* p. 192. Unless otherwise noted this chapter is based on this source.

panies, a few air units, and a small detachment with the 168th Regimental Combat Team of the Eastern Assault Force, were the only Ordnance troops in the Mediterranean assault convoys.[4] Some 2,000 additional Ordnance troops were due in the second convoy from England, expected on D plus 3, and the following convoys, coming in at regular intervals through December, would bring in other units that would swell the total number of Ordnance troops (to support base as well as combat operations) to nearly 9,000.[5]

Ordnance Service: The Group Concept

Aboard the *Orbita* in the assault convoy, Colonel Niblo had been taking advantage of shipboard freedom from routine to develop his final plan for Ordnance service to II Corps. The plan, set forth in essence as a standing operating procedure in the last frantic weeks before the departure from England, assembled Ordnance battalions—the maintenance battalion authorized for a normal corps, plus as many additional battalions as were needed for a reinforced corps such as II Corps—under an Ordnance group headquarters.[6]

In planning for the reorganization of the Army after Pearl Harbor, General McNair recommended that regimental organization be abolished in all branches except infantry and cavalry regiments of divisions and that its place be taken by *group* headquarters, a small, nonadministrative unit for the training and tactical handling of about four battalions. The group concept provided a flexibility that was impossible in large organic units such as the regiment, because battalions were not assigned to the group organically, but were attached to it and detached from it as circumstances required. The application of this principle to service units followed naturally as a means of providing support for widely dispersed combat units and was strongly advocated for Ordnance units by General McNair's Ordnance officer, Col. Robert W. Daniels, especially after Ordnance received greatly increased responsibilities in the transfer of motor vehicle supply and maintenance in the summer of 1942.[7]

Meanwhile, the planning at the Office, Chief of Ordnance, was directed toward the older regimental organization for Ordnance troops. It had been initiated by Brig. Gen. James K. Crain, chief planner for Ordnance field service at the beginning

[4] (1) Miscellaneous Papers in Center Task Forc., Naval Shipping (Loading Plans) Oct–Nov 42. (2) Rpt, Col D. J. Crawford, Ordnance Service in Support of the Tunisian Campaign, Nov 20, 1942 to May 15, 1943 (hereafter cited as Ord Serv Tunisian Campaign), p. 2, OHF.

[5] Standing Operating Procedure, II Corps Ordnance Service, 13 Oct 42, Annex A, II Corps Ord Sec, Misc Corres, KCRC.

[6] (1) SOP, II Corps Ordnance Service, 13 Oct 42. (2) Interv with George L. Artamonoff, 14 Feb 56. (3) The normal corps was essentially the same as the old *type* corps (which consisted organically of three infantry divisions plus specified corps troops) but without the organic assignment. At this period the trend was away from organic assignment and the term *type*. Greenfield, Palmer, and Wiley, *Organization of Ground Combat Troops*, pp. 279–80.

[7] (1) Draft Memo (unused), Lt Gen L. J. McNair for CofS U.S. Army, sub: Revision of Type Army Corps and Army Troops (n.d.), and Memo, same to same, sub: Organization of Service Troops, 8 Jan 43, both in AGF 320.2 Strength, Binder 17. (2) Interv, Brig Gen Robert W. Daniels, USA Ret, 5–6 Jun 63. (3) Brig Gen R. W. Daniels, "Field Ordnance Service," *Ordnance*, XXXVIII, No. 203 (Mar–Apr, 1954), 750–51.

of World War II, and grew out of his experience in World War I. At that time the largest Ordnance organization with the combat troops consisted of a maintenance company with each division, attached to the division ammunition train, without equipment or supplies, and commanded by the colonel commanding the train, who sometimes, Crain observed, put the Ordnance men to such tasks as kitchen police duty or washing trucks. Crain, then Ordnance officer of Second Army, concluded that Ordnance units ought to have their own housekeeping facilities, because otherwise they were shackled to the unit that fed them; that they ought to be concentrated for more efficient service; and that they ought to be under Ordnance command, or if that was not possible, under Ordnance technical supervision. The answer was battalion organization, which he learned about from the French at Rheims in February 1918. By 1940 he had succeeded in establishing an Ordnance battalion in the U.S. Army at corps level. In the formative 1940–42 period, he went further and made much more ambitious plans, which envisioned placing under the Ordnance officer at army level an Ordnance brigade consisting of an ammunition regiment and a maintenance and supply regiment.[8]

During 1942 approval could not be obtained either for group or regimental organization for Ordnance troops in the combat zone, though the General Staff did approve regimental organization for Ordnance overseas base maintenance units. Niblo, who had been refused authority to expand the II Corps Ordnance Section to



COLONEL NIBLO. *(Photograph taken after his promotion to brigadier general.)*

a size large enough to enable him to exercise properly command control over his Ordnance battalions—ultimately five—favored the group type of organization. With authorization from the II Corps commander, Maj. Gen. Lloyd R. Fredendall, he was able to organize a group headquarters provisionally in the theater. There was not time to wait for authorization from Washington, which might have delayed the formation of the group interminably.[9] On the surface, five battalions, totaling nearly 5,000 men, seemed a rather large and "top-heavy" Ordnance organization for a single reinforced corps; but men who served with it later in Tunisia considered it "very nearly correct." [10]

[8] (1) Interv with Maj Gen James K. Crain, 17 Feb 54. (2) Maj Gen J. K. Crain, "Ordnance in the Field," *Ordnance*, XXXIX, No. 206 (September–October, 1954), 327–29.

[9] (1) Interv with Niblo, 28 Sep 55, and Artamonoff Interv. (2) Ltr, Maj Gen John B. Medaris, USA Ret, to Lida Mayo, 2 Dec 63. (3) Ltr, Niblo to Campbell, 1 Sep 43, Campbell Overseas File, OHF.

[10] Rpt, Maj George T. Petersen, Ordnance Operations in the Mediterranean Theater of Oper-

The II Corps Provisional Ordnance Group (POG) in the planning stage consisted of two battalions, one composed chiefly of heavy maintenance automotive companies, the other of medium maintenance and ammunition companies. Niblo intended to command the group himself, with Lt. Col. Russell A. Rose as his executive, setting up his headquarters according to the table of organization provided on 1 April 1942 for an Ordnance base regiment. He planned to operate the Ordnance Zone of Communications (SOS) facilities, which would be his responsibility temporarily, with an Ordnance base regiment coming from the United States, one of the new base shop organizations that were now ready to be sent overseas.[11]

The Landing at Oran

As the convoy passed through Gibraltar on the evening of 6 November, one question uppermost in everybody's mind was the attitude of the French. At Oran, ill will toward the British might be expected, for it was there that the Royal Navy had attacked the French Fleet, but the Americans hoped to be received as friends. The first landing craft to go ashore at Arzew were equipped with loudspeakers through which men especially chosen for their American-accented French were to shout "Ne tirez pas! Vive la France!" To emphasize dramatically that the landing was American, the 18th Regimental Combat Team carried a mortar that would shoot an egg-shaped bomb about two hundred feet into the air, where it would burst into a magnificent pyrotechnic display of the American flag in color. There were four such sets of fireworks, each capable of flinging the star-spangled banner a hundred feet across the sky.[12]

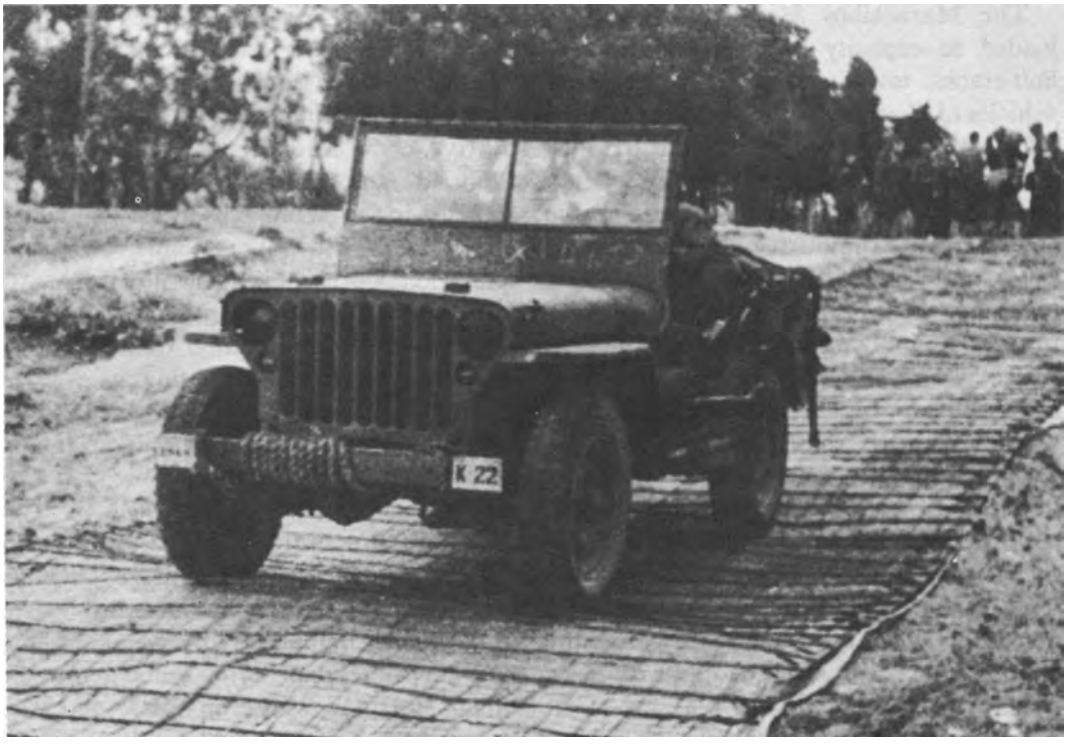
On the evening of 7 November the convoys of the Center and Eastern forces separated off Oran. The Eastern Assault Force proceeded to Algiers and the Center Task Force turned south. One group of transports stood into the Gulf of Arzew, two others made contact with British beacon submarines that guided them to their beaches west of Oran.

In the Gulf of Arzew the landings began about 0030 on 8 November. The Rangers landed without much opposition and were followed by infantrymen of the 1st Division. The French were taken by surprise. They seemed to have no inclination to regard the invaders as friends and liberators, but their fire was sporadic and uncertain since the landing craft were well concealed by smoke screens laid down by the Royal Navy and the dispersed landings confused and disorganized the defenders. The only 1st Division unit that encountered any firm resistance was the 18th Regimental Combat Team, advancing northwest of Arzew, and that was triggered by a sergeant's impatience to "shoot the flag." About 0300, a column of flame shot upward near the 18th Regimental Combat

ations (hereafter cited as Petersen Rpt, 14 Feb 45), Incl to Ltr, Gen Stilwell to CG's Second and Fourth Armies, same sub, 14 Feb 45, Document 155.2-20, Armored School Library.

[11] (1) SOP, II Corps Ordnance Service, 13 Oct 42. (2) CTF, LO, 13 Nov 42, sub: Organization of Provisional Ordnance Group, II Corps, II Corps Ord Sec Misc Corres, KCRC. (3) A battalion of the 303d Ordnance Base Regiment, the first unit of this new type of organization to reach any theater of operations, was then on its way to Egypt to work in the Heliopolis tank shop. See above, p. 22.

[12] Knickerbocker *et al.*, *Danger Forward*, pp. 24, 39.



JEEP HEADED INLAND OVER STEEL MATTING NEAR LES ANDALOUSES

Team's command post, emitting sparks that hung in the sky for a moment and then burst into the American flag in full color. At last the French had a good target. Mortar, machine gun, and rifle fire converged on the new target and the men at the command post had to scatter.[13]

The personnel ships carrying Colonel Niblo and other staff officers entered the Gulf of Arzew at sunrise. As the sun dispelled the early morning fog that hung over the water and struck the slopes of the mountains beyond the beaches, the men at the rails of their ships could see the assault columns fighting their way to the crest of the heights above Arzew and later the small groups of prisoners descending the slopes to the town. They could see also the operation of the flat-bottomed, ungainly Maracaibos, forerunners of the LST's (landing ships, tank). These shallow-draft oil tankers, designed to sail Lake Maracaibo, Venezuela, and converted by the British into tank-landing vessels, had a bow landing ramp, closed while under way with a pair of huge doors, that could be extended with a ponton bridge section to cover the span between ship and shoal water. The bow openings were too narrow for medium M3 tanks but could easily take light tanks.[14]

[13] (1) Morison, *Operations in North African Waters*, pp. 231–35. (2) Knickerbocker *et al.*, *Danger Forward*, p. 25.

[14] (1) McNamara, "The Mounting of 'Torch' from England," pp. 13–14. (2) Robinett Interv.

The Maracaibos *Misoa* and *Tasajera,* loaded to capacity with the light tanks, half-tracks, towed guns, jeeps, and other vehicles of Combat Command B, grounded off the beach at Arzew about 0400. It took nearly two hours to emplace the ponton bridging, but in another two hours all the vehicles had rumbled over the bridge, splashed through the few feet of water, and driven across steel matting laid on the sand to their assembly area for dewaterproofing, which was done by the tankers' own mechanics. The Maracaibos might not have worked if the sea had not been calm, the slope of the beach steep, and opposition nonexistent, but fortune had favored the landing. At 0820 the reconnaissance elements moved off, followed fifteen minutes later by the flying column. The Ordnance officers were gratified to observe that the waterproofing had succeeded and could be removed without difficulty.[15]

The *Orbita* was ten hours in the harbor before the British naval officers, who were short of landing craft, allowed anyone to disembark. Late in the afternoon the sea sprang up, and vehicles and supplies could no longer be ferried onto the beaches but had to be unloaded on the docks, which were soon clogged. When Maj. George L. Artamonoff, Niblo's operations officer, got ashore on the evening of D-day he saw that the quays were blocked with equipment and that there had been no adequate provision for carrying it away. The unloading of motor vehicles seemed inordinately slow.[16]

Fortunately, railway facilities at Arzew were usable. The 1st Division's Quartermaster battalion commandeered a locomotive and five cars and with the help of a native crew and an Engineer brigade shuttled stores around docks and from beaches to the Arzew railway station, which served as a distribution point. A Transportation Corps officer by distributing C rations to a French crew persuaded it to run a trainload of ammunition from Arzew to the 18th RCT, then fighting its way to Oran. The next day the Quartermaster battalion organized an ammunition, ration, and water supply dump in a bivouac area a few miles inland.[17]

While the mobile columns of tanks mopped up the airfields and the 1st Division combat teams pressed toward Oran, staff officers remained in Arzew, sleeping on the stone floor of a schoolhouse the night of D-day. Late on the second day, word came from General Fredendall, still aboard his ship, that the combat teams were moving too slowly and that it was imperative that Oran be taken the next day, 10 November. Maj. Gen. Terry de la Mesa Allen, commanding the 1st Infantry Division, thereupon ordered the attack for 0715. Colonel Niblo sent Major Artamonoff forward at once so that he could enter the city as soon as possible after its capture to reconnoiter sites for Ordnance

[15] (1) Operation Report, Task Force Red, in Center Task Force, Rpt on Opn TORCH, 13 Nov 42. (2) Ltr, Maj Artamonoff and Capt John Ray to Ord Officer, CTF, 2 Dec 42, sub: Data on Amphibious Operations (D Convoy), II Corps Ord Sec Misc Corres, KCRC.

[16] (1) *Ibid.* (2) CTF, Lessons from Operation TORCH, p. 4. (3) A few amphibious jeeps had been used, but they were not particularly successful. Artamonoff Interv.

[17] (1) William F. Ross and Charles F. Romanus, *The Quartermaster Corps: Operations in the War Against Germany,* UNITED STATES ARMY IN WORLD WAR II (Washington, 1965), p. 53. (2) H. H. Dunham, Historical Unit, OCT, ASF, Monograph, U.S. Army Transportation and the Conquest of North Africa, 1942–1943 (hereafter cited as Dunham MS), January 1945. pp. 86, 180. MS, OCMH.

depots and dumps. Artamonoff started off in a driving, sleety rain on the evening of 9 November and, in spite of the blackout and unfamiliar terrain, late that night caught up with the most advanced elements of the 16th RCT. He spent the rest of the night at Ferme St. Jean de Baptiste, on the eastern outskirts of Oran. There at noon the next day he saw a blue flag raised over the city, the prearranged signal that Oran had surrendered.[18]

The city's wide, palm-lined streets, bordered with modern office buildings and sidewalk cafes, offered interesting contrasts. Most of the people were French and Spanish, but there were Arabs in ragged sheets, and gaunt dogs shared the streets with horse-drawn carts. The few automobiles burned alcohol, and the odor pervaded the city. The beautiful harbor was littered with wreckage, for the attempt on D-day by the British cutters *Hartland* and *Walney* to capture the batteries and wharves and prevent sabotage had been a costly failure. The quays were piled with merchandise, including thousands of barrels of wine destined for export to Germany and Italy.[19]

Soon after the Americans entered Oran they learned that the landing of the Eastern Assault Force at Algiers had been successful. That of Western Task Force at Casablanca had met stiff opposition, but by 12 November Morocco was safely in American hands. Of the three task forces, Center was the only one, according to the official history of TORCH, that "could subsequently claim to have won a decision wholly by force of arms."[20] Elsewhere, political considerations entered in. Nowhere did the French seem very much disposed to regard the Allies as liberators. Except for a few scattered bursts of enthusiasm, the people lined up along the streets of Oran were not friendly. The French were cool and many of the Arabs, who had been good subjects for Axis indoctrination, were actively hostile and continued sniping for some time.[21]

Major Artamonoff, who was in Oran well ahead of Quartermaster and other supply officers, and who had another advantage in being able to speak French fluently, obtained good depot space at Nouvelle Halle, the local market. On a tip from French newspapermen, he found comfortable quarters for Colonel Niblo and the Ordnance staff at a villa just vacated by the Italian naval delegation to the German-Italian Armistice Commission. Called Villa Charpentier, located on Lotissement Saint Hubert, it was about two miles from the center of town, behind the Oran Tennis Club. Offices and a mess were set up at the tennis club when Colonel Niblo and the staff arrived next day, 11 November.[22]

On the same day the first important follow-up convoy from England arrived, bringing a large contingent of Ordnance troops and the rest of the staff. Disembarking at Mers-el-Kébir, the troops were met by Major Artamonoff and taken to camps in the countryside around Oran. They found the sunny African climate a welcome change from the cold English autumn. The

[18] Artamonoff Interv.

[19] (1) Morison, *Operations in North African Waters,* pp. 225–30. (2) Pyle, *Here Is Your War,* pp. 26–27. (3) Dunham MS, p. 195.

[20] Howe, *Northwest Africa,* p. 227.

[21] (1) Knickerbocker *et al., Danger Forward,* p. 32. (2) Artamonoff Interv.

[22] (1) *Ibid.* (2) Memo, Niblo for AG CTF, 8 Dec 42, sub: Location of Ordnance Units, CTF, 320.2 II Corps Ord Sec KCRC.



ORAN HARBOR

arrivals included four "old Ordnance" companies: the 14th Medium Maintenance, the 53d and 66th Ammunition, and the 30th Heavy Maintenance (Tank); and two automotive maintenance battalions, the 87th Medium Maintenance and the 1st Battalion of the 55th Heavy Maintenance Regiment (Q), a unit that still carried its old Quartermaster designation.[23]

The Provisional Ordnance Group

Colonel Niblo lost no time in organizing his Provisional Ordnance Group. For the 1st Battalion of the group he took the 1st Battalion of the 55th Heavy Maintenance Regiment (Q) and added the "old Ordnance" maintenance companies and one company of the 87th Medium Maintenance Automotive Battalion. For the 2d Battalion of the group he took the 87th Medium Maintenance Battalion (Q) (less one company) and added the two ammunition companies. The mission of the 1st Battalion was to furnish Ordnance service (other than ammunition supply) for all U.S. Army units within the geographical limits of the towns of Oran and Arzew, including the ports of those towns, and to support the 2d Battalion with fourth echelon work. The 2d Battalion was to furnish

[23] (1) Artamonoff Interv. (2) Ltr, Crawford to Campbell, 28 May 43, in file Hist AFHQ Ord Sec, OHF.

Ordnance service—except fourth echelon repair—to all U.S. Army organizations outside Oran and Arzew. For the time being this meant the Ste. Barbe-du-Tlelat area south of Oran, where most of the troops of the 1st Division and Combat Command B were stationed.[24] Since the units were more or less static, the maintenance work at first consisted of inspecting vehicles, seeing that waterproofing had been removed and salt water damage repaired, training drivers in preventive maintenance, and reporting shortages of vehicles, tools, and parts.[25]

The group's first and most important job—and this fell to the 1st Battalion—was to supply the trucks that were so badly needed everywhere. The decision to send on wheels only 60 percent of the vehicles called for by tables of equipment, to save shipping space, and to send the rest unassembled in crates had worked great hardship. Ordnance planners had counted on local vehicles to help in the emergency. Major Artamonoff had orders to buy all he could find, and was given $5,000 in silver for the purpose.[26] The French trucks had been converted to charcoal or alcohol and many were in poor shape. Some dated from World War I, some had been driven from Central Africa. Tires were worn and batteries were a constant problem. Still, the French trucks were very useful in the days following the first landings and local transport was so badly needed that even horse-drawn wagons were pressed into service within the port area. Therefore it was important to get the American vehicles unloaded and operating as quickly as possible.[27]

At Oran and Arzew the 1st Battalion rendered "Driveaway Motor Service." It set up assembly plants and maintenance sections near the docks, assembled the crated vehicles, and serviced the wheeled vehicles, removing all waterproofing. After this was done the men picked up a pay load, preferably Ordnance Class II supplies or Ordnance organization equipment, delivered it, and then turned the vehicles in to the 1st Battalion Motor Depot at Nouvelle Halle in Oran for issue to Center Task Force units. The trucks were so much in demand that many of them were put into service without being given a thorough road test.[28] Some could not be assembled or put into service at all because of shortages. Some of the twin unit pack crates containing 2½-ton trucks arrived without brake fluid and

[24] CTF, LO, 13 Nov 42, sub: Organization of Provisional Ordnance Group, and Ltr, Colonel Niblo to Commanding Officers, 1st and 2d Battalion, Prov Ord Gp, 21 Nov 42, sub: Ordnance Maintenance Service and incls, both in II Corps Ord Sec, Misc Corres, KCRC.

[25] Memo, Maj B. Whitehouse for Commanding Officer, 1st Battalion, Provisional Ordnance Group Center Task Force, 23 Nov 42 and Ltr, 2d Lt Joe I. Milliken to Chief Ordnance Officer, Second Corps, 6 Dec 42, sub: Motor Vehicle Inspection, both in II Corps Ord Sec, Misc Corres, KCRC.

[26] Artamonoff Interv. When Ernie Pyle arrived on 11 November, he found the Renault automobile showroom full of new cars. In a few days the Army had bought every car. Pyle, *Here Is Your War*, p. 26. Another correspondent commented on the "fantastic prices" paid for civilian cars and trucks. Bennett, *Assignment to Nowhere*, p. 61.

[27] (1) Dunham MS, pp. 186–87, 259. (2) Artamonoff Interv.

[28] (1) Memo, Colonel Niblo for Commanding Officers, 1st and 2d Battalions, Provisional Ordnance Group, 22 Nov 42, sub: Ordnance Service, Ports of Oran and Arzew, and Memo, Niblo for G–4, Center Task Force, 21 Nov 42, both in II Corps Ord Sec, Misc Corres, KCRC. (2) MS, History of Ordnance Service in the Mediterranean Theater of Operations, Nov 42–Nov 45 (hereafter cited as Hist Ord Serv MTO), ch. I, p. 18.

shock absorber fluid. Electrolyte for batteries was sometimes missing. French laborers, who along with Arabs were used in great numbers in the motor vehicle operation, made unpredictable mistakes in servicing the trucks. One day they were found filling dry automobile batteries with wine from the casks on the docks.[29]

Arab labor, as well as French, had its drawbacks. The Arabs stole weapons and ammunition; one newspaper correspondent reported that a whole native village near Oran had armed itself and was contemplating raiding a neighboring village for booty and women. And they were avid for cloth or anything to make clothing. They cut the canvas tops out of jeeps parked in the streets. At ammunition dumps they stole rope grommets from the 155's to make shoes and opened small arms boxes to steal the bandoleers. On occasion they blew themselves up in their eagerness to examine boxes of grenades. Many laborers were young or so weak physically that they could hardly lift heavy loads; and their disinclination to work in the rain played havoc with schedules once the rainy season set in. Nevertheless, in the early days after the Oran landings, Niblo made good use of native workers.[30]

The Provisional Ordnance Group was expanded when the second follow-up convoy arrived from England on 28 November. The convoy brought the headquarters and headquarters detachment of the 62d Ammunition Battalion, which made possible the formation of the 3d Battalion of the group, to which the two ammunition companies were shifted. It also brought two medium maintenance and one depot company. These were added to the group's 2d Battalion, which was now given responsibility for all local maintenance, leaving the 1st Battalion free to concentrate on assembling crated vehicles. The 3d Battalion operated three ammunition dumps.[31]

The flexibility of the Provisional Ordnance Group was to be tested again very soon. Just as the organization for the support of the base and the troops around Oran was taking shape, it had to be dismantled to furnish Ordnance service to the battlefront in northern Tunisia. Under Gen. Sir Kenneth A. N. Anderson, the British First Army, which was actually only a skeleton outfit consisting of two infantry brigades and one tank regiment, had lost the race to capture Tunis and Bizerte and was meeting heavy resistance from the Germans who were pouring in from Italy. To help the British, General Eisenhower on 23 November, the day he arrived in Algiers from Gibraltar, sent from Oran Combat Command B of the 1st Armored Division, and during late November and

[29] (1) Interv, 2 Jan 43, with Colonel Niblo, in MS, Col Heavey, Personal Notes on Training Activities in England and Observations in North Africa, app. II (hereafter cited as Heavey Notes), in Folder, "British Relations," Barnes File, OHF. (2) Speech, Brig Gen Edward E. MacMorland, Deputy Chief for Planning Ordnance Field Service, Boston, 5 May 44, p. 9, OHF.

[30] (1) Bennett, *Assignment to Nowhere*, p. 58. (2) Capt. William G. Meade, "Ammunition Supply in the Mediterranean Theater of Operations," *The Ordnance Sergeant*, VIII (October, 1944), 262–63. (3) Artamonoff Interv.

[31] (1) Niblo Ltrs of 21, 27 Nov, 1 Dec 42, and CTF Admin Order No. 3, 20 Nov 42, all in II Corps Ord Sec, Misc Corres, KCRC. (2) Special Order No. 4, 23 Nov 42, Provisional Ordnance Group II Corps Ord Sec, KCRC. (3) CTF Station List, 27 Nov 42, II Corps Ord Sec, 320.2, KCRC.

early December he also sent forward elements of the 1st Infantry Division.[32]

The Move to Northern Tunisia

For the first Ordnance move forward, Colonel Niblo selected his 1st Battalion, Provisional Ordnance Group, and reorganized it. Under the headquarters of the 1st Battalion, 55th Ordnance Heavy Maintenance Regiment (Q), he placed the 53d Ammunition Company, the 14th Medium Maintenance Company, Company D of the 87th Medium Automotive Maintenance Battalion, and the 78th Depot Company. Colonel Rose was the commander of the new battalion. Niblo ordered the unit to proceed to Souk el Arba in northern Tunisia, the most forward airfield and supply base, about 750 miles from Oran. On arrival at l'Arba, a town near Algiers, the battalion was to come under the control of Colonel Ford, Ordnance officer of Allied Force Headquarters, who had just arrived in Algiers by air from England.[33]

The move had to be made by truck, for the railroad east of Algiers was being used to its limited capacity by the British, and transportation by sea to the small ports of Bône and Philippeville was too dependent on weather, availability of shipping, and freedom from enemy air attack. Above all, trucks were needed within the combat zone to make the Ordnance units completely mobile. The advance elements of the 715-man 1st Battalion headed east under cover of darkness on the evening of 30 November and all its 183 trucks were on the road, escorted by fighter planes, by 10 December.[34]

Two days later orders came from Allied Force Headquarters to send the 30th Ordnance Heavy Maintenance Company (Tank) forward immediately with all the replacement tanks, wreckers, and parts it could transport. On the night of 10–11 December during the withdrawal from Medjez el Bab, the focal point of enemy attack, scores of combat vehicles—tanks, half-tracks, and tank destroyers—had bogged down in the mud and had to be abandoned. The tanks were so badly mired that the Germans themselves could not extricate them. It was a crippling loss. In its brief experience in action, Combat Command B had lost 32 medium and 46 light tanks. The combat vehicles that remained were in poor condition. Because of limitations on shipment by railroad or by sea, most had made at least part of the journey to the front on their own tracks, which were already worn from maneuvers in Ireland, for there had not been time to replace them before sailing for Africa. Once in Africa, some of the vehicles had gone overland all the way

[32] Eisenhower, *Crusade in Europe*, pp. 118–22.

[33] (1) Prov Ord Gp, II Corps, SO Nos. 8 and 16, 29 Nov, 13 Dec 42. (2) History AFHQ Ord Sec, 6 Jan 43, OHF.

[34] (1) Ord Serv Tunisian Campaign, pp. 1–3. (2) Logistical Plans Sect, AFHQ, Aide-Mémoire on Logistic Limitations to Forces in North Africa, 11 Jan 43, in ASF Planning Div, Theater Br, 20 General, vol. I. (3) Dunham MS, pp. 206–10, 246. (4) LO, CTF to CO Prov Gp, 30 Nov 42, and memo, Prov Ord Gp for CG CTF, 1 Dec 42, sub: Personnel and Matériel in Movement of 2d Echelon, 1st Battalion, POG, both in II Corps Ord Sec, 370.5, KCRC. (5) By D plus 11 there were in Algeria four AAF fighter groups minus one squadron. Wesley Frank Craven and James Lea Cate, eds., "The Army Air Forces in World War II," II, *Europe: TORCH to POINTBLANK* (Chicago: University of Chicago Press, 1949) (hereafter cited as Craven and Cate, *AAF II*), p. 82.

to the front since there had been no way to carry them over the highways. A tractor-trailer for transporting tanks had been developed by the United States in 1941 at the request of the British, who wanted them to rush tanks to danger points if the Germans invaded England. The British Eighth Army in Egypt was equipped with the tractor-trailers and had a tank delivery regiment to carry combat vehicles from bases to the front. II Corps had only ten tank transporters because the U.S. Army had not foreseen the need for them. This need was one of the earliest lessons learned in Tunisia.[35]

When the 30th Ordnance Heavy Maintenance Company (Tank) left Oran for Souk el Arba on the morning of 14 December, it took, in addition to its 25 shop trucks, 13 cargo trucks, miscellaneous light trucks, trailers, and jeeps, 4 40-ton tank transporters, each carrying a light tank (medium tanks could not be unloaded from ships in time), and 2 10-ton wreckers. The 30th also took all the spare parts that were available in Oran and additional supplies for the rest of the 1st Battalion, POG.[36]

[35] (1) Rad, Freedom Algiers to CG, CTF, No. 9611, 12 Dec 42, II Corps Ord Sec, 370.5, KCRC. (2) Dispatch by Lt Gen K. A. N. Anderson, "Operations in Northwest Africa from 8th November 1942 to 13th May 1943," 7 Jun 43, Supplement of 6 Nov 46 to *The London Gazette*, 5 Nov 46, pp. 5449–64. (3) Diary and Report of Brig Gen Barnes on Trip to North Africa and United Kingdom December 1942–January 1943, pp. 14, 19 and "Notes on General Barnes' Report," p. 6, OHF. (4) Intervs, Colonel Crawford, 3 Jun 56, and Robinett.

[36] (1) Ltr, CO POG to CG CTF, 14 Dec 42, sub: Personnel and Matériel in Movement of 30th Ord Co, II Corps Ord Sec 370.5, KCRC. (2) Ltr, Col Niblo to Ordnance Officer AFHQ, 13 Dec 42, sub: Ordnance Service for US Troops in ETF, II Corps Ord Sec, Misc Corres, KCRC. (3) Special Order No. 16, 13 Dec 42.

The Ordnance convoys leaving Oran between 30 November and 14 December went east over a hard-surfaced, two-lane road that presented few problems until they got to the mountainous country beyond Algiers, where steep inclines slowed the heavily loaded trucks and corkscrew turns all but defeated the heavy wreckers. The depot company almost lost a van over a cliff when a tire blew out, but there were no major disasters.[37] After the four-day trip the convoys came down from the Atlas Mountains into a flat valley and encamped in the neighborhood of Souk el Arba. For the first few days, until the winter rains set in, the position was constantly attacked by German dive-bombers, which were stationed on concrete runways at Tunis and Bizerte, whereas Allied aircraft were bogged down in the mud far behind the lines.

This early Ordnance effort to support the British First Army was short but strenuous. The ammunition men, camouflaging their dump with the only vegetation they could find, some scrubby growth resembling tumbleweed, sent detachments to Bône, where most of the ammunition came in from Oran by sea, and to the railheads at Duvivier and Souk Ahras, to direct shipments by truck to Souk el Arba. The maintenance men ranged up and down the front in small contact parties, sometimes consisting of a single vehicle and a handful of men, visiting tankers, infantry units, and widely dispersed antiaircraft units at the railhead and in the small ports along the coast.

[37] (1) NATOUSA Report, 1st Lt. Charles S. Schwartz, The Field Operations of a Maintenance Battalion, copy in OHF, pp. 3–4. (2) Hist 78th Ord Depot Co, Jan 42–Dec 44, p. 4.

One detachment, on orders from AFHQ, was sent south to central Tunisia to support a small U.S. parachute detachment under the command of Col. Edson D. Raff that was helping the French 19th Corps on raiding and reconnaissance missions. All contact parties were in constant danger from German aircraft. By the end of December, the II Corps Ordnance officer was asking Center Task Force to equip every Ordnance technical vehicle and truck with a machine gun for defense.[38]

The men in Colonel Rose's battalion were the first American supporting troops at the front. Moreover, thanks to Colonel Niblo's "top-heavy" organization, Ordnance was the only supply service able to send troops to Tunisia with the combat troops during November and December 1942. The 78th Ordnance Depot Company also handled Signal Corps supplies and acted as middleman in obtaining clothing, bedding, tools, and other articles from the British and then issuing them to all arms. There was an enormous demand for Ordnance supplies. In the first week after its arrival the depot company made enough issues to free six of its nine huge vans for trips back to Oran for restocking.[39]

To put an end to the "constant daily shipping of piecemeal equipment, all of which appears to be too little and too late," Colonel Niblo urged Colonel Ford to turn over the Ordnance job in northern Tunisia to the whole Provisional Ordnance Group. This would enable Niblo to send more maintenance men and also would allow him to set up a general supply depot and large ammunition dump east of Algiers. Colonel Ford agreed that a depot and shop should be established nearer the front. The two officers in late December made a reconnaissance trip to locate space in Constantine, the Algerian city where the British First Army headquarters was located, but before they could make arrangements a momentous decision changed all plans.[40]

Planning for Central Tunisia

On Christmas Eve, General Eisenhower returned to Algiers from a reconnaissance of the front in northern Tunisia convinced that the torrential rains, deep mud, and stiffening enemy resistance had effectively stopped General Anderson's advance and that the best course was to go on the defensive for the time being, holding the airfields at Souk el Arba in the north and Thélepte and Youks-les-Bains in the south and protecting the flank on the south by moving II Corps forward to Tébessa, the Algerian border city that was the gateway to central Tunisia. There the weather would be better and, when sufficient reinforcements had been brought up, General Fredendall could move east to the coast at Sfax or Gabès and prevent Rommel's

[38] (1) Ord Serv Tunisian Campaign, pp. 2–5. (2) Meade, Ammunition Supply in the MTO, pp. 261–64. (3) Colonel Edson D. Raff, *We Jumped to Fight* (NY: 1944), pp. 153, 163. (4) Memo, Col John B. Medaris, Acting Ord Officer, CTF, for ACofS G–4, CTF, 31 Dec 42, sub: Memo Hq CTF, 28 Dec 42, in II Corps Ord Sec 319.1, KCRC.

[39] (1) Petersen Rpt of 14 Feb 45. (2) Ord Serv Tunisian Campaign, p. 3. (3) Hist 78th Depot Co, p. 4.

[40] Ltrs, Niblo to Ordnance Officer, AFHQ, 13 Dec 42, sub: Ordnance Service for US Troops in ETF, and 16 Feb 42, sub: Estimate of the Ordnance Situation in II Corps, II Corps Ord Sec Misc Corres, KCRC.

Afrika Korps, then making a rapid strategic withdrawal to Tunisia from Tripolitania, from joining Generaloberst Hans-Juergen von Arnim's forces in the Tunis-Bizerte area. An outline plan for an attack toward Sfax, called SATIN, was approved at AFHQ on 28 December.[41]

By 14 January 1943 final decisions on Operation SATIN had been made in conferences between General Eisenhower, General Anderson, General Alphonse Juin, and General Fredendall at Allied Force Headquarters in Constantine. The next day Eisenhower flew to Casablanca to report to the Combined Chiefs of Staff, who were attending an international strategic conference there. SATIN provided that Fredendall would first attack Gabès and then proceed north up the coast to Sfax, with a tentative D-day of 22 January. Operating directly under AFHQ, II Corps would consist of the U.S. 1st Armored Division, the U.S. 26th Regimental Combat Team, the British 1st Parachute Brigade less one battalion, and the French Constantine Division. Over the protests of AFHQ logistics staffs, who during the conferences at Constantine between 10–14 January "wailed that our miserable communications could not maintain more than an armored division and one additional regiment," [42] Eisenhower firmly intended to assign to II Corps three infantry divisions as soon as they could be brought forward: the 1st, the 9th (less the 39th Regimental Combat Team), and the 34th.[43]

[41] (1) Eisenhower, *Crusade in Europe,* pp. 124–26. (2) Clark, *Calculated Risk,* pp. 139–41.

[42] Eisenhower, *Crusade in Europe,* p. 125.

[43] *Ibid,* pp. 125–26.

A Long, Weak, Supply Line

The logistics staffs had reason for their wails. The supply line was very long and very weak. The distance from Constantine—itself from 100 to 300 miles from the front—to the nearest big port, Oran, was 445 miles; Casablanca was 440 miles west of Oran. Base sections had been planned early for both ports, but on Christmas Eve, when Eisenhower decided upon the movement to central Tunisia, the Mediterranean Base Section (MBS) at Oran had been in existence only about three weeks, and the first echelon of the Atlantic Base Section at Casablanca was just arriving. Eventually there was to be an Eastern Base Section (EBS) at Constantine, nearer the front, but it did not come into being until late February 1943.[44] (*See Map 1.*)

For most of the campaign in the spring of 1943 supplies had to be brought 500 to 1,200 miles from ports of entry; moreover, the base sections at the ports were just learning, as men had learned in Australia, how hard it was to operate in a strange country far from home. Colonel Heiss, the Ordnance officer of the Mediterranean Base Section, who, like other rear area officers lacked depot equipment such as record cards, bins, and lift trucks and had to get along with a small inexperienced staff and untrained labor, found that it took about eight months to establish complete base facilities. In the meantime, before he could build up his

[44] (1) Col. Creswell G. Blakeney, comp., *Logistical History of NATOUSA-MTOUSA* (Naples, Italy: G. Montanino, 1945), pp. 21, 23. (2) History of Ordnance Operations Eastern Base Section, 13 Feb 43–1 Aug 43 (hereafter cited as Hist Ord EBS), pp. 2, 10, OHF.

stocks he had to supply troops who arrived in the theater without all the weapons that their tables of basic allowances called for. The system that then existed for equipping overseas forces provided that when a unit in the United States received orders to go overseas it packed its own equipment, addressed it to itself, and shipped it to the port for delivery overseas. The equipment might arrive long after the troops, or at a different port.[45]

The bases themselves were at the end of a long overwater supply line. It usually took about three months to get supplies from the United States to the theater, often much longer to obtain complete items. Supply officers came to regard delivery by ship as "probably the most unsatisfactory method of supply that the Devil could have invented."[46] Sometimes the chassis of a truck would be on one ship, the cab on another; projectiles would arrive without their powder charges, which were on another ship. This situation was especially serious in the early days, when part of a convoy might be sunk or have to be diverted to a different port. The failure to load ships with complete items was "the most severe and general criticism" of supply coming from the United States. There were many other complaints from base sections of thoughtless editing of requisitions, poor marking and packing, and "just plain negligence." [47]

The new theater had not yet established its own organization. It was under Allied Force Headquarters, a part of the European Theater of Operations, until 4 February 1943, when the North African Theater of Operations, United States Army (NATOUSA), under General Eisenhower was organized. On 12 February a Communications Zone, NATOUSA, under Brig. Gen. Everett S. Hughes, Deputy Theater Commander, NATOUSA, was established; and a few days later Services of Supply, NATOUSA, assumed responsibility for supply and the administration of the base sections. It took time for all these relationships to be straightened out and confusion during the first few months of operation was inevitable.[48]

The problems for Ordnance were especially complicated because the thousands of trucks used in the long haul to the battlefront had to be furnished and maintained by Ordnance. The responsibility was new, and Ordnance was discovering the burden it imposed. When General Hughes took over the job as theater deputy, he selected Ordnance's Colonel Ford as his chief of staff because he realized that about 60 percent of his job was ordnance supply and maintenance; he felt "if we could lick the ordnance job, we could lick anything easier than that." [49]

[45] (1) Col. G. K. Heiss, "Ordnance Overseas: Problems of Supply and Maintenance in the Theater of Operations," *Army Ordnance, XXVII* (July–August 1944), 92–93. (2) Memo, Somervell for Campbell, 20 Feb 43, O.O. 350.05/2614½. (3) History Ord Service MTO, ch. VII, p. 214.

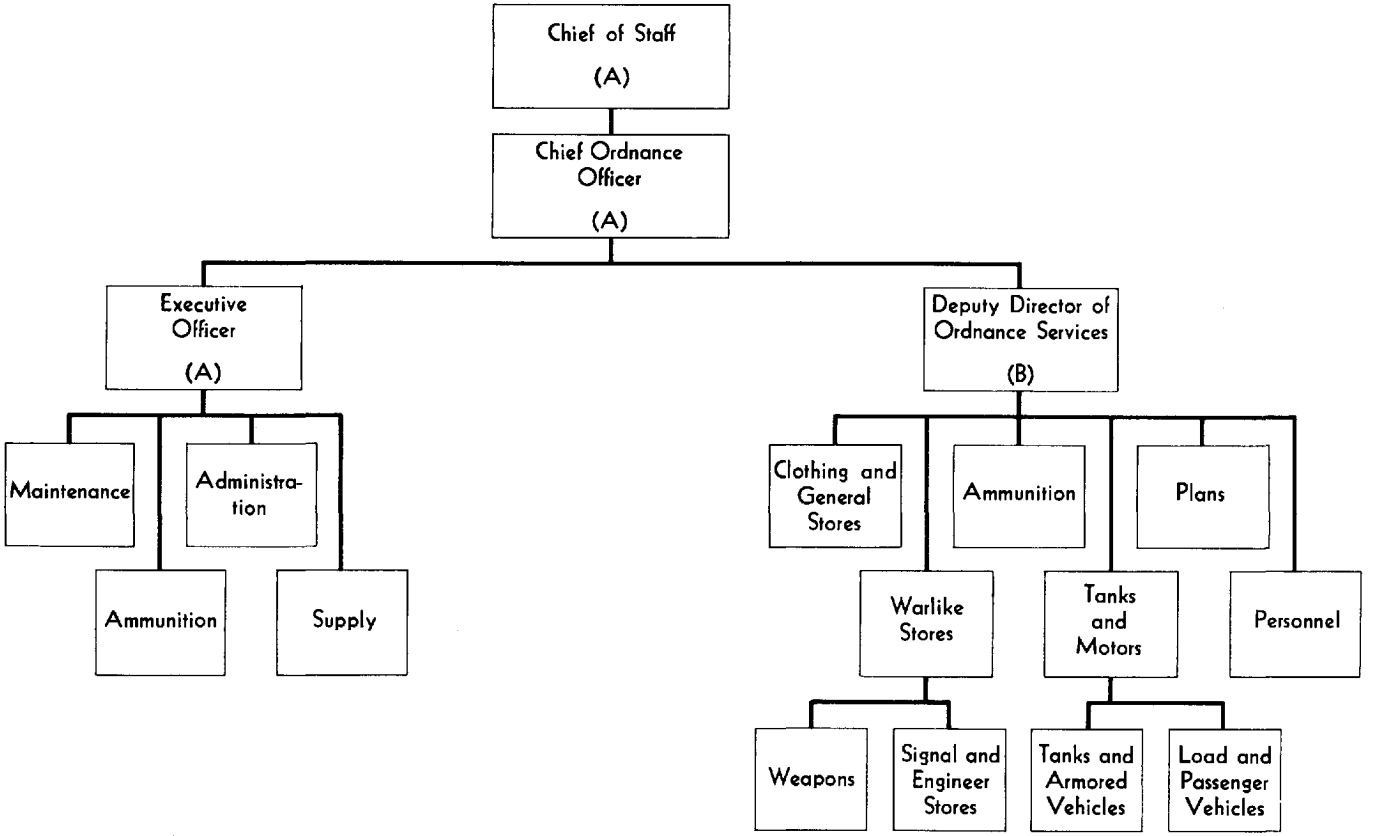
[46] Ltr, Maj Gen E. S. Hughes to Gen Campbell, 12 Apr 43, Campbell Overseas file, OHF.

[47] Ltr, Col Carter B. Magruder to Gen Lutes, 16 Mar 43, ASF Planning Div, Theater Br, 20 General, vol. III.

[48] (1) *Logistical History of NATOUSA-MTOUSA*, pp. 20–24. (2) History Ord Service MTO, ch. VII, pp. 214–16.

[49] Ltr, Hughes to Campbell, 12 Apr 43.

CHART 3—ORGANIZATION OF THE ORDNANCE SECTION, AFHQ, NOVEMBER 1942



(A)=AMERICAN (B)=BRITISH

Note: Most of the British part of the section accompanied the British First Army into the theater under temporary assignment until AFHQ arrived in Algiers.

Source: History of Allied Force Headquarters, Part One, August–December 1942.

AFHQ Ordnance

In the first and most trying months of the campaign in Tunisia, Ordnance crises at the front had to be referred to the small Ordnance Section at AFHQ. On 25 November Colonel Ford had brought to Algiers a staff consisting only of his executive officer, Maj. John G. Detwiler, and one sergeant. His maintenance and supply officer, Colonel Crawford, his ammunition officer, Lt. Col. Russell R. Klanderman, and the rest of the staff—two captains and three technical sergeants—left England on the fifth large convoy, aboard the British troopship *Strathallan,* which was torpedoed off Oran on 21 December. All aboard were picked up by British destroyers and landed safely, but it was Christmas Day before the AFHQ Ordnance office was officially organized.[50]

Like other staff sections of AFHQ, the Ordnance Section followed the principle called "balanced personnel," that is, the section was composed of Americans and British in approximately equal strength—nine Americans and eight British. Each nationality, however, was organized along different lines because of different connotations of ordnance. The British branch included—in addition to sections devoted to ammunition, weapons and other "warlike stores," vehicles, and tanks—sections that handled clothing and signal and engineer stores. Another difference was that the British branch did not perform technical intelligence, which the British assigned to their AFHQ G–2 (Combat Intelligence) Section. (*Chart 3*) On the American side, technical intelligence was an important function. Soon after his arrival in Algiers, Colonel Crawford, who was to succeed Colonel Ford as U.S. Ordnance officer of AFHQ when Ford went to NATOUSA with Hughes, was sent by plane to Egypt to study British Eighth Army equipment.[51]

American and British staffs of the AFHQ Ordnance office were housed together in a building that had been a school for girls, Ecole Sainte Genevieve. Colonel Crawford was amused to find over the door to Colonel Ford's office a reminder of the former tenants—a sign, "Les Violettes." The sign was the more incongruous because inside, along with the office equipment, were stacked rifles and hand grenades used to arm men of the French resistance movement. The French were trained in demolition work by Major Artamonoff (who had arrived in Algiers in late December to represent U.S. Ordnance on the French Rearmament Commission), and then dropped behind enemy lines disguised as Arabs.[52]

It was thus in an atmosphere of change and confusion that the Ordnance effort to support II Corps in Tunisia began. Notwithstanding the forebodings of the logistics staff, nobody could yet tell how hard it was to be.

[50] (1) Hist AFHQ Ord Sec. (2) History of AFHQ, Part One, pp. 100–101. (3) History Ord Service MTO, ch. VII, pp. 243–46.

[51] (1) History of AFHQ, Part One, pp. 67–71. (2) Crawford Interv.

[52] (1) Crawford and Artamonoff Intervs. (2) History Ord Service MTO, ch. VII, p. 247. (3) For the French rearmament program see Marcel Vigneras, *Rearming the French*, UNITED STATES ARMY IN WORLD WAR II (Washington, D.C., 1957).

CHAPTER VIII

With II Corps in Tunisia

On the map Tunisia looks like a sea horse, with its snout (Cap Bon) pointing toward Sicily. The city of Tunis is the eye; Bizerte sits on top of the head. The chest protrudes east into the Mediterranean. The waistline, formed by the Gulf of Gabès some 250 miles south of Bizerte, is narrow, only about a hundred miles wide from the port of Gabès to the Algerian border, which forms the spiny upper back of the sea horse. Below the waist, all is desert; above it there are two irregular mountain chains running more or less north and south about twenty miles apart and known as the Eastern Dorsal and the Western Dorsal. It was in the half-desert, half-mountain region of the lower chest and waist, where bleak, rocky mountains, or djebels, rise straight from barren plains, a region that reminded Americans of Arizona and New Mexico, that the U.S. Army began the war against Germany.

Part of the SATIN plan, a II Corps rush to the coast to seize Gabès, thereby cutting Rommel's line of communications from northern Tunisia, was changed late in January. General Eisenhower decided, after talks with General Sir Alan Brooke and General Sir Harold R. L. G. Alexander at the Casablanca Conference, to keep II Corps in mobile reserve in the Tébessa area, conducting only limited operations and building up strength to attack when the British Eighth Army caught up with Rommel on the southern border of Tunisia. At the time this decision was made General von Arnim began to attack the Eastern Dorsal passes, which were lightly held by the French 19th Corps, and Rommel's rear guard began to arrive in Tunisia. By 26 January the enemy was so strong at the mountain passes and so determined to keep the eastern coastal plains from Tunis to Tripoli open for a joining of Rommel's and General von Arnim's forces that the Allies had to give up any thought of an immediate breakthrough to Gabès. They had all they could do to plug the gaps in the mountains between Tébessa and the coast.[1]

Railroads, macadam roads, and camel trails converged at the ancient Algerian border city of Tébessa, which is encircled by tall remnants of a golden-stoned wall built when the Romans held North Africa. A narrow-gauge railroad came south through Algeria and then turned north; at Haïdra it connected with a railroad southeast to Kasserine, a junction from which rails ran east to the coast. Several highways curved north through Haïdra and Thala. One turned south toward the desert, winding its way past a gendarme's post, Bou Chebka, on the border, passing through a

[1] (1) II Corps Opns Rpt Tunisia, 1 Jan–15 Mar 43, 202-0.3. (2) Eisenhower, *Crusade in Europe*, p. 140. (3) Howe, *Northwest Africa*, pp. 373–83. Howe's volume has been relied upon throughout this chapter.

beautiful forest of fir trees—the only forest in that part of Tunisia—and descending onto a flat plain to reach the tiny French-Arab town of Thélepte, which is surrounded by Roman ruins. Here the road branched; the left fork led to the coastal city of Sousse via Kasserine and Sbeïtla; the right to Gabès via Fériana and Gafsa.

An oasis town of tall palms, flowering gardens, and pink and white buildings, about eighty miles south of Tébessa, Gafsa is less than three hours' ride by automobile from Gabès and was the logical take-off point for a breakthrough to the coast. In mid-January, when the Ordnance troops came to central Tunisia, Gafsa was the headquarters of the French-American Tunisian Task Force, composed of a detachment of the French Algiers Division, some French irregulars, and "Raff's Army" of U.S. paratroopers, infantrymen, and tank destroyers. The force had recently been built up to about 4,000 men, and Allied Force Headquarters had given it a few pieces of artillery and some antiaircraft guns, but it was still seriously short of weapons. The French were equipped with thin armor, mule-drawn carts, and ancient trucks, all that the Axis Armistice Commission had left them. Late in December Colonel Raff had received from AFHQ and turned over to the French a company of American M5 light "Honey" tanks (Company A, 70th Tank Battalion, Light), but after an encounter with German antitank guns at Pichon and long hours in combat without maintenance, the Honeys were of little use.[2]

By 20 January, when General Fredendall set up II Corps headquarters on a pine-wood ridge just south of Tébessa, more than 1,300 Ordnance troops had arrived in central Tunisia.[3] From northern Tunisia, Niblo had brought the bulk of the 1st Battalion, 55th Ordnance Heavy Maintenance Regiment (Q), now redesignated the 188th Ordnance Heavy Maintenance Battalion (Q),[4] and from Oran, along with the Provisional Ordnance Group headquarters, the headquarters of the 42d Maintenance and Supply Battalion, which had just arrived from the United States. He also brought from Oran another ammunition company, the 66th, another medium automotive maintenance company, the 3485th, and a medium weapons maintenance company, the 109th.[5]

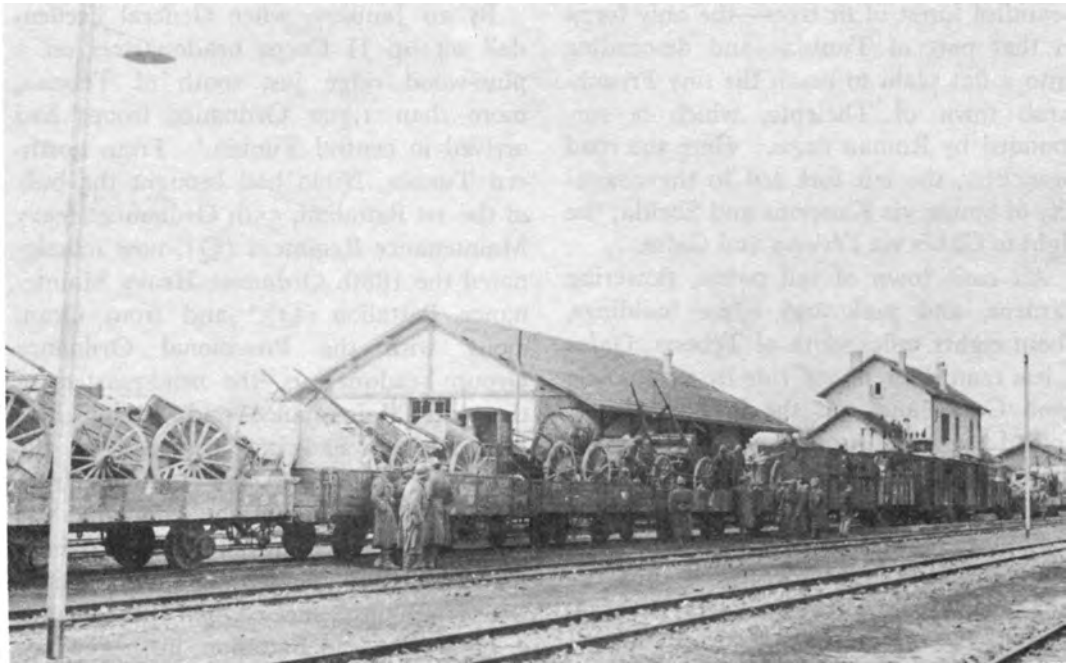
Under the 42d Battalion, his heavy battalion, Niblo placed the 30th Ordnance Heavy Maintenance Tank Company, which set up shop in the woods at Bou Chebka; the 78th Ordnance Depot Company, which parked its big vans and spread its dump near Aïn Beïda, a few miles northwest of Tébessa on the road to Constantine; and the two ammunition companies, the 53d and 66th, which established the main ammunition depot at Tébessa and ammunition supply points at Fériana, Sbeïtla, and Maktar. Under the 188th Battalion, Niblo assembled three medium maintenance companies, the 3485th and 3488th for automotive work and the 109th for

[2] (1) Raff, *We Jumped to Fight*, pp. 66, 163, 190. (2) Memo, Ford for Niblo, 4 Jan 43. (3) Ltr, Comdr 42d Maint and Supply Bn to Ord Officer II Army Corps, 25 Jan 43, sub: A Company, 70th Tank Battalion. Last two in II Corps Ord Sec, Misc Corres, KCRC.

[3] Journal of Events, 1-20-43 to 1-25-43, II Corps Ord Sec, KCRC.

[4] Redesignated by War Department letter indorsed to II Corps 8 January 1943.

[5] Special Orders 11 and 14, II Corps Ord Sec Special Orders 1 to 65, 1943, KCRC.



ANTIQUATED FRENCH EQUIPMENT ON RAILROAD CARS AT TÉBESSA

weapons. Primarily for truck and antiaircraft repairs, this light battalion was strung out from Tébessa to Gafsa and from Tébessa to Maktar, with detachments at the airfields at Thélepte and Fériana. All maintenance units sent out contact parties daily or weekly to the combat and service elements in central Tunisia. Constant road patrols were not possible because there were not enough trucks.[6]

The equipment of the two Ordnance battalions left something to be desired, for most of it had been furnished under old tables of organization and equipment written before Ordnance was made responsible for motor vehicles. The 78th Ordnance Depot Company, for example, had been designed and equipped as a semimobile company to stock "old Ordnance" supplies for an army, with the bulk of the stock under canvas or in a warehouse and the vans used only to establish forward supply points. Now, swamped with demands for truck parts and assemblies in the forward areas, the depot company was practically immobilized and yet had no canvas to protect its stocks nor any barbed wire for fences. The maintenance men also needed lightproof and weatherproof shop tents and were woefully short of shop trucks. Before leaving Constantine for the front, Colonel Niblo had appealed to Colonel Ford to

[6] (1) Ord Serv Tunisian Campaign, p. 5. (2) Hq 42d Ord M&S Bn, Maintenance Memorandum No. 3, 24 Jan 43. (3) Hq II Corps Admin Order No. 6, 26 Jan 43, II Corps Ord Sec, 319.1, KCRC. The 14th Medium Maintenance Company at that time was still under the control of British First Army. Ltr, 1st Lt Fred W. Winokur to Col Niblo, 9 Feb 43, sub: Conflict in Orders, and 1st Ind, 16 Feb 43, II Corps Ord Sec Misc Corres, KCRC.



AMMUNITION STORED UNDER TREES NEAR SBEÏTLA

send more shop trucks, pointing out that he was short three for welding, eight for tank maintenance, eight for automotive repair, and one for instrument repair, adding forcefully, "there are not enough red stars or red stripes for me to put on this letter." He had received only a few shop trucks and some of these were not completely equipped.[7]

From the beginning, the Provisional Ordnance Group had to support a long and very fluid front. General Anderson, to whose British First Army the U.S. II Corps was attached on 24 January, sent U.S. tanks and infantry on long treks from one mountain pass to another in an attempt to stop German jabs at the Eastern Dorsal from Fondouk and Faïd in the north to Maknassy in the south. These "long pointless forays," as the commander of Combat Command B called them,[8] were

[7] Ltrs, Niblo to Ordnance Officer AFHQ, 14 Jan 43, sub: Urgent Extraordinary Requirements and 16 Feb 43, sub: Estimate of Ordnance Situation in II Corps (hereafter cited as Niblo Ltr of 16 Feb 43); Ltr, Capt John B. Scott to Ord Officer II Corps, 5 Feb 43, sub: Operational Requirements of the 78th Ord Co (D), and 1st Ind; Memo, 1st Lt Warren H. Spear for Rose, 7 Feb 43. All in II Corps Ord Sec Misc Corres, KCRC.

[8] Robinett Interv. General Robinett commanded Combat Command B, 1st Armored Division.

hard on tanks. The first job of the 42d Battalion was to supply the 1st Armored Division's organic maintenance battalion with engines and tracks for Combat Command B's aging tanks, which were being brought into the woods near Bou Chebka for refitting after having fought hard and traveled over long distances since their arrival in North Africa.[9]

The second job was to provide enough cargo trucks to bring supplies from Constantine to Tébessa. By 23 January seventy-five cargo trucks were urgently needed for immediate replacement of actual losses. Road transportation was vital since the narrow-gauge railroad that ran south to Tébessa from Ouled Rahmoun (the main line station south of Constantine) could bring in only about a third of the daily tonnage needed by II Corps. The loss of a single truck seemed to planners at AFHQ "almost a tragedy." [10]

On 25 January, after the Casablanca Conference, General Eisenhower told Generals Marshall and Somervell, then in Algiers, of the desperate need for more trucks and the requirement for tank transporters to save the tanks' tracks from the damage inflicted by the long drag over the mountains. General Somervell cabled to Washington for 5,000 2½-ton trucks (1,500 on wheels), 400 1½-ton trucks (200 on wheels), 72 tank transporters, 2,000 trailers, and rolling stock. By almost superhuman effort, this enormous shipment was assembled and sailed on 15 February; it reached the theater in early March. In the meantime, according to General Truscott, supply became "the absorbing problem in every headquarters in North Africa." [11]

The Supply Crisis

Taking stock at the end of January, Colonel Niblo found in the II Corps area, or en route to it, only 35 spare tanks, of which 20 were light M3's; 57, including 32 mediums, had been requisitioned. Trucks of all kinds, not only the 2½-ton cargo trucks, but weapons carriers and jeeps, were desperately short. Also badly needed were more binoculars and more antiaircraft machine guns and mounts to place on tank destroyers and vehicles. The Allies had discovered that the Germans would strafe a single truck and repeat the strafing if the fire was not returned. The most serious parts shortages were those for the 90-mm. and 40-mm. antiaircraft guns, 155-mm. howitzers, carbines, and, above all, parts for trucks.[12]

Early in February the automotive spare parts shortage became acute. Colonel Niblo warned Colonel Crawford, AFHQ Ordnance officer, that unless drastic action was taken at once to obtain parts for the 6,000 or so trucks carrying ammunition, weapons,

[9] (1) George F. Howe, *The Battle History of the 1st Armored Division* (Washington: Combat Forces Press, 1954), p. 116. (2) Memo, Lt Col H. Y. Grubbs for Col Niblo, 9 Jan 43, II Corps Ord Sec Misc Corres, KCRC.

[10] (1) Memo, Medaris for ACofS G–4, 23 Jan 43, II Corps Ord Sec Misc Corres, KCRC. (2) Truscott, *Command Missions,* p. 128.

[11] (1) Minutes of Conference Held at 3:00 P.M. Hotel St. George by General Somervell, Jan 25, 1943, ASF Planning Div, Theater Br 20 Gen, vol. II. (2) Bykofsky and Larson, *The Transportation Corps: Operations Overseas,* pp. 165–66. (3) Truscott, *Command Missions,* p. 128.

[12] (1) Troop Organization, Ordnance Units II Corps, 27 Jan 43, II Corps Ord Sec 319.1, KCRC. (2) Memo, Lt Col J. B. Medaris for ACofS, G–4, 23 Jan 43, II Corps Ord Sec Misc Corres, KCRC. (3) Heavey Notes. (4) Interv with Col Niblo, 2 Jan 43.



STRAFED SUPPLY TRUCK, TUNISIA

fuel, food, and other supplies along the front, the tactical situation would be seriously affected. Of the trucks in the Tébessa region, 95 percent needed repairs in some degree, and the parts bins of the 3485th Ordnance Medium Automotive Maintenance Company were almost empty. Many of the vehicles were badly in need of fourth echelon overhaul, having been driven more than 15,000 miles without adequate first, second, or third echelon service, and thousands were headed for deadline within two or three weeks unless help came from the base.[13]

The boxed lots of spare parts sent under the automatic supply system, each lot theoretically furnishing enough parts for 100 vehicles for a year, contained too many parts of some kinds and not enough of others. Those most needed in Tunisia as in other theaters were simple, fast-moving items such as spark plugs, nuts, bolts, headlight bulbs, tire patches, and carburetors. Another crying need was for engines. In the boxed set of parts for 100 vehicles, only 18 were furnished; experience showed that 30 would have better filled the need. Reserve engines had to be on hand to replace those taken out for overhaul, otherwise the trucks would be deadlined. Not only engines, but clutches, generators, starters, and other complete units were needed to a degree unusual for front-line maintenance. This abnormal demand developed because

[13] (1) Niblo Ltr, 16 Feb 43. (2) Memo, Capt Joseph M. Montgomery, 3485th Ordnance MM Co (Q) for CO POG, 18 Feb 45, II Corps Ord Sec Misc Corres, KCRC.

adequate base shop facilities had not yet been established.[14]

"Miracles of Maintenance"

For prompt and adequate fourth echelon maintenance behind the front, Colonel Niblo wanted a heavy maintenance company at Constantine and on 5 January found suitable buildings for a shop and warehouse. By the end of January the headquarters of the 5th Ordnance Battalion (Maintenance), relieved from the POG and attached to the Mediterranean Base Section, had arrived along with the 45th Ordnance Medium Maintenance Company and one company of the 67th Ordnance Battalion (Q), but neither company was trained in heavy maintenance and both lacked fourth echelon tools and equipment. In these early days, little or no fourth echelon work was being done at Oran, as the condition of some of the trucks and tanks forwarded from there showed. Out of 58 trucks received from MBS early in February, 50 had to be worked on by automotive maintenance men before they could be delivered to the users.[15]

Lacking both spare parts and support from the rear, American resourcefulness at the front accomplished results that one Ordnance officer called "miracles of maintenance."[16] The mechanics manufactured parts and even such major items as range drums and sight brackets, all of which would normally be base shop work—if there had been base shops close enough to make them quickly. The commanding officer of the 3485th Ordnance Medium Maintenance Company (Q) estimated that half of the work of his company was "semi-fourth" echelon. Of the vehicles serviced by the 3488th Ordnance Medium Maintenance Company (Q), 20 percent would have been deadlined if the company had not performed fourth echelon repairs, including such difficult jobs as crankshaft replacements.[17]

Wrecks brought into the shops were cannibalized. This expedient, normally reserved for nonrepairable items, was permitted by Colonel Niblo in the spare parts crisis of early February on repairable items that would have had to be evacuated to a higher echelon. The solution was uneconomical and did not really solve the problem since, for example, there was only one set of bearings on each salvaged truck, and ten trucks might be waiting for bearings. But it was the only way to get parts. Capt. Joseph M. Montgomery of the 3488th reported that the authority to salvage vehicles and reclaim the parts had been the deciding factor in keeping the trucks

[14] (1) Ltrs, Crawford to Campbell, 3 Mar 43, and to Lt Col G. H. Olmstead, 26 Feb 43. (2) Memo, Capt D. D. Harwood for Maj F. P. Leamy. All in Tank-Automotive Spare Parts Policy Documents, World War II, OHF. (3) Ltr, Niblo to Ord Officer, AFHQ, 14 Jan 43. (4) Rpt, Maj Sills and Mr. Gay, Trip to North African Theater, January 20–February 27, 1943, in Truman Committee File, OHF.

[15] (1) Niblo Ltr, 16 Feb 43. (2) History Hq 5th Ordnance Bn, pp. 3–4, II Corps Ord Sec, KCRC.

[16] Ltr, Maj George T. Petersen to Gen Campbell, 28 Jun 43, Campbell Overseas file.

[17] (1) Ltrs, Petersen to Campbell, 28 Jun 43, and Brig Gen John A. Crane to CO 188th Ord Bn, 12 May 43, sub: Commendation, both in Campbell Overseas file. (2) Memo, Montgomery for CO Hqs POG, 18 Feb 43, and Ltr, Lt Col John F. Moffitt to CO 3488th Ord Medium Maint Co (Q), 15 Feb 43, sub: Fourth Echelon Repairs on Vehicles and 1st Ind, both in II Corps Ord Sec Misc Corres, KCRC.

rolling; 75 percent of the jobs completed by his company were made possible by cannibalization.[18]

Up in the mountain passes, detachments of the 1st Armored Division's maintenance battalion also stripped many wrecked items to make up for the shortage of weapons spare parts—making one good gun out of two unusable ones. In devising machine gun mounts for vehicles, always a pressing problem, the men used whatever they could find on the battlefield; one mount was made out of the aluminum landing gear of a Junkers 88 that had been shot down. The barrel of a 37-mm. gun taken out of a wrecked P–39 formed the axle for a makeshift trailer and a disabled truck provided the wheels.[19]

In the shop areas as well as in the combat zone men worked in helmets and had to take to slit trenches when German dive bombers came over. On the road, supply trains and small service parties learned to shift for themselves. They carried C rations in their trucks and cooked them on a "desert stove" made by digging a small hole, filling it half full of water, and pouring on top a small quantity of gasoline, thus providing "a good, hot fire capable of cooking almost anything." If there was no opportunity to stop and cook, the men ate their rations cold or wired them on the exhaust manifold of the engine, heating them on the run. For cooking, drinking, and washing, they carried 5-gallon water cans, two or three to a vehicle. Ordnance mechanics doing contact work spent more than half their time on the highway, covering hundreds of miles. These men were therefore not available for work in the shop areas, where the task of supporting French and American forces that were strung out over the long front was becoming increasingly harder.[20]

On 30 January the enemy took Faïd Pass in the Eastern Dorsal and on 4 February Rommel crossed the Tunisian frontier. His first aim was to break up the American forces in central Tunisia, because he believed that the greatest danger to his Tunisian bridgehead would be an American offensive from Gafsa through to Gabès. If such an attack were successful it would separate him from von Arnim.

The Germans divided their offensive forces into two prongs, sending one to Faïd, breaking through the pass on 14 February, and another prong up the Gabès-Gafsa road.[21]

On both flanks the Americans began to pull back to the Western Dorsal, evacuating Gafsa and Sbeïtla. On the night Gafsa was evacuated in rain and blackout over a narrow road choked, as an observer reported, "bumper to bumper, from head to tail with tanks, artillery, infantry, French Legionnaires, camels, goats, sheep, Arab and French families with crying children, jackasses and horse-drawn carts," an Ordnance detachment brought up the rear, pulling tanks and vehicles out of ditches. At Sbeïtla the last men to get out of town were

[18] Memo, Niblo to CO's 42d Ord Maint and Supply Bn and 188th Ord Medium Maint Bn, 2 Feb 43, and Memo, Montgomery for CO Hq POG II Corps, 18 Feb 43, both in II Corps Ord Sec Misc Corres, KCRC.

[19] Hist Ord Serv MTO, ch. I, p. 19, OHF.

[20] (1) Schwartz, The Field Operations of a Maintenance Battalion, p. 6, OHF. (2) Niblo Ltr, 16 Feb 43.

[21] Liddell-Hart, *The Rommel Papers*, pp. 397–407.

two Ordnance officers who were firing the ammunition dump.[22]

Rommel occupied Gafsa and Fériana and on 17 February overran Kasserine Pass in the Western Dorsal. He caused appalling losses in American men and equipment, but achieved no lasting victory. By 17 February the Americans had brought up the 9th and 34th Infantry Divisions from Oran and Casablanca, and the British had sent their 26th Armoured Brigade from northern Tunisia. After five days of hard fighting, Rommel was forced to withdraw to the coastal plain.

Niblo Leaves II Corps

In the midst of the German breakthrough Ordnance service was undergoing a crisis of its own. Colonel Niblo in a forceful letter to Colonel Crawford on 16 February had pointed out the inadequate Ordnance support from the rear at Constantine and Oran; the deterioration of the trucks and tanks at the front; the dearth of spare parts; and the impossibility of expecting the Ordnance troops in the field without enough tools, time, or men to do the whole job of keeping the combat men armed and mobile. He concluded bluntly, "we do not have any Ordnance policy for the operation of Ordnance service in North Africa." [23]

The rush of events in those early days of 1943 had indeed created a tangle in policy and administration. The Ordnance organization had been cut to fit II Corps on its arrival in North Africa in November as an independent reinforced corps (Center Task Force). Much had happened since then. Fifth Army was organized in North Africa on 4 January 1943, under Maj. Gen. Mark W. Clark. On 5 January II Corps was assigned to Fifth Army and thus in theory reverted to a typical corps, a tactical unit only; but in fact it continued to be a reinforced corps since it remained the major U.S. ground force combat unit in Tunisia. General Clark, at the suggestion of General Marshall, turned over the field command in Tunisia to the II Corps commander, General Fredendall, and remained at his Oujda (French Morocco) headquarters, planning and training for later operations. Thus the Provisional Ordnance Group—for a short time renamed the Provisional Ordnance Regiment (Field)—remained in much the same situation as before. Though it was theoretically under army, it was assigned to II Corps on 15 January.[24]

On 24 January, at a time when American forces had to rush in to close the gaps in the front made by small but determined German attacks against the weak French forces, General Eisenhower attached II Corps to the British First Army. He also attached to the British First Army the French forces, which along with Raff Force had been operating directly under AFHQ. This was the rather hazy situation when II Corps set up headquarters in the Tébessa area on 20 January. As commander of the only U.S. Ordnance organization in central Tunisia, Niblo, who was always inclined to

[22] (1) Lt. Col. W. C. Farmer, "Ordnance on the Battlefield," *Army Ordnance,* XXVII (September-October, 1944), p. 297. (2) Capt William G. Meade, "Oran to Naples; The Story of an Ammunition Job Well Done," *Army Ordnance,* XXIX, 152 (September–October, 1945), p. 263.

[23] Niblo Ltr, 16 Feb 43.

[24] (1) Interoffice Communication, Ord Officer II Corps for CofS II Corps, 28 Jan 43, and 3d Ind, Hq II Corps to CG Fifth Army, 29 Jan 43. Both in II Corps Ord Sec Misc Corres, KCRC. (2) Clark, *Calculated Risk,* pp. 140–41.

be generous with Ordnance support, sent out contact parties to U.S. tank and tank destroyer battalions attached to the French and supplied the French Ordnance squadron. Realizing that he was providing service on an army scale, which II Corps was "more or less directed by AFHQ" to do, he appealed to II Corps for a clear statement of policy, for an enlarged headquarters staff, and for permission to operate "under general control of the Army Commander." [25]

The outcome was a II Corps command decision that Ordnance maintenance service "until further administrative instructions are received from higher headquarters" would be furnished for "all U.S. forces within the physical boundaries of the II Corps and for all U.S. matériel in the hands of the French within the same geographical boundaries"—that is, within a line on the north running through Thala-Kairouan-Sousse, on the south running east and west approximately twenty-five miles south of Gabès (the line of demarkation between II Corps and the British Eighth Army), and to the rear running north and south through Tébessa.[26] On the question of policy, General Fredendall sent word by his G–4 that he wanted Ordnance service continued as a corps function by corps troops "exactly as it is now being done." [27] These orders were ambiguous, because contact parties had been accustomed to servicing all American units they found whether attached to II Corps or not; also, the command decision did not expressly forbid contacting and servicing units outside the area.[28]

Niblo continued his effort to support the Raff Force and other American units attached to the French, but found it increasingly difficult. A request for ammunition for some pack howitzers that had been turned over to the French was refused by the Mediterranean Base Section on the ground that a directive from AFHQ was necessary; and an urgent appeal to the II Corps chief of staff for parts for the badly crippled Honey tanks of Company A, 70th Tank Battalion, attached to the French Algiers Division at the front—"if this company is subject to control by II Corps"—went unanswered. Citing his futile attempts to furnish Ordnance service to the tank company, Niblo on 12 February again appealed for a clarification of policy, this time to Colonel Crawford at AFHQ, stating his conviction "that boundary lines of various Corps do not figure in the normal Army Ordnance supply and maintenance of Army Combat troops which are assigned or attached to the various Corps from time to time." [29]

Less than a week after this letter was written, General Fredendall relieved Niblo

[25] (1) Interoffice Communication, Ord Officer II Corps for CofS II Corps, 28 Jan 43, and 3d Ind, Hq II Corps to CG Fifth Army, 29 Jan 43. Both in II Corps Ord Sec Misc Corres, KCRC. (2) Hq 42d M&S Bn, Maintenance Memo No. 3, 24 Jan 43, II Corps Ord Sec 319.1, KCRC.

[26] Memo, Ord Officer II Corps for Exec POG, 30 Jan 43, 1st Ind, 30 Jan 43, and 2d Ind, 31 Jan 43, II Corps Ord Sec Misc Corres, KCRC.

[27] Memo, Col Robert W. Wilson, G–4 of II Corps, for Col Niblo, 31 Jan 43, II Corps Ord Sec Misc Corres, KCRC.

[28] 1st Ind to Memo, Ord Officer II Corps for Exec POG, 30 Jan 43, and Memo, Rose for Niblo, 4 Feb 43. Both in II Corps Ord Sec Misc Corres, KCRC.

[29] Ltr, Capt Lee V. Graham, Jr. to CO MBS (Constantine), 24 Jan 43, sub: Ammunition for 75-mm. Pack Howitzers, and 1st Ind, 7 Feb 43; 1st Wrapper Ind, Niblo to Ord Officer AFHQ, 12 Feb 43, and Incl #2; Ltr, Niblo to CofS, Hq II Corps, 26 Jan 43, sub: Equipment of Company A, 70th Tank Battalion. All in II Corps Ord Sec, Misc Corres, KCRC.

as Ordnance officer of II Corps. The reason, according to the impressions of men in the field, was that Niblo had been extending his services to Raff and the French forces.[30] Fredendall had little confidence in the French—a feeling shared by many British and Americans; and he may have felt that II Corps had all it could do to take care of itself, the supply situation being what it was over a long and overextended front. On the other hand, he probably never saw with his own eyes the wretched condition of the battered U.S. light tanks attached to the French or the frustration of men who were denied the weapons they needed to fight with. When the American Grant and Sherman tanks of the 1st Armored Division arrived in central Tunisia, the men of Raff Force, according to their commander, "stood at the Thelepte road junction watching the tanks as children do fire engines."[31] Instead of visiting the front, Fredendall remained most of the time at his headquarters in a deep ravine east of Tébessa. There was a widespread feeling among subordinate commanders and staffs that he never understood the situation as it was known to the troops in the field.[32]

Colonel Niblo left II Corps on 17 February and went to Fifth Army, where he succeeded Colonel Ford as General Clark's Ordnance officer. His successor at II Corps was Lt. Col. John B. Medaris, who had been his assistant for some time. A few days later an important change occurred at the top. The 18 Army Group under General Alexander was established to co-ordinate the British First and Eighth Armies, the U.S. II Corps, and the French 19th Corps. Alexander's first act, in the words of Maj. Gen. Omar N. Bradley who was then acting as Eisenhower's special representative at the front, was "to unscramble the chaotic commitment of units on Anderson's front."[33] The forces of each nation were concentrated under the nation's own command and given their own sectors. The U.S. II Corps, formerly attached to British First Army, early in March came directly under 18 Army Group, in a position parallel to the British First and British Eighth Armies.

Supporting the Thrust Through Gafsa

Colonel Medaris, the new Ordnance officer, had a big job on his hands. The German attack at Kasserine had swept away hundreds of tanks, trucks, and weapons—most of the 183 tanks, 194 half-track personnel carriers, 122 pieces of self-propelled artillery, 86 artillery pieces, 213 machine guns, and 512 trucks and jeeps that II Corps lost between 21 January and 21 February. For some items the losses were greater than the combined stocks of the Atlantic and Mediterranean Base Sections.[34] Replacements were urgently needed, for Maj. Gen. George S. Patton, Jr., who succeeded General Fredendall as commanding general of II Corps on 6 March, had orders for a new offensive through Gafsa and Maknassy to be launched during the third week in March. The offensive, conceived by General Alexander, was timed to coincide with the Eighth Army's arrival at the Mareth Line and was intended to

[30] Crawford Interv.
[31] Raff, *We Jumped to Fight*, p. 193.
[32] Truscott, *Command Missions*, pp. 145–46.
[33] Bradley, *A Soldier's Story*, p. 36.
[34] Ord Serv Tunisian Campaign, pp. 8–9.



TIGER TANK CAPTURED IN TUNISIA

help General Montgomery by threatening one of the German flanks.

In planning for the offensive, Eisenhower instructed Patton to study the lessons already learned in Tunisia. One of the most important was how to deal with German land mines—the bounding antipersonnel mine and the big plate-shaped Teller antitank mine, twice as heavy as the American and British mine. The Germans had used mines lavishly and the British Eighth Army had learned what they could do in the great tank battles in Egypt and Libya; the Americans now saw how effective they were in guarding the mountain passes in Tunisia. For their own defenses at Kasserine, II Corps had had to bring to the front all the antitank mines that were available in Casablanca and Oran; 20,000 were flown to the most forward airfield, Youks-les-Bains, in fifty-two planeloads.[35]

In some respects there were sobering comparisons between U.S. and German equipment. American tankers first encountered German armor in northern Tunisia on 26 November 1942, when several 1st Armored Division companies of M3 Stuart tanks ambushed a small German force of six *Pzkw* IV Specials with long, high-velocity 75-mm. guns and three or more *Pzkw*

[35] (1) History Ord Service MTO, ch. II, p. 7 and ch. VII, p. 2. (2) Ord Serv Tunisian Campaign, p. 7. (3) Green, Thomson, and Roots, *Planning Munitions for War*, pp. 380–87.

III's with the long 50-mm. guns. Swarming around the German tanks, the Stuarts with their 37-mm. guns firing on flank and rear at close range managed to knock out all the *Pzkw* IV's and one of the III's. However, this was a victory of superior numbers rather than superiority of matériel. As in the Western Desert, the *Pzkw* IV Specials outgunned not only the little Stuarts but also the Shermans. During the German attack in the Pont-du-Fahs area in mid-January 1943, British antitank guns disabled and captured a tank more powerful than the *Pzkw* IV Special—the low-silhouette, thick-skinned *Pzkw* VI Tiger, armed with an 88-mm. gun. It was not used at Kasserine. General von Arnim had only nineteen, sent to him in November for combat-testing, and he refused to release any of them to Rommel. The Tigers were still full of bugs and had an inadequate engine. Their greatest threat was their armament. The troops in Tunisia had already learned to recognize and respect the whip crack of the 88-mm. gun.[36] On the credit side for U.S. equipment at Kasserine was the artillery, which put a great number of Rommel's tanks out of action, astonishing his panzer division by its accurate and rapid fire. Some of the captured Germans asked to see the American 155-mm. "automatic cannon." [37] On the whole, Rommel considered the Americans "fantastically well equipped" and concluded that the Germans "had a lot to learn from them organisationally." [38]

After Kasserine, Ordnance at the front profited greatly from better organization in the rear. Ordnance officers at AFHQ and SOS quickly dispatched from Casablanca, by every available means of transportation, the weapons and tanks of the 1 Armored Corps and other Fifth Army units. Trucks came from Casablanca and Oran assembly lines, and the thousands of wheeled trucks Somervell shipped from the United States arrived in the special convoy on 6–7 March. By 15 March the shortages in trucks, tanks, artillery, and machine guns had been made up.[39]

Tanks were arriving in better condition because the Mediterranean Base Section shops at Oran, operating more smoothly than before, rigidly processed the tanks as they came into the port, fully kitted them, and shipped them by coaster or tank landing vessels to Philippeville, where they were driven overland to the bivouac of the 30th Ordnance Company near Youks-les-Bains. Early in March there was organized at MBS the 2622d Ordnance Tank Transporter Company—the first company of its kind in the U.S. Army. With its sixty trailers the company could lift a battalion of medium tanks and six spares in one move, delivering them over long distances that would otherwise materially have shortened their serviceable lives. The first week in April, two platoons were able to take on the task of moving tanks and self-propelled artillery south from Philippeville.[40]

[36] (1) *The Rommel Papers,* p. 406. (2) Brig Gen Gordon C. Wells, Report of Observations in the Mediterranean Theater, MTO Ord Sec 319.1 Reports General, KCRC. (3) For characteristics of the *Pzkw* VI Tiger, see U.S. Army Ordnance School text, *Tank Data* (July 1958), p. 57, OCMH. The model encountered in Tunisia early in 1943 was the *Pzkw* VI (H), developed by Henschel & Sohn. MS, Achtung Panzer, p. 84, Jarrett Collection.

[37] Hist Ord EBS, p. 13.

[38] *The Rommel Papers,* pp. 404–07.

[39] (1) Crawford Interv. (2) Ord Serv Tunisian Campaign, p. 12, and Incl, Matériel Status Report, II Corps and Attached Units, 15 Mar 43, OHF.

[40] (1) Ltrs, Crawford to Campbell, 3 Mar 43,

Arriving at Constantine in mid-February and inheriting the small 5th Ordnance Battalion (Maintenance) stationed there, Col. Ward E. Becker, Ordnance officer of Eastern Base Section, found that he not only had base section responsibilities but also had to furnish support to II Corps that would have been army responsibility if the corps had been functioning normally under an army instead of as an independent corps. This meant pushing units forward. The first move was to send the 5th Battalion—soon reinforced by several newly arrived maintenance companies, one of them the heavy automotive type—down to Taxas (south of the railhead of Ouled Rahmoun and eighty-nine miles from Tébessa on the main supply route to II Corps), to keep the truck fleet operating and to process new armament arriving at Bougie and Philippeville. The battalion sent detachments to the ports and railheads to drive the tanks, self-propelled artillery, and trucks to the shops, where they processed them, and then drove them to II Corps under difficult conditions of blackout, steady rain, and enemy raids. After II Corps advanced to Gafsa, Eastern Base Section Ordnance Section sent two maintenance companies (one armament, one automotive) to Tébessa and also took over the corps depot company there and the principal corps and ammunition dump. The dump created a serious problem, because EBS had received only two ammunition companies and both were needed to operate the base ammunition depot at Ouled Rahmoun, where large quantities of ammunition had been arriving by rail from the west. Becker solved the problem by successfully converting a company of mechanics into a provisional ammunition company.[41]

When the new offensive began, along with the spring rains, on 17 March, II Corps Ordnance Service had received some reinforcement. A new type of heavy maintenance company designed to support a field army, the 82d Ordnance Company (Heavy Maintenance) (Field Army), was assigned to the 42d Ordnance Battalion to operate a heavy machine shop in support of corps and divisional artillery. Colonel Medaris moved the 42d Battalion, now commanded by Maj. John F. Moffitt, 10 miles east of Tébessa to establish a heavy maintenance base and sent the 188th Ordnance Battalion, which now included the 30th Heavy Maintenance Tank Company and was commanded by Maj. George T. Petersen, forward with II Corps in the attack. One medium maintenance company, the 14th, which had been brought down from northern Tunisia, was sent to Fondouk to support the 34th Division in a British-American attempt to break through the Eastern Dorsal at that point; the rest of the 188th Battalion supported the effort through Gafsa to draw German forces off from the Mareth Line.[42]

The advance was easy at first; the enemy had withdrawn toward the coast. The corps took Gafsa and Maknassy without opposition and got into El Guettar, a date

in Tank-Automotive Spare Parts Policy Documents, World War II, OHF. (2) Ltr, same to same, 28 Mar 43, Campbell Overseas File. (3) Ord Serv Tunisian Campaign, p. 13.

[41] (1) Hist Ord EBS, pp. 2–3, 8–13. (2) Ord Serv Tunisian Campaign, p. 11. (3) History 5th Ord Bn Hq and Hq Det, pp. 4–5, II Corps Ord Sec, KCRC.

[42] (1) Ord Serv Tunisian Campaign, p. 12. (2) Ltr, Petersen to Commanding Officers, All Units Concerned, 18 Mar 43, sub: Maintenance Responsibility, and 2d Ind, Hq 42d Ord M&S Bn to CO Prov Ord Gp, II Corps, 1 Mar 43, both in II Corps Ord Sec Misc Corres, KCRC.

palm oasis on the road to Gabès. Just beyond El Guettar, in a region of bleak hills and plains covered with short grass, the Germans reacted strongly, counterattacking on 23 March with a panzer division including some Tiger tanks, supported by the Luftwaffe, which strafed and dive-bombed. So strong was the counterattack during the week following that Gafsa itself was threatened. The 188th Battalion, which had followed II Corps headquarters into Gafsa on 20 March, was organized for defense. One company practiced firing 105-mm. howitzers, another was made into an infantry heavy weapons company, and the third was assigned an antitank and infantry role. A tremendous strain was placed on the 53d Ammunition Company's dump, manned by only half the company, the other half having been left behind with the 42d Battalion. On 23–24 March one section of the 53d handled an average of about 40 tons per man. Fortunately the crisis was soon over and the Ordnance units did not have to become combat units. The Germans had only been fighting a skillful guerrilla action in terrain that favored them. At the end of March they began to pull out. By then the Eighth Army had broken the Mareth Line and occupied Gabès and by the second week in April was sweeping up the coast toward northern Tunisia.[43]

The March to Bizerte

The last battle against the Axis in North Africa was to take place in northern Tunisia. In this battle, planned primarily as a British First Army and Eighth Army pincers operation, General Alexander at first gave II Corps a very minor part. The 9th Division was to be assigned to British First Army to help the British left flank in the attack on Bizerte, and the remainder of II Corps was to stage a demonstration at Fondouk against the enemy's right rear flank. But Maj. Gen. Omar N. Bradley, who had been acting as Patton's deputy and was to succeed Patton as commander of II Corps on 15 April, protested to General Eisenhower that the Americans had earned a right to share in the final victory, fighting under their own flag. Convinced that Bradley was right, Eisenhower insisted that II Corps be given a sector on the northern front. General Alexander finally decided to transfer II Corps across the rear of First Army and place it on the northern flank facing Bizerte.[44]

The II Corps march across the rear of the British First Army took place during the week beginning April 10. Supplies were shifted north from the central dumps near Tébessa in 5,000 trucks, most of them furnished by the Eastern Base Section. Unable to take main roads for fear of blocking British lines of communication, the great supply train made the trip in two days in a driving rain over secondary mountain roads. Ordnance units helped move tanks and heavy artillery. From Sbeïtla, where the 1st Armored Division had been refitting and regrooming for the move north, two platoons of the 2622d Ordnance Tank Transporter Company, supplied with additional tank transporters by the British First Army, lifted the tanks and carried them 200 miles in two nights and a day to the new assembly area. The

[43] (1) Petersen Rpt of 14 Feb 45. (2) Hist 53d Ord Amm Co, Jun–Dec 44. (3) Philip Jordan, *Jordan's Tunis Diary* (London, 1943), p. 213.

[44] (1) Bradley, *A Soldier's Story*, pp. 56–59. (2) Eisenhower, *Crusade in Europe*, p. 152.

big guns of the 13th Field Artillery Brigade, in serious need of overhaul after Kasserine and El Guettar, were repaired during halts on the march north by a special detachment of 30 picked mechanics, with 10 shop trucks, furnished by the 30th Heavy Maintenance Tank Company.[45]

The headquarters of the Provisional Ordnance Group began the 5-day journey by motor from Gafsa to Souk el Khémis on 13 April. The general assembly area for service troops was near LeCalle and Tabarka, on the northern coast road. The 42d Ordnance Battalion moved to a point about ten miles east of Tabarka. The 188th Ordnance Battalion remained behind at Gafsa until 20 April to assist Eastern Base Section in the mammoth job of battlefield clearance. The Americans had left behind them a 3,000-square-mile area, twice fought over, that was littered with ammunition, tanks, gasoline and water cans, clothing, and all kinds of scrap. Out of the 20,544 long tons collected, more than half was ammunition. There were 2,117 tons of badly needed motor parts. From wrecked vehicles sent to the salvage yard established by EBS at Tébessa, more than $200,000 worth of parts was reclaimed.[46]

During the El Guettar–Maknassy operations Colonel Medaris began to use a new type of company that he put together from men and equipment of the 188th Battalion, calling it the Provisional Ordnance Collecting Company. Its job was to go into the forward area, whether the actual field of battle or ground over which combat troops had merely passed, and bring back all the Ordnance matériel it could find, Allied or enemy. This was a pioneer effort at battlefield recovery and evacuation. An Ordnance evacuation company (TOE 9–187) had been organized in the United States in November 1942 but it had not yet arrived in the theater; besides, it was mainly for evacuating armor from collecting points to the rear, being equipped with tank transporters rather than wreckers and trucks. Theoretically, combat troops cleaned up the battlefield, bringing damaged matériel to division or corps collecting points where Quartermaster troops picked it up, sent it back to depots, and if it was repairable turned it over to the technical service that had supplied it.[47]

Experience in Tunisia showed that the combat troops did not have the time, manpower, or equipment to clear the battlefield. It took 4-ton and 10-ton wreckers, plenty of 2½-ton trucks, and men with special skills—riggers, tank mechanics, welders, and drivers who could handle tank transporters and other special vehicles. To get these, Medaris robbed the maintenance companies of his 188th Battalion, pooling

[45] (1) Dunham MS, pp. 288–90. (2) Ord Serv Tunisian Campaign, pp. 14–15. (3) Ltr, Petersen to CofOrd, 14 Jun 43, sub: Ordnance General Supply, Incl 4, Campbell Overseas File.

[46] (1) Ltr, Medaris to CO, Hq & Hq Det, Prov Ord Group, II Corps, 12 Apr 43, sub: Travel Orders, II Corps Ord Sec 370.5, KCRC. (2) Ord Serv Tunisian Campaign, pp. 11–14. (3) *Logistical History of NATOUSA-MTOUSA, 11 August 1942 to 30 November 1945*, pp. 413–14.

[47] (1) Ltr, Medaris to CofOrd, 1 Jun 43, sub: Ordnance Service (hereafter cited as Medaris Rpt of 1 Jun 43), Incl 1, Ltr, CG II Corps to CinC Allied Force, 29 May 43, sub: Facilities for the Collecting and Evacuation of Ordnance Matériel, O.O. 350.05/3725, copy in OKD 372/9. (2) WD Ordnance Field Manual 9–10, 20 Apr 42, and Change 3, 15 Apr 44, Recover and Evacuation of Matériel. (3) Ross and Romanus, *The Quartermaster Corps: Operations in the War Against Germany*, p. 63. (4) First United States Army *Report of Operations* (20 Oct 43–1 Aug 44), Annex 13, app. 2, "Operations Division," pp. 84–85.

all evacuation and recovery equipment in his collecting company. This was hard on the maintenance companies, but the collecting company recovered a tremendous amount of supplies that might otherwise have been lost, and many of the items were promptly returned to service. On one occasion the equipment of an entire battery of 90-mm. guns, badly shot up by enemy artillery, was collected between 1700 of one day and 0600 the next, and taken to an Ordnance maintenance company, which repaired it and got it ready for action by 1600 of the following day.[48]

Battlefield recovery was dangerous work, often performed under fire since early arrival at the scene was essential to keep the matériel from being cannibalized by combat troops, damaged further by enemy action, or falling into the hands of the enemy. Usually the company operated at night, recovering equipment that had been knocked out during the day. The men had to learn not only how to work in blackout conditions, to operate mine detectors and remove mines and booby traps, but how to scout and patrol and defend themselves with small arms, bayonets, and even divisional artillery. Self-reliance and discipline were stressed, for these men were in a sense the Rangers of Ordnance. Until the end of the Tunisia Campaign, they operated very successfully within the limits of the equipment available to them. Unfortunately, there was never enough equipment to do a complete job of recovery, especially the job of recovering tanks.[49]

Unable to foresee the extent of mine damage, the Ordnance Department was late in furnishing tractors powerful enough to evacuate tanks from the battlefield; in March 1943 Colonel Crawford was forced to admit, "we were all caught asleep." Commanders of 1st Armored Division elements had observed on the northern front in January that as soon as a German tank was knocked out it would simply disappear, towed off by another tank or a tank recovery vehicle. Colonel Crawford found on his visit to the Middle East in January that the British had an effective tractor, the Scammell, to snake mine-damaged tanks back to roads; at Kasserine it had been used to save 68 tanks by a unit of Royal Electrical and Mechanical Engineers, the British maintenance agency. In the United States the Ordnance Department, on the recommendation of General Barnes, had in the fall of 1942 improvised a tank recovery vehicle, the T2, by affixing a crane to an M3 tank with a low compression engine, and by March 1943 some of them were on their way to the theater for the use of the combat troops of the 1st Armored Division. There was no provision for heavy tractors either in the maintenance battalion of the armored division or in the Ordnance heavy tank maintenance company. Realizing the importance of tank recovery, Colonel Crawford in mid-February asked for a heavy recovery platoon to be used as an adjunct to the Ordnance heavy tank maintenance company. The 1st Provisional Ordnance Recovery and Evacuation Platoon arrived in the theater in April and on 23 April was assigned to the 188th Battalion, where its

[48] Medaris Rpt, 1 Jun 43, Incl 1.

[49] (1) History Ord Service MTO, Ch. II, pp. 10–11. (2) Ltr, Petersen to Campbell, 28 Jun 43, Campbell Overseas File. (3) Maj William C. Farmer, "Recovery of Matériel in Combat," *The Ordnance Sergeant*, VII (May 1944), pp. 278–81.

heavy recovery and tank transporter equipment was made available to the collecting company; but it was by then rather late in the Tunisian day.[50]

"The End of the Beginning"

The final offensive against the Axis forces in Tunisia was launched the third week in April. It would take ten days of the hardest infantry fighting yet encountered to defeat them and achieve what Winston Churchill called "the end of the beginning."[51] The enemy was strongly entrenched in a 120-mile arc around the northeastern tip of Tunisia, from Enfidaville on the coast around to the rocky djebels that stood like fortresses before the plains leading to Tunis and Bizerte.

In the American sector two main roads ran through the djebels to Mateur, the Germans' main supply base. The northern and shorter road ran from Djebel Abiod through Djefna; the southern began at Bédja and skirted the Tine River valley. General Bradley placed the 9th Infantry Division at Djebel Abiod, with the Corps Franc d'Afrique on its left, with orders to avoid the main road and advance through the Sedjenane valley to Bizerte. He ordered the 1st Infantry Division to Bédja to open the Tine valley floor so that the 1st Armored Division could break through to Mateur. The jump-off date for the attack, set by the British, was Good Friday, 23 April, but whether or not the Americans could meet it depended on how fast supplies could be brought up to the front.[52]

A shortened supply line, stronger support from Eastern Base Section, and the employment of new techniques learned during early stages of the campaign made possible an Ordnance build-up in a phenomenally short time. At Bône, the new base port for II Corps, Eastern Base Section quickly amassed an ammunition depot of about 9,000 tons. From Bône, ammunition and light Ordnance general supplies were reloaded on tank landing craft and balancelles (Mediterranean fishing boats) and moved by night to the small shallow-water port of Tabarka behind the front. From Tabarka the 66th Ammunition Company and the 78th Depot Company sent the ammunition, spare parts, small arms, and other matériel in trucks to forward ammunition supply points and maintenance companies. Light tanks, half-tracks, and light artillery were processed by the 45th Medium Maintenance Company at an EBS shop at Morris, ten miles east of Bône, and went by the coast road to Bédja. Medium tanks and the heavier self-propelled artillery, which were too heavy for the bridges along the coast road, were loaded on tank transporters and sent south through Souk el Arba to Bédja. En route,

[50] (1) Ltr, Col D. J. Crawford to Maj Gen Levin H. Campbell, Jr., 3 Mar 43. (2) Memo, JWH for Colonel Magruder, 2 Feb 43, sub: Notes on Talk by Major General Oliver, ASF Planning Div, 20 Gen File, vol. I. (3) MS, Combat Maintenance, Armored Force Library. (4) Ltr, Col D. J. Crawford to OCO, 1 Apr 43, sub: Technical Information Letter No. 2—Service Units, O.O. 320.2/1178. (5) Ltr, Ch Ord Off NATO to CofOrd, 16 May 43, sub: Technical Information Letter No. 5, O.O. 350.05/3416. (6) MS, Full Track, Armored Tank Recovery Vehicles, OHF. (7) CO Provisional Ordnance Group, 23 Apr 43, sub: Assignment of Ordnance Units, II Corps Ord Sec Misc Corres, KCRC.

[51] Winston Churchill, Speech, November 10, 1942, in *The End of the Beginning, War Speeches by Rt. Hon. Winston S. Churchill, 1942*, compiled by Charles Eade (London: Little, Brown and Company, 1943).

[52] Bradley, *A Soldier's Story*, pp. 77–79, 88.

at Duvivier, they were groomed and combat-loaded by the 87th Heavy Tank Maintenance Company.[53]

The Americans attacked at dawn on 23 April in an explosion of artillery fire that lit up the eastern sky. Artillery and infantry were to play the major role in this last battle for Tunisia because Bradley was not willing to expend his tanks in valleys dominated by the enemy, which was entrenched on a succession of rocky hills. The fighting was a matter of attacking hill by hill, on both the 9th Division and the 1st Division fronts. The last major obstacle on the 1st Division sector was a white, soaring djebel known as Hill 609, northeast of the railhead at Sidi Nsir. Bradley brought up the 34th Division, which took the hill on 30 April. The way was then open for the 1st Armored Division to move to Mateur. To the north the 9th Division, advancing through a dense, breast-high thicket, outflanked the Germans' strong Djefna position. The enemy began to withdraw. Mateur fell on 3 May and after some regrouping, during which Bradley's command post advanced from Bédja to Sidi Nsir, II Corps resumed the attack on 6 May. The next day the forward halftracks of the 9th Division were clanking into the rubble-filled streets of Bizerte, the 1st Armored Division was occupying Ferryville, and British First Army tanks were entering Tunis. On 9 May the Axis forces in Tunisia surrendered.

[53] (1) Ord Serv Tunisian Campaign, pp. 15–16, and Plate V. (2) Rpt, MacMorland to Chief of Ordnance, 13 Jul 43, sub: Notes on Trip to North African and European Theaters of Operation (hereafter cited as MacMorland Rpt of 13 Jul 43), pp. 13–17, OHF. (3) Ltr, Crawford to Campbell, 28 May 43, in History AFHQ Ord Sec, OHF. (4) Dunham MS, p. 287. (5) History 78th Depot Company, p. 6.

In support of this battle, Colonel Medaris had placed a battalion on each flank of II Corps, the 188th near Bédja behind the 1st Infantry Division and 1st Armored Division on the south, the 42d near Djebel Abiod behind the 9th Division on the north. Both battalions supported the 34th Division when it arrived between the two flanks. Believing strongly that Ordnance service ought to be "so far forward at all times that troops need not seek it out, but merely by 'holding up their hands' may have them filled with adequate tools of war," Medaris sent his mechanics up to the front to repair equipment or bring it back to battalion shops and advanced the corps ammunition dumps "to the absolute limit of reasonable safety." [54]

On a visit to the corps Ordnance installation between 30 April and 2 May, Col. William A. Borden, an Ordnance research and development specialist from the United States, found that Medaris had instilled "an adventurous spirit in his personnel so that they are keen to go forward and keep up with the front line troubles." Medaris repeatedly sent his assistant, "a reckless boy who fitted in here perfectly," to the front lines to check on Ordnance service, using a weapon-filled jeep that carried on a pedestal an antiaircraft .50-caliber machine gun and on the front a high angle iron to cut the wire that the Germans sometimes strung across the road to catch the heads of jeep drivers. After touring the shops and dumps in this jeep and talking to veterans of central Tunisia, Borden observed: "These Ordnance boys are tough experi-

[54] (1) Medaris Rpt of 1 Jun 43. (2) Rpt, Col William A. Borden, Official Report of Observations in North Africa and United Kingdom April 15, 1943–May 22, 1943 (hereafter cited as Borden Rpt N.A. and U.K. 1943), Incl 17, OHF.

enced men, front line troops. . . . Most of them are seasoned and their outfits have been through some severe combat." [55]

Medaris himself inspected his outfits several times a week with a quick and critical eye, seeing to it that the shop trucks in the treeless, rocky terrain were covered with camouflage nets; the piles of ammunition were scattered to minimize the effects of bombing; and the men did not congregate in mess lines and shop areas where they could be spotted from the air. For his own quarters at Bédja, his mechanics had fitted up a trailer with a folding bunk, a desk, maps, and electric lights that could be connected to a power source. An idea borrowed from the British and soon to be adopted by most American commanders in the field, the trailer provided a headquarters office that could be hooked to a truck and quickly moved to a new location. Medaris had learned that it was impossible for an Ordnance officer to operate successfully from the rear echelon, as specified in "the book." [56]

Colonel Borden and other observers from the United States had been warned by General Hughes that it was dangerous to draw conclusions from the Tunisia Campaign because so few U.S. troops had been involved. It was true that in some respects the experience had been too special to be used as a guide; for example, II Corps had not been operating normally, as a typical corps under a typical army. For this reason, Colonel Crawford and planners in the United States were inclined to discount Medaris' recommendation that forward Ordnance service in the future flow from corps rather than from army. The planners felt that a vigorous Ordnance officer at army level would be just as successful as Medaris had been in delivering service far forward—and in later campaigns army Ordnance officers (Medaris was one of them) proved this to be true.[57]

The men in the field had learned a great deal in Tunisia that was to be extremely valuable to them when they went on to Sicily, Italy, and France. They had experimented with Ordnance organization in the field and with such important innovations as battlefield recovery. They had made some important discoveries about their equipment. One of them was the need for radio transmitters to enable widely dispersed Ordnance troops to communicate with each other. Above all, Ordnance men had learned that they could not operate by the book. Maintenance men had discovered that it was "utterly impossible" to operate the field shop prescribed by Field Manual 9–10. Modern warfare required repairmen to be much closer to the front, more mobile, and more versatile than had ever been contemplated. Furthermore, the manual was out of date, for it had been published in April 1942, before Ordnance had been given responsibility for all motor vehicles. Colonel Medaris had found that 85 percent of the Ordnance field maintenance task was automotive, including

[55] Borden Rpt N.A. and U.K. 1943, Incl 8, pp. 10–12, Incl 16, p. 1.

[56] (1) *Ibid.*, Incl 8, p. 14, and Incl 16, p. 1. (2) Medaris Rpt, 1 Jun 43.

[57] (1) Borden Rpt N.A. and U.K. 1943, Incl 9, p. 2, and MacMorland Rpt, 13 Jul 43, p. 3. Both quote General Hughes. (2) Medaris Rpt, 1 Jun 43 and 1st Ind. (3) Ltr, Lt Col Joseph M. Colby, Asst to Chief Tank-Automotive Center, to CofOrd, 25 Aug 43 (1st Ind to Ltr CofOrd to Chief Tank-Automotive Center), O.O. 350.05/4600.

tanks.[58] American forces were dependent on motor transport to a degree never before known in the history of warfare. British war correspondents were astonished by the bumper-to-bumper truck traffic and the number of jeeps. One of them tells the story that in Gafsa an Arab denounced three German spies dressed in American uniforms, and when asked how he knew they were spies answered, "Because they were walking and had no jeep." [59]

The problem of getting enough spare parts to take care of this flood of vehicles, especially such simple, ordinary items as tire patches, seemed almost unsolvable. Another unexpected cause for concern in Tunisia was the shortage of spare parts for artillery. The war was turning out to be an artillery war, especially a war of heavy artillery: the 155-mm. howitzer, affectionately called "a faithful old dog" by artillerymen, and the 155-mm. Long Tom, highly prized because it could deliver fire up to 23,000 yards.[60] By mid-February 1943, the twenty-four Long Toms had been fired so often with supercharges to obtain maximum ranges that their tubes were beginning to wear out, and stocks of parts dwindled. When there were no parts, Ordnance mechanics made them in their shop trucks.[61]

The book on ammunition supply was not followed in several respects. Colonel Niblo had always disliked and opposed the provision of Field Manual 9–6 that predicated ammunition supply on the submission of an ammunition status report every day by every commander, from company level up. He knew this procedure required a great deal of paper work and created too much traffic in the Ordnance officer's section; besides, the figures were often inaccurate. His substitute plan, put into effect early in the Tunisia Campaign, was patterned after the basic load of the maintenance companies. Basic load ammunition was the amount that could be carried in the vehicles allotted for the purpose in tables of basic allowances. No loads in borrowed trucks were permitted. When a commander needed ammunition, he sent a man to the nearest ammunition supply point with an order, signed by the division ammunition officer, containing a certificate that the ammunition was to replace expenditures. This requirement was to prevent divisions and smaller units from establishing dumps that might later have to be abandoned. On the presentation of the certificate, the unit was allowed to draw all the ammunition it wanted—up to the limit of its basic load. The supply point sent a report to the II Corps Ordnance officer every day.[62]

Experience in Tunisia had also demonstrated that the prescribed methods of stocking ammunition supply points were unrealistic. Automatic supply on the basis of so many units of fire was not feasible because of the wide variation in types and

[58] (1) Ltr, Petersen to CofOrd, 28 Jun 43, sub: Ordnance Field Maintenance, Campbell Overseas File, OHF. (2) Medaris Rpt, 1 Jun 43. (3) MacMorland Rpt, 13 Jul 43, pp. 5, 20.

[59] Jordan, *Jordan's Tunis Diary*, p. 213.

[60] Borden Rpt N.A. and U.K. 1943, Incl 19, p. 1; Incl 25, p. 2. Also, File, NATOUSA Rpts, OHF.

[61] (1) MacMorland Rpt, 13 Jul 43. (2) Ltr, Brig Gen John A. Crane to CO 188th Ord Bn, sub: Commendation, Campbell Overseas File.

[62] (1) Niblo Interv of 28 Sep 55. (2) History Ord Service MTO, ch. II, p. 23. (3) Hq II Corps Adm Order, 9 Feb 43, and Memo, Ord Off II Corps for Ord Off 1st Armored Div, 11 Feb 43, both in II Corps Ord Sec, Misc Corres, KCRC.

quantities consumed. The War Department unit of fire was excessive on many items, markedly so on small arms ammunition. II Corps had substituted for it a "day of combat expenditure." Also, Medaris had discovered that rail transportation of ammunition to the front could not be depended upon because it required too much advance planning.[63]

On the performance of weapons, Allied and enemy, the Libyan desert rather than Tunisia had been the proving ground.[64] In Tunisia the Americans had encountered three new German weapons, the *Pzkw* VI Tiger tank; the *Nebelwerfer,* a five-tube or six-tube cluster of rocket launchers mounted on a gun carriage and fired electrically; and the long-range 170-mm. gun. None had given very impressive performances. The tank, described by a British correspondent as a "legendary flop," [65] was used rather gingerly, usually in conjunction with *Pzkw* IV or *Pzkw* III tanks, and frequently broke down. The *Nebelwerfer,* brought from the Russian front and first employed briefly at Kasserine, had little effect on the campaign. Though the piercing screech of their long 150-mm. or 210-mm. rockets, earning for them the nickname of "Screaming Meemies," was hard on the nerves, the models that appeared in Tunisia were inaccurate. The 170-mm. gun, first encountered at Maknassy in late March 1943, outranged any American artillery in Tunisia by about 5,000 yards, but its ammunition was poor and scarce, and the gun seems to have made little impression on most American observers. One significant piece of news brought back to the United States by Colonel Borden was that the Germans had a self-propelled 88-mm. gun. Pictures of it were found on a German captured in Tunisia.[66]

The most important new Allied weapon employed was the M1 rocket launcher firing the M6 antitank rocket—the bazooka. Task forces embarking for Northwest Africa from the United States and England had been equipped with bazookas at the last moment. In the case of Western Task Force, the weapons were brought to the U.S. ports by plane from manufacturers all over the country and distributed the night the troops were going aboard ship. In England the Center Task Force had little time for training. On the evening before embarkation for North Africa, one troop commander shocked General Eisenhower by saying that he was completely at a loss "as to how to teach his men the use of this vitally needed weapon. He said, 'I don't know anything about it myself except from hearsay.'" [67] Also, the bazooka had been rushed into production very fast. There

[63] (1) Medaris Rpt, 1 Jun 43. (2) Air Forces ammunition supply was entirely separate from that of the ground forces. It went directly from ports to Air Forces ordnance depots; and the one nearest the front was at El Guerrah, 25 miles south of Constantine. Memo, Col William G. Young for Chief, Military Training Division, 9 Jun 43, sub: Information Desired by Military Training Division, O.O. 350.05/3720. (3) Crawford Interv.

[64] See above, pp. 23–33.

[65] Jordan, *Jordan's Tunis Diary,* p. 213.

[66] (1) Crawford Interv. (2) Borden Rpt N.A. and U.K. 1943. (3) Memo, Hq 9th Inf Div Arty to CO's, 26th, 34th, 60th and 84th Field Artillery Bns, 4 Sep 43, sub: The German Nebelwerfer, Annex F to AGF Bd Rpt, ETO No. 25. (4) Ltr, Col George B. Bennett to Lida Mayo, 19 Nov 59. (5) Schmidt, *With Rommel in the Desert,* pp. 191, 213. (6) OCO Rpt, Heavy Self-Propelled Artillery: Design, Development and Production, 1 Sep 44, app. C, Extracts, Military Reports from Various Sources, pp. 62–65, OHF.

[67] Eisenhower, *Crusade in Europe,* p. 94.

were so many reports of malfunctions that the War Department suspended issue in May 1943, pending modifications. In these circumstances, it is understandable that the bazooka did not play an important part in the Tunisia Campaign. Visiting the theater at the close of the campaign, the commanding general of the Armored Command could not find anyone who could say definitely that a tank had been stopped by bazooka fire.[68]

In April 1943, one of the first of the specially trained Ordnance Technical Intelligence Teams arrived in the combat area in Tunisia. Commanded by Capt. George B. Bennett and attached to AFHQ G–2, the team worked directly with Colonel Medaris. In a very short time it proved to be extremely valuable not only to II Corps Ordnance but to tactical commanders who came up against German tanks, mines, and guns for the first time and wanted information on the capabilities of enemy weapons and means of defeating them.[69] Captain Bennett also earned the gratitude of Ordnance tank designers by sending to the United States the first Tiger tank captured in Tunisia early in 1943. Getting it to Algiers and aboard ship was a feat that required considerable energy and ingenuity. Lacking any standard tank handling equipment, Bennett managed to get the 60-ton Tiger into the hold of a Liberty ship with the help of two enlisted men and an improvised block and tackle.[70]

At the "end of the beginning," the first American ground effort in the war against Germany, roads and fields in the battle area were littered for miles with weapons, tanks, and vehicles, including sand-colored *Afrika Korps* trucks distinguished by a small green palm tree painted on the door —a reminder of service in the Middle East. The trucks and other enemy equipment and all salvage went to collecting points at Mateur, the town to which Eastern Base Section moved its headquarters the latter part of May. Medaris sent the experienced 42d and 188th Battalions there to help clear the Mateur-Bizerte area. Most tanks, many of the small arms, and hundreds of trucks were destroyed, but large quantities of usable matériel were recovered. Ammunition companies blew up or burned out not only a great deal of unserviceable ammunition but also thousands of rounds that had been transported for some time out of their containers and thus were considered of uncertain quality. Some of this type might have been reclaimed if there had been enough facilities to do the job. A detachment of one of the ammunition companies set up a renovation plant at Mateur, but it was too small to

[68] (1) Leighton and Coakley, *Global Logistics and Strategy, 1940–43*, p. 440. (2) Interv unnamed interviewer with Maj. Morgan, Stock Control Branch, Field Service Division, Office Chief of Ordnance, Folder Notes—Ordnance Supply and Activities North Africa and Sicily, OHF. (3) Thomson and Mayo, *Procurement and Supply*, p. 183. (4) Green, Thomson, and Roots, *Planning Munitions for War*, p. 350. (5) Maj Gen Alvan C. Gillem, Jr., CG Armored Command, to CofS War Dept. 1 Aug 43, sub: Report of Observations at European Theater of Operations and North African Theater of Operations, Doc. 78.2-7, Armored School Library.

[69] (1) See above, p. 33. (2) Ltr, Col George B. Bennett, to Linda Mayo, 19 Nov 59, OHF.

[70] (1) G. B. Jarrett, Achtung Panzer, p. 82. (2) Press release, "Ordnance Intelligence Officers Exercise Ingenuity on Battlefields . . . ," Folder Enemy Matériel, Barnes File, OHF.

handle more than a fraction of the salvaged ammunition.[71]

Six months almost to the day after the landing in North Africa, II Corps pulled down its tents and headed west, back over the mountains to the neighborhood of Oran. In the long convoys, almost every truck had a German or Italian helmet fastened to its radiator; jeeps and motorcycles flew French flags or the black and yellow death's head pennants that the Germans used to mark their mine fields; the men had Lugers, German field caps, goggles, and other trophies. Tanned by the African sun and toughened by service close to the front, Medaris and his staff arrived at Oran late in May. There they found the Mediterranean Base Section far along in its preparations to support the next campaign and the tactical units engaged in an intensive training program. Near Arzew, General Clark had built a village with streets and mock-up houses and stores to accustom troops to street fighting. The Allies were getting ready for the invasion of Sicily.[72]

[71] (1) Hist Ord EBS, pp. 29–31, 36, 43–44. (2) Ord Serv Tunisian Campaign, p. 17. (3) Memo, Medaris for CO's, 42d Bn, 188th Ord Bn, 14 May 43, II Corps Ord Sec Misc Corres, KCRC. (4) Meade, "Ammunition Supply in the MTO," p. 265.

[72] (1) Pyle, *Here is Your War*, p. 275. (2) Clark, *Calculated Risk*, p. 173.

CHAPTER IX

The Short Campaign in Sicily

The decision to invade Sicily in order to intensify pressure on Italy, divert German forces from the Eastern Front, and cement the Allied hold on the Mediterranean was made at the Casablanca Conference late in January 1943 by President Roosevelt and Prime Minister Churchill, acting with the Combined Chiefs of Staff. General Eisenhower was designated Supreme Commander, and General Alexander, his deputy, was placed in command of ground operations. By mid-February the planning headquarters that Eisenhower set up in Algiers, known as Force 141 from its room number at the Hotel St. George, had chosen the favorable July moon as the target date and designated General Montgomery's Eighth Army (Force 545) and General Patton's I Armored Corps (Force 343) to make the assault. The headquarters of I Armored Corps was largely composed of Patton's Western Task Force headquarters, which had directed the landing at Casablanca. With the additional strength assigned to it for the invasion, the corps was really an army, and was to be designated Seventh Army on landing in Sicily. For the present, to confuse the enemy and conceal the strength of the invasion forces, it was called I Armored Corps (Reinforced). Its major elements were to consist of II Corps headquarters and six divisions—four infantry, one armored, and one airborne.[1]

At the time his corps was given its mission, General Patton was in Tunisia commanding II Corps. He detailed a group of officers to go to Algiers and represent him in the nomination of troops for Force 343. Among them was Col. Thomas H. Nixon, his Ordnance officer. Nixon had helped plan the landing at Casablanca, had come to North Africa as Ordnance officer of the Western Task Force, and had made an excellent record in establishing extensive Ordnance installations in the Port-Lyautey area. A few years older than Niblo and Medaris, he was described by Colonel Borden as "energetic and forward-looking," and was highly esteemed by Patton.[2]

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[1] (1) *The Conquest of Sicily from 10th July, 1943 to 17th August, 1943, Dispatch by His Excellency Field-Marshal the Viscount Alexander of Tunis . . .* (supplement to The London *Gazette*, February 12, 1948), p. 1009. (2) Lt. Col. Albert N. Garland and Howard McGaw Smyth, *Sicily and the Surrender of Italy*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1965), chs. I–V. Unless otherwise noted, this chapter is based on this source. (3) Samuel Eliot Morison, "History of United States Naval Operations in World War II," vol. IX, *Sicily—Salerno—Anzio* (Boston: Little, Brown and Company, 1954), p. 15. (4) Report of Operations of the United States Seventh Army in the Sicilian Campaign (hereafter cited as Seventh Army Rpt), p. a–2.

[2] (1) Memo, Borden for Campbell, 7 Jun 43; Ltr, Col R. Sears to Campbell, 18 Aug 43. Both in Campbell Overseas file. (2) Report of the Ordnance Installation at Port-Lyautey, French Morocco, MS, OHF.

Plans for Husky

The Ordnance planning for the Sicily Campaign (HUSKY) was based on the support of three large attack (subtask) forces —CENT, DIME, and JOSS. There was also to be a small reserve force, KOOL (operating with DIME). The rest of the Seventh Army was to follow when the beachheads were secured. In all, one American armored and four reinforced infantry divisions were to be committed, about 228,000 men, along with British and Canadian divisions amounting to 250,000 men. Nobody expected an easy victory. Sicily, a mountainous, rugged country, offered every advantage to the defender and was thought to be held by about 350,000 Axis troops that could easily be reinforced from Italy across the narrow Strait of Messina. The Allied invasion of Sicily was to be the greatest amphibious operation yet attempted—and was to remain the greatest in World War II in terms of initial assault. There were to be more than 3,200 vessels in the vast armada, of which 1,700 were required to carry American men and cargo. By the end of the first week of operations, the United States had landed 132,113 men, 25,043 vehicles, and 515 tanks.[3]

The proposed Ordnance troop list to support the campaign consisted of 8 battalions of 41 companies: 3 battalions (2 maintenance, 1 ammunition) to support the task forces, and 5 (4 maintenance, 1 ammunition) to follow with Seventh Army. Colonel Nixon planned more depot companies, proportionally, than had been used in the North African operations because of the spare parts problem, and more heavy maintenance companies because of the growing importance of heavy and self-propelled artillery.[4]

The Ordnance supply planning, supervised by Nixon's executive, Lt. Col. Nelson M. Lynde, Jr., took three and a half months, beginning at Rabat, Morocco, in mid-March, continuing at Oran—to which I Armored Corps headquarters moved early in April—and winding up at forward headquarters at Mostaganem the end of June. The planners soon discovered, as the Center Task Force planners had learned in England, that it was very hard to mount an operation in an overseas theater. It was especially hard for HUSKY planners because they had no exact reports as to the weapons, vehicles, and other major items on hand with the troops at the time. Many of the units assigned to the force were not yet in the theater and others were still actively engaged in the Tunisia Campaign. The only way to order supplies for the units was to find out from tables of basic allowances (T/BA's), tables of equipment (T/E's), and tables of organization (T/O's), Ordnance equipment charts, and special authorizations what they ought to have, and to estimate the maintenance parts and spare major items that would be needed, modifying normal amounts according to experience in Tunisia. The planners had been

[3] (1) Morison, *Sicily—Salerno—Anzio*, pp. 12–13, 18. (2) H. H. Dunham, U.S. Army Transportation and the Conquest of Sicily, Monograph 13 (hereafter cited as Dunham Sicily MS), p. 1, MS, OCMH. (3) Rpt, Lt Col Henry L. McGrath, Ordnance Planning for Operation HUSKY (hereafter cited as McGrath Rpt), p. 6, Incl to Memo, Field Service Div, Military Plans & Organization Br, Theater Plans for Chief Industrial Div, 22 Sep 43, sub: Report of Ordnance Service in Sicilian Campaign, O.O. 350.05/6491.

[4] (1) Seventh Army Rpt, Report of the Ordnance Officer, p. K–1. (2) Ltr, Nixon to Campbell, 10 Mar 43, Files of Travel and Insp Rpt Unit, OCO Field Service.

directed to submit requisitions every two weeks (for delivery thirty days later), without a cut-off date. They were told that operations in Sicily would take four months. General Patton, who disagreed with this estimate, stating in Colonel Nixon's presence, "We'll either take Sicily in 60 days or be forced off the island," finally secured permission to stop requisitioning, but by that time a tremendous amount of matériel was on the way. Between 18 April and 15 July, 140,551 tons of Ordnance supplies, including depot equipment, were ordered, to be delivered in ten bimonthly convoys labeled UGS–11 through UGS–20. The requisitions went from I Armored Corps to SOS NATOUSA, which forwarded them to the New York Port of Embarkation.[5]

During the spring months supply planners in North Africa became more and more aware of the great power exercised by the New York Port of Embarkation. The port's Office of Overseas Supply scrutinized all requisitions to see that the stocks ordered did not exceed the maximum level prescribed by the War Department for NATOUSA, which was enough supplies to last for ninety days. This process of review, known as editing, was bitterly resented by the men in the theater, but was considered essential by the port in order to keep any one theater from being given more than its fair share of supplies.

When enormous requisitions began to come in from North Africa, the New York port officials suspected that much was being ordered that was already in the theater; that, in fact, requisitioners were not first examining stocks and then ordering but were simply applying combat maintenance factors to the standard T/BA's for the entire troop basis. All through the spring, Army Service Forces tried to find out just what was on hand in North Africa. Reports in February showed that Casablanca had 270 days of supply and Oran 205, but little was known specifically and it was probable that the stocks were unbalanced; for some items the levels were probably not up to the authorized figure of 90. The truth was that NATOUSA did not know what it had in its depots. Most of the records were inaccurate because cards had been posted by French or Italian clerks, who were the only civilian help available locally, but whose English was poor. For great piles of equipment, unloaded helter-skelter to let ships leave the docks promptly, no records existed. The G–4 Division of the Mediterranean theater later admitted that it was not until early in 1944 that inventories at the depots in North Africa "even approached a semblance of accuracy." [6]

Whatever the reason for editing, the Ordnance men in the theater felt that their requisitions ought to be filled because they

[5] (1) Ltr, Col Thomas Hay Nixon (USA Ret) to Brig Gen Hal C. Pattison, 24 Sep 63 (hereafter cited as Nixon Comments), OCMH. (2) Seventh Army Rpt, Report of the Ordnance Officer, p. K–1. (3) Col. T. H. Nixon, "Across the Beachheads," *Army Ordnance,* XXVIII (May–June 1945), p. 396. (4) For problems of estimating ammunition requirements at division level, see "Task Force Ammunition Planning," by Lt. Col. Wayne H. Snowden (3d Div Ordnance) in *Military Review,* vol. 26, No. 12 (March 1947), pp. 51–55.

[6] (1) *Logistical History of NATOUSA-MTOUSA,* p. 58. (2) Memos, Lutes for Somervell, 11 Mar, 5 May, and 19 May 43, sub: Chronology of a Certain Plan, ASF Planning Div, Theater Br, Gen File 17. (3) Memo, CG ASF for ACofS OPD, WDGS, 5 May 43, sub: Requisitions from the North African Theater of Operations, ASF Planning Div, Theater Br, Gen File 1. (4) Minutes, Conference Held in the Office of Overseas Supply, NYPE, 22 Feb 43, ETO Ord Sec 400.37, KCRC.

needed the matériel. They were willing to use theater stocks, even though levels on some weapons had been maintained by using obsolete types such as the 1917 model 155-mm. howitzer, but they could not use stocks that were unrecorded and therefore unknown. On the whole, they felt that the New York port was unrealistic in attempting to apply a prewar post-camp-and-station system to a vast, new, and unpredictable combat theater. And in addition to the general editing on the basis of levels of stocks, the Ordnance Section of the Office of Overseas Supply, headed by Col. Waldo E. Laidlaw, was checking requisitions to see whether or not the item ordered was listed in the addendum to the Standard Nomenclature List; if not, the demand was forwarded to the Chief of Ordnance and the theater was advised that the item would probably not be available. In this process there were plenty of opportunities for mistakes on the part of the editors, as Colonel Nixon knew from his own experience. The preceding December he had ordered 2,000 fuzes to replace those lost in the Casablanca landing, and had received exactly 11, which was one-twelfth of a year's maintenance according to the SNL's. In preparing for HUSKY he appealed to General Campbell to see that his requisitions for small, fast-moving items such as electrical parts, gaskets, and seals were filled, even though they were excessive according to the SNL's, and he won his point.[7]

New Matériel

While the heavy requisitions for HUSKY were being dispatched to the United States, the planners were also studying new types of matériel. The Tunisia Campaign had shown that some way had to be found to combat land mines. The men in the Ordnance shops were working on a mine-destroying vehicle similar to the British Scorpion, which used steel chains attached to a revolving roller to flail the ground in front of a tank; but material for it was hard to get locally. At Mostaganem the mechanics of the 83d Heavy Maintenance Company tried to make a mine-resistant vehicle by lining the floor of a command car with armor plating, but it was not a success. At a demonstration attended by General Patton, they tied a young goat to the seat and set off a Teller mine underneath the car. They reported that "the goat died bravely."[8]

In Sicily the first bazooka model (the M1 launcher with the M6 rocket), which had been suspended from issue at the end of the Tunisia Campaign, was to be given another chance. To make desirable modifications, teams equipped with materials and tools were being sent overseas from the United States in July 1943; but the new model (the M1A1 launcher and M6A1 rocket) could not be produced in time for use in Sicily. Convinced that the advantages of the M6 rocket far outweighed its disadvantages, Ordnance officers in the theater deplored the suspension, feeling that the

[7] (1) Seventh Army Rpt. Report of Ordnance Officer, p. K–1. (2) Memo, Col Harry A. Markle, Jr., for Col Hollis, 12 Sep 43, sub: Report on Sicilian Operations, ASF Distribution Div, 319.1. (3) Ltr, Ford to Campbell, 28 Apr 43, O.O. 350.05/3144½. (4) Ltr, Coffey to Campbell, 20 Jul 43, Campbell Overseas File. (5) Minutes, Conference Held in the Office of Overseas Supply, NYPE, 22 Feb 43. (6) Ltrs, Nixon to Campbell, 17 Apr 43, 1 Jun 43, O.O. 350.05/3083 and 3653. (7) Ltr (personal), CofOrd to Ord O, I Armd C Reinf, 23 Jun 43, O.O. 350.05/3730½.

[8] (1) Ltr, Nixon to Campbell, 10 Mar 43. (2) Hist 83d Ord HM Co (Field Army) (Formerly HM Co Tank), 16 Jun 41–Dec 44.

War Department had been too hasty. Colonel Coffey, Ordnance officer of SOS, requested reconsideration of the decision. He was successful and the early bazooka was again issued, but with restrictions on using it at high temperatures because of the belief that the sensitivity of the rocket to heat created the hazard of a premature explosion.[9]

Some twenty miles west of Mostaganem, where amphibious exercises were going on at Arzew and neighboring Port aux Poules, there were some striking evidences of how far amphibious warfare had advanced since that November morning when the Maracaibos *Misoa* and *Tasajera* had grounded off Arzew. Men were using LST's manufactured in the United States from a British design based on the Maracaibo, and LCT's (landing craft, tank), resembling floating flatcars, to take tanks, guns, and vehicles close inshore. More interesting to Ordnance men were the 2½-ton amphibian trucks swimming through the surf—the first DUKW's the men in the theater had seen.[10]

This strange hybrid that could swim from LST's to the shore and then waddle to inland dumps had been named by the engineers of General Motors: D for the year 1942, U for utility, K for front-wheel drive, and W for two rear driving axles; and was of course nicknamed the Duck. Its ancestor was the amphibious jeep used, though without much success, in the North African landings. In the spring of 1942 the method used on the jeep—that of wrapping around it a watertight hull and adding a rudder and a propeller—had been applied to the 2½-ton truck. The result was a swimming truck that could carry 5,000 pounds of supplies, or 50 men, or a 105-mm. howitzer ashore and then operate over beach sand and coral. Army Service Forces had at first opposed taking on a new special vehicle, with all the maintenance headaches involved, but when the problem of landing on beaches became pressing in the fall of 1942 General Somervell directed Ordnance to procure 2,000. After spectacularly successful tests in late December and early January 1943, the number was increased to 3,000. The later models had a central tire-control system that enabled the driver to partially deflate tires so they could travel over beach sand. A useful accessory was the A-frame, or crane, for unloading cargo.[11]

The first DUKW's were sent to the South Pacific, where warfare was primarily amphibious. They were used to expedite the turnaround time of ships at places such as Guadalcanal where there were no docks, and were not contemplated for use in assault landings.[12] The DUKW's were first

[9] (1) Green, Thomson, and Roots, *Planning Munitions for War*, p. 359. (2) Ltr, Coffey to Campbell, 21 Aug 43, Campbell Overseas File. (3) Ltr, Medaris to Borden, 21 Aug 43, Folder NATOUSA Report (Col Medaris to Col Borden), 9 Sep 43, OHF.

[10] (1) Borden Rpt, p. 9. (2) Memo, Maj Gen Wilhelm D. Styer to CofOrd, 12 Feb 43, sub: Lessons Learned from Amphibious Operations in North Africa, Incl, p. 11, Files of Travel & Insp Rpt Unit, OCO Field Service.

[11] (1) National Defense Research Committee, Division 12, Vol I, *Transportation Equipment and Related Problems* (Washington, 1946), Chs. 1–4. (2) Ltr Gen George C. Marshall to Dr. Vannevar Bush, 14 Jul 43, and unsigned memorandum for General Somervell, 15 Jul 43. Both in RCS 19—Transportation Corps Historical Program File, Amphibious Vehicles in World War II (hereafter cited as TC Amphibious File). (3) Thomson and Mayo, *Procurement and Supply*, pp. 284–86.

[12] (1) Memo, Col John M. Franklin for Deputy Chief of Transportation, 30 Mar 43, sub: Shipment of 2½-ton Amphibian Trucks Overseas. (2) Memo, Lt Col L. W. Finlay for Brig Gen

used by an invasion force in the Sicily landings. General Eisenhower included 400 in a requisition for amphibious equipment on 3 March 1943. When they arrived at the invasion training center near Oran they performed so well that everyone wanted them. General Patton doubled his request, and by early summer the theater had more than a thousand.[13]

The DUKW had its faults. It was small, hard to unload, performed poorly in mud, was slow in the water (about 5 knots was the best it could do), and was so bulky on land that it blocked traffic on narrow roads. As a new and very special vehicle, it was going to present Ordnance with tough maintenance problems, just as Army pessimists had predicted.[14] But in the spring of 1943 the DUKW's were new and as yet untried under combat conditions. They were easy to operate and seemed remarkably sturdy. They were hailed with great enthusiasm by the men assembling the vast invasion force along the coast of Africa, and the fact that they were becoming available in large numbers, along with the LST's, made possible a significant change in the tactical planning for HUSKY.[15]

The first plans for the invasion had provided for a landing by the Americans on the northwest corner of Sicily with the object of capturing Palermo, a large city with good docks. Early in May General Montgomery insisted that, instead, the Americans take over some of the assault area allotted to the British on the southeastern coast, arguing that the enemy would be too powerful to permit the wide dispersion of British forces. He won his point and the plan was changed. Thus II Corps was to attack in the crescent-shaped Gulf of Gela, the 1st Division (DIME Force) to take the town of Gela, and the 45th Division (CENT Force) to land in the east at Scoglitti. Both were to drive inland to capture airfields; and a regiment of the 45th was to make contact with Montgomery still farther east, at Ragusa. Twenty miles west of the town of Gela, General Truscott's JOSS Force, consisting of the 3d Division and a combat team of the 2d Armored Division, was to land at the small port of Licata and make contact with the II Corps on the right. Since Palermo was not to be taken, supplies would have to be brought in by LST's and DUKW's and moved over the beaches for the first thirty days.[16]

Wylie, *et al.*, 28 Oct 43. (3) Report, Amphibian Organization in the Pacific [1943]. All in TC Amphibious File.

[13] (1) Dunham Sicily MS, pp. 47–48. (2) Borden Rpt, p. 18.

[14] (1) Seventh Army Report, Annex 12, First Engineer Special Brigade, p. I–17. (2) Memo, Brig Gen Robert H. Wylie for Lt Comdr Taylor, Planning Division, OCT, 11 Sep 43, and unsigned manuscript of Feb 44 (hereafter cited as DUKW MS), both in TC Amphibious File. (3) J. Wallace Davies, "The Dead Dukw?" *Army Transportation Journal* II (June 1946), p. 9. (4) AFHQ, Notes on Chief Administrative Officer's Conference N. A., Jun–Jul 43, ASF Planning Div, 20 Gen File, Vol III. (5) Rpt, Maj William H. Connerat, Jr., Report on Ordnance in Sicilian Campaign, Through 2 August 1943 (hereafter cited as Connerat Rpt), p. 6, Incl to Ltr, Crawford to CofOrd, 24 Aug 43, sub: Technical Information Letter No. 2, O.O. 350.05/6491.

[15] Eisenhower, *Crusade in Europe*, p. 163.

[16] (1) Field Marshal the Viscount Montgomery of Alamein, *El Alamein to the River Sangro* (Germany: Printing and Stationery Services, British Army of the Rhine, 1946), pp. 70–72. (2) Eisenhower, *Crusade in Europe*, pp. 163–64. Many Americans continued to believe that the original plan was the better, and it later turned out that Montgomery had overestimated enemy strength. *Ibid.*, p. 164.

The Invasion Fleets Depart

To support the task forces, Colonel Nixon selected the 63d Ammunition Battalion, which at Casablanca had been operating one of the largest depots in North Africa; the 43d Maintenance and Supply Battalion, a Western Task Force unit; and the 42d Maintenance and Supply Battalion, which had been released by II Corps to Eastern Base Section to work on battlefield clearance and help mount the Sicily operation in the Bizerte area. Nixon kept his ammunition battalion under army, but assigned his maintenance battalions to the tactical units, the 43d to II Corps and the 42d to Joss Force, which was later to become the Provisional Corps. As in the later phases of the Tunisia Campaign, the maintenance battalions were combined third and fourth echelon battalions with attached depot companies, but included some specialists that were new—several companies devoted entirely to antiaircraft maintenance, one automotive company trained on DUKW's and another equipped to supply spare parts, and two platoons of a bomb disposal company. Most of the maintenance battalions were to arrive in Sicily after D plus 4. The assault troops were to be accompanied by four ammunition companies, divided evenly between II Corps and Joss Force, and some detachments for repairing DUKW's and trucks.

CENT Force (primarily 45th Division), arriving combat-loaded from the United States in 28 transports on 22 June, was to sail from Oran on 4 July; DIME Force (primarily 1st Division) was to embark from Algiers the following afternoon; and Joss Force (primarily 3d Division) would leave from Bizerte still later on 5 July. The Ordnance troops to support not only DIME but CENT, which had with it only the 45th Division's organic light maintenance company, assembled near Algiers and spent most of their time on the last-minute job of waterproofing their vehicles. Waterproofing was still in the experimental stage. There was a serious shortage of kits and such materials as asbestos grease and flexible tubing, and no really satisfactory method of waterproofing trucks and jeeps had been developed.[17]

During the latter part of June Colonel Medaris, Ordnance officer of II Corps, and most of Colonel Nixon's Ordnance Section left Oran for Tunisia to board LST's for the invasion. At Bizerte, where Force 343 was setting up a small base to handle supply in the first stages of the battle, they found feverish preparations. Harbor lights were blazing all night, in spite of the risk of air raids, so that loading could go on around the clock. Here were concentrated the LST's, LCI's (landing craft, infantry), and LCT's upon which General Truscott's Joss Force was to embark. In Joss, the first big shore-to-shore operation, LCT's, which were usually carried on the decks of LST's, were to go under their own power, since the Joss landing area in Sicily was not much more than a hundred miles away; smaller types of landing craft such as the LCVP and the LCM (landing craft, mechanized) were carried on the davits of LST's and transports.[18]

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[17] (1) Diary of Events, Ordnance Section II Corps, 21 May to 23 Aug 43 (hereafter cited as II Corps Ord Sec Diary), II Corps Ord Sec, KCRC. (2) Connerat Rpt. (3) McGrath Rpt. (4) Report on Sicilian Operations, 7 Sep 42, ASF Distribution Div, 319.1.

[18] (1) Seventh Army Rpt, Report of the Ordnance Officer, p. K–1. (2) Ernie Pyle, *Brave Men* (New York: Henry Holt and Co., 1944), p. 2. (3) "Invasion Force," *Army Ordnance*, XXVI (March-April 1944), pp. 309–16.

Near Ferryville the 42d Battalion was waterproofing its vehicles for its D plus 8 landing and drawing supplies from a large Ordnance depot installed by Eastern Base Section in the seaplane hangars at the French Navy Yard. In the shop section of the depot there was an Ordnance unit with an interesting history—the 525th Heavy Maintenance Company (Tank), recently arrived from Tripoli. Having crossed the Western Desert with Montgomery's Eighth Army and operated shops at Benghazi and Tripoli, repairing everything from English revolvers to captured German 88's, the company had been brought to Tunisia in early June to prepare the tanks of the 2d Armored Division for the invasion of Sicily. There it came under U.S. control for the first time in its year of overseas service. The men had gotten along well with the British, but never got used to tea.[19]

At Bizerte and Mateur were huge ammunition dumps. The Mateur dump, where all marked ammunition for Sicily was stored, had just lost about 2,200 tons of ammunition in a fire that broke out on 30 June and spread quickly in a high wind. The fire had been brought under control by the 66th Ammunition Company and maintenance men of the 188th Ordnance Battalion, stationed nearby, who fought it with tanks, trampling out fires carried over the firebreaks and swirling the tanks to throw dirt on the flames. In the midst of thundering explosions and falling shell fragments, the tank crews had had several narrow escapes. In all, there were fourteen casualties, but 10,000 tons of ammunition had been saved.[20]

D-day was 10 July. On the bright, sunny afternoon of 8 July the ships and landing craft of Joss Force swarmed out of the harbor and into the dark blue of the Mediterranean. Suddenly the men saw out at sea the great invasion fleet of the CENT and DIME Forces. To Ernie Pyle, aboard a Joss Force ship, the armada standing on the horizon was a sight he would never forget. It "resembled a distant city. It covered half the skyline, and the dull-colored camouflage ships stood indistinctly against the curve of the dark water, like a solid formation of uncountable structures blending together. Even to be part of it was frightening." [21]

The huge fleets joined and filed through the Tunisian "War Channel." Then the transports turned south, to deceive the enemy, and the landing craft turned east. All were to converge near Gozo, north of Malta, where the approach dispositions for JOSS, DIME, and CENT were to form; but as they sailed toward the meeting place there was a piece of bad luck that threatened the whole invasion. After days of calm a stiff norther—a true Mediterranean mistral—began to blow on the morning of 9 July and became worse during the afternoon. The sea sprang up, rocking the transports from side to side and pouring over the little landing craft. By twilight it seemed all but impossible to gather the ships together in any kind of order, but the

[19] (1) Hist Ord EBS, p. 28. (2) History 525th Ord HM Co, Tank, 1943. (3) Martinez, "Saga of the 'Great 525th,'" pp. 326–28. (4) See also above, p. 21.

[20] (1) Hist Ord EBS, pp. 39, 46. (2) Petersen Rpt of 14 Feb 45, p. 13.

[21] Quote from p. 8, *Brave Men* by Ernie Pyle. Copyright 1943, 1944 by Scripps-Howard Newspaper Alliance. Copyright 1944 by Holt, Rinehart and Winston, Inc. Reprinted by permission of Holt, Rinehart and Winston, Inc.



LANDING AT GELA. *An LST loaded with ammunition burns offshore after a hit from a dive bomber.*

armada had proceeded too far to turn back. Good seamanship saved the day and shortly after midnight, when the first ships of the three U.S. forces were within radar range of Sicily, the wind began to die down.[22]

The Landings

Off Gela, the men at the rails of the DIME transports saw a long line of brilliant yellow and orange lights. They were fires in wheatfields started by Allied bombers. While the mine sweepers combed the waters off Gela, the transports hove to about seven miles offshore, flanked by LST's and LCI's, and began lowering men into landing craft. Once in the craft, the troops took an hour and a half to cover the distance to the beach over a sea that was still running so high that the little boats pitched and shuddered and were all but drowned in great, roaring waves. Searchlights from the shore played over the boats and explosions were heard in the neighborhood of Gela, but the apprehensions of the men were soon quieted, for there was little opposition the first day except from dive bombers and artillery from inland. The coastal area, lightly garrisoned by Italian troops, had been taken by surprise.[23]

[22] Morison, *Sicily—Salerno—Anzio,* pp. 67–68.

[23] Jack Belden, *Still Time to Die* (New York and London: Harper and Brothers, 1944), pp. 244, 251.

The only serious resistance to the landings came on D plus 1 when the *Hermann Goering Division*, which was a tank division, arrived on the Gela plain and very nearly succeeded in breaking through to the beachhead. The Germans were stopped by 1st Division artillery and infantry with bazookas, powerfully aided by the guns of the cruisers and destroyers offshore—the most effective large-scale use of naval gunfire in land operations so far in the war. In the afternoon, when Tiger tanks had come up, self-propelled artillery and Sherman tanks, landed from the reserve KOOL Force that came in with DIME, knocked out about one-third of the German tanks, including ten Tigers, and drove off the rest. The beachheads were saved, and on 12 July 1st Division took its main objective, the Ponte Olivo airfield.

The work of the bazooka in the landings and throughout the campaign was watched with great interest. One Ordnance observer claimed that bazookas accounted for *Pzkw* IV tanks on four occasions; another claimed a *Pzkw* VI Tiger, though admittedly the Tiger was knocked out by a lucky hit through the driver's vision slot. On the other hand, many officers preferred the rifle grenade to the bazooka as a close-range antitank weapon. An interesting discovery made in Sicily was that the bazooka was effective as a morale weapon against enemy soldiers in strongpoints and machine gun nests. It was no longer thought of only as an antitank weapon, and in its new role was so well liked by the troops that they disregarded the restrictions on its use. At high temperatures three barrel bursts did occur, but fortunately no one was hurt.[24]

The first Ordnance officers ashore on D-day were men of Medaris' II Corps staff, Maj. William C. Farmer and Lt. Edward A. Vahldieck, who landed at dawn with infantry combat teams to find sites for ammunition dumps and collection points and generally keep abreast of the tactical and supply situation. During the morning the 1st Division's light maintenance company got ashore, crossed the dunes, and bivouacked about a mile inland. Beyond the beach were stone farmhouses, vineyards, and, best of all, fields of ripe tomatoes and watermelons—a delicious change from K rations. To the left, on a small hill that dominated the flat countryside, were the whitewashed roofs and church spire of the little gray stone town of Gela. The swarthy, thin-faced Sicilians the Ordnance troops saw at the farmhouses or driving bright painted wagons down dusty roads were friendly; and many of the Italian soldiers who came running out of pillboxes to surrender seemed actually glad to see the Americans. In spite of heavy bombing, strafing, and artillery fire, in which 1st Lt. Charles P. Bartow of the light maintenance company was wounded, the II Corps Ordnance officers managed to spike a number of the coastal defense guns.[25]

[24] (1) Connerat Rpt. (2) Ltr, Lt Col Frederick G. Crabb, Jr., to Gen Campbell, 7 Sep 43, and Ltrs, Medaris to Borden and Crawford, 21 Aug 43. All in NATOUSA Report (Col. Medaris to Col. Borden), 9 Sep 43, OHF. (3) The Germans reported capturing some bazookas, which they called *Ofenrohre* (stovepipes) at Gela; however it seems probable that their *Panzerschreck*, was copied from a U.S. bazooka captured on the Russian front in the fall of 1942. See Oberstlieutnant Hellmut Bergengruen, *Der Kampf der Panzerdivision 'Hermann Goering' auf Sizilien*, MS # T–2 (Fries *et al.*), p. 53, OCMH; also see above, p. 32.

[25] (1) Lt. Col. W. C. Farmer, "Ordnance on the Battlefield," *Army Ordnance*, XXVII (September–October 1944), p. 298. (2) II Corps Ord Sec Diary, June, July 1943. (3) History 1st Ord LM Co, p. 5. (4) Belden, *Still Time to Die*, pp. 260–63. (5) Pyle, *Brave Men*, pp. 20–22.



DUKW'S IN SHIP-TO-SHORE OPERATION, SICILY

By the afternoon of D-day the beach below Gela was piled for miles with boxes, bags, and crates of every shape and description. All day the ships on the horizon had been unloading their cargoes, mostly into DUKW's. To everybody's great disappointment, the LST's could not get close enough to open their great bow doors directly on the beach, for there were sand bars beyond which the water leading to the true beach was so deep that it could not be forded. Ammunition and artillery had to be brought ashore by the DUKW's. All had been loaded in North Africa before embarkation, 100 with three tons of ammunition each, 28 with shore regiment equipment, and each of the remaining 16 with a 105-mm. howitzer. Four hours after the first assault troops landed, the DUKW's swarmed ashore and in a matter of minutes the four batteries of 105-mm. howitzers were in action. Ton upon ton of ammunition rolled in as the DUKW's raced back and forth from ship to shore. A war correspondent, Jack Belden, described the scene: "The rim of the horizon ten miles out to sea was lined with transports . . . And from the transports new hordes of tiny craft, like water bugs, were scooting toward the shore to add their own heaped-up loads and the chattering of their own roaring engines to the riot and the confusion already on the beach." [26]

[26] (1) DUKW MS. (2) Connerat Rpt. (3) Morison, *Sicily–Salerno–Anzio,* p. 106. (4) Belden, *Still Time to Die,* p. 269.

By late afternoon three LST's were able, by rigging causeways, to unload vehicles and men directly on the beach, but the vehicles had hard going. The beaches were mined, and, worse, the sand was soft. The engineers had laid down wire matting, but it could not accommodate all the traffic; trucks sank to their hubcaps in the sand, engines racing, as jeeps tried to pull them out. Many stalled because their motors or batteries had been corroded by salt water during the landing; the waterproofing had not stood up under unexpectedly deep water. Soon the beach was clogged with stalled and disabled vehicles. All were badly needed to bring order out of the mountainous piles of matériel on the beaches.[27]

Unlike the trucks, the DUKW's, which had desert-type tires as well as the automatic tire-deflating mechanism, ran easily over the sand, and in the first days of the invasion they were badly overworked on land as well as at sea. When the combat troops moved forward, nine DUKW's were commandeered to rush ammunition to the front twenty miles inland because other vehicles could not get through the sandhills. No sooner had they returned to the beach than they were ordered to pull 105-mm. howitzers, needed to stop a German tank attack, over dunes as high as 180 feet. The appearance at the front line of the queer, high-sided vehicle completely mystified the enemy. Some thought it an amphibian tank; a hundred Italians were reported to have surrendered at first glance. One DUKW was captured by the Germans, but they were apparently unable to operate it, and it was recaptured by the Americans twenty-four hours later in exactly the same spot.[28]

Long hauls over rough roads at high speeds were hard on the DUKW's special tires, salt water and sand damaged their brakes, and overloading at shipside—some DUKW's waddled ashore with as much as seven tons aboard, showing only two or three inches of freeboard above the water—weakened their bodies. The thirty-nine men of the 3497th DUKW Maintenance Company who came ashore at Gela at dawn on the morning after D-day had their work cut out for them. They did not have enough spare tires and parts for propellers, and bilge pumps were sadly lacking. The mechanics, by cannibalizing DUKW's that were wrecked by mines or sunk offshore, kept most of the fleet operating, against great odds.[29]

In the British landing area also the DUKW plagued the repairmen, but it did so well that its faults seemed minor. The commander of the task force that landed the Eighth Army praised it highly; the British Royal Army Service Corps reported that it "revolutionized the business of beach maintenance." A British commander summed up the feeling of many when he called the DUKW "a magnificent bird." [30]

[27] (1) *Ibid.*, p. 267. (2) Ltr, 1st Lt Charles P. Bartow, CO 1st Ord LM Co, to CG 1st U.S. Inf Div, 12 Aug 43, sub: Lessons Learned in Operations, Folder, History 701st Ord LM Co. (3) Connerat Rpt.

[28] DUKW MS, pp. 2–3.

[29] (1) Connerat Rpt. (2) Rpt on Sicilian Campaign by Maj Gen John P. Lucas, quoted in Memo, Brig Gen Robert H. Wylie for Lt Comdr Taylor, Planning Div, OCT, 11 Sep 43, TC Amphibious File. (3) Seventh Army Rpt, Rpt of First Engineer Special Brigade, pp. I–17. (4) DUKW MS, pp. 10–11. (5) History 3497th Ord MAM Co, pp. 2–3. (6) Ltr, Crawford to CofOrd, 19 Oct 43, sub: Technical Information Letter No. 15. MTO Ord Sec 400.113, KCRC.

[30] (1) Rpt of Eastern Naval Task Force, Vice Adm B. H. Ramsay, Commander, to CinC Medi-

DIME Force at Gela had run into more opposition than had CENT Force at Scoglitti or Joss at Licata. At Scoglitti the surf had been so strong that new beaches had to be found, but by the afternoon of 11 July the 45th Division had succeeded in taking one of its main objectives, the Comiso airfield, had entered the large town of Ragusa, and had stopped a German counterattack at Biscari airfield with the help of the newly arrived 82d Airborne Division, plus a battery of 155-mm. field artillery, a company of Sherman tanks, and heavy fire from the Navy. That night, General Bradley moved the II Corps command post two miles inland, and two days later Maj. John Ray, the II Corps ammunition officer, made arrangements with the Engineer beach group, which controlled supplies on all beaches, to establish a dump for the 45th Division at Vittoria, a town seven miles inland on the coast road, the first Allied ammunition supply point on the island. The beaches at Scoglitti were closed on 17 July. After the 17th, until a better port was captured, supplies were to be landed in the Licata area.[31]

Because of the early capture of port facilities at Licata, the build-up there had been easier than that at Gela and Scoglitti. On D-day Truscott's Joss Force, consisting of the 3d Infantry Division and Combat Command A of the 2d Armored Division, took Licata and advanced to occupy strongpoints on the hills beyond. Before dark the countryside far inland was crowded with troops, vehicles, and thousands of boxes of ammunition. Command posts were being established in orchards and old buildings, field kitchens were being set up to cook hot food. Next day Joss Force began its move up the west coast and by noon was well ahead of schedule.[32]

Colonel Nixon's Problems

On the afternoon of 12 July Colonel Nixon went ashore at Gela with the rest of General Patton's staff and helped to set up the advanced command post, one echelon in a school building, the other in a grove north of town. As Ordnance officer of the first U.S. army to take to the field in World War II, Nixon had a pioneer job and had to perform it under rather difficult circumstances. He had a very small staff, only 14 officers and 3 warrant officers; for so large an operation as HUSKY he later estimated that he ought to have had at least 4 more officers and 30 enlisted men. He had asked repeatedly for more men but each time had been refused.[33]

The very rapidity of Seventh Army's advance made Ordnance support difficult. By 22 July General Truscott's Joss Force, now designated Provisional Corps and

terranean, 1 Oct 43, Incl to "The Invasion of Sicily" [dispatch 1 Jan 44 by Admiral of the Fleet Sir Andrew Cunningham, to Supreme Commander, AEF, with Admiralty and Air Ministry footnotes], 28 Apr 50 Supplement to the *London Gazette* of 25 Apr 50, p. 2084. (2) *The Story of the Royal Army Service Corps, 1939–1945* (London, 1955), p. 254. (3) Rpt, Capt Frank Speir, Lessons Learned, ASF Planning Div, Theater Br.

[31] (1) II Corps Ord Sec Diary, 11–13 Jul 43. (2) Ltr, Maj John Ray to Ordnance Officer, II Corps, 26 Aug 43, sub: Ammunition Supply—Sicilian Campaign (hereafter cited as Ray Ltr, 26 Aug 43) in folder, II Corps Ammunition Supply Report Sicilian Campaign July 10, 1943–August 15, 1943, II Corps Ord Sec, KCRC.

[32] Pyle, *Brave Men*, pp. 20–22.

[33] (1) Seventh Army Rpt, p. B–6, and list of staff at end, no pagination. (2) Connerat Rpt. (3) Extracts from Notes of the Commanding General, Seventh Army, on the Sicilian Campaign, MTO Ord Sec 400.113, KCRC.

augmented with all the tanks of 2d Armored Division (except Combat Command A), had raced northwest and captured the large port of Palermo. General Bradley's II Corps advanced up the center of the island and captured the hub of the network of roads in the Caltanisetta-Enna area. Then the 1st Infantry Division headed east toward the Messina peninsula, where the Germans were concentrated and the British Eighth Army was stalemated. The 45th drove north and captured San Stefano on the northern coast.

The combat forces outran their Ordnance support. The 45th Division, for example, moved so rapidly that until 27 July it had only its own 700th Light Maintenance Company to repair its guns and vehicles. The 2d Armored Division, in its fast run of about 200 miles in five days to Palermo, starting 19 July from near Licata, had only part of its own maintenance battalion—not more than 30 percent of the support it would normally have demanded. It encountered enemy opposition and had to cross terrain that was extremely difficult for tanks. The roads were mountainous, flinty, and dusty, and at times cut by defiles from which bridges had been blown. Not only tank tracks but truck tires, then and throughout the campaign, suffered from the narrow wagon-track roads covered with volcanic rock.[34]

General Patton, dashing about in a command car decked with oversize stars and insignia or poring over maps in his office with his G–3, planning the tactics of his Seventh Army, seemed to General Bradley to be "almost completely indifferent to its logistical needs." [35] On the other hand, Colonel Nixon maintained that General Patton put great emphasis on logistics but preferred to delegate responsibility for supply to experts whose judgment he trusted. With one exception (the Battle of the Bulge) Patton never failed before every operation to ask Nixon whether he was prepared to support it, and gave full weight to Nixon's reply.[36] The general's attitude had also been illustrated by a remark he had made in the presence of Lt. Col. Carter B. Magruder of ASF during the planning for the Casablanca landing of Western Task Force. On that occasion Patton had said to his G–4, Col. Walter J. Muller, "I don't know anything about logistics. You keep me out of trouble." [37]

Palermo was captured on 25 July, and the port was quickly opened. Colonel Nixon moved to Palermo with the rest of Patton's staff, and the general established himself in the Royal Palace. An Italian aircraft factory, spared from bombing by arrangement with the various air forces, made an admirable Ordnance depot, eventually to be operated by two depot companies. The 42d Maintenance and Supply Battalion, which landed at Licata on 18 July, arrived in Palermo 28 July. Com-

[34] (1) Connerat Rpt. (2) Ltr, Crabb to Campbell, 7 Sep 43. (3) Ltr, Hq Maint Bn, 2d Armd Div, to Ord, Armd Comd, Ft. Knox, sub: Maintenance Operations of Maintenance Battalion Detachment, 2d Armored Division during period of July 10–31st 1943 Inclusive, Mitchell Notes, OHF. (4) Combat Maintenance, Doc 179.1–5, p. 5, MS, Armored Force Library. (5) Nixon Comments.

[35] (1) Bradley, *A Soldier's Story*, pp. 145–46, 159–60. (2) Diary of Maj. Gen. John P. Lucas, pt. I, Sicily (hereafter cited as Lucas Diary, Sicily), OCMH.

[36] (1) Nixon Comments. (2) See also below, p. 316.

[37] Lecture, Lt. Gen. Carter B. Magruder, DCSLOG DA, Army Logistics, Command and General Staff College, Fort Leavenworth, Kansas, 10 Apr 59, MS, OHF.

manded by Lt. Col. John F. Moffitt, it consisted largely of veterans of the Tunisia Campaign, including the 991st Heavy Maintenance Tank Company (the old 30th).[38]

The men of the 42d Battalion were assigned to maintain the Provisional Corps, but by the time they had arrived, the fighting around Palermo had dwindled to mopping-up operations. The immediate task of Seventh Army in early August was to support II Corps. Bradley's corps now included the 3d Division (replacing the 45th, retired for rest and refitting), which was pushing east along the north coast road toward Messina, slowed by mountainous terrain and stiffening resistance. The 1st Division, aided by the newly arrived 9th Division and reinforced by a brigade of field artillery, was stopped at Troina, near Mount Etna, where the enemy had taken a strong stand. The battle of Troina, in which the greatest weight of II Corps was committed, lasted from 3 to 6 August.

In attempting to support II Corps in the battle of Troina, Colonel Nixon was handicapped by a woefully weak staff, especially after he had to release his ablest officer, Colonel Lynde, to become Ordnance officer of the Provisional Corps. He himself was working from 16 to 18 hours a day, having to devote time to routine details that subordinates could have handled. In addition, information and reports came late from the front because all correspondence, including Ordnance, had to flow through command channels. And he was hindered from sending all-out Ordnance support to II Corps because of the army's inflexibility in the matter of men and supplies. Maj. Gen. Geoffrey Keyes, Patton's deputy at Palermo while Patton was ranging up and down the front every day, jealously guarded army's prerogatives and, far from agreeing to the assignment of more Ordnance troops to corps, insisted that all Ordnance troops remain under army.[39]

On 3 August Colonel Medaris made the 5-hour trip from the 1st Division front back to Palermo to protest that he was not getting enough support from army. The 43d Ordnance Battalion did not provide him with enough maintenance. He desperately needed another automotive repair company. He had no collection and evacuation point nearer than Palermo, and no maintenance and supply facilities close to the front. To get supplies his men had had to race back to the beaches, sometimes spending days going from dump to dump. This in turn placed a heavy drain on transportation, for trucks and tires wore out rapidly when operated continuously over the lava rock roads of Sicily. He complained that Ordnance matériel in the dumps was being stolen and diverted. And he strongly protested that the supply of ammunition had not been adequate to give the II Corps commander complete tactical freedom.[40]

"A Black Eye on Ordnance"

The reason for many of these troubles was Seventh Army's supply system. In a command decision very early in the campaign, General Patton gave the supply task

[38] (1) Col. T. H. Nixon, "Across the Beachheads," *Army Ordnance,* XXVIII (May–June 1945), p. 396. (2) Connerat Rpt.

[39] (1) Connerat Rpt. (2) Bradley, *A Soldier's Story,* p. 159. (3) II Corps Ord Sec Diary, Colonel Medaris' Journal—3 August 1943 (hereafter cited as Medaris Jnl of 3 Aug 43), p. 1.

[40] *Ibid.*

to the 1st Engineer Special Brigade, which would act as an SOS, managing depots beyond the beaches, right up to the front. General Bradley thought it was a mistake. Ordnance objected, but in vain. As Ordnance officers foresaw, the improper handling of ammunition by the Engineers was "a black eye on Ordnance, even though the fault lay elsewhere." [41]

Confusion was inevitable at the beach dumps; it was when the ammunition began to move inland that Ordnance officers began to worry. They observed that the Engineers considered it just so much tonnage, moving small arms ammunition first, because it was the easiest to handle, disregarding tactical requirements and the recommendations of their Ordnance liaison officer. Three out of four ammunition dumps established by Seventh Army were overstocked with small arms ammunition and never had enough 105-mm. and 155-mm. artillery ammunition, which was what II Corps wanted most. The expenditures for small arms were surprisingly low and, because of the mountainous terrain and Allied command of the air, those for tank and antiaircraft weapons were almost negligible. The only ammunition dump that had enough artillery ammunition was so far from both the north coast and the east front that it took too long to send trucks back to it over the narrow, mountainous roads. One of II Corps' chief complaints was that army did not have enough transport to move stocks far enough forward. The dump at Nicosia, closest to the Messina front, reached its artillery target only with the help of corps transport.[42]

The main reason for confusion at the forward dumps was that the Engineers did not make the best use of Ordnance ammunition companies, which they controlled. The headquarters men of the Seventh Army's 63d Ammunition Battalion, which landed soon after D-day, could act only in an advisory capacity. The Engineers used technically trained ammunition troops as common labor and, over Ordnance protests, did not give them any organic transportation. A few 2½-ton trucks would have enabled the ammunition detachments to segregate types within the dumps and would have facilitated issues immeasurably. When artillery ammunition finally began to move, an Ordnance observer saw in several advanced dumps all four types of 105-mm. howitzer ammunition in one stack, which made night issues extremely difficult. Near the end of the campaign, Colonel Nixon arranged for the 63d Ammunition Battalion to take over from the Engineer special brigade the operation of all forward dumps, but the battalion had no transportation and came too late on the scene to be of much help.[43]

Nixon believed that the problem created by the Engineers' misuse of Ordnance troops would have been corrected immediately if the troops had reverted to army after the landing operations instead of remaining attached to corps, because he would have had a prompt report on the fiasco. As it was, it took some time for

[41] (1) Connerat Rpt, p. 11. (2) Bradley, *A Soldier's Story*, p. 145.

[42] (1) Connerat Rpt. (2) Ray Ltr, 26 Aug 43. (3) Medaris Jnl of 3 Aug 43. (4) Maj. William C. Farmer, "Beach Parties," *Firepower* (June 1944), p. 6.

[43] (1) Connerat Rpt. (2) History 63d Ord Bn (Ammunition), p. 28. (3) Ray Ltr, 26 Aug 43. (4) Memo, Maj W. C. Farmer for Ordnance Officer, AFHQ, 3 Aug 43, sub: Ordnance Notes Based on Sicilian Campaign, II Corps Ord Sec 319.1, KCRC. (5) II Corps Ord Sec Diary, 27 Jul, 5–15 Aug 43.



HAULING A 155-MM. GUN INLAND, SICILY

Bradley to inform Patton of the situation through command channels. The decision to attach army Ordnance units to corps without providing for reversion after landing was Nixon's own, and he afterward reproached himself for it—"a bitter lesson" and one that was not forgotten when he became Ordnance officer of U.S. Third Army.[44]

It took heavy artillery to blast the enemy out of his Etna position on the Messina neck. The Germans had begun to dread the Americans' "mad artillery barrages," which they nicknamed *Feuerzauber* or "fire magic."[45] Keeping the guns operating was the most serious Ordnance maintenance problem of the last two weeks of the campaign. The problem began about 24 July when several field artillery units were transferred from Provisional Corps to II Corps, bringing II Corps artillery to 60 155-mm. howitzers, 25 155-mm. guns, and 54 105-mm. howitzers. Most of the 155-mm. howitzers were of the M1917 or M1918 type and some of these, Ordnance officers surmised, had been used ever since World War I. Many were already worn out, a few actu-

[44] Nixon Comments.

[45] Lucas Diary, Sicily, app. 1, quotes a letter of 29 July found in an abandoned German gun position near Troina.

ally condemned, before they arrived in the theater. Others had had hard service in the Tunisia Campaign and afterward not enough assemblies or parts had been available in North Africa to do more than patch them up. They began to fail the first day they were fired in Sicily, and soon 18 were out of action. The new 155-mm. M1 howitzers functioned much better, but had all the idiosyncracies of a new weapon; they also often arrived without spare parts and such accessories as telescopes.[46]

To repair the guns and howitzers at the Etna position Colonel Medaris had only the 18-man artillery section of his 83d Heavy Maintenance Tank Company. None of the men had ever worked on either the 155-mm. howitzer or the 155-mm. gun, and had no tools for either. Operating near Nicosia, so close to the front that they could plainly hear small arms fire, the men manufactured tools and reshuffled serviceable assemblies. They sent out contact parties to work at the gun positions at considerable risk; they lost two men, 2d Lt. Tom P. Forman and Technician 5 Roland G. McDorman, killed by an accidental explosion while working on a 155-mm. gun.[47]

[46] (1) II Corps Ord Sec Diary, 17 Aug 43. (2) Ltr, Medaris to Campbell, 15 Aug 43 (hereafter cited as Medaris Ltr, 15 Aug 43), NATOUSA Letter, Personal to Gen Campbell, 15 Aug 43, OHF. (3) Ltr, Capt Ralph G. Atkinson to Col Medaris, Ord Officer, II Corps, 11 Sep 43, sub: Report of Operations, Armament Section (hereafter cited as Atkinson Rpt), and appendices, File, Ordnance Report II Corps Sicilian Campaign 10 July to 15 August 1945, OHF. Most failures of the 155-mm. howitzers were due to the short life of the recoil mechanism. See Project Supporting Paper No. 80, Medium Artillery Weapons, Design, Development and Production of the 155MM Howitzer and 4.5 Gun, OHF.

[47] (1) Hist 83d HM Co, pp. 24–25. (2) Atkinson Rpt. (3) Medaris Ltr, 15 Aug 43. (4) II Corps Ord Sec Diary, 10 Aug 43.

Not until 8 August did the 42d Maintenance and Supply Battalion arrive at the front with the experienced 991st Heavy Maintenance Tank Company.[48] By then, the campaign was nearly over. The enemy was withdrawing, although he slowed the Allied advance as much as he could with delaying actions and demolitions. Along the north coast road, Truscott's 3d Division, aided by an adroit amphibious landing behind the enemy's front at San Fratello, pushed quickly on to Messina. On 16 August a battery of 155-mm. howitzers was wheeled into position on the coast road and fired a hundred rounds on the Italian mainland—the first U.S. ground attack on the continent of Europe. The next day Truscott's infantry was in Messina, only a few minutes before an officer from Montgomery's Eighth Army raced in. The Germans had made good their escape across the Strait of Messina—but the battle for Sicily had been won.

The Evidence at the End

The Sicily Campaign ended thirty-eight days after the landings on the beaches. Short in time, it was a "first" in several respects—the first massive amphibious landing, the first use of DUKW's in an invasion, the first attempt to supply combat forces for thirty days over beaches. It was also the first test of army support of corps, though not perhaps a really fair one because it was so brief.

General Bradley was critical of the Seventh Army for not giving him enough support; his supply officers, after an attempt by army to borrow trucks from corps, re-

[48] *Ibid.*, 8 Aug 43.

marked, "We seem to be backing Army instead of Army backing us." [49] Colonel Medaris continued to maintain that corps, not army, should be made responsible for maintenance and ammunition service in the forward areas.[50]

On the other hand, II Corps had moved very fast in an advance as far from base as an advance across France to the German border would have been. The supply lines had been long and difficult—more difficult, reported General Lucas (observer for General Eisenhower) than Bradley probably realized. Lucas, traveling from Algiers to the front lines, saw no real breakdowns in supply, and praised the hard-working Seventh Army staff. Colonel Nixon, convinced as were Niblo and Medaris, that Ordnance service ought to be as close to the front as possible, had sent maintenance and ammunition men forward from Palermo as soon as he became aware of the need for them. They arrived too late, but this was mainly because communications between army and corps were never adequate. When General Lucas visited General Bradley at his command post on 14 August, Bradley told him that army did not maintain telephone lines to corps and that no army staff officer had ever visited him. On the vital matter of ammunition, Major Ray, Medaris' ammunition officer, was appalled at the lack of liaison and communication between forward ammunition supply dumps, army headquarters, and the Engineer special brigade.[51]

The combat troops had had enough weapons and ammunition, thanks to less enemy opposition than had been anticipated and to the sheer bulk of matériel. By D-day plus 5 it was plain that too many supplies had been brought in; army stopped the flow after the UGS–11 convoy. Of supplies shipped to Sicily, 50,714 long tons were ammunition (7,500 were expended) and 18,617 long tons were Class II and IV Ordnance supplies; the total for Ordnance accounted for more than half of the matériel supplied by all the technical services. At the same time, many of the weapons that had been taken from stocks in North Africa were old or obsolete, and there were never enough trucks and truck parts to meet the insatiable demands.[52]

Ordnance service at the front in the short campaign had indicated the need for more automotive companies, proportionally; for a collecting company with recovery and evacuation equipment; and for more men trained on heavy artillery. It had confirmed Medaris in his conviction that versatility was more to be desired than specialization. Sicily had provided the first experience with antiaircraft maintenance companies, and it was disappointing. The men were trained mainly to service directors, and the 40-mm. antiaircraft guns in the forward areas seldom used director control. Ordnance officers strongly recommended that if such companies were kept, they be trained also to repair vehicles, but Medaris felt that a better solution was to

[49] (1) *Ibid.*, 11 Aug 43. (2) Ltr, Bradley to TAG, 1 Sep 43, sub: Report of Operation of II Corps in the Sicilian Campaign. (3) Lucas Diary, Sicily, 14 Aug 43.

[50] (1) Medaris Ltr, 15 Aug 43. (2) Ltr, Medaris to Borden, 21 Aug 43, Folder NATOUSA REPORT (Col. Medaris to Col. Borden) 9 Sep 43, OHF.

[51] (1) Lucas Diary, Sicily, 14 Aug 43. (2) Seventh Army Rpt, Report of the Ordnance Officer, p. K–7. (3) Ray Ltr, 26 Aug 43.

[52] Msg, Algiers to War No. W–9322, 6 Sep 43, ASF Planning Div, Theater Br, 12 General.

attach antiaircraft maintenance sections to ordinary maintenance companies. Another new type of company that was felt to be wasteful of personnel was the bomb disposal company; most officers preferred separate squads.[53]

The ammunition companies had been controlled by the Engineer special brigade. Under this arrangement, reported Major Ray, ammunition supply had been "characterized throughout the campaign by ignorance on the part of personnel in rear areas, and by lack of control of types shipped to forward areas." [54] Ray strongly urged that Ordnance in the future keep control of ammunition companies. He also recommended a revision and simplification of Ordnance Field Manual 9–6, which set up ammunition supply procedures. Ray's critique contained, in Medaris' opinion, much food for thought and many practical suggestions. When it was sent back to the Ordnance Department, it was given respectful attention because it came from actual battle experience in both North Africa and Sicily and was used in revising the manual.[55]

Before the summer of 1943 had ended, Ordnance officers in the Mediterranean had learned much about the use of men and about supply methods and were able to apply these lessons in several ways. Colonel Coffey had set up in Oran a stock control system that was eventually to help locate unidentified, "lost" stocks; Colonel Crawford and Lt. Col. William G. Hynds, Coffey's assistant, had returned to the United States and persuaded the New York Port of Embarkation to edit requisitions less stringently. Crawford had also arranged for an eye-witness report on Ordnance support of invasions. Beginning with Sicily, he sent at least one representative from his AFHQ section, temporarily assigned to army staff, to observe Ordnance operations. Maj. William H. Connerat, Jr., of AFHQ went to Sicily with the first contingent. His report, submitted on 2 August 1943, was carefully studied by Colonel Niblo who, as Ordnance officer of Fifth Army, was planning for Ordnance support of the invasion of Italy, soon to take place.[56]

[53] (1) Ltr, Bradley to TAG, 1 Sep 43, sub: Report of Operation of II Corps in the Sicilian Campaign, app. F, p. 1. (2) Medaris Ltr, 15 Aug 43. (3) Connerat Rpt. (4) Farmer Memo, 3 Aug 43.

[54] Ray Ltr, 26 Aug 43.

[55] (1) Memo, Ray for Ordnance Officer II Corps, 15 Aug 43, sub: Informal Report to Chief of Ordnance, O.O. 350.05/6136. (2) Medaris Ltr, 15 Aug 43. (3) Ltr, Campbell to Medaris, 9 Sep 43, NATOUSA Letter, Personal to Gen Campbell, 15 August 1943, OHF.

[56] (1) Ltr, Campbell to Coffey, 4 Aug 43. (2) Ltr, Coffey to Campbell. Both in Campbell Overseas File. (3) History Ord Serv MTO, ch. VII. (4) Crawford Interv.

CHAPTER X

Salerno and the Growth of Fifth Army Ordnance Service

A month before the invasion of Sicily, Prime Minister Churchill told the House of Commons that "the mellow light of victory" had begun to play upon the great expanse of World War II. In Tunisia the Axis forces had surrendered; fewer U-boats were harassing the Atlantic shipping lanes; on the Eastern Front the Russians had driven the Germans back to the Donetz River Basin; in the Pacific, operations against the Central Solomons and the Bismarcks Barrier were about to begin.

On the next move in Europe and the Mediterranean, the British and Americans were reaching agreement. At the British-American conference (TRIDENT) in Washington in May 1943 the Americans, who wanted to get on with the attack across the English Channel, had got the British to agree to a target date of 1 May 1944 and a force of 29 divisions, of which 4 American and 3 British would be withdrawn from the Mediterranean; the British, who wanted to invade Italy in order to pin down as many German divisions as possible and provide bases to bomb Germany from the south, had obtained the assent of the Americans to another landing in the Mediterranean after Sicily.

At first Italy was not specified—could not be, in the American view, until the outcome in Sicily was known—and plans made during the early summer encompassed several operations. By mid-July, however, the chances for a short campaign in Sicily looked so good that planning was centered on Italy. Toward the end of the month the prognosis looked better still. Benito Mussolini was ousted from the Italian Government, and negotiations with Marshal Pietro Badoglio, his successor, excited hopes that Italy would get out of the war. To take advantage of an Italian collapse, the Allies on 26 July agreed that General Eisenhower should plan to make an amphibious assault in the vicinity of Naples as soon as possible. The bay of Salerno was determined upon, and the operation, named AVALANCHE and set for 9 September, was assigned to General Clark's Fifth Army, consisting of the U.S. VI Corps and the British 10 Corps. As soon after Sicily as possible, General Montgomery's Eighth Army would cross the Strait of Messina in a diversionary operation. Both armies would come under General Sir Harold R. L. G. Alexander's 15th Army Group.[1]

[1] (1) Maurice Matloff, *Strategic Planning for Coalition Warfare, 1943–44*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1959), pp. 160–61, 246. (2) Morison, *Sicily–Salerno–Anzio*, pp. 228–33. (3) Clark, *Calculated Risk*, pp. 174–79. (4) For the tactical history of early operations in Italy see Martin Blumenson, Salerno

Between the fall of Mussolini and the invasion of Italy, begun by General Montgomery on 3 September, forty days of precious time were lost. In answering critics who ascribed the delay to unnecessarily prolonged negotiations with Marshal Badoglio, Prime Minister Churchill pointed out that landing craft could not be withdrawn from Sicily until the first week in August and then had to be taken back to Africa for repair and reloading. General Marshall, who was irritated by the slowness in mounting the operation, thought the logistical officers too cautious.[2] Whatever the reason for the delay, in those forty days the Germans brought thirteen divisions into Italy, occupied Rome and Naples, and even held exercises to repel invaders at Salerno—the obvious spot for a landing, since it was as far north as the Allies could go and still have fighter cover.[3]

When the Fifth Army's first assault wave neared shore before dawn on 9 September, from the shore a loud speaker blared in English, "Come on in and give up. We have you covered!" [4] Though this sounded like a Wild West movie, the Germans were not bluffing. Very nearly throwing the invaders back into the sea, the Germans pinned them down on the beaches for about ten days before withdrawing north to take up strong defensive positions that kept the Allies in Italy, storming mountain after mountain, until the end of the war in Europe.

Beyond Naples, which fell on 1 October, was the Volturno River and the strong German Winter Line. That penetrated—it took until mid-January 1944 in winter mud to do it—there was the even stronger Gustav Line anchored at Mount Cassino and further protected by the swift Rapido and Garigliano Rivers. To overcome the Gustav Line and break out into the Liri Valley leading to Rome, ninety miles away, took four months of grueling struggle through torrents of rain and snow and lakes of mud. An attempt to hasten the breakthrough by landing behind the German line at Anzio on the coast below Rome did not succeed. Rome did not fall until 4 June 1944, only two days before D-day in Normandy. After the capture of Rome, seven veteran divisions were drawn off for the invasion of southern France. The remainder, plus new divisions of varying nationalities, pushed forward in Italy, but were caught by winter at the final barrier in the high Apennines and could not break through until March 1945.

Whatever the merits of this slow, arduous, expensive, and much-criticized battering operation up the Italian peninsula, the campaigns required a heavy weight of Ordnance support. Fortunately General Clark had an Ordnance officer who was more than equal to the job. Veteran of TORCH and the Tunisia Campaign, Col. Urban Niblo had shown that he was inventive, vigorous, and resourceful. He had very definite opinions, especially as to the organization of Ordnance service, but he was always willing to profit by mistakes

to Cassino, a volume in preparation for the UNITED STATES ARMY IN WORLD WAR II.

[2] (1) Winston S. Churchill, "The Second World War," *Closing the Ring* (Boston, Houghton Mifflin Co., 1951), p. 156. (2) Interv, Gen George C. Marshall by Maj Roy Lamson, Maj David Hamilton, Dr. Sidney T. Mathews, and Dr. Howard M. Smyth, 25 Jul 49, OCMH.

[3] (1) Morison, *Sicily–Salerno–Anzio,* 249–50. (2) Rpt on Italian Campaign 3 Sep 43–2 May 45 from the viewpoint of the German High Command (written from German sources), p. 8, OCMH.

[4] History Fifth Army I, 32.

and never hesitated to "throw away the book" when necessary. In this ill-starred theater, he was to need all the resourcefulness he could command.[5]

One problem in AVALANCHE plaguing other Fifth Army sections, the Engineers for example, did not trouble the Ordnance Section. That was the difficulty of meshing British and American logistical support of Fifth Army, which consisted of the U.S. VI Corps and the British 10 Corps. In the case of Ordnance, the differences in the connotation of the word ordnance and in the organizations that performed parallel functions in the British and U.S. Armies made separate services necessary. For that reason the British 10 Corps had its own ordnance support, which was supplied from the same line of communications (known as Fortbase) that supplied Montgomery's Eighth Army; Fifth Army Ordnance Service, organized by Niblo, supported the American portion of Fifth Army—the portion soon to be predominant.[6]

Niblo's Group Organization

On 1 September 1943 Colonel Niblo sent General Campbell a handwritten V-mail note informing him that Colonel Rose was that day giving birth to a new provisional Ordnance group, and added "bastard as it is, I have confidence it will live and be even more successful than its predecessor." The unit was illegitimate because the War Department had not yet given final approval to a permanent organization of this kind. During the summer of 1943 the Army Ground Forces headquarters was working on a combat zone Ordnance group organization, and was even reported to favor an Ordnance brigade to control the work of the groups. But the War Department did not authorize group headquarters for AGF service units until mid-October of 1943, and there was no TOE for an Ordnance combat zone group until the appearance of TOE 9–12 on 15 April 1944.[7]

Colonel Niblo's reason for jumping the gun on the War Department was that he wanted a staff that would be adequate to "administer, operate, and command" Fifth Army Ordnance service. On the day he obtained his provisional group, 1 September 1943, a year had passed since Ordnance had received responsibility for supplying and repairing trucks and other vehicles. That task now accounted for about 80 percent of the total Ordnance work load, yet the War Department had done nothing to enlarge the army Ordnance officer's staff, which was (prior to the establishment of the Provisional Ordnance Group) limited to the 38 men (11 officers, 1 warrant officer, 26 enlisted men) provided in the table of organization for an army headquarters (T/O 200–1) dated 1

[5] (1) Crawford Interv. (2) Brig Gen Urban Niblo, Lessons of World War II, OHF. (3) Colonel Borden reported to General Campbell that "General Clark spoke very highly of Niblo and is very confident in his ability." Memo, Borden for Campbell, 7 Jun 43, sub: Outstanding Ordnance Officers Contacted, Campbell Overseas File.

[6] (1) *Engineer History–Fifth Army–Mediterranean Theater*, vol. I, p. 11, OHF. (2) *History of AFHQ*, pt. Two, sec. 1, pp. 149, 179; sec. 4, pp. 513–14, OCMH. (3) Montgomery, *El Alamein to the River Sangro*, pp. 116, 154.

[7] (1) Ltrs, Niblo to Campbell, 1 Sep 43; Campbell to Niblo, 17 Sep 43. Both in Campbell Overseas File. (2) Fifth Army GO 64, 1 Sep 43, 105–1.13 (48999) General Orders–Fifth Army Jan–Dec 43. (3) WD Cir 256, 16 Oct 43. (4) Memo, CofS AGF for CG, AGF, 15 Jul 44, sub: Activation of Hq Detachment, Ordnance Groups and Shipment of Ordnance Groups, ASF Planning Div, Theater Br, ETO, vol. VII, Troop Units 1944.

July 1942, a complement considerably less than half the strength of the Quartermaster Section of 84 men and far behind the Engineers with 72, and the Signal Corps with 66. Moreover, the Engineer and Signal Sections were organized according to their own service tables of organization, T/O 5-200-1 and T/O 11-200-1, respectively.[8]

In the fall of 1942 Ordnance planners in the United States had tried to strengthen the hand of the Ordnance officer at army level. In the campaigns to come he would have to carry a heavy burden of administration—from which corps was now freed; his responsibility for motor transport was certain to be enormous; and it seemed very likely that other duties would require efforts far beyond anything hitherto demanded of him. For example, the responsibility for recovering matériel from the battlefield, which required Ordnance troops to be present in the combat zone, was cited by General Campbell in November 1942 when he requested Army Service Forces to redesignate the Ordnance Department a supply arm, rather than a supply service. General Somervell turned down the request.[9] Attempts to obtain War Department approval for an Army Ordnance Command at army headquarters, with an enlarged staff consisting of a headquarters and headquarters company organized under T/O 9-200-1, also came to nothing. General McNair's dislike of large army headquarters and his horror of excess paper work in the theaters made any sizable increase impossible during 1943.[10]

At Fifth Army—the first U.S. army activated overseas—Colonel Ford as Ordnance officer had tried to obtain an Army Ordnance Command organized on an operational basis, and Niblo had continued the effort, but they had failed. By late July, faced with the probability that Fifth Army combat operations would require as many as 36 Ordnance companies, Niblo was ready to welcome "any workable solution or plan . . . rather than further delay in search of a perfect T/O & T/E 9-200-1."[11] Reports that came back from the Sicily Campaign showed clearly that an Ordnance officer with a weak staff was badly handicapped.[12] In the end, Niblo's answer was the group organization.

There was one important difference between the new group, which was designated the 6694th Ordnance Group (Provisional), and its predecessor, the 1st Provisional Ordnance Group. Instead of commanding it himself, as he had the POG when he formed it as Ordnance officer of II Corps, Colonel Niblo placed his executive officer, Colonel Rose, at the head, delegating to

[8] (1) Niblo Interv of 28 Sep 55. (2) Ltr, Niblo to Chief Ord Officer, NATOUSA, 20 Jul 43, sub: Headquarters and Headquarters Company, Fifth Army Ordnance Command, History Ord Service MTO, vol. I, ch. II, Annex F. (3) WD Table of Organization No. 200-1, 1 Jul 42, Headquarters, Army.

[9] Ltr, Campbell to CG Services of Supply, n.d., sub: Redesignation of the Ordnance Department as a Supply Arm; 1st Ind, 2 Dec 42, ASF Planning Div. Both in Folder Ordnance Department, Gen Styer's File.

[10] (1) Memo, Col Robert W. Daniels, AGF Ord Officer, for Key Ord Officers, 24 Nov 42, sub: Ground Force Ordnance Units, History Ord Service MTO, vol. I, ch. II, Annex H. (2) Greenfield, Palmer, and Wiley, *The Organization of Ground Combat Troops,* pp. 359-61. (3) Ltr, Medaris to Daniels, 8 Nov 43, no sub, ETO Ord Sec 320.3 Organization of British Army, KCRC. (4) WD T/O 200-1 as revised 26 Dec 43.

[11] Ltr, Niblo to Chief Ordnance Officer NATOUSA, 20 Jul 43, sub: Headquarters and Headquarters Company, Fifth Army Ordnance Command, and Incls 1-6, Hist Ord Serv MTO, vol. I, ch. II, Annex F.

[12] (1) MacMorland Rpt, pp. 19-20. (2) Connerat Rpt, p. 11.

him all operation and command of army Ordnance battalions and envisaging the Ordnance Section of Fifth Army headquarters as a policy-forming, advisory, and planning unit only.[13] Rose, after commanding two battalions in the early part of the Tunisia Campaign, had gone to Fifth Army with his old commander, and in April had been sent to the British Eighth Army to study its organization.[14]

For the important job of maintenance and supply officer of the Fifth Army Ordnance Section, Niblo had Colonel Moffitt, who also had come to North Africa with him. Moffitt had served as a battalion commander throughout the Tunisia Campaign and had gone to Sicily as commander of the 42d Ordnance Battalion. After the Sicily Campaign was over Colonel Medaris, on leaving for England to become Ordnance officer of First Army, recommended Moffitt to succeed him as Ordnance officer of II Corps. However, Niblo was able to obtain his services and Moffitt reported for duty in August 1943. With the 20 men in Rose's headquarters and the 31 planned for the advance and rear echelons of Niblo's staff, there were 51 experienced men for staff duties and command operations.[15]

Having succeeded in obtaining an adequate staff, Niblo went a step further in planning Fifth Army Ordnance Service. He wanted a second group headquarters to be used to control the composite battalions sent forward in direct support of VI Corps, but such a unit was not available in the theater and could not be obtained from the War Department. Some three months later, after the strength of the German resistance was evident to all, Niblo was able to organize three groups—one for forward third echelon work, one for ammunition supply, and one for operations in the rear.[16] For the time being, however, he placed under the 6694th Ordnance Group the four battalions planned for the campaign: one for ammunition; one for third echelon support of the VI Corps infantry divisions; one for repair of corps and army trucks, DUKW's, and other motor vehicles; and one to do fourth echelon work on tanks and other heavy maintenance.[17]

The group headquarters and most of the battalions were to land in Italy on D plus 12, 21 September, when the bulk of Fifth Army was scheduled to arrive. The American D-day combat forces were VI Corps headquarters, the 36th Infantry Division (fresh from the United States), one tank battalion, and a floating reserve consisting of a reinforced regimental combat team of the veteran 45th Division. The Americans were to land at Paestum, the British 10

[13] Ltr, Crawford to CofOrd, 29 Feb 44, sub: Technical Letter No. 19, MTO Ord Sec 400.113, KCRC.

[14] Ltr, Rose to Niblo, 2 May 43, sub: Report on Special Duty with the Eighth Army, MTO Ord Sec 319.1, KCRC.

[15] Ltr, Niblo to CG Fifth Army, 2 Oct 43, sub: Initial Bi-Weekly Report of Army Ordnance Service, Covering the Period 9 September to 30 September, 1943, Incl 1, Organization of Army Ordnance Service as existing on 30 September 1943, Fifth Army Ordnance Officer's Bi-Weekly Reports to the Army Commander, Book Number 1, OHF. (Hereafter these reports will be cited as Niblo Rpt, with appropriate date.)

[16] (1) Ltr, Crawford to CofOrd, 29 Feb 44, sub: Technical Letter No. 19, MTO Ord Sec 400.113, KCRC. (2) Army Ordnance Administrative Instructions 28, 10 Dec 43, sub: Army Ordnance Service, in Niblo Rpts, OHF. Unless otherwise indicated, all Army Ordnance Administrative Instructions hereafter cited are from this file.

[17] Outline Plan AVALANCHE Operation, 26 Aug 43, Annex II, pt. II, U.S. Troops, RED VAULT (Fifth Army).

Corps with two divisions a few miles farther north, near Salerno. The AVALANCHE plan of 26 August was based on the assumption that the Italian resistance would approximate that in HUSKY—which was very little—and that Germany's commitments in the USSR would continue to hold the bulk of the German ground and air force on the Soviet front.[18]

Optimism grew after Italy's surrrender to the Allies on 3 September. Aboard ship just before sailing with the D-day convoy on 5 September, General Clark seemed to think there would not be much opposition. He even talked of the possibility that one of his follow-up divisions might land as far north as Rome. Some of the newspaper correspondents understood General Eisenhower to say that the Allied forces would be in Rome by mid-December or very soon thereafter. The British were optimistic too. On the evening of 7 September a member of Admiral Sir Andrew B. Cunningham's staff came aboard the *Boise,* one of the ships in the D-day convoy then steaming toward Italy, with the news that the landing in the harbor of Salerno would be unopposed.[19]

These miscalculations were not fatal to the Allied cause, although they came near being so to the American beachhead on the evening of 14–15 September, when General Clark was faced with the possibility of being driven back to the sea.[20] Their main effect was to disarrange the schedule of the follow-up landings. The necessity for sending in fresh combat troops ahead of time, out of proportion to the service elements already landed, placed a great strain on the supporting units. Additional combat troops were landed in Italy while the Ordnance companies assigned to support them were still in North Africa and Sicily. Niblo's carefully worked out task assignments soon had to be revised. After II Corps was sent to the aid of VI Corps early in October, his whole organization had to be taken apart, reorganized, and considerably enlarged. By mid-November the 6694th Ordnance Group was comparable in size to a brigade. The Italian campaign was destined to be the first real test of Ordnance field service in direct support of ground forces; according to Colonel Coffey, "the first true large-scale proving ground."[21]

"Hell in the Dunes"

Colonel Niblo planned carefully for AVALANCHE. The report on Sicily by Maj. William H. Connerat, Jr., had shown clearly that more weapons and ammunition had been landed there than the men could

[18] (1) *Ibid.* (2) The D-day convoy carried 105,000 C rations to feed the 15,000 prisoners that VI Corps was expected to capture in the first seven days. RED VAULT Fifth Army G–4 History of Opn AVALANCHE—Salerno, Jul–Oct 43.

[19] (1) Truscott, *Command Missions,* p. 247. (2) Christopher Buckley, *The Road to Rome* (London, 1945), p. 226. (3) George Biddle, *Artist at War* (New York: Viking Press, 1944), p. 126. (4) Alan Moorehead, *Eclipse* (New York: Coward-McCann, 1945), p. 60.

[20] Clark, *Calculated Risk,* p. 198. See Morison, *Sicily–Salerno–Anzio,* pp. 293–94, for the plan to shift troops from the American to the British beachhead.

[21] (1) Memo, Col Garland H. Williams for Director, Planning Div, 6 Jan 44, sub: Notes on Italian Campaign, Folder, Lessons Learned, ASF Planning Div, Theater Br. (2) Col Niblo, quoted in AGF Board Report, 26 Nov 43, sub: Comments from North African Theater, ASF Planning Div, Theater Br, General File 17. (3) Army Ordnance Admin Instr 2, 14 Oct 43. (4) Ltr, Coffey to Niblo n.d., quoted in Army Ordnance Admin Instr 15, 9 Nov 43, OHF.

classify or segregate. For the Italian landing, Niblo scaled down the amount of supplies, arranging for the bulk to come in on the convoy due on D plus 12, and sent in more Ordnance troops. He also took along some experienced officers to direct beachhead operations. As commander of the AVALANCHE maintenance battalion, the 45th, he had Lt. Col. Henry L. McGrath, who was Colonel Crawford's executive at AFHQ Ordnance Section and had been an observer of the landing in Sicily. To direct ammunition operations Niblo was able to obtain Maj. Daniel F. Shepherd, Crawford's ammunition officer. The DUKW repair expert in the landing was Capt. Herbert A. Suddard of the Amphibian Vehicle School at Fifth Army's Invasion Training Center, who had made a study of DUKW maintenance in the invasion of Sicily. There was nothing wrong with Niblo's planning—but Salerno was to be quite different from Sicily.[22]

On the evening before D-day, as the attacking forces were sailing toward the Gulf of Salerno on a calm sea silvered by the moon, General Eisenhower's voice over the radios announced to the troops the surrender of Italy. Shouts from the whole fleet echoed over the Mediterranean. In his cabin on the *Ancon* General Clark was discussing with his staff "such pleasant possibilities as a direct move into Naples Harbor"; one Air Forces unit was so certain of landing at Naples that it dewaterproofed its vehicles aboard ship. Some infantrymen of the 36th Division proposed to go in with unloaded weapons, some complained that they would not have a chance to fight.[23]

What they got was "hell in the dunes."[24] As the assault forces neared the beaches the Germans opened up with artillery, mortar, and machine gun fire. The machine gun fire came from the most seaward dunes, about 20 to 70 yards behind the shore line; artillery fire from farther back, where a flat plain extended inland three to five miles before giving way to a mountain range. Tanks roamed the plain and even came down to the beaches; two of them fired on small landing craft and had to be driven off by gunfire from an LST. Mine fields and heavy shellfire closed two of the southernmost beaches for several hours. The dodging, circling landing craft and DUKW's were forced to land wherever they could. But in spite of the German barrage, which increased with the first light, the cursing, sweating shore parties made roads, laid out beach dumps, and began to unload. By midmorning the situation was better. Naval guns (at first silent to gain surprise) had gone into action; the men on the beaches had driven back tanks with bazookas and the invaluable 105-mm. howitzer; and the infantry, recovering from the first shock, climbed out of foxholes and began to push out toward the hills. By midafternoon men, vehicles, and supplies were crossing the beaches at a fast pace.[25]

[22] (1) Crawford Interview. (2) Interv with McGrath, 8 May 57. (3) Ltr, Crawford to OCO, 19 Oct 43, sub: Technical Information Letter No. 15, MTO Ord Sec 400.113, KCRC.

[23] (1) Clark, *Calculated Risk*, p. 187. (2) Belden, *Still Time to Die*, p. 291. (3) Capt Madison Post for Gen Coffey, 14 Oct 43, sub: Trip Report (hereafter cited as Post Rpt), p. 5, Folder, Fifth Army Operation AVALANCHE, Report of Captain Madison Post, OHF. (4) Company E History, in History 531st Engr Shore Regt, 2d Bn, 20 Aug–30 Sep 43, p. 9.

[24] History Co E, p. 12.

[25] Company histories in History 531st Engr Shore Regt, 2d Bn and 3d Bn, 20 Aug–30 Sep 43. For the best detailed official account of the land-

The Ordnance men began landing at 0900. There were detachments from seven companies: two ammunition, the 66th and the 2652d (provisional); two automotive maintenance, the 3485th and the 3486th, the latter primarily for DUKW's; two medium maintenance, the 46th and the 28th, the latter primarily for antiaircraft maintenance; and a depot, the 189th. All were ashore by 1900 and working in the Engineer dumps and motor pool. For the first three days they were attached to the 531st Engineer Shore Regiment; on 12 September they reverted to VI Corps and were placed under the newly arrived 45th Ordnance Battalion headquarters, all except the men of the DUKW repair company, who were left under the Engineers a few days longer to work at the beachheads.[26]

As a result of the disrupted landing plans and congested beaches, Ordnance shop trucks, tools, and other equipment were late getting ashore or were landed on the wrong beaches and could not be found. All the detachments except the 46th's were without proper tools and equipment for the first three or four days. This was especially serious for the truck and DUKW mechanics, who always bore most of the maintenance burden in beachhead operations. With only hand tools and almost no spare parts, the men did their best, cannibalizing wrecked vehicles and borrowing tools from the Engineers until D plus 3, when the technical vehicles of the 46th, the bulk of the company, and about 200 tons of supplies landed. The little 18-man detachment of the 189th Depot Company was perhaps worse off than any other unit. It had no jeeps to use in searching the beaches or any trucks or cranes to use in hauling and stacking the mountainous supplies piled haphazardly on the beaches. Without transportation, the men even had trouble getting rations and water.[27]

The ammunition men were better off than they had been in the invasion of Sicily, but the confusion that everyone had come to expect in amphibious operations was just as great. For example, a box containing most of the 155-mm. howitzer primers got lost among the piles of rations and other supplies and caused a dangerous shortage in 155-mm. howitzer ammunition in the first few days. Ammunition arrived at the dumps in nearly every combination conceivable; a single DUKW would bring in as many as 21 types. But unlike their predecessors in HUSKY, the ammunition detachments in AVALANCHE had 2½-ton trucks to use in arranging their dumps and could thus segregate types and make issues without errors. This time, there was no oversupply to burden transportation, and Ordnance, not the Engineers, was in control. Major Shepherd got ashore shortly after noon on D-day to supervise the beach dumps, unofficially; on D plus 2 he was officially attached to the Engineer shore regiment to control all ammunition and saw to it that there were no shortages. For being able to anticipate the combat troops' requirements and thus get critical ammunition unloaded on time, for "unselfish devotion to duty, coolness under fire, and capable

ings see Vice Adm H. K. Hewitt, The Italian Campaign, Western Naval Task Force, Action Report of the Salerno Landings, September–October, 1943, Jan 45 (hereafter cited as Western Naval Task Force Rpt).

[26] (1) Post Rpt, p. 7. (2) History 531st Engr Shore Regt, 20 Aug–30 Sep 43, pp. 3, 9–10. (3) 45th Ordnance Battalion (M&S), Historical Record, 1 Sep to 30 Sep 43.

[27] Post Rpt, pp. 7–9.

leadership," he was given a commendation by General Clark.[28]

Colonel McGrath, who arrived with the headquarters of the 45th Ordnance Battalion on the evening of D plus 2, and Major Shepherd ran the show very competently for the first twelve days. Niblo's invasion staff paid off handsomely. Captain Suddard, sent to Maiori with an Ordnance detachment of 4 officers and 50 enlisted men to support Colonel Darby's Ranger Task Force, worked hard and long under enemy shellfire and bombing. For this he received a promotion to major—the first battlefield promotion of an Ordnance officer or of any service branch officer.[29]

McGrath rounded up the Ordnance detachments scattered along the beaches and assembled them at his battalion bivouac area two miles north of Paestum, the ruins of an ancient town just behind the American beaches, distinguished by a conical stone watchtower and the Doric columns of two temples. On the morning of the 13th, the day the Germans counterattacked, he set off in his jeep to make contact with the combat troops and the next day sent out contact parties from the 46th Ordnance Company to service and resupply the weapons of the infantry and tank battalions that had staved off the German advance at the danger point near the Sele River.[30]

The first job tackled by the 45th Battalion as a whole was dewaterproofing. By mid-September, areas for this important work had been set aside behind the beaches; until then only the air intake pipes and a little of the grease had been removed from the vehicles. Many vehicles were operating without air cleaners, or without oil in air cleaners, in the clouds of dust that were everywhere; batteries and gear cases had not been given proper attention. McGrath sent details from his companies to the dewaterproofing areas to make certain that the vehicles were properly checked and to be sure that air cleaners were installed and filled. Trucks became even more immediately important when it was discovered that because of a favorable beach gradient and good weather—there were only small waves, no surf—they could be backed up to landing craft to be loaded and then driven to inland dumps.[31]

Supplies and reinforcements were pouring in. By 20 September the 82d Airborne Division was ashore, the 3d Infantry Division and the rest of the 45th had been brought forward from Sicily, and the 34th Infantry Division was on the way from North Africa. By then the beachhead was secure, the enemy was withdrawing, and the 3d and 45th Divisions were beginning

[28] (1) Post Rpt, p. 10. (2) App. No. E, G–4 Hist Rpt, Ord Sec, Period 9 September to 31 December 1943, RED VAULT Fifth Army Office of the Ord Officer, 9 Sep–Dec 43. (3) Niblo Rpt, 31 Oct 43, Incl 6. (4) Ltr, Maj William O. Green, Div Ord Off, to CG 36th Inf Div, 24 Sep 43, sub: Ordnance Report, Operation AVALANCHE, in Opn AVALANCHE Staff Sec Rpts 36th Inf Div 9–21 Sep 43. (5) Maj Daniel F. Shepherd, Report on Operation of Ammunition Supply in Operation AVALANCHE, 12 Dec 43, ETO Ord Sec 320.1, KCRC.

[29] (1) Crawford Interv. (2) Ltr, Niblo to CO's 45th Ord Bn and 62d Ord Bn, 20 Sep 43, sub: Ordnance Support for Ranger Task Force, History Ord Serv MTO, ch. IV, pt. I, app. C. (3) Interv with Marshall S. David, 20–21 Jun 57. (4) VI Corps G–4 Jnl, 11 Sep 43.

[30] (1) Jnl 11–14 Sep in 45th Bn History. (2) History 46th Ord Medium Maint Co, Sep 43. The 46th lost two men, an officer and an enlisted man "last seen crossing the Sele River in a jeep, not thereafter heard from." *Ibid.* For the counterattack and its repulse see **Fifth** Army History, vol. I, pp. 37–41.

[31] (1) Jnl 15–16 Sep in 45th Bn History. (2) Post Rpt, pp. 4–6, 12.

the advance northward toward the next objective, the Volturno River. The advance, slow in getting under way because of the unexpected resistance on the beaches, was further impeded by the Germans' skillful delaying tactics in blowing bridges and planting land mines in the path of the invaders. It was 1 October before the British 10 Corps, advancing up the coast, entered Naples. The wrecked port, by "a miracle of reconstruction" [32] was placed in operation by 15 October but until then, as the U.S. VI Corps continued to press north of Naples in pursuit of the enemy and the first elements of II Corps headquarters began to arrive from Sicily, supplies had to come from the Salerno dumps.[33]

The inland dumps were managed better than they had been at Sicily, for at Salerno, because of the insistence of General Clark's G–4, Col. Ralph H. Tate, the service chiefs, not the Engineer beach group, had control after 12 September; and fortunately plans had called for an abnormally large build-up of twenty days' supply over the beaches. These supplies helped tremendously when more combat troops had to be brought in than originally planned. Even so, Colonel Tate "sweated blood" in attempting to get supplies to the front in the fifteen days before the port opened.[34] For Colonel Niblo there was a stroke of bad luck early in the game.

The greatest blow for Ordnance in AVALANCHE came on 21 September after the ordeal of the dunes was over. It took place not on land, but at sea where fifteen Liberty ships of the D plus 12 convoy were waiting to come in. One of them, the S.S. *William W. Gherard,* carried the depot stocks and organic equipment of the 189th Ordnance Depot Company—16 vans and other vehicles loaded with weapons and spare parts. Also aboard were the supplies of three other companies—all the organic equipment of the 529th Heavy Maintenance Company (Tank), as well as 30 days' supply of replacement vehicles and spare parts; three tank recovery units belonging to the 477th Evacuation Company; and 183 boxes of bulk-stored spare parts destined for the 46th Medium Maintenance Company.[35]

The danger from the guided bombs that sank one merchant ship and badly damaged another in an earlier convoy seemed to have abated, but submarines were beginning to worry the Navy. Three U-boats were reported in the southeast Tyrrhenian Sea in the late afternoon of 20 September. The next morning the *Gherard* was torpedoed near Point Licosa. The tug *Moreno* tried to beach her, but fire broke out in holds containing gasoline and ammunition, making salvage impossible. By dark all the men aboard except one had been saved, but the ship was a total loss.[36] So went down "all," reported Colonel Niblo, "repeat all, Ordnance Class II supplies to support operation AVALANCHE." The worst effect was the loss of all the spare parts that had been counted on for maintenance to D plus 17.[37]

Niblo requested replacements immediate-

[32] Clark, *Calculated Risk,* p. 217.

[33] Truscott, *Command Missions,* p. 254.

[34] (1) Interv, Brig Gen Ralph H. Tate by Dr. Sidney T. Mathews, 19 Jan 49, pp. 3–5, OCMH. (2) VI Corps G–4 Jnl.

[35] Niblo Rpt, 2 Oct 43.

[36] Western Naval Task Force Rpt, 50–52, 100–101. The *Gherard* was one of three merchant ships out of nearly a hundred Allied craft of all types sunk or damaged in the invasion, most of them by bombs or shellfire. *Ibid.,* pp. 206–09.

[37] (1) Niblo, quoted in AGF Board Report, 26 Nov 43. (2) Niblo Rpt, 31 Oct 43.

ly, but they did not arrive until 1 December, when the second big convoy came in. In the meantime there was the problem of resupplying small arms lost in battle—carbines, rifles, pistols, and bayonets—and supplying the newly landed combat troops, of which some 4,000 arrived without hand weapons. These items were short in North Africa: SOS NATOUSA had advised that it could not arm replacements and maintain the reserve as well. "There must be an explanation," commented Colonel McGrath, "but I wonder if it would be convincing to a doughboy short something he needs to fight with." [38]

Watches and binoculars were in very short supply. Some of the antiaircraft units who shot down friendly planes in the first ten days complained that many of their observers could not identify Allied markings in time because they had no field glasses. Field artillery and tank destroyer units also suffered from the shortage. Pilferage accounted for some of the watch and binocular losses, but it was also true that more were needed for mountain fighting, which required a great number of patrols and observation posts, than had been called for in tables of equipment.[39]

"Uninterrupted" Ordnance Service

As the infantry divisions pushed north from Salerno to Cassino along the edge of the Neapolitan plain—the *Campania felix* of green winter wheat, Lombardy poplars, and orchards—and into rocky hills and somber mountains blanketed with rain clouds and reverberating with the roar of guns, the Ordnance units followed close behind. By the end of October Colonel Rose's 6694th Ordnance Group headquarters, which had landed with the D plus 12 convoy, had 7 battalions with 29 companies, a total of nearly 6,000 men. Most of the men were veterans of Sicily or Tunisia. They came from Palermo or Bizerte on LST's and LCT's with their shop trucks, cargo trucks, vans, and jeeps, and found Italy a welcome change. The men of the 525th Heavy Maintenance Tank Company, the unit that had served with the British in the Libyan desert, had the first fresh fruit they had tasted since they left home in May of 1942.[40]

On arrival, the battalion commanding officers were given their task assignments. The 42d and 45th Ordnance Battalions were to provide third echelon maintenance and supply support to II Corps and VI Corps, respectively; the 62d Ammunition Battalion was to operate army forward ASP's and rear dumps; the 87th Battalion was to repair corps and army trucks, DUKW's and other motor vehicles; the 188th was to furnish third echelon maintenance to all tank and tank destroyer groups; the 197th was responsible for evacuation and fourth echelon work; and the 2630th, a new unit organized in North Africa, was to provide third echelon maintenance and supply to all the antiaircraft units in Fifth Army.[41]

The third echelon companies were given

[38] (1) *Ibid.*, 2 Oct, 28 Nov 43. (2) RED VAULT Fifth Army, G–4 History Opn AVALANCHE–Salerno, p. 7. (3) ASF Information Letter NATOUSA #2, 14 Oct 43, Incl C, McGrath Report on Operation AVALANCHE (hereafter cited as McGrath Rpt).

[39] (1) McGrath Rpt. (2) Interv, Mathews with Tate. (3) Ordnance Weekly Bulletin No. 2, 30 Oct 43.

[40] (1) History 525th Ord Heavy Maint Co, Tk. 1943. (2) Niblo Rpt, 14 Oct 43.

[41] (1) Army Ordnance Admin Instr 2, 14 Oct 43. (2) Niblo Rpt, 14 Nov 43, Incl 5. (3) Jnl 45th Ord Bn 18–19 Sep in History 45th Ord Bn.

definite assignments to support a specified infantry division or artillery, tank, tank destroyer, antiaircraft or other unit. Colonel Niblo was convinced from a study of the Tunisia and Sicily Campaigns that it was inefficient to place Ordnance troops geographically in certain areas with the general task of supporting all combat units that might be passing through. Therefore he gave firm instructions that when the line units moved the Ordnance units moved too, as closely behind as logistics would permit, sending out contact parties daily to combat units. He ordered the group commander, the battalion commander, or the company commander to make periodic calls on the commanding officer of the combat unit being supported to keep him informed of the mission and location of his Ordnance troops and the condition of his Ordnance matériel, and to offer and request co-operation in solving communications and other problems. Niblo did everything he could to instill in his men the conviction that every major combat unit was entitled to support at all times. His slogan throughout the Italian campaign was "UNINTERRUPTED Ordnance Service." [42]

In placing Ordnance units close behind the combat troops, with definite assignments, Colonel Niblo had the enthusiastic suport of Colonel Tate, the Fifth Army G–4, who wanted to keep supply service troops under army control for greater flexibility and at the same time give no cause for complaints that support was too far to the rear, a complaint often heard about the Sicily Campaign. Another advantage in Tate's eyes was that the men in the division or corps and the Ordnance men "would get to know each other and the ordnance outfit would take great pride in repairing and servicing the equipment of the outfit it worked with." [43] This feeling was fostered when Niblo sent the 42d Battalion to the vicinity of Avellino to act as "host" or "welcoming committee" to the units of II Corps that were ferried from Sicily in October, and drove up the Italian coast. The 42d selected bivouac areas, provided guides and signs, and, after organizing the staging area, repaired and conditioned all weapons and vehicles so that they were ready for action when the corps moved into the combat zone.[44]

The policy of moving Ordnance companies when their combat units moved had to be modified in late January 1944 when the War Department was reorganizing and regrouping certain combat units, such as nondivisional artillery, tank, and tank destroyer battalions, so that they would be more sensitive to the surge of battle. The constant regrouping and shifting made it too difficult for the Ordnance maintenance companies, limited in number, to keep up. Therefore, as a general policy, maintenance and supply responsibility was transferred from one Ordnance company to another as required. The old company forwarded to the new company within twenty-four hours an envelope containing complete, up-to-date records of the status of Ordnance support to the combat unit involved, a process described by Niblo as the "simple transfer of the record of business with a customer from one branch office to another." The Envelope System, as it was called, made it possible for one company

[42] (1) Army Ordnance Admin Instr 2, 14 Oct 43; see also later administrative instructions. (2) Ltr, Rose to Campbell, 17 Oct 43, Campbell Overseas File.

[43] Interv, Mathews with Tate.

[44] Niblo Rpt, 14 Oct 43.

to pick up quickly where another left off, and gave excellent results.[45]

Poop Sheets and Purple Blurbs

In the interest of UNINTERRUPTED Ordnance Service, Colonel Niblo believed in keeping his Ordnance units as well informed as possible. He expanded the usual Army Ordnance Administrative Instructions, prescribed in the Ordnance field manual, to include revised task assignments and policies, useful technical information, and items of interest. He also took steps to keep his Ordnance commanders informed on the movement and equipment of the combat forces. He knew from his own experience how vital such information was. For example, learning for the first time at a conference that a unit was coming in with different weapons than those he had planned for, he had to leave the conference in order to stop some trucks that had already started and get them to return to base and pick up the proper ammunition and spares.[46]

Beginning early in November 1943 he issued Ordnance commanding officers down to battalion level a daily top secret Ordnance Operations Bulletin giving the tactical situation, including the location of the combat units, and the Ordnance situation. Copies went also to Ordnance officers at AFHQ, SOS Peninsular Base Section (PBS), and corps and divisions, more than thirty copies in all. Because purple ink was the only kind available in Naples for multicopy, the bulletins got the name of purple blurbs. The cover sheet bore the insignia of Fifth Army Ordnance Service, which was a robot holding up a flaming bomb superimposed on the Fifth Army sleeve insignia.[47]

The number and frequency of the mimeographed bulletins and instructions that poured out of the Fifth Army Ordnance office during the fall of 1943 earned for Colonel Rose the title of Poop Sheet Pappy; and one battalion commander complained that "the makeup of my battalion keeps shifting with the ebb and flow of poop-sheets from Nib." [48] Nevertheless, the publications were undoubtedly helpful. General Coffey, Ordnance officer of SOS NATOUSA, considered the Fifth Army Ordnance Administrative Instructions "the finest thing in their line" he had ever seen, and the Operations Bulletins were considered by Headquarters, Fifth Army, one of the outstanding contributions by Ordnance to the Italian campaign.[49]

Ammo Joe

Ammunition was the subject of Army Ordnance Administrative Instruction 1. Colonel Niblo gave ammunition supply, always of the first importance, particular attention because in several respects it was a pioneering operation. For the first time there existed an ammunition battalion able to operate tactical ammunition supply points. In North Africa such battalions

[45] (1) Army Ordnance Admin Instr 39, 31 Jan 44. (2) Ltr, Crawford to CofOrd, 7 May 44, sub; Technical Information Letter # 21. MTO Ord Sec 400.113, KCRC.

[46] Niblo Interv.

[47] Copies of these publications are in OHF.

[48] Ltrs, Lt Col John G. Detwiler to Col D. J. Crawford, 28 Sep, 16 Dec 43, MTO Ord Sec 319.1, KCRC.

[49] (1) Ltr, Coffey to Niblo, copy in Army Ordnance Admin Instr 15, 9 Nov 43. (2) Hq Fifth Army, Training Memo 12, 15 July 1944, Lessons Learned in the Battle from the Garigliano to North of Rome.

had been used only at large depots; in Sicily, the ammunition battalion sent forward at the end of the campaign did not have enough transportation to furnish adequate support. In Italy the 62d Ammunition Battalion, commanded by an exceptionally capable officer, Lt. Col. William H. Jaynes, and closely controlled by Colonel Niblo (since the 6694th Group had no ammunition officer), operated forward and rear ASP's stocking all Class V supplies, Engineer and Chemical Warfare as well as Ordnance.

During the first few months of the Italian campaign the ammunition battalion effected several innovations. One, a new requirement of Fifth Army, was the submission to higher headquarters at 1800 every day of a report giving the amount of ammunition (by types) expended in the previous twenty-four hours, and the amount on hand at the end of the period. Another was the first effective segregation of artillery ammunition by lot number. A third was a guide service that prepared maps and made signs showing the way to the ASP's. For the signs, two men at battalion headquarters, Sergeant Offenbacher and Pfc. Arko, made a sketch of "Ammo Joe," a striding soldier carrying aloft a huge shell. This figure, appearing on signs, ammunition maps, and messenger vehicles, became the symbol, and Ammo Joe the nickname, of Fifth Army ammunition supply.[50]



AMMO JOE

The segregation of artillery ammunition by lot number, successful for the first time in the war, promised to be a great step forward in ammunition supply. Experience in Tunisia and Sicily had convinced artillerymen that the best results in barrage fire could be obtained only by the use of one lot of ammunition, that is, ammunition manufactured by one manufacturer under the same conditions and thus uniform. Mixed lots produced shot dispersion that made it unsafe for infantrymen to approach closer than fifty yards to their own artillery fire.[51] Early in the Italian campaign, the artillerymen asked Ordnance for a considerable amount of one lot of ammunition to fire close-support missions. The request was not unreasonable, for every lot of ammunition had a code number, given to it at the time of manufacture,

[50] (1) Niblo Rpts, 2 Oct 43, Incl 2; 31 Oct 43, Incls 9, 13. (2) Meade, Ammunition Supply in the Mediterranean Theater of Operations, pp. 266–68. (3) Crawford Interv. (4) Memo, Maj. J. H. Mathewson for Col D. J. Crawford, 26 Jan 44, sub: Ammunition Supply in Italy (hereafter cited as Mathewson Rpt), MTO Ord Sec 400.113, KCRC. Copies of the mimeographed maps are in History 62d Ammunition Bn, Jan–Dec 43.

[51] (1) Ltr, Maj Gen J. P. Lucas to Theater Commander, 26 Aug 43, sub: Sicilian Campaign, OHF. (2) AGF Board Rpt NATO, No. 119. (3) Memo, Somervell for CG NYPOE, 3 Nov 43, sub: Report on Trip to NATOUSA by Gen Goodman, and Incl, ASF Planning Div, Theater Br, 12 General.

but it brought groans from the Ordnance ammunition men. They had tried sorting by lot number in North Africa but had had to give up; the effort not only took more labor than could be spared but gave discouraging results. For example, at Bou Chebka the 53d Ammunition Company had found 112 different lots in 150 bundles of 105-mm. ammunition. There were no more than three bundles of any one lot, and the average lot size was 1⅓ bundles.

After the request in Italy, Ordnance resumed the attempt, and Niblo tried a new method of sorting. Instead of physical labor at one stage of the process, he used paper work. The ammunition handlers tore down a stack of ammunition and recorded the lot numbers on paper. Then the depot office men tabulated the results of the sorting. If there were more than 17 bundles for any lot, they were collected at one point, marked Specially Segregated Ammunition, and shipped under this designation to forward ASP's. Lots of 5 to 17 bundles were left separated and were not consolidated and moved until more ammunition of the lot showed up.[52]

Ammo Joe was congratulated by Brig. Gen. Thomas E. Lewis, Fifth Army Artillery officer. Colonel McGrath reported to Colonel Crawford, "Niblo is definitely the darling of the Artillery boys since he made effective the segregation of ammunition by lot number. This is accomplished and it's working. Tom Lewis and Joe Burrill get lyric every time they speak of it. Seriously it is undoubtedly a tremendous help to the Artillery man and represents the solution of what seemed to be an insoluble problem." In the United States, the War Department, beginning in late January 1944, stopped the shipment overseas of lots in small quantities.[53]

Lot sorting, the submission of new reports, the layout and operation of forward ASP's in difficult terrain and rainy weather, all placed a heavy drain on ammunition manpower and equipment. More clerks, carpenters, sign painters, truck-drivers, and laborers, and more trucks, water trailers, stoves, and other necessities were required than were provided by TOE's, which had not, as late as March 1944, even begun to catch up with the lessons learned in the Mediterranean theater. All the companies had more than twice as many trucks and trailers as their T/E called for, having taken them from maintenance stocks, and they needed still more, for most companies operated two or more ASP's. Ordnance often had to draw additional trucks from a pool set up by Fifth Army's Transportation Section, and it took careful planning and co-ordination with Transportation to make possible the daily shipment of enough ammunition to forward ASP's.[54]

The ammunition labor problem was solved by hiring Italian civilians. At the end of November, Fifth Army Ordnance was using a thousand-man Italian work battalion, broken down into five "Italian companies," with one each attached to the

[52] Meade, Ammunition Supply in the Mediterranean Theater of Operations, p. 266.

[53] (1) Fifth Army Arty Info Memo of 3 Nov 43, quoted in O.O.B. 4, 13 Nov 43. (2) Ltr, McGrath to Crawford, 21 Nov 43, MTO Ord Sec 319.1, KCRC. (3) Ltr, Secy War to Commander-in-Chief, SPA, CG's ETO, NATO . . . , 25 Jan 44, sub: Mixed Ammunition Lots, Fifth Army AG 471 Ammunition, KCRC.

[54] (1) Mathewson Rpt, p. 6. (2) Meade, Ammunition Supply in the Mediterranean Theater of Operations, p. 262 (3) Bykofsky and Larson, *The Transportation Corps: Operations Overseas*, pp. 221–22.

five companies of the 62d Ordnance Ammunition Battalion. The Italians were paid 87 cents a day, with 30 cents deducted for their food, and received their clothing, mostly from captured Italian Army stores. Their discipline was semimilitary, for most of them were ex-soldiers, and on the whole they were good workers. The greatest advantage was that they were attached to the ammunition companies and could be taken wherever the company moved, so that labor was a more or less constant factor instead of a variable one.[55]

Forward ASP's normally stocked two units of fire of artillery ammunition and one unit of fire for all other weapons. Reserve ASP's doubled that amount, but this target was raised or lowered whenever availability of transportation, capability of resupply, or previous battle experience dictated a change. Issues were made to the combat forces according to the system used in North Africa, that is, upon the presentation of a transportation order signed by the division ammunition officer or special unit ammunition officer certifying that the ammunition was required to replace a like amount expended in combat and was not in excess of the unit's basic load.[56]

By 9 November 1943, two months after the landing at Salerno, theater stocks of Ordnance Class V supplies, built up on the basis of ten units of fire at the base section for all weapons, reached the astronomical figure of 320,500 long tons. Though shortages in certain types of artillery ammunition, especially for the 105-mm. howitzer, were already causing some anxiety, there was hope at Fifth Army headquarters that better transportation, the ironing out of difficulties in setting up the Peninsular Base Section, and the substitution of actual theater experience on daily expenditures of artillery ammunition (1/3 of a unit of fire) for the War Department's estimate (1/4 of a unit of fire) would soon solve the problem of resupply.[57]

The Search for Better Organization

The Allied advance was stopped temporarily in mid-November by mountainous terrain, the stubborn resistance of the enemy, and the rains, which, increasing since October, had swelled the Volturno River, deepened the mud, and made life miserable for the weary troops. General Alexander ordered Fifth Army to halt its attack for two weeks. Colonel Niblo took advantage of the lull to reorganize his Fifth Army Ordnance Service. He had never given up the idea of a forward group headquarters to control all army third echelon maintenance and supply support of combat troops, and the arrival of the newly organized 2630th Ordnance Battalion gave him a headquarters to use for this purpose. Obtaining approval from NATOUSA to reorganize the battalion under TOE 9–312 as a group headquarters commanded by a full colonel, he placed under the 2630th the 42d, 45th, 188th, and 87th Battalions, and also the French third echelon battalion, the 651st Maintenance Battalion, which had been organized to operate Ordnance support for French troops. To com-

[55] (1) Niblo Rpt, 13 Dec 43, Incl 1. (2) Meade, Ammunition Supply in the Mediterranean Theater of Operations, p. 268.

[56] (1) Niblo Rpt, 2 Oct 43, Incl 2. (2) Petersen, Rpt 14 Feb 45.

[57] (1) History Ord Service MTO Nov 43–Nov 45, vol. II, ch. VII, OHF. (2) Ltr, CG Fifth Army to CG Peninsular Base Sec, 24 Nov 43, sub: Ammunition Supply, Incl 5 to Niblo Rpt, 28 Nov 43.

mand the forward group headquarters he selected Lt. Col. George L. Artamonoff, who had for most of the past year been working with the French Rearmament Commission in Algiers.[58]

Another and more sweeping reorganization took place a few weeks later. Colonel Niblo again brought Colonel Rose into his main command headquarters as executive and converted the 6694th Group, now commanded by Lt. Col. William H. Jaynes, into a field headquarters charged with all fourth echelon maintenance, supply, evacuation, distribution, and salvage within Fifth Army. The change brought the command of all Ordnance groups and battalions directly into Niblo's hand; it was now plain that delegating authority to the commander of the 6694th Group had been a mistake. The introduction of the group headquarters between the Ordnance officer and the battalion commanders had resulted in the multiplication of paper work and in conflicting orders to battalions. It had also slowed the reaction time of Ordnance supply service. Often weaknesses in the service had attained formidable proportions before Niblo was aware of them.[59]

Part of the trouble in the earlier organization had been caused by dissension between Colonel Rose as commander of the 6694th Group, and Colonel Moffitt, Niblo's staff officer for maintenance and supply. One lesson learned in these early campaigns was that "the military art is a most personal one."[60] Rose worked hard, but was considered un-co-operative by several of his closest colleagues; Moffitt was able, but was described by a fellow officer as having "a genius for irritating people." On one occasion the Fifth Army G–2 reported Rose and Moffitt for their language to each other over the telephone. In January 1944 both men were forced to leave Fifth Army Ordnance office because of illness. Moffitt, suffering from jaundice and overwork, came down with pneumonia and was taken to the hospital in Naples, where he died in March. Rose contracted dysentery and was transferred to an easier job as Ordnance officer of Northern Base Section in Corsica, which had been captured by the Allies in October and was being developed as an air base.[61]

Personalities aside, it was no easy matter to evolve an efficient Ordnance command organization in Italy at that stage of the war. The best Niblo could do during the first winter of the Italian campaign was to obtain from NATOUSA authority to activate a new group to use as headquarters—the 2660th Ordnance Group (Provisional), organized on 7 January 1944 at Caserta, in the baroque royal palace (the Versailles of Naples) occupied by Fifth Army headquarters. The group provided an adjutant and better organization, though it did not increase the size of Niblo's staff. The Ordnance Section was simply transferred to the 2660th on temporary duty, while remaining assigned to the Headquarters and

[58] (1) Army Ordnance Admin Instr 21, 25 Nov 43. (2) Ltr, Detwiler to Crawford, 26 Nov 43, MTO Ord Sec 319.1, KCRC. (3) Artamonoff Interv. (4) Crawford Interv.

[59] (1) Army Ordnance Admin Instr 28, 10 Dec 43. (2) Ltr, Crawford to CofOrd, 29 Feb 44, sub: Technical Information Letter No. 19. (3) Ltr, McGrath to Crawford, 16 Dec 43, MTO Ord Sec 319.1, KCRC.

[60] Truscott, *Command Missions*, p. 546.

[61] (1) Artamonoff, Crawford, and McGrath Intervs. (2) Ltr, McGrath to Crawford, 16 Dec 43, MTO Ord Sec 319.1, KCRC. (3) O.O.B. 118, Incl 1, Niblo Rpt, 3 Apr 44. Moffitt was promoted to full colonel the day before he died; Niblo was with General Clark when he pinned on Moffitt's eagles in the hospital. *Ibid.*

Headquarters Company, Fifth Army (T/O 200–1). It was far from an ideal solution. Niblo came to feel that an army Ordnance brigade was the answer, with the brigade commander to administer a small staff section at army headquarters as well as to command all Ordnance groups. But brigade organization, early advocated by Maj. Gen. James K. Crain, had been disapproved by the General Staff and was not achieved during World War II.[62]

With the few men allotted in T/O 200–1, the 2660th Group operated through four office divisions: one for maintenance and general supply, one for ammunition and bomb disposal,[63] one for administration, and one for operations and inspection. It controlled three large field headquarters, furnishing ammunition, third echelon maintenance and supply, and fourth echelon support to Fifth Army. The whole organization contained nearly seven thousand men, including some of the French units that had been coming into Italy from North Africa since mid-December. The field headquarters were also using thousands of Italian civilian laborers for maintenance work as well as for Class II and IV and ammunition supply.[64]

Niblo announced in a bulletin that the January reorganization was to be the last one. This announcement was received with joy by officers in the field who had found it hard to adjust to the many changes that had taken place since October. One of them commented, "This is a historic moment, and I think long overdue—so hope it sticks."[65] It did stick, in essentials, though some changes were later made. The most important took place in May 1944, when the 2630th Ordnance Battalion (Provisional) became the 53d Ordnance Base Group, the 6694th Ordnance Group (Provisional) became the 55th Ordnance Base Group, and the 56th Ordnance Base Group was activated to control the army ammunition battalions, relieving the 62d Ordnance Ammunition Battalion of the dual function of group and battalion.[66]

Later changes were made necessary by the departure of units to the European Theater of Operations, but the pattern of organization remained the same—that of having one field headquarters to operate third echelon service, another, fourth echelon supply and evacuation, and a third, ammunition. The 2660th Ordnance Group (Provisional) remained the command headquarters through the rest of the Italian campaign, twenty long months, including two winters.[67]

[62] (1) Niblo Rpt, 13 Jun 44, Incl 1. (2) Hq Fifth Army GO 2, 7 Jan 44. (3) Brig Gen Urban Niblo, Lessons of World War II, OHF. (4) Crain "Ordnance in the Field," *Ordnance,* XXXIX (Sep–Oct 54), p. 329.

[63] The removal of unexploded bombs was the responsibility of the Base Section Ordnance officer. At first the main job was removing bombs (German and Allied) from Naples and other ports; but later, as the skies were cleared of German aircraft, the bomb disposal men were used to destroy uncertain ammunition in captured enemy dumps. Bomb disposal squads (1 officer and 6 enlisted men each) were attached to the Fifth Army Ordnance ammunition battalions for administration and supply. See History Ord Service MTO, vol. II, ch. VII, p. 323; and Niblo Rpt, 17 Apr 44, Incl 2.

[64] (1) Niblo Rpt, 22 Jan 44, Incls 3 and 5. (2) Fifth Army Station List 13 Dec 43, 10, 17 Jan 44. (3) Ltr, Crawford to CofOrd, 29 Feb 44, sub: Technical Letter No. 19.

[65] Ltr, Detwiler to Crawford, 25 Jan 44, no sub, MTO Ord Sec 319.1, KCRC.

[66] (1) Niblo Rpt, 30 May 44. (2) From the two forward groups, the 53d and 56th, the word "Base" was later dropped because it was a misnomer, Niblo Rpt, 25 Jul 44.

[67] (1) Niblo Rpts, 12 Jul 44, Incl 3; 25 Jul 44, Incl 9. (2) Brig Gen Urban Niblo, Lessons of World War II.

In November 1943 General Coffey criticized the Fifth Army Ordnance organization for having too much fourth echelon service. Army then had eleven heavy maintenance and four depot companies located not very far from Naples, where the Peninsular Base Section was being organized; theoretically army would not need so much heavy maintenance, and the situation created the danger of undue dispersion of spare parts, already a "serious headache." [68] Nevertheless, Niblo, bolstered by the recommendations of Fifth Army ground force Ordnance officers that he retain full control of such service, went ahead with plans to establish a large base shop and depot in the army area. By late January Colonel Jaynes's 6694th base group had three strong battalions: a supply battalion, the 5th; a battalion for evacuation and salvage, the 87th; and a heavy maintenance battalion, the 197th.[69]

It was fortunate that Niblo established his big army rear area, for Peninsular Base Section was not able to furnish adequate support for several months. Locating and establishing working space in crowded and rubble-strewn Naples took time. Base section Ordnance units and equipment were slow in arriving. In January the Peninsular Base Section in Naples had only three heavy maintenance companies, and one of them was on loan from Fifth Army. The most urgent job of PBS Ordnance units in the early months was not fourth echelon work but vehicle assembly and third echelon repair of the thousands of trucks used in rehabilitating the port and the city. Effective Ordnance fourth echelon maintenance support of the army was not available in the PBS until the middle of February 1944; there was no fifth echelon support until the following July.[70]

Near Capua, an old fortress town on Highway 7 on the Volturno River, Colonel Jaynes operated a large field arsenal housed in Italian Army buildings and manned by men who were veterans by now of several campaigns, men who, according to General Clark, "had discovered the hard way that necessity is the mother of invention." Jaynes's mechanics, helped by hundreds of Italian civilians and by the concentration of machine tool equipment, rebuilt weapons and vehicles and manufactured parts and special equipment on a mass-production basis. One example of a big industrial operation was the brake repair work done in the shop on trucks and jeeps whose brakes had been damaged by the mud that piled up on highways after the torrential rains of late 1943. In early 1944, the Capua Arsenal handled many more crises on the Cassino front in the grueling months of mountain fighting, which General Clark called "the most difficult months of the entire campaign." [71] Beginning in late January the arsenal also had to help solve some of the unprecedented problems of the Anzio beachhead.

[68] Ltr, Brig Gen John W. Coffey to Col Niblo, quoted in Niblo Rpt, 9 Nov 43. For support of this position in the United States, see Report of G–4 Conference on Organization for Maintenance, Maintenance Doctrine and Policies Governing the Distribution of Spare Parts, held 26 February 1944, ASF Maint Div 451.9.

[69] (1) Niblo Rpts, 9 Nov 43; 20 Nov 43. (2) Organization Chart, 20 Jan 44.

[70] (1) History Peninsular Base Section, North African Theater of Operations United States Army, vol. II, 28 Aug 43–31 Jan 44, ch. 18, KCRC. (2) Petersen Rpt, 14 Feb 45. (3) McGrath Interv. (4) History MTO Ord Service, ch. IV, pt. 3, p. 96, OHF.

[71] (1) Clark, *Calculated Risk*, pp. 342, 334. (2) Petersen Rpt, 14 Feb 45. (3) Crawford Interv.

CHAPTER XI

Anzio and Artillery

An American Ordnance unit that could boast a battle history dating back to Tobruk blamed its presence at Anzio on its proclivity for always being in the worst place at the worst time. At Anzio and Nettuno, two neighboring resort towns on the coast south of Rome, the Allies were pinned down by the Germans for four months on a small beachhead about seven miles deep and fifteen miles wide. Every inch of it was under German artillery fire. Nobody was safe. Depot men, repairmen, truck drivers, clerks, all were as likely to be hit as a man in the front lines. The very sidewalks of Anzio had shell holes in them. Military police were occasionally killed while directing traffic. In the first two months Ordnance lost 14 men killed and 78 wounded. The total battle casualties for the whole period at Anzio, 22 January–24 May 1944, were about 5,000 killed in action and nearly 16,000 wounded.[1]

Prime Minister Churchill, who by mid-December 1943 had become convinced that only an amphibious end run around the German Winter and Gustav Lines could break the "scandalous" impasse on the Italian front, needed all of his famous powers of persuasion to get the Combined Chiefs of Staff to agree to an amphibious landing in the Anzio-Nettuno area about a hundred miles north of Naples.[2] The Allied generals might have been more enthusiastic about the operation, known as SHINGLE, had they been permitted a really strong force of at least three divisions, but the scarcity of landing craft limited SHINGLE to two: the British 1st Division and the U.S. 3d Division, both under VI Corps.[3]

The landing early on the morning of 22 January 1944 went off well. The weather was good, and the only enemy forces encountered were a few outposts, some drunken Germans riding in a staff car, and a battalion or so of panzer grenadiers sent to Anzio for a rest, many of whom were captured in their beds. Anzio and Nettuno, with their pink and white villas and seaside hotels rising from a beach about three miles long, were like ghost towns because after the invasion at Salerno the Ger-

[1] (1) Martinez, "Saga of the 'Great 525th,'" p. 328. (2) Pyle, *Brave Men*, pp. 159, 161. (3) History Ord Service MTO, ch. IV, pt. 2, p. 82, OHF. (4) Truscott, *Command Missions*, p. 550. (5) DA Rpt, Army Battle Casualties and Non-battle Deaths in World War II . . . 7 Dec 41–31 Dec 46, p. 92, OCMH.

[2] Churchill, *Closing the Ring*, pp. 427–29.

[3] Intervs, Sidney T. Mathews and others with Field Marshal Alexander, Gen George C. Marshall, Gen Mark W. Clark, Maj Gen John P. Lucas, and Brig Gen K. W. D. Strong, all in Misc 314.82 Interviews — Mediterranean by Mathews, Smyth and Watson, OCMH. Field Marshal Albert Kesselring, German commander in Italy, told a newspaper correspondent in January 1946 that the Allies' "basic error" at Anzio was using "a halfway measure as an offensive." Truscott, *Command Missions*, p. 550.

mans had evacuated the civilians from the strip of land, about twelve miles in depth, behind the coast. Beyond Nettuno in the American sector were farmlands reclaimed from the Pontine Marshes in Mussolini's heyday, a resettlement project on which canals had been dug and modern farmhouses, community centers, and straight, tree-lined roads had been built.[4]

Here the advance was halted at the end of January. With astonishing speed the Germans brought in divisions from northern Italy, France, and elsewhere, while still holding at Cassino. Thus the Anzio operation did not accomplish its main objective, which was to draw off enough German divisions from the Cassino front to allow the Allies to make a quick breakthrough there. Bitterly frustrating months were in store for the Anzio force until the build-up for the May 1944 drive on Rome was completed. Though the force was not strong enough to break out of the beachhead, it did hold under fierce counterattacks, and throughout the spring managed to contain more than a dozen German divisions that might otherwise have been used against the Normandy landing or on other Allied fronts. This, and the heavy German losses in men and supplies, seemed to Allied commanders to be worth the high cost of Anzio.[5]

Supporting an embattled beachhead for months on end called for careful planning. One innovation that saved much time on resupply was introduced into the Mediterranean theater by Col. Ralph H. Tate, Fifth Army G–4. Trucks (2½-ton) were packed with five tons each of either ammunition, POL (petrol, oil, and lubricants), or rations— one type to a truck— at Naples, then backed into LST's. When they arrived at Anzio they ran straight from the LST's to the dumps, discharged their cargoes, and returned to an empty LST to be sent back to Naples, refilled with supplies, and dispatched on the next turnaround. A truck-loaded LST could be emptied in about an hour, instead of the twelve hours usually required for a bulk-loaded LST; consequently it was in that much less danger of being shelled and bombed; also, the speed of the operation made for great flexibility, since VI Corps could ask for specific supplies one morning and receive them the next. Artillery, heavy engineer equipment, and build-up supplies came in on Liberty ships and were unloaded by DUKW's and LCT's. Intelligent planning made it possible to land from Libertys and LST's an average of almost 4,000 tons of supplies a day between January and May.[6]

By the end of January, when the 45th Infantry Division and the 1st Armored Division (less Combat Command B) had

[4] (1) Truscott, *Command Missions,* pp. 309–10. (2) Morison, *Sicily–Salerno–Anzio,* p. 341. (3) David Interv.

[5] (1) Eisenhower, *Crusade in Europe,* p. 213. (2) Truscott, *Command Missions,* pp. 550–51. (3) For the Anzio operation as a whole see Blumenson, Salerno to Cassino, MS, OCMH. (4) Rpt, Gen H. Maitland Wilson, 16 Apr 45, sub: Allied Commander's Dispatch—Italian Campaign 8 Jan–10 May 44, 95-ALI-0.5 (hereafter cited as Wilson Rpt, 16 Apr 45).

[6] (1) Intervs with Brig Gen Ralph H. Tate and Col Edward J. O'Neill, G–4 VI Corps, by Sidney T. Mathews, OCMH. (2) RED VAULT Fifth Army Hist Rpt G–4 Sec, Dec 43–May 44 (Phase IV). (3) Wilson Rpt, 16 Apr 45. (4) The practice of loading trucks in advance in order to speed the unloading of LST's was used in the South and Southwest Pacific beginning in June 1943. John Miller, jr., *CARTWHEEL: The Reduction of Rabaul,* UNITED STATES ARMY IN WORLD WAR II (Washington, 1959), p. 178.



THE ANZIO-NETTUNO AREA

been brought from Naples, the Allies had at Anzio a force of 68,886 men, 508 guns, and 237 tanks.[7] Fascinated by "the steady thundering flow of heavy war traffic," Ernie Pyle stood by a road near Anzio one day and noted, "of the first twelve vehicles that passed each was something different. There was a tank, and a great machine shop on heavy tractor treads that shook the earth as it passed, and a jeep of a one-star general, and a 'duck,' and a famous American six-by-six, and a prime mover trundling the great Long Tom gun with its slim, graceful barrel pointing rearward. Then came a command car, and a stubby new gun covered with canvas—on four rubber-tired wheels—and an ambulance, and a crew of wire stringers, and a weapons carrier. Then a big self-propelled gun on tractor treads, and finally another duck to start the heterogeneous cycle over again." [8]

Anzio was a good test of the flexibility of the Fifth Army Ordnance organization. On 27 December 1943 Colonel Niblo informed the officers of the 45th Ordnance Battalion—the forward battalion support-

[7] Wilson Rpt, 16 Apr 45.

[8] Pyle, *Brave Men*, p. 187.

ing VI Corps—that they were going to handle Ordnance service at Anzio. Only the headquarters was nominated to go. The companies then under the battalion were relieved, and Maj. Marshall S. David, commanding officer of the battalion, was allowed to select the companies he wanted. He selected from the 42d Battalion the 14th Medium Maintenance Company, which was already supporting the 3d Division; from the 87th Battalion, the 45th Medium Maintenance Company, a good all-around company; from the 188th Battalion, the 3407th Medium Maintenance Company (Q), experienced in the maintenance of DUKW's; from the 197th Ordnance Battalion, a detachment of the 525th Heavy Maintenance Company (Tank); and from the 62d Ammunition Battalion, the 66th and 58th Ammunition Companies. In the assault wave, only the ammunition companies went in entire; the maintenance companies were represented by small advance detachments totaling a hundred men, nearly half of them for DUKW maintenance. The rear detachments were scheduled to proceed overland and join their units as the attack progressed toward Rome.[9]

When it became obvious that the operation was not going according to plan, the rear detachments were hastily loaded on LST's and brought to the beachhead, arriving in the middle of a storm four days after D-day. The combat troop build-up a few days later of another infantry division, half an armored division, and additional field artillery, tank destroyer, and antiaircraft battalions made it necessary for Niblo to add to his Ordnance strength another medium maintenance company skilled in artillery maintenance, the 101st, an antiaircraft maintenance company, the 262d, and a depot company, the 77th. He also sent in a detachment of the 476th Tank Evacuation Company and a platoon of the 2622d Tank Transporter Company to provide wrecker service for tanks mired in muddy fields or immobilized by mines. Anzio by then had 1,886 Ordnance men, of whom 73 were officers.[10]

Major David, who landed on the evening of D-day, gave Maj. Madison Post, his maintenance officer, the job of supervising dewaterproofing, and set up the 45th Ordnance Battalion headquarters and the Ordnance depot in a group of buildings arranged in a quadrangle around a courtyard, a compound formerly used by an Italian Army elite corps. Parts were stored in the horse stalls of the stables. Profiting by his experience at Salerno, when he had to break crates open in order to find out what was in them, David had ordered an inventory in a waterproof envelope to be tacked onto each box of supplies; he carried with him a master packing list showing the part number, correct nomenclature, quantity, and box number of each item shipped. This master list was extremely useful in operating the depot.

Across the field from the compound, the 45th Medium Maintenance Company was bivouacked around a villa with palm trees. The men of the 525th Tank Mainte-

[9] (1) Memo, Detwiler, CO 45th Ord Bn, for Ordnance Officer Fifth Army, 7 Apr 44, sub: Ordnance Operations in the Anzio Beachhead (hereafter cited as Detwiler Rpt), in Personal Papers of Marshall S. David (hereafter cited as David File). (2) David Interv. (3) Niblo Rpt, 22 Jan 44, Incls 1 and 5.

[10] Niblo Rpts, 5 Feb, Incl 1; 21 Feb, Incl 3; and 4 Mar 43, Incl 2.

nance Company found some buildings at Nettuno with concrete floors that made them ideal for shops; and the 3407th Medium Maintenance Company (Q) set up its DUKW shop area on hard ground north of Nettuno. The 14th Maintenance Company, supporting the 3d Division, was closer to the front than any other company, but nowhere was the front far away. From the roof of the compound Major David could see the front lines and the hills from which the German artillery was methodically shelling the beachhead.[11]

The heaviest maintenance job for the first two weeks was DUKW repair. Three hundred American DUKW's were used to land supplies from the Liberty ships anchored far offshore. So many were put out of commission by slippery and congested roads, night driving and unloading, rough weather, enemy action, and carelessness on the part of drivers, that the one DUKW repair company was swamped and had to have help from other Ordnance maintenance companies. Fortunately on this strange topsy-turvy front, where no rules seemed to apply, truck maintenance was not a serious problem. Distances were short, the traffic within the beachhead was severely restricted, and the turnaround trucks that came in on the LST's were serviced in Naples. Fortunately also, Ordnance supplies were plentiful compared with those on other battlefronts. Fifth Army, expecting VI Corps to break out of Anzio in a few weeks, had set the supply level at fourteen days. Major David (with Niblo's tacit consent) had gone far beyond this level, requisitioning at the beginning for thirty days from Naples, sixty days from North Africa, and ninety days from the United States. The supply position was strengthened further in early February when Fifth Army took over resupply, until then handled by VI Corps.[12]

Supplies were adequate and supply distances were short, but the success of the support operation depended largely on careful planning by Ordnance officers and the initiative and adaptability of Ordnance troops. Entrenching their vehicles and equipment, the troops worked under front-line conditions at any jobs that came their way: repairing DUKW's, fighting fires at ammunition dumps, doing guard duty at Fifth Army headquarters, practicing to convert themselves into combat troops in case of an enemy breakthrough. For its important contribution to the landing and early operations at Anzio, Fifth Army Ordnance Service received the thanks of the VI Corps Ordnance officer and the congratulations of General Clark.[13]

The Ordnance men slept, whenever they were able to sleep in the noise and frequent alerts, wherever they could. At first they tried abandoned houses and apartments, which offered protection from the cold, damp, sometimes snowy weather,

[11] (1) David Interv. (2) Detwiler Rpt. (3) Ltr, Crawford to OCO, 7 May 44, sub: Technical Information Letter #21, KCRC.

[12] (1) Detwiler Rpt. (2) Rpt of Survey of Automotive Spare Parts Situation in NATOUSA and ETOUSA Jan 44–Mar 44, ASF Planning Div, Theater Br. (3) David Interv. After the beachhead became stabilized, Colonel Tate raised the supply level to 30 days, and increased it to 40 days just before the drive on Rome. Interv, Mathews with Tate. (4) Comments enclosed in Ltr, Lt Col Marshall S. David (USAR, Ret), to Brig Gen Hal C. Pattison, 11 Oct 63 (hereafter cited as David Comments). A huge salvage dump was also established at Anzio. *Ibid.*

[13] Ltr, Lt Col Walter G. Jennings to Ord Off, Fifth Army, 11 Feb 44, sub: Appreciation, and 1st Ind, David File.

but soon found they had to go underground in foxholes, slit trenches, and wine cellars. The billets of the 77th Depot Company, for example, ranged all over Anzio—"From deep caves 40 feet underground at the water's edge, through old wine cellars two levels below the street, through rooms in an old medieval fort, through a magazine in an open field filled with Italian high explosives, to the billet of a couple of second looeys on the top floor of the tallest building on the highest hill in the town of Anzio." [14]

Paradoxically in this strange place, the safest company was the one nearest the front lines because most of the German fire passed over it, to fall on the harbor and port; also, the company at the front had room to disperse. In the crowded area around Anzio-Nettuno were the heaviest Ordnance casualties and the worst cases of "Anzio Anxiety" or "Nettuno Neurosis," caused by the strain of constant shelling and bombing, added to overwork. One night 50-kilo bombs fell near the spot where two officers of the 45th Medium Maintenance Company were sleeping on cots. One was wounded; the other suffered such a case of shock that he had to be evacuated from the beachhead. At the end of February Major David was relieved and sent down to the Fifth Army Rest Center at Sorrento. He found it difficult to forget "the nightmare of the past month." [15]

On 1 March Niblo sent Lt. Col. John G. Detwiler from the Cassino front to Anzio to succeed Major David as commander of the 45th Battalion. In March a small detachment from the 2660th Ordnance Base Group (Provisional) headquarters also arrived to serve as an Ordnance advance command post. Early in May Colonel Detwiler was given command of all Ordnance troops at the beachhead, including an ammunition battalion that had been sent forward from Naples.[16]

The Ammunition Dumps

One of Major David's greatest worries had been his ammunition dumps. Until 2 February he had no battalion ammunition officer and never had enough men to handle the vast quantities of ammunition that poured into the beachhead from D-day on. Of all the cargo aboard the truck-loaded LST's 60 percent was ammunition, and more (about one-fourth of the total amount received) came in on Liberty ships, LCT's, and LCI's (landing craft, infantry). The field storage of ammunition was perhaps the most critical problem for Ordnance at Anzio.[17]

By mid-March 1944 about 40,000 tons were on the ground in a small area, exposed to enemy bombing and shellfire. On D-day the 66th Ammunition Com-

[14] (1) Quote from Lt. John Delehanty, "Company A, Anzio," April–May 1945 issue of *Firepower*, quoted by permission of the Editors, American Ordnance Association, Washington, D.C. (2) Lt. Norman L. Holland, "A Day on Anzio," *Firepower* (October 1944). (3) Lt. Clyde L. Lerner, "Bivouacs," *Firepower* (April–May 1945), p. 11.

[15] (1) Detwiler Rpt. (2) Ltr, Maj Marshall S. David to Mrs. Marshall S. David, 1 Mar 44, David File.

[16] (1) Ltr, Col D. J. Crawford to OCO, 7 May 44, sub: Technical Information Ltr #21. (2) Niblo Rpt, 19 Mar 44, Incl 1. (3) O.O.B. 187, 27 May 44.

[17] (1) History Ord Service MTO, ch. IV, pt. 2, pp. 85, 88. (2) At first the commanding officer of the 58th Medium Maintenance Company acted as battalion ammunition officer. He was succeeded by the maintenance officer of the 45th Battalion, who had had ammunition experience in North Africa. David Comments.

pany opened a large ammunition supply point, capacity about 20,000 tons, a mile north of Nettuno, and during February that company and the 58th Ammunition Company, broken down into detachments, opened and operated four more, each with a capacity of from 1,600 to 6,000 tons. Working under combat conditions, the men manhandled enormous quantities of the heavy and dangerous material. Between 22 January and 31 March nearly 86,000 long tons were brought to the ASP's.[18]

It was a bigger job than two companies could manage. The ammunition men were mostly clerks accustomed to depending for labor on their attached Italian labor companies. David had been refused permission to bring in Italians during the assault phase;[19] and only about fifty civilians were available at Anzio. Some help came from the Cassino front on 2 February, when Niblo sent to Anzio 300 men from the Italian labor companies and Capt. James F. Fisher and three enlisted men from the 62d Ammunition Battalion, but this was still not enough. Following a complaint to army by Maj. Gen. Lucian K. Truscott, Jr., who took over command of VI Corps on 23 February, of "deplorable conditions" in the ammunition dumps, Niblo sent to Anzio the 684th Ammunition Company, accompanied by its attached labor company of 140 Italians.[20]

The arrival of the 684th meant that three-fifths of the ammunition troop strength of Fifth Army was now at the beachhead, since only two out of five companies remained with the 62d Ammunition Battalion on the Cassino front. It soon became evident that an ammunition battalion headquarters would have to be brought forward. None was available. Niblo solved the problem by converting to ammunition work his 87th Battalion headquarters, then administering evacuation and fourth echelon automotive repair at Capua. Transferring its companies to the 197th Ordnance Battalion, he dispatched the 87th headquarters to Anzio on 10 March and attached to it the three ammunition companies at the beachhead. He named Captain Fisher (soon promoted to major) the commanding officer and gave him Capt. Paul S. Blandford, Jr., of the 62d Ammunition Battalion as his executive and "Fire Chief."[21]

A fire occurred in one or the other of the dumps nearly every night, beginning on 7 February, when the first ASP was hit, until late May. The men fought the first fires with hand shovels and dirt, the only equipment they had. Later they got some 40-gallon foamite fire extinguishers and mounted them on half-tracks so they could get closer to the blaze. But it was the tankdozer that saved the day.[22]

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[18] History Ord Service MTO, ch. IV, pt. 2, pp. 82, 85–88 and apps. C, D.

[19] David Interv. One heavy maintenance company commander was so determined to take his Italian laborers with him that he smuggled them aboard his LST disguised as GI's. Lt. O. B. Rosstead, "Italian Labor," *Firepower* (December 1944), p. 14

[20] (1) Rpt, Capt James F. Fisher, Ammunition Supply at the Anzio Beachhead (hereafter cited as Fisher Rpt), 1 Apr 44, Annex 3 to O.O.B. 140. (2) Truscott, *Command Missions*, p. 339. (3) Fifth Army Main Headquarters to CG Fifth Army Rear (2660th Ordnance Group), 28 Feb 44, Incl 2 to History 62d Ord Ammunition Bn for Feb 44.

[21] (1) Niblo Rpt, 19 Mar 44. (2) O.O.B. 11, 12 Mar 44. (3) Crawford, Technical Information Letter #21. (4) History Hq and Hq Det 87th Ord Bn 1944.

[22] (1) History Ord Service MTO, ch. IV, pt. 2, pp. 90–94. (2) History Hq and Hq Det 87th Ord Bn, Apr and May 44. (3) O'Neill Interv.

Fighting fires with tanks, which protected the men, had first been tried in Tunisia. At Anzio Maj. John Merrill, VI Corps ammunition officer, suggested putting a bulldozer blade on the front of a tank to scoop up the dirt.[23] Early in April Niblo turned the problem over to his 197th Ordnance Battalion at Capua. Its heavy tank maintenance companies got bulldozer blades from the Engineers and welded them to M4 tanks and T2 tank recovery units (M3 tanks equipped with cranes). Four of these units were shipped to Anzio and distributed among the ammunition dumps hardest hit by fires. They were an immediate success, smothering fires with dirt and extinguishing those that could not have been controlled any other way. In May Niblo was able to obtain from the Engineers kits for installing bulldozer blades on M4 tanks. The kits had been designed in the United States for modifying tanks so that they could excavate mines, and had just arrived in the theater.[24]

The tankdozer led to the development of the L-shaped storage bunker. In Anzio's dangerous and limited area, where proper dispersion was not possible, the first requirement was to keep fires from spreading from one stack to another. At first straight trenches were dug, but they were often flooded, since the water table at Anzio was very near the surface. Also, there was not enough space between the trenches to fight fires effectively. Captain Blandford developed a system of storing all ammunition above ground in a series of L-shaped dirt bunkers, each containing about 30 tons, with the corner of the L toward the enemy artillery positions for better protection against shellfire. Along the sides were piled large quantities of loose soil that could be pushed by a tankdozer over a burning stack.[25]

After the tankdozers went into action in April, manned by courageous volunteers from the Ordnance ammunition companies, losses fell from an average of 40 tons per fire to 10 tons. For the whole Anzio period only 3,807.9 tons were lost by fire. Casualties from this source were remarkably light. On 17 March 1944 Pfc. Gordon J. Eigenberger, a first-aid man of the 87th Battalion's medical unit, was killed by exploding 155-mm. shells when enemy bombs started a fire in the ASP north of Anzio, but no other deaths were caused by fires in the dumps. Thirty ammunition men were wounded by shells or personnel bombs—thin-case bombs full of small shot that scattered widely when the bomb burst. Three men of the 66th Ammunition Company were killed on 12 February by personnel bombs dropped on their bivouac area.[26]

In spite of dangerous working conditions and storage problems in the dumps, about 52,000 long tons of ammunition had been issued by the end of March. Most of it was artillery ammunition. During the major German offensive, from 16 to 20 February, prisoners taken by the Allied

[23] (1) See above, p. 159. (2) O'Neill Interv.

[24] (1) Niblo Rpt, 26 Jun 44, Incl 5, Fire Fighting Equipment for Ammunition Supply Points. (2) Ltr, Maj Arra S. Avakian, Ord Sec Hq NATOUSA, to OCO, 29 May 44, sub: Mine Exploder, T1E3; First Interim Report on Field Test of Two in NATOUSA, O.O. 476/1083.

[25] (1) History Ord Service MTO, ch. IV, pt. 2, pp. 89, 91, 94. (2) Mathewson Rpt. (3) Lt. Col. John G. Detwiler, "Ordnance at Anzio," *Army Ordnance*, XXVIII, 148 (January–February 1945), p. 101. (4) "Ordnance Roll of Honor," *Army Ordnance*, XXIX (September–October 1945), p. 253.

[26] (1) History Hq and Hq Det 87th Ord Bn, 1944. (2) David Interv. (3) Fisher Rpt.



TANKDOZER USED TO FIGHT AMMUNITION DUMP FIRES, ANZIO

forces said that the "terrific" and "continuous" artillery fire of the Americans caused heavy casualties, cut off food supplies and communications, and brought some units to the verge of panic. At the peak of the attack, for every shell the enemy artillery fired, VI Corps threw back from ten to twenty. The artillerymen of one of the Long Tom batteries, veterans of Tunisia, Sicily, and the Salerno-Cassino operation, told Ernie Pyle that they had fired more rounds "sitting there in one spot on the Anzio beachhead" than they had in the entire year preceding, and that another battery had fired more in four hours one night than in the previous eight months. A tremendous supply of ammunition was needed to offset the advantage the Germans had in possessing guns of longer range and larger caliber.[27]

Anzio Annie and the Clamor for Heavier Artillery

At the end of the first week of February 1944 the men at the beachhead heard the "thundering scream," as they described it, of enormous German shells, the largest the

[27] (1) History Ord Service MTO, ch. IV, pt. 2, p. 85. (2) Pyle, *Brave Men*, p. 175. (3) For official German reports, beginning 3 February, on the Allies' "accurate and strong artillery, which is abundantly supplied with ammunition," see German Military Document Section, Military Intelligence Div, War Dept, The German Operation at Anzio (hereafter cited as German Mil Doc Sec Rpt on Anzio), pp. 28ff., OCMH.

Americans had yet encountered on any front. They saw geysers two hundred feet high when the big shells fell into the sea; they saw thick-walled three-story buildings demolished, an ancient Roman cave split open, a whole cemetery plowed up, "unburying the dead." Ordnance experts studying the fragments determined that the shells were 280 millimeters or 11 inches in diameter and fired from a railroad gun with a range of about 63,000 yards or 36 miles.[28]

By 2 February the Germans had brought down from the north several railroad guns to counter the naval gunfire that Salerno had led them to expect. The largest was the 280-mm. rifle, nicknamed Anzio Annie or the Anzio Express by the Allied troops. With a barrel 65 feet long, Anzio Annie was drawn by a diesel-electric locomotive and accompanied by four cars, one of which bore a turntable on which the gun was mounted to obtain traverse when firing. Another was an air-conditioned car for carrying powder. On 7 February the Germans used 280-mm. guns to shell Allied ships off Anzio and Nettuno. After that date the weather began to clear and the monsters were so vulnerable to air attack that they could probably be used only sporadically if at all. They may have been sent back up the coast as protection against the threat of an Allied amphibious assault at Civitavecchia, which the Germans continued to expect. Two 280-mm. guns were discovered on a railroad siding at Civitavecchia after the fall of Rome. Their names were Leopold and Robert. Leopold was shipped to Aberdeen Proving Ground, where careful study of several unorthodox design features led to the development of the postwar U.S. 280-mm. "atomic gun."[29]

Because of Allied air superiority, railroad guns had to be kept in tunnels most of the time; they were rolled out and fired at night or on cloudy days and then hauled back into the tunnels. Early in March the German High Command offered to send down to Anzio a 280-mm. railroad battery and one even more powerful, a 320-mm. Czechoslovakian railroad battery; but the commanding general of the German *Fourteenth* Army at Anzio reported that no suitable tunnels were available, since the tunnel farthest to the south gave an effective range of only three kilometers in front of the main German line of resistance. Two weeks later the *Fourteenth Army* was expecting a railroad battery of 320-mm. guns, but it does not appear that they ever arrived. The railroad guns most used at Anzio were a battery of 210-mm. kept in a tunnel west of Albano, not far from Castel Gandolfo, the Pope's summer palace.[30]

Every time a shell from a large long-range gun hit the Anzio beachhead, and they continued to hit regularly until the breakout in May, the troops blamed it on Anzio Annie, but the Germans had a formidable array of heavy artillery in addition to the railroad guns: 220-mm. howitzers, 210-mm. howitzers, and 170-mm. guns.

[28] (1) T/Sgt. Milton Lehman, "Anzio Express," *Firepower* (June–July 1945), p. 16. (2) David Interv.

[29] (1) Lehman, "Anzio Express," *Firepower* (June–July 1945), p. 16. (2) Journal of the *Fourteenth Army*, in German Mil Doc Sec Rpt on Anzio, pp. 27, 36. (3) Lt. Col. W. L. Nicholson, *The Canadians in Italy, 1943–1945*, Official History of the Canadian Army in the Second World War, vol. II (Ottawa, 1956), p. 390. (4) Rpt on 280-mm. German gun in OI-343-44 C, Source: Ord Intell Unit D, Ord Tech Intel Files.

[30] (1) Journal of the *Fourteenth Army*. (2) Clark, *Calculated Risk*, pp. 325–26. (3) Truscott, *Command Missions*, p. 337. (4) AGF Board Rpt NATO, No. 126, 2 Mar 44, Field Artillery.



ANZIO ANNIE, *from a German water color.*

The 170's, on surrounding hills, possessing a range of about 30,000 yards, did more damage than the railroad guns. On 16 February, when the Germans began their big counteroffensive, they fired 454 rounds from six 170-mm. guns and only 50 rounds from two 210-mm. railroad guns. On 29 February they had eighteen 170-mm. guns, from which they fired 600 rounds; and on that day they fired only 12 rounds from their 210-mm. railroad guns.[31] The railroad guns were freaks; but Anzio Annie symbolized a bitter truth—the Germans had in the 170-mm. a gun that outranged the best gun the Allies had, the 155-mm. Long Tom, with its maximum range of 25,700 yards. It was at Anzio that the clamor for heavier artillery began.[32]

The 240-mm. Howitzer and 8-inch Gun

On the Cassino front the Allied forces had by 22 February 1944 in addition to sixty 155-mm. Long Toms, twelve

[31] (1) Sidney T. Mathews, "The Drive on Rome," ch. V, p. 73, MS, OCMH. (2) German Mil Doc Sec Rpt on Anzio, pp. 54, 74.

[32] Interv, General Marshall by Lamson, Hamilton, Mathews, and Smyth, 25 Jul 49, OCMH.

240-mm. howitzers, which had a range slightly less than the Long Tom but a projectile more than three times as powerful. The 240-mm. howitzer and the 8-inch gun were the heaviest mobile U.S. artillery weapons. The designers had intended that both use the same mount, in line with the Ordnance Department's policy of pairing a gun (a long-barreled cannon of high muzzle velocity) with a howitzer (a short-barreled cannon of low muzzle velocity, firing shells in a relatively high trajectory) of approximately the same caliber. Next in power in the gun-howitzer pairs were the 155-mm. gun and the 8-inch howitzer, and last were the 4.5-inch gun and the 155-mm. howitzer, which were considered medium, rather than heavy, artillery.[33]

The theater had not requested the 240-mm. howitzers. Early in October 1943 the commanding general of NATOUSA had asked the War Department for 55 tubes for 155-mm. guns, needed because the guns had been fired so much of the time at extreme ranges, necessitating the use of supercharge ammunition, that the tubes were beginning to wear out. In reply to this request, Maj. Gen. Wilhelm D. Styer, chief of staff of Army Service Forces, cabled that the tubes were not immediately available and asked whether the theater could use the 240-mm. howitzer for some missions then assigned to the 155-mm. gun.[34]

At the time, the U.S. commanders in Italy were not eager for the 240-mm. howitzer. General Lucas, then commander of VI Corps, was "doubtful of the value of the 240 howitzer in this country." The Fifth Army Artillery officer thought that both the 240-mm. howitzer and the 8-inch gun would be "quite useful," but that "the road net and mountains make their movement and employment extremely difficult." [35] Nevertheless, the theater agreed to accept two battalions of 240-mm. howitzers and also asked for two battalions of 8-inch howitzers, which had a range of 18,500 yards. The four battalions were to be used "for destruction of field fortifications and to relieve 155-mm. M1 units of many missions which are now causing rapid destruction [of] gun tubes." [36]

Two battalions of 8-inch howitzers were in position on the main Italian front by 20 November 1943 and were immediately successful, especially for close support of infantry, because of their accuracy and power. The 240-mm. howitzers were delayed because the heavy tractor designed to move them was not yet available. The Ordnance Department recommended that the T2 tank recovery vehicle, with modifications, be used. In spite of the Field Artillery Board's objections, the T2 was decided upon, and the 240-mm. howitzers were shipped before the end of 1943.[37]

Successfully moved by the T2 tank recovery vehicle, two batteries of 240-mm. howitzers were in position near Mignano on

[33] Maj. Gen. Gladeon M. Barnes, *Weapons of World War II* (New York: D. Van Nostrand Co., Inc., 1947), pp. 124–39.

[34] Msg, Styer to CG NATO, No. 9745, 9 Oct 43, ASF Planning Div, Theater Br, Class II.

[35] Rpt, Director of Intelligence, ASF, n.d., sub: Report from AGF Board Report, 26 Nov 43, ASF Planning Div, Theater Br, General File 17, Lessons Learned.

[36] Msg, Algiers to WAR No. W 2842/9222, 15 Oct 43, ASF Planning Div, Theater Br, Class II

[37] (1) AGF Board Rpt NATO No. 107, 10 Jan 44, pp. 30–31. (2) Msg, Marshall to Eisenhower No. 2228, 9 Nov 43; also, Msgs and Memos, 15–24 Nov in ASF Planning Div, Theater Br, Class II. (3) Memo, CG ASF for CofOrd, 30 Oct 43, sub: 240-mm. Howitzer and Prime Mover; 1st Ind, 3 Nov 43, in Rpt, OCO Tech Div, 240-mm. Howitzer Materiel, OHF.



240-MM. HOWITZER IN THE SAN VITTORE AREA

27 January and began firing next day. Both battalions of 8-inch howitzers were in action on the Cassino front by the end of the third week in February. Remarkably accurate, with a very small expenditure of ammunition the howitzers demolished important bridges behind the German lines, notably the bridge at Pontecorvo funneling traffic from the south and west into the Liri Valley. They were extremely effective against big buildings in Cassino and other heavy masonry structures, especially when used with the concrete-piercing fuze. According to a British artillery brigadier, the fire of the 240-mm. and 8-inch howitzer batteries was largely responsible for the ultimate reduction of the monastery at Cassino.[38]

The heavy howitzers were ideal for the main Fifth Army front, which was "howitzer country," because they could deliver a heavy weight of explosive on the reverse

[38] (1) Narrative, 698th Field Arty Bn, Feb–Dec 44. (2) AGF Board Rpts NATO, No. 126, 2 Mar 44, and No. 168, 10 Jul 44. (3) Rpt, Col J. M. Roamer, 13 May 44, sub: Ammunition Supply, NATO, ASF Planning Div, Theater Br, General File 17, Folder, Lessons Learned.

slopes of mountains. In operations in the high Apennines after the capture of Rome, Maj. Gen. Alfred M. Gruenther considered the 240-mm. howitzer the most generally satisfactory artillery weapon Fifth Army had. Late in March 1944 twelve 8-inch howitzers and two 240-mm. howitzers were sent from the Cassino front to Anzio. In their first mission they demolished a tower in Littoria, a strong German observation point that the Germans had been using to direct fire on the port.[39]

In such special situations the howitzers were invaluable, but the answer to the German 170-mm. gun was the 8-inch gun, which had a range of 35,000 yards, outranging the 170-mm. by about 5,000 yards.[40] The Caliber Board Report of 1919 had recommended the development of a long-range 8-inch gun along with the long-range 240-mm. howitzer, and the Chief of Field Artillery had asked the Chief of Ordnance in January 1940 to procure pilot models of both, but the Army's interest in heavy artillery had lapsed in the early years of the war when the Germans were demonstrating so spectacularly the effectiveness of dive bombers and tanks. It revived after Tunisia, where the U.S. forces had come up against the 170-mm. gun for the first time. Returning from North Africa, General McNair on 15 May 1943 had stated, "Instead of artillery becoming an arm which is tending to fade out of the picture under the pressure of air power or tanks, it is there in the same strength and importance that it had in the [first] World War." [41] The 240-mm. howitzer, rather than the 8-inch gun, however, received most of the benefit from the renewed interest in heavy artillery.

The 240-mm. howitzer was standardized in the spring of 1943, the 8-inch gun in December 1943. General McNair considered the ammunition for the 8-inch gun unsatisfactory; there was also trouble with the carriage. Though originally it was thought that the same mount could be used for both the heavy howitzer and the gun, the 65-degree elevation for the howitzer could not be accommodated to the plus 10-degree elevation of the gun, and therefore another carriage for the gun had to be devised.[42]

Field Artillery officers wanted to wait until the gun and carriage were improved before sending them to the battlefield. The Ordnance Department took the position that although improvements were desirable, the guns ought to get into action. General Campbell urged General Somervell early in July 1943 to speed the production of the 8-inch gun as well as the 240-mm. howitzer; a few days before Salerno General Barnes, the head of Ordnance's Research and Development Division, told the AGF Ordnance officer that the guns were all right "and not to be using them is wasting a tremendous amount of fire-

[39] (1) Transcript, Telephone conversation with General Gruenther, CofS Fifth Army, 4 Nov 44, Folder, Telephone Conversations of Gen McNarney, CG MTOUSA, 4 Nov 44 to 22 Sep 45, MTOUSA/Office Secretary of General Staff Files, KCRC. (2) O.O.B., 3 Apr 44, Annex 1, OHF. (3) Truscott, *Command Missions,* pp. 338–39.

[40] Barnes, *Weapons of World War II,* p. 137, quoting General Lewis, Fifth Army Artillery officer.

[41] (1) *New York Times,* 16 May 43. (2) See also statement by Brig Gen Robert V. Maraist, Artillery Officer of 1st Armored Div, 16 Jun 43, quoted in OCO Rpt, Heavy Self-Propelled Artillery, 1 Sep 44, p. 65, OHF.

[42] Memo, McNair, CG AGF, for CG ASF, 12 Apr 43, sub: Heavy Field Artillery; and OCM 20328, 17 Mar 43, in Rpt, OCO Tech Div, 240-mm. Howitzer Materiel, OHF.

power which is definitely needed in operations on the continent." [43]

It took Anzio Annie to clinch the argument, for until she spoke the theater was in no hurry for the big gun. When Brig. Gen. Gordon M. Wells, chief of Ordnance's Artillery Division, visited the Cassino front during Christmas week 1943 he noted that the German 170-mm. gun outranged all Allied artillery in the theater, making it necessary to move the 155-mm. guns far forward for effective counterbattery action; that the 8-inch gun would no doubt provide the proper remedy; and that Fifth Army, though still concerned about the transportation problem, intended to request 8-inch guns "as soon as they are ready for issue." [44] A battalion was in fact then ready but it was earmarked for the ETO. Colonel Crawford, Ordnance officer of AFHQ, suggested during the first week of January that some of the big guns might be diverted to Italy, but Maj. Gen. Lowell W. Rooks, AFHQ G–3, replied that though later developments might disclose a need for an 8-inch gun battalion, he could see no prospect of being able to accept such a battalion for several months. Six weeks later, in mid-February 1944, Fifth Army wanted 8-inch guns immediately, to be used by a converted 155-mm. howitzer battalion without waiting until men for an 8-inch gun battalion could be trained and equipped.[45]

Four 8-inch guns arrived in Italy at the end of April 1944 and were assigned to the 240-mm. howitzer battalions. Two went to the Cassino front, two to Anzio. The ammunition for them arrived just in time for the big guns to add their roar to the great salvo from Cassino to the sea that heralded the beginning of the battle for Rome on 11 May. They silenced 170-mm. guns emplaced deep in enemy territory; they harassed areas the Germans had hitherto considered safe; and to intensify the effect on the enemy's morale, Ordnance troops had bored holes in the windshield of the shell to produce a scream. In the Anzio breakout, beginning 23 May, the 8-inch guns shattered power and railway stations in Albano, cratered roads, and generally hampered the retreat of the Germans. In moving the big guns and howitzers forward on both fronts in the drive for Rome, the T2 tank recovery vehicle justified the confidence the Ordnance Department had placed in it. The use of the 8-inch guns and 240-mm. howitzers on the Italian front was nevertheless comparatively brief. After the capture of Rome, the shipment of guns to the high-priority European theater began and by November 1944 none of the 8-inch guns and 240-mm. howitzers were left in Italy.[46]

[43] (1) Memo, General Campbell for General Somervell, 6 Jul 43, sub: Heavy Mobile Artillery, in OCO Rpt, 240-mm. Howitzer Materiel, OHF. (2) Barnes Diary, 4 Sep 43, OHF; and see OCO Rpt. 8" Gun Materiel, OHF. (3) For efforts by Ordnance to get heavy artillery and heavy artillery ammunition into production, see Thomson and Mayo, *Procurement and Supply*, pp. 100–103, 144–45.

[44] Memo, Wells for CofOrd, 5 Feb 44, sub: Report of Observations in the Mediterranean Theater (hereafter cited as Wells Rpt, 5 Feb 44), Folder Gen Wells' Trip to Battle Areas #1.

[45] (1) Msg, Marshall to Eisenhower, No. 6251, 2 Jan 44. (2) Memo, Crawford for G–3 AFHQ, 3 Jan 44, sub: 8-Inch Guns. (3) Memo, Rooks for Ord, 6 Jan 44, sub: 8-Inch Guns. All in MTO Ord Sec 472 Guns (General) 1944, KCRC. (4) Col G. G. Eddy, Rpt of New Weapons Board, 27 Apr 44, pp. 39, 51, OHF. (5) AGF Board Rpt, NATO, No. 126, 2 Mar 44.

[46] (1) AGF Bd Rpts, NATO, Nos. 168, 171. (2) Narrative, 698th Field Arty Bn, Feb–Dec 44. (3) Mathewson Rpt, p. 8. (4) Rpts of Opns of II Corps in the Italian Campaign 1 Apr–30 Jun

"Balanced Artillery Firepower"

For most of the Italian campaign, the brunt of the long-range heavy artillery duels was borne by the 155-mm. Long Toms. Massed close behind the front lines and fired for 90 percent of the time (instead of the conventional 20 percent) at maximum range with supercharge ammunition, they performed nobly. This unorthodox use, which had begun in Tunisia, soon wore out the tubes. A correspondent who visited an Ordnance heavy maintenance company near the Volturno River has left a vivid description of the tube-changing operation, which "looked like a meeting of dinosaurs. Heavy wreckers with long-necked cranes sparred and maneuvered through the mud. One eight-wheeled wrecker with an enormous boom backed up to the gun and the boom was hooked to the worn-out gun barrel. A second wrecker edged its way up, until its winch was in position to ease the great gun carriage forward. When the old tube had been extracted, the new one, as long as a telephone pole, and weighing 9,500 pounds, was lifted into the air. To act as counterbalance for the heavy breech end while the tube was being lowered into place, a group of men jumped up and sat astride the muzzle end of the gun like a row of schoolboys on a seesaw." [47]

Tubes and other gun parts wore out so fast that the criteria of supply—the time factor and the number of guns—were meaningless. When this became apparent in the fall of 1943, Colonel Niblo came forward with a suggestion that the time factor be ignored and that the supply of gun tubes, gas check pads, and other items be based on the only factor that really counted—the number of rounds fired. Aware that tubes began to wear out after about 1,200 rounds, causing thrown rotating bands and short bursts, he suggested that with every 1,200 rounds of 155-mm. M1 gun ammunition requisitioned, one gun tube and three gas check pads be authorized.[48]

Colonel Crawford at AFHQ followed up with an official recommendation that spare guns or gun tubes and spare gas check pads be provided on the basis of the amount of ammunition manufactured for the weapons, and General Wells, chief of Ordnance's Artillery Division, backed him up. Unfortunately, the policy could not be put into effect because there were not enough of the items, especially the tubes, in the United States. The stalemate at Anzio and the increased effort on both fronts brought alarming demands for tubes. NATOUSA asked for 192 in February 1944—96 for immediate replacement and 96 to be shipped not later than 15 March. That many were not available. By robbing the Navy, the European theater, the British, and troops in training in the United States, 144 could be made available, but only 48 replacements could be provided by 15 March. Colonel Niblo therefore had to inform the Fifth Army Artillery officer that for two or three

44, II Corps Ord Sec, KCRC. (5) O.O.B. 154, 24 Apr 44 through 195A, 4 Jun 44, OHF. (6) Telephone Conversations of Gen McNarney, 4 Nov 44 to 22 Sep 45. On 2 June two captured 170-mm. guns took some of the pressure off of the two 8-inch guns at Anzio. O.O.B. 193, 2 Jun 44, OHF.

[47] Margaret Bourke-White, *They Called it "Purple Heart Valley"* (New York: Simon and Schuster, 1944), p. 77.

[48] (1) Ltr, McGrath to Crawford, 26 Nov 43, MTO Ord Sec 319.1, KCRC. (2) Ltr, Maj Allen S. Jorgensen to OCO, 22 Nov 43, sub: Technical Letter No. 17, Incl, Ordnance Technical Notes (Italian Campaign), MTO Ord Sec 400.113, KCRC.



"Ordnance? Ah'm havin' trouble with mah shootin' arn."

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months restrictions would have to be placed on firing the Long Toms.[49]

This experience confirmed Niblo in the belief that firepower was the sum of five factors: first, a complete round of ammunition; second, a gun tube that had not reached the limit of its serviceability; third, equilibrators (if applicable) to elevate the muzzle properly; fourth, a recoil system that met certain standard pressure tests; and fifth, a serviceable gas check pad. He was convinced that gun tube, equilibrators, recoil system, and gas check pad must be arranged for, beginning with the manufacturing program and ending with the distribution over the zone of combat, in proper proportion to the amount of ammunition supplied. He called this concept "balanced artillery firepower," and it was the subject of considerable discussion in Ordnance supply circles in May 1944.[50] As yet it was only theory. As the battle for Rome began, a battle in which artillery was to play a great role, Niblo was forced to confess that "we are keeping just one jump in front of the sheriff in trying to make our ammunition, tubes and recoils balance out and still meet tactical demands." [51]

[49] (1) Ltr, Crawford to OCO, 29 Feb 44, sub: Technical Letter No. 19, MTO Ord Sec 400.113, KCRC. (2) Ltr, Brig Gen Gordon M. Wells to Col G. N. Taylor, 22 Dec 43; and Ltr, Crawford to Wells, 3 Mar 44. Both in Folder Gen Wells' Trip to Battle Areas #1. (3) Memo, Col Frank A. Bogart for Gen Lutes, 26 Feb 44, sub: Gun Tubes for North Africa, and Incl, Status of Tubes for the 155-mm. M1 Gun, ASF Planning Div, Theater Br, Folder, North Africa. (4) O'Neill Interv. (5) Interv, Mathews with Tate. (6) Petersen Rpt, 14 Feb 45.

[50] (1) O.O.B. 162, 2 May 44. (2) Petersen Rpt, 14 Feb 45. (3) Ltr, Crawford to Wells, 17 May 44, Folder, Gen Wells' Trip to Battle Areas #1.

[51] Ltr, Niblo to Wells, 20 May 44, Folder, Gen Wells' Trip to Battle Areas #1.

CHAPTER XII

Rome and "The Forgotten Front"

Preparations for the May offensive began in March on both the Anzio front and the Cassino front. On the Cassino front forces were regrouped. To break through the Gustav Line, where mountain and town had defeated American, New Zealand, and Indian troops, General Alexander brought his Eighth Army from the Adriatic coast. For a simultaneous attack on the mountains that bordered the Tyrrhenian Sea, he shifted the Fifth Army—II Corps and the French Expeditionary Corps—westward to the lower Garigliano River. Under the cover of an elaborate deception plan designed to make the Germans expect an amphibious landing at Civitavecchia, the changeover took place in the last two weeks in March. At the same time, II Corps underwent a reorganization. The 34th Division was sent to Anzio and the 36th Division was taken out of the line. Their places were taken by two divisions fresh from the United States, the 88th and 85th.[1]

The Ordnance forward maintenance group, which still bore the misleading designation of the 2630th Battalion (Provisional), moved to an area around Cascano on Highway 7 near the center of the new army zone south of the Garigliano. The men were glad to get away from the bloody Cassino front. Bombs dropped on Venafro by an Allied formation trying to bomb the town of Cassino on the night of 15 March, for example, had just cost the 42d Battalion of the forward group one man killed and eleven wounded. In the Garigliano sector there was a lull throughout April. The maintenance men were able to concentrate on repairing or replacing equipment, sending contact parties to the new divisions, calibrating field artillery pieces, and checking spare parts. Army depots were fairly close to the front and the shortage of spare parts that had caused such anxiety during the winter had been somewhat relieved; General Wells had gotten action on the shortage as soon as he returned home in January.[2]

At the Anzio beachhead, spare parts were more plentiful than at any other time in the history of Fifth Army Ordnance. To provide insurance against a hit on the depot in the town of Anzio, Colonel Detwiler removed half the supplies, splitting each SNL group vertically, to an Italian ammunition loading plant one mile south of Nettuno, a building enclosed in a large earth bunker and fairly safe from enemy action. With the arrival of a second depot

[1] (1) Interv, Field Marshal Alexander, by S. T. Mathews 10–15 Jan 49, OCMH. (2) For the deception plan, see Fred Majdalany, *The Battle of Cassino* (Boston: Houghton Mifflin, 1957), pp. 254–57.

[2] (1) Histories 2630th, 188th and 42d Ord Bns for 1944. (2) Rpt Opns II Corps Italian Campaign, 31 Mar–30 Apr 44. (3) Ltr, Campbell to Niblo, 17 Jan 44; also other corres, Folder, Gen. Wells' Trip to Battle Areas #1.

company early in April, the 201st (borrowed from Peninsular Base Section), Detwiler had enough manpower to operate the twin depots effectively. Every job in both depots was handled by two men, one from the 77th Depot Company and one from the 201st, so that when the drive to Rome began, the 77th could load its 16 vans and follow, while the 201st could continue to operate both depots after PBS took over the beachhead.[3]

On both fronts Ordnance mechanics created several ingenious devices to enable troops to advance through German defenses. At Anzio they made a portable artillery observation tower that folded into the bed of a truck, and they converted Italian farm tractors into driverless prime movers (called "mangle buggies") to tow long strips of primacord that would blow up barbed wire entanglements or detonate mine fields. At the Capua arsenal on the Cassino front they modified tank grousers, using a six-inch extension to the usual grousers, to help tanks cross the Pontine Marshes beyond the coastal mountains, and they manufactured "battle sleds."[4]

The battle sled, invented by Brig. Gen. John W. O'Daniel (Truscott's successor as commander of the 3d Division), was half a torpedo shell, just large enough to hold one soldier lying down. Six were hooked together and attached to each side of a tank and the twelve sleds were pulled forward in the paths made by the tank's tracks, enabling an infantry squad to accompany a tank without being exposed to small arms fire and antipersonnel mines. After O'Daniel sent Ordnance a sketch of what he wanted, Colonel Jaynes and his staff developed a model with runners, to prevent heat from friction, and made the sleds in an atmosphere of the greatest secrecy in a field near the Capua shops. They set up a production line, using 80 welding sets in stalls under a big circus tent, and with the expert supervision of Sergeant Sellfors as chief welder, Fifth Army and PBS mechanics working in 8-hour shifts manufactured 360 sleds between 29 April and 14 May.

All the sleds were used in the breakout at Anzio. The worst impediments were ditches and mines that immobilized the tanks. In one regiment a platoon of tanks and four sets of sleds failed to get into action because of rough ground and the loss of several tanks from mines; in another, the results were negligible because the terrain was unsuitable; in a third unit, the towed infantry, supported by the tanks, took a strongly fortified house. Infantrymen were not enthusiastic about the sleds because they felt like "dead ducks" lying so close behind the tanks. General O'Daniel felt that the combat test was not conclusive, and that these special devices should be employed against organized positions when terrain and antitank defenses permitted. Half the sleds were salvaged from the battlefield and used in the invasion of southern France.[5]

[3] (1) History Ord Service MTO, ch. IV, Part 2, p. 83. (2) Detwiler, "Ordnance at Anzio," *Army Ordnance*, XXVIII, 148 (January–February 1945), p. 102.

[4] (1) Niblo Rpt, 30 May 44. (2) Clark, *Calculated Risk*, pp. 343–44. (3) After Action Report Maint Bn 1st Armd Div 1 Jan–May 44, D 844.13, Armored School Library. The Capua shops also manufactured thousands of rifle grenade adapters and supplied the hospitals with such items as mosquito-bar frames and X-Ray equipment. Histories 881st and 529th Ord Heavy Auto Maint Cos, Jan–Dec 44.

[5] (1) Truscott, *Command Missions*, p. 360. (2) O'Neill Interv. (3) David Interv. (4) History 529th Ord HAM Co, Jan–Dec 44.

In preparation for the "big shoot" that began the drive on Rome, Ordnance men handled thousands of tons of ammunition. Beginning at 2300 on 11 May, in what General Clark called "perhaps the most effective artillery bombardment of the campaign," 173,941 rounds of artillery ammunition of all types were fired in twenty-four hours. The 2652d (later 236th) Ammunition Company serving II Corps made a remarkable record. On 11, 12, and 13 May a detachment, helped by 200 Italians, handled about 2,500 tons a day at the ASP for divisional weapons; and a detachment of only 25 men with the help of 100 Italians completely stocked a 1,700-ton ASP for artillery in twenty-four hours.[6]

At Anzio and on the main front massed artillery fire, in which all guns within a corps were concentrated on a single objective, played a spectacular part in the Allied advance. The Germans were awed by the lavish use of ammunition; prisoners of war said that the intensity, accuracy, and volume of the Allied artillery fire, exceeding anything they had experienced on the Russian front, caused "a general feeling of helplessness, panic, and confusion" in the ranks. At Anzio a refinement of this technique was employed. Allowing for the difference in the time of flight of the shells of the various guns, the weapons were so fired as to insure that all shells reached the target simultaneously (called time on target, or TOT). The results disrupted enemy supply lines and shattered morale. German officers said their men trembled when it began.[7]

The attack jumped off and though there was bitter fighting in the Fifth Army sector for the first few days, the French Expeditionary Corps and II Corps advanced steadily. By 19 May the Germans were retreating toward their next defensive position, the Hitler Line, at Terracina. On 21 May there was a symbolic union with the Anzio beachhead when a II Corps 8-inch gun below Monte Biagio and a VI Corps 8-inch gun at Anzio fired on the same target, the town of Sezze. Terracina fell on 24 May. Next day the Allies pushed into the Pontine Marshes and joined the forces coming from the beachhead. Ordnance units moved on the heels of the combat forces; on 29 May at Littoria the forward group headquarters was joined by its 45th Battalion. To supply the fast-moving attack Colonel Tate had sent army trucks from rear areas with rations, gasoline, ammunition, and engineering equipment to points designated by the divisions and unloaded material from the tailgates of the trucks into division vehicles. He used this method until the troops from the main front joined the force from Anzio; thereafter, all Fifth Army troops were supplied out of Anzio until the port of Civitavecchia was opened.[8]

The Allies Enter Rome

The Allies entered Rome on 4 June 1944, nine months after the landing at Salerno. In that time 11,292 Americans of Fifth Army had died in action. Twenty-two Ordnance men had been killed and

[6] (1) Clark, *Calculated Risk*, p. 346. (2) Mathewson Rpt. (3) History 236th Ord Ammunition Co, 1944.

[7] (1) AGF Board Rpts NATO, No. A-Misc-100, Field Artillery, 22 May 44; No. 171, FA, 15 Jul 44. (2) Field Artillery Information Letter #8, 30 May 44. (3) Truscott, *Command Missions*, p. 337.

[8] (1) Histories 2630th and 42d Ord Bns. (2) Interv, Mathews with Tate.



M4 TANK PULLING BATTLE SLEDS AROUND A CURVE *to demonstrate sleds' flexibility, Nettuno, Italy.*

165 had been wounded. Operating ammunition dumps under shellfire, making repairs under front-line conditions in the rain and mud, changing gun tubes at the battery sites, they had suffered many hardships, notably at Anzio, where 14 of the 22 had lost their lives in the first two months.[9]

Ordnance men had learned to make the best of things. At Anzio they had dug an underground movie theater, called the "Diggers' Dream"; and when their rations improved in April they were grateful for such luxuries as "old fashioned eggs" and Coca Cola, "enjoyed with the symphonic shell whining while dining."[10] On the main front of "mules, mountains and mud," they had become accustomed to getting along with a heterogeneous collection of human beings of many kinds and nationalities, including turbaned Indians, Scottish bagpipers, French Goumiers, and a battalion of Japanese-Americans. In the foxholes around Cassino Colonel David had even found some sailors who had left their ships and gotten rides to the front to do some fighting. The French Goums with their burnooses, their old Enfield rifles, and their women—each tabor (battalion) had forty women who, observed General

[9] (1) Clark, *Calculated Risk,* p. 365. (2) History Ord Service MTO, ch. IV, pt. 2, p. 82.

[10] After Action Rpt Maint Bn 1st Armd Div, 1 Jan–May 44.

Lucas, "look after the wounded and perform other functions"—were an unfailing source of interest, as were the French Ordnance companies who took the tools out of their shop trucks, stacked them on the ground, and used the trucks as house trailers. All this was instructive and sometimes amusing. But on the whole, as Ernie Pyle reflected in the plane carrying him from Italy to England, "it had been bitter. Few of us can conjure up any truly fond memories of the Italian campaign." [11]

"The Forgotten Front"

Two days after Fifth Army entered Rome, the Allies landed in Normandy. Preparations for the cross-Channel attack had been going on since the fall of 1943. With the end of the campaign in Sicily, men began to leave the Mediterranean for England, and by December 1943, when General Eisenhower departed to command OVERLORD, Italy was already becoming a secondary theater. After the capture of Rome, Army planners concentrated on the defeat of Germany in the European Theater of Operations. The invasion of southern France (DRAGOON) by Seventh Army, which was mounted from Naples in August 1944, took from General Clark all of VI Corps (3d, 36th, and 45th Divisions) and the French Expeditionary Corps, and robbed Colonel Niblo of a great many of his men, enough to form two Ordnance groups. The attrition continued; Italy sank to such a low priority on the list of theaters that by the winter of 1944–45 the men there began to feel that they were on a "forgotten front." [12]

Because of the low priority for supplies for Italy after Rome's capture, Fifth Army was forced, more than any other army, to make the best of what was already available in the theater. Whenever there was a lull in action, combat areas were combed and guns, vehicles, clothing, equipment of every kind damaged or abandoned during battle were returned to the supply services. Quartermaster and Ordnance ran extensive salvage and reclamation facilities, far beyond those normally expected of a field army. In the fall of 1944 Colonel Niblo (who was to become a brigadier general before the year was out), moved his heavy maintenance companies from Capua to Florence and there in the Fiat automobile plant set up what he called his "Willow Run" operation, a huge repair shop in which hundreds of Italian mechanics supervised by Ordnance men completely rebuilt trucks and jeeps by assembly-line methods. With living quarters for the Ordnance troops above the shop and overhaul and depot sections set up in the Fiat garage near the main plant, the installation became one of Fifth Army's "show centers" during the winter of 1944–45.[13]

Lessons of the Mediterranean Campaigns

During the long winter evenings on the comparatively quiet front in northern Italy, waiting for supplies and replacements to build up for the spring offensive in 1945,

[11] (1) David Interv. (2) Diary of Maj Gen John P. Lucas, Part II, Italy, 10 Dec 43. (3) Pyle, *Brave Men*, p. 200.

[12] Clark, *Calculated Risk*, p. 423, quoting Representative Clare Boothe Luce.

[13] (1) Truscott, *Command Missions*, pp. 458–59. (2) Niblo Rpt, 22 Aug 44, Incl 1. (3) Booklet, *Fifth Army Ordnance Operations: Po Valley Campaign*, OHF.



PANTHER TANK

combat commanders and staff officers had leisure for the first time to look back upon the campaigns in the Mediterranean. Fifth Army had had fifteen months of continuous combat in Italy. The memories of many of the officers, including Niblo, went back two years to North Africa.[14]

Matériel

By early June 1944, the Allied forces in the Mediterranean had encountered most of the weapons that the Germans were counting on for the defense of France. Land mines had been sown as lavishly in Italy as in North Africa, with the addition of the particularly vicious antipersonnel *Schuetzenmine.* In Italy first appeared the Panther tank; the self-propelled 88-mm. gun, as well as a new model of the 88, the *Flak* 41, which had a longer range, more muzzle velocity, and greater armor penetration than the American 90-mm. gun; and the miniature Goliath tank, a small, crewless, remote-controlled explosives container. Except for the Goliath, which was a failure, this was an impressive array of new weapons. The best counterweapon

[14] Niblo, Lessons of World War II.

the Allies had was still their field artillery, received in Italy in larger calibers than had yet been employed as field artillery in World War II. The trial of new American weapons such as the bazooka was inconclusive in the Mediterranean because the theater received them in early models before improvements had been made. The improved models were reserved for Europe, as were the first of the American multiple rocket launchers, inspired by the German *Nebelwerfer*.[15]

The Panther tank (*Pzkw* V), which the Germans designed to supplant the *Pzkw* III and IV as their main fighting tank, carried a 75-mm. gun (*Kwk* 42), even longer than the long-barreled 75-mm. on the *Pzkw* IV Special, with a muzzle velocity of 3,066 feet per second as compared with the 2,050 muzzle velocity of the 75-mm. gun on the U.S. M4 Sherman tank. In addition to an excellent suspension system, the tank had a long, sloping frontal plate (copied from the Soviet T34 tank) that was hard to penetrate. A distinctive feature was the turret, with its sloping walls. The Panther did not appear until the drive on Rome had reached the Liri Valley. By that time, the Germans' supply routes had been so wrecked by Allied bombing that gasoline was in short supply, which severely limited tank operations. When the Allies got to the Hitler Line in the mountains they found installed there turrets taken from Panther tanks.[16]

Most of the Mediterranean campaigns had been fought in the mountains, in country that was not, to use a British word, "tankable." It was mainly a war of artillery, infantry—and mules. One of the most surprising developments of the war was the necessity, beginning in northern Tunisia, of supplying isolated units by pack train. Scouring the countryside for mules and equipment, each division organized its own train of from 300 to 500 animals—"the most peculiar collection of little jackasses, packsaddles, ponies, and gear of all description."[17] From Sicily onward, with one exception, the Germans had natural barriers of swift rivers and high mountains of which they took full advantage, using snipers, machine pistols and guns, artillery, blown bridges, and mines.

The exception was Anzio, and it was there in the flat farmlands, where the terrain was more nearly like that of the battlegrounds of France and Germany, that the most fruitful lessons had been learned about weapons. The Germans in their attempts to drive the Allies from the beachhead had brilliantly employed their self-propelled 88-mm. Hornets and Elephants for harassing fire. They would bring the guns up to the perimeter of the beachhead, fire twenty or thirty rounds, and then quickly withdraw before the Allies could get the range. Self-propelled artillery was not new to the Allies, who had been using tank destroyers in that role for some time,

[15] (1) Green, Thomson, and Roots, *Planning Munitions for War*, p. 387. (2) Memo, Maj Gen G. M. Barnes for Gen Campbell, 6 Apr 44, sub: Comparison of German and American Weapons, Barnes-Campbell Corres, Barnes File, OHF. (3) Eddy Rpt. 27 Apr 44. (4) AGF Board Rpt NATO No. 91, Dec 1943.

[16] (1) U.S. Army Ordnance School, APG, *Tank Data, July 1958*, pp. 59, 185. (2) Rpts, No. 7266–44, OI–340–44; No. 70802, OI–349–44, in Files Dev Div, OCO-D, copies in OHF. (3) Jarrett, Achtung Panzer, pp. 71–75, MS, Jarrett Collection. The first known capture of a Panther was on the Russian front around November 1943. *Ibid.*, p. 71.

[17] Lucas Diary, Italy.

but until the beachhead experience with the German 88's, there was little interest in self-propelled heavy artillery; most combat commanders preferred towed guns. In spite of the using arms' indifference, however, the Ordnance Department had developed a motor carriage for the 155-mm. gun, and it was ready in time to be used with good effect in Europe.[18]

"Much was fomenting at the time of the Anzio expedition," General Marshall later remembered; it was then that field commanders abandoned the position that only light, mobile artillery was wanted and "began yelling for heavy artillery." [19] Largely because of the foresight of the Ordnance Department, which had always advocated longer ranges and heavier projectiles, Fifth Army got the 8-inch gun in time to use it in the drive on Rome. After the end of the war in Europe when General Truscott said that he had never taken his division, his corps, or his army into combat without the certain knowledge that the Germans had American artillery outranged and outcalibered,[20] he could only have been thinking of the 280-mm. and 210-mm. railroad guns. But railroad guns, demanding tracks and tunnels, had limited use, to say the least. Against the German 170-mm. gun, which was the real long-range artillery menace on both Italian fronts in spite of the poor quality of its ammunition, Truscott admitted, the 8-inch gun put the Allies "on better than an even footing." [21]

In the Mediterranean theater as in all the others, it was hard to say which was more important—the gun that fired the ammunition at the enemy or the truck that brought the ammunition to the gun position. General Lucas called the 2½-ton truck "the greatest military vehicle ever invented." Trucks and jeeps continued to win golden opinions from all; DUKW's and other automotive matériel such as tank transporters and tank recovery vehicles had been invaluable. The Ordnance shop truck gave excellent service and had an unexpected use as a command post trailer, beginning in North Africa. In the field, Ordnance men put a cot across one end, placed a desk and map boards on one side and cushioned seats on the other, and even fitted in a clothes closet and a wash basin with hot and cold running water, making "a very comfortable little house." [22] By February 1944 seventy were being constructed in the Ordnance shops at Naples. The most elaborate was General Clark's, which had fine mahogany furniture and a specially woven rug of virgin wool.[23]

Supply

The Mediterranean operations taught a great deal about supply. In the important nine months between Salerno and Rome, Colonel Niblo gave considerable study to the resupply of Class II, IV, and V items,

[18] (1) Truscott, *Command Missions*, p. 338. (2) Wells Rpt, Feb 44. (3) Eddy Rpt, 27 Apr 44. (4) Green, Thomson, and Roots, *Planning Munitions for War*, pp. 316–17. (5) Field Artillery Information Letter #3, 17 Mar 44, Fifth Army 475.1, KCRC.

[19] Interv, Marshall, 25 Jul 49.

[20] Ltrs, Detwiler to Campbell, 4 Jun 45; Campbell to Detwiler, 14 Jun 45, Folder Artillery Fifth Army, OHF.

[21] Truscott, *Command Missions*, p. 339. On the large proportion of duds among 170-mm. projectiles, which "remained a source of curiosity throughout the campaign," see Lucas Diary, 19 Nov 43.

[22] Lucas Diary, Italy, 8 Sep, 20 Oct, 15 Nov 43.

[23] (1) Eddy Rpt, 27 Apr 44, pp. 44–45. (2) David Interv.

"the paramount problem of Combat Zone Ordnance Service." The conclusion was that doctrine and methods were not sufficiently realistic or flexible. One reason for early shortages in artillery ammunition in Italy had been the fact that production rates in the United States had been based on experience in North Africa, where much smaller amounts had been used. Class II and IV supplies were inadequate at times because tables of equipment did not provide enough guns or trucks to meet special situations and this caused a drain on maintenance stocks.

Automotive spare parts were nearly always scarce. There were of course problems of distribution, but in Niblo's opinion the main trouble was the too low estimate made in Washington of the spare parts that would be needed. Washington's estimate was based on the theory that 50 percent of the trucks issued would be replaced with new trucks when they broke down—and the replacement vehicles did not exist. Mortality tables for certain types of spare parts, notably brake linings, were sadly inadequate for deep mud and other conditions of the Italian campaign. At the end of the Tunisia Campaign Ordnance planners in the United States had begun a revision of SNL addenda to reflect actual consumption rates with the help of experience data from the field, much of it contributed by Colonel Moffitt of Niblo's staff; but the effects of the re-evaluation could not be felt for some time. On the whole, men in the theater considered that resupply had been computed on an outmoded basis—the amount of matériel that would be consumed in a month or a year—rather than on the basis that really counted, which was the amount of ammunition that would be shot by a gun, or the number of miles a truck would travel. They had learned that it was useless to furnish thousands of rounds of artillery ammunition if gun tubes to fire the ammunition were not available; useless to furnish gasoline if there were not enough tires to keep the vehicles operating.[24]

To make up for shortages caused by defects in the supply system, Niblo had had to use imagination and ingenuity. Extremely "Ordnance-minded," according to General Tate, "he never permitted supply to lag." [25] Niblo saw to it that his ammunition men renovated unserviceable ammunition and recovered usable fuzes; a great deal of this work was done at Anzio. His collecting companies cleared the battlefields, using techniques learned in Tunisia, and turned over to fourth echelon shops every vehicle and weapon that could be repaired or cannibalized. He had learned from experience that more than 50 percent of certain critical spare parts had to be obtained in this way.[26] He used native labor and native machinery and materials on a scale larger than had ever before been attempted. On the Cassino front alone, by May 1944 Fifth Army Ordnance Service was employing an average of 3,300 Italian laborers a day; the Fifth Army

[24] (1) O.O.B. 21, 30 Jun 44, Lessons Learned in the Italian Campaign. (2) Intervs, Niblo of 28 Sep 55; O'Neill; and Tate. (3) AGF Board Rpt No. A-105, 6 Jan 44. (4) Ltr, CofOrd to Deputy Theater Cmdr, NATO, 29 Jan 44, O.O. 350.05/9049½. (5) Niblo Rpt, 16 May 44, Incl 1.

[25] Interv, Mathews with Tate.

[26] (1) Niblo Rpts, 25 Jul 44, Incl 4; 12 Jul 44, Incl 2. (2) The first Ordnance Ammunition Renovation Company in the theater was activated by PBS on 26 July 1944. Ltr, Maj Gen Thomas B. Larkin to CG Northern Base Section, 29 Jul 44, Fifth Army 471 Gen, Vol. VIII, KCRC.

engineer was using 1,200, the quartermaster, 250.[27]

Many officers of the various supply services had become convinced that base sections were outmoded. By the time base sections were established and operating, the front had moved too far away. Their shops and depots ran on union hours and consequently, as Colonel Crawford expressed it, "did not respond to the surge of battle." This was apparent in North Africa early in the Mediterranean operations and continued to be true in Italy. The discovery about base sections was one lesson that was applied to the planning for Europe. It led to the organization of an Advance Section to furnish close support to the armies. In January 1944 a party of ETO Advance Section officers visited Italy and North Africa to gather information on base section operations in the Mediterranean.[28]

Organization

The most important gain for Ordnance in the Mediterranean campaigns was the emergence of an effective organization in the combat zone. Group organization, first tried in Tunisia, had been expanded in Italy and had proved that it was flexible enough to meet the ever-changing demands of battle commanders. It worked so well, according to testimony by General Tate, that Ordnance, except for inherent shortages in certain spare parts and ammunition, never caused the Fifth Army G–4 any worries. The use of a group headquarters to command Ordnance troops was so successful that it was copied by the Fifth Army engineer and Fifth Army signal officer (though not, in spite of Tate's urging, by the quartermaster). The Fifth Army engineer considered that the very considerable advantage he gained by having all Engineer troops under his direct command was "the primary administration lesson learned during the Italian campaign." [29] Niblo's employment of three group headquarters in the field, under the command group, had been equally successful. The group system was used in Europe and after the war became the standard organization of Ordnance service in the field army.[30]

In armies of the future, weapons would be different, methods of supply would change, new training would produce new skills, but men would not change very much. For Ordnance, perhaps the most useful lesson of the Mediterranean campaigns was a lesson in what men could do: what the Ordnance officer of an army could do to create an efficient organization; what Ordnance company, battalion, and group commanders could achieve in close support of combat operations; what Ordnance troops could accomplish and endure.

[27] (1) RED VAULT 5th Army G–4 Hist Rpt Feb–11 May 44. (2) Fifth Army Training Memorandum 12, 15 Jul 44, Lessons Learned in the Battle from the Garigliano to North of Rome.

[28] (1) Intervs, Niblo, 28 Sep 55; Crawford. (2) Ruppenthal, *Logistical Support of the Armies I*, pp. 211–12.

[29] (1) Interv, Mathews with Tate. (2) Campbell Comments. (3) Engr History Mediterranean Theater—Fifth Army, vol. II, 1943–45, p. 266.

[30] (1) Rpt of the General Board, United States Forces, European Theater, Study 101 (hereafter cited as USFET Bd Rpt 101), The Employment of Ordnance Staff Sections, Ordnance Combat Service Units, and Ordnance Service Units in the European Campaign, ch. 6, sec 2. (2) DA FM 9–10, Aug 51, p. 36–40.

CHAPTER XIII

Arming for the Grand Campaign

From the Mediterranean, from the United States, from Guadalcanal and Kwajalein, commanders enplaned for England to begin the grand campaign of the war—the invasion of Europe. Lt. Gen. Omar N. Bradley, commander of First Army, which was to spearhead the invasion, arrived in England in October 1943. By the end of October his staff was hard at work in the Gothic buildings of Clifton College at Bristol. The staff had to plan for the entire U.S. assault force of about 600,000 men, assigned or attached to First Army during the invasion and the first two weeks in Normandy, the heaviest responsibility placed on any staff at field army level during the war. Fortunately the planners did not have to depend on theory but could draw on a year of combat experience in the Mediterranean. Many of the staff had served with Bradley in II Corps. Among them were his G–4, Col. Robert W. Wilson, and his Ordnance officer, Col. John Bruce Medaris.

Medaris brought with him extensive data, based on his service in Tunisia and Sicily, that was used by Brig. Gen. Henry B. Sayler, Chief Ordnance Officer, ETOUSA, in planning support for the vast operation. In the march on Germany there were eventually to be five U.S. armies, two American army groups. At the beginning, First Army was to be under the 21 Army Group along with the Second British and First Canadian Armies. When Third Army landed on the Continent in August an American group was to be formed, the 12th (called in the planning stage the 1st U.S. Army Group, or FUSAG), to which would be assigned the First, Third, and eventually the Ninth and Fifteenth Armies. And from the Mediterranean, landing at Marseille in Operation DRAGOON, there would come another American group, the 6th, composed of the Seventh U.S. Army and the French 1st Army. By May 1945 the five U.S. armies on the Continent would total 1,703,613, a mighty force indeed when compared with the 231,306 Americans Fifth Army had had in Italy at its peak.[1]

Sayler had been Chief Ordnance Officer, ETOUSA, since July 1942, had been promoted to brigadier general in the spring of 1943, and was to become a major general in June 1944. A longtime friend and classmate of General Eisenhower, he was one of only two technical service chiefs who were West Pointers. His friendships in the theater and his excellent relationship with his chief in Washington were definite assets to Ordnance. And he had the loyal support

[1] (1) Gordon A. Harrison, *Cross-Channel Attack,* UNITED STATES ARMY IN WORLD WAR II (Washington, 1951), pp. 114–15. (2) USFET Bd Rpt 101, app. 16. (3) Forrest C. Pogue, *The Supreme Command,* UNITED STATES ARMY IN WORLD WAR II (Washington, 1954), p. 542. (4) Fifth Army History, pt. VI, p. 139.



COLONEL SAYLER. *(Photograph taken after his promotion to brigadier general.)*

of his two staffs—the ETOUSA planning staff in London (usually referred to as APO 887) and the operating SOS staff in Cheltenham (APO 871). Sayler's deputy in Cheltenham, Col. Joel G. Holmes, wrote to General Campbell, "If Ordnance is a success over here, and you can be damn sure it will be, Henry Sayler is the fellow responsible for it. Every officer here has confidence in his ability and leadership, and we are all back of him one hundred percent." [2]

New Methods of Supply

The ETOUSA SOS organization had learned a great deal about supply in the year after the TORCH convoys sailed for North Africa. One important lesson was the folly of shipping troops to a theater ahead of their equipment. To prevent this from happening again, and to take advantage of an excess of cargo space available to ETOUSA in 1943, when troops were being sent to the Mediterranean, the theater persuaded the War Department to ship T/E allowances in advance of the units; moreover, to ship them in bulk, not marked for any particular unit. This procedure was unprecedented and took a great deal of urging on the part of the theater and ASF, but it was finally put into effect in the summer of 1943. It was never entirely successful for at least two reasons: in the summer and early fall of 1943 it was hard to obtain stocks in the United States because of the theater's comparatively low priority at the time; later, the increasing troop movements crowded out cargo space in the ships. The system nevertheless was an improvement over the old one.[3]

Early in 1944, the War Department asked the theater to submit its requirements for "special" matériel—over and above T/BA's and T/E's—that would have to be procured in the United States for use by the supply services on the Continent. These items were called PROCO (projects for continental operations). For Ordnance, they meant from the start vehicles and more vehicles, of all types: tractors and

[2] (1) Memo, Sayler for G–3 ETOUSA, 22 Oct 43, ETO Ord Sec 370.09 Requirements for Personnel and Troops 1943, KCRC; (2) Interv, Maj Gen Henry B. Sayler, 19 Mar 58; (3) Ltr, Holmes to Campbell, 5 Jun 44, OCO–D Field Service Operations, Overseas File, 1944.

[3] (1) Ruppenthal, *Logistical Support of the Armies, I,* 132–36. Unless otherwise indicated this chapter has been based on this source. (2) Ord Serv ETO: Plan and Organ, p. 206; Class II and IV Supply, Ann 1, Historical Notes, General Supply Division, MS, Lt Col Nathan B. Chenault, Jr. (hereafter cited as Chenault History). (3) Rpt, General Board, United States Forces, European Theater, Ordnance Class II and IV Supply in European Theater of Operations, Ord Sec Study 99 (hereafter cited as USFET Bd Rpt 99), p. 17.

trailers for its own depot companies; wreckers; gasoline tank trailers; tank transporters; staff cars; trucks for other services, mainly the Engineers and the Air Forces; beach kits of spare parts. In March 1944 the theater cabled the War Department for weapons and vehicles to replace those that First Army expected to lose in its first month of operations. This was a new kind of PROCO item, but it was approved, and the shipment helped greatly in the early operations.[4]

Another innovation was introduced in July 1943 with the decision to package 45 days of supply "amphibiously," that is, so that supplies would be waterproof and thus would not deteriorate when they went over the beaches. This posed a hard problem for the men of the theater Ordnance staff: since the packaging would have to be done in the United States—men, materials, and transportation to do it in England were lacking—should all of one particular item for the entire 45 days be sent over as one shipment or several shipments? The men did not know the detailed plans for the landing on the Continent, and indeed the plans were not firm; but they did know that two or more forces would have to be supplied along more than one supply route. They decided that the huge amphibiously packed stocks—16,000 long tons of spare parts in 450,000 individual boxes—ought to be shipped from the United States according to their "group" designation. All Ordnance general supplies belonged in one of 26 groups, each designated by a letter of the alphabet, for example, Group A consisted of automatic weapons and mortars, Group B hand and shoulder arms, and so on.[5] Spare parts for each of these groups were shipped in 26 individual "bricks" and maintained their identity to their final point of destination on the European continent. The special packaging held up well. After the Normandy landings, an examination of thousands of boxes showed no deterioration.[6]

For the Ordnance men at Cheltenham the new supply methods meant first of all a search for more depot space and vehicle parks. In 1942 there had been two Ordnance branch depots, Tidworth in the Southern Base Section (SBS) and Rushden in the Eastern Base Section (EBS), and Ordnance sections in six general depots—Ashchurch, Taunton, and Hilsea in SBS and Barry, Moreton-on-Lugg, and Sudbury in the Western Base Section (WBS). In 1943, as labor and materials became available, branch depots were activated at Warminster for combat vehicles and at Castle Bromwich for tools, and Ordnance had obtained space at two more general depots, Coypool at the port of Plymouth and Wem near Liverpool. Five vehicle parks had been added to the six in existence in 1942. This amount of space had been planned for theater reserve stocks in BOLERO and was obviously inadequate for OVERLORD.

The program for the advance shipment of T/BA and T/E matériel alone, which went into effect in July 1943, entailed a sizable expansion in storage space: for example, the preshipped equipment for one infantry division included 2,089 vehicles.

[4] (1) Memo, Col Robert A. Case for Director of Supply, 18 Feb 44, sub: Report of Visit to Headquarters, SOS ETO, Incl 1, Tab M, ASF Distribution Div 400 ETO, 16–23 Feb 44. (2) Memos on PROCO projects in ASF Planning Div, Theater Br, ETO. (3) Chenault History.

[5] Thomson and Mayo, *Procurement and Supply*, pp. 356–57.

[6] Chenault History.

To take care of preshipment and other OVERLORD requirements, Ordnance activated two additional branch depots, Devizes and Upper Ballindery; obtained sections at four general depots—Lockerly Hall, Boughton, Histon, and Honeybourne—and added five vehicle parks. The twelve BOLERO depots were expanded or modified to fit into the new plan, making it necessary for certain bulk depots to act as issue depots also. Acres of Nissen huts covered the countryside.[7]

To see that the troops arriving in the theater got what they needed from the depots but not more than they were entitled to, Col. Graham B. Trainer and his General Supply Division staff at Cheltenham kept a close check on supplies. A simple, workable system of stock control, which was based on the traditional Ordnance Provision System (the submission by depots of a stores report monthly on each "group" of matériel and special reports as required on critical major items) and which had been in effect since early 1943, was considerably expanded. Clear-cut instructions on how to identify and report the matériel were issued to all general supply depots. Scanning ships' manifests, port records, and Transportation Corps forecasts of troop arrivals, Trainer's staff arranged for the storage of incoming equipment at the proper depot and issued credits for it when the troops arrived; thus no requisitions were required.[8]

Keeping records on the equipment supplied to thousands of units meant long hours of painstaking work for the men at Cheltenham. Approximately 350 different types of units came into the theater during the build-up, each with a different T/BA and T/E; besides, many units had special authorizations, which complicated the problem immeasurably. Not all could be equipped with full T/E, for many weapons or vehicles were in critical supply in the United States or had to be left behind because of limitations on shipping. In order to provide Headquarters, ETOUSA, with accurate, current information on what was on hand with the troops or in the depots and what was required, the General Supply Division prepared a Monthly Matériel Status Report. This was an exceedingly difficult job, since reports from units in the field and information on ships' manifests were scanty and unsatisfactory, but it was finally accomplished after an exhaustive examination of requisitions, shipping orders, reports, and all sorts of documents, and was so successful that the other technical services used the report as a model.[9]

The Ordnance SOS troops to handle the vast tonnages that were expected began to arrive in the United Kingdom in the late summer of 1943, but the planners could not predict the arrivals with any degree of confidence. There were constant changes in requirements, availability, and shipment dates for the units; as one of the General

[7] (1) Ord Serv ETO, Class II and IV Supply, pp. 56–57, 502–03; and Annexes 1, 16, 17, 19. (2) ComZone Staff Confs 3 Jan–25 Jun 44, notes for 10 Jan; Admin 457 Staff Conference Notes 1944.

[8] (1) Manuals, Chief Ord Officer Hq SOS ETOUSA, APO 871, Standard Operating Procedure for Ordnance Service General Supply Depots in the European Theater of Operations; Hq ETOUSA, Standing Operating Procedure for the Issue of Initial Organizational Equipment to U.S. Forces in the U.K., 28 Mar 44, Ord Serv ETO, Class II and IV Supply, Annexes 20, 37. (2) Memo, APO 871 for APO 881, 19 Oct 43, sub: Answers to G–4 Questions for Army Ground Force Observers—Ordnance, ETO Ord Sec 320.1 Organization of Ordnance Department, KCRC.

[9] Ord Serv ETO, Class II and IV Supply, pp. 84–86.

Supply men put it, "the jig-saw puzzle was never completed, for it seemed that a few pieces were always missing." [10]

One of the most important missing pieces was a new type of company that had been counted on to move trucks from docks or assembly plants to vehicle parks, operate the parks, and if necessary deliver the trucks to the troops—the motor vehicle distributing (MVD) company. Badly needed during 1942, the MVD companies did not begin to arrive until July 1943, and only twelve of the nineteen scheduled for the theater between that date and May 1944 ever arrived. It took months to orient and train the new arrivals. With every unit in the theater clamoring for trucks, Ordnance had to rely heavily on British manpower, civilian and military. The greatest help came from two British military units, the 6th Vehicle Reception Detachment, which in November 1943 was still operating three of the busiest parks, and the 435th General Transport Company, which in October 1943 moved 60 percent of the vehicles driven from the ports or assembly plants to the parks. Both outfits received the everlasting gratitude of the men at Cheltenham.[11]

Motor Vehicle Assembly

In midsummer 1943 there was a flurry of anxiety about another type of Ordnance unit—the motor vehicle assembly (MVA) company, which put together cased vehicles. The greatest worry that summer concerned 2½-ton trucks; the vehicle parks had few left. Thousands were going to be needed in the fall to fill the T/BA requirements of incoming combat and service troops. At the same time, crates containing cased trucks were piling up at an alarming rate because the British TILEFER plants, which were assembling British and Canadian trucks as well as American, were falling behind. General Sayler cabled for two MVA companies in addition to the two already requested and asked that all four be expedited. But these units were also badly needed in the Pacific, and in the CBI where a great motor base was being set up at Calcutta. Only three arrived between August and December and one of them had to spend weeks in further training.[12]

On 7 August 1943 General Sayler ordered Ashchurch to start assembling 2½-ton trucks on 16 August. This very large order, to be filled in a very short time, went to the 622d Base Automotive Battalion, which had no mechanics trained in assembly work, and, what was worse, none of the special equipment considered essential, such as overhead cranes, roller conveyors, and power tools. There was also at the time no SOP. Fortunately, the 622d had an energetic and enterprising commander,

[10] Chenault History.

[11] (1) Ord Serv ETO, Class II and IV Supply, pp. 22, 32–37, 93–99. (2) Ltr, Holmes to DCofOpns APO 871, 29 Nov 43, sub: British Units Operating in U.S. Establishments, ETO Ord Sec 370–A Activation, Inactivation, Designation and Redesignation of Units, KCRC.

[12] (1) Memo, Ord Service APO 871 for Chief Ord Officer APO 887, 8 Jul 43, sub: Status of Assembly of 2½-ton, 6x6, Trucks (Long Wheel Base and Short Wheel Base), and Incl; Memo, Chief of Services APO 871 for Ord APO 871; both in ETO Ord Sec, O.S. 451–A, Assembly TILEFER 1943, KCRC; (2) Memos, Ord APO 871, 1 Aug 43; and Sayler, 3 Sep 43, in ETO Ord Sec 370.09 Requirements for Personnel and Troops 1943, KCRC. (3) Histories 144th and 145th, 146th, 147th, 150th, 436th, 497th Motor Vehicle Assembly Cos. (4) ASF Plans Div, Theater Br, Diary Jun–Dec 43.

Maj. William R. Francis, who went to Treforest and studied the British Austin Motor Works assembly operation. "Yank ingenuity," as he expressed it, did the rest. With the help of two capable assistants, M. Sgt. Leroy Bell, shop foreman, and Pvt. George Phillips III, a time and motion study expert, he got the assembly line in operation by 18 August. Production rose when three newly arrived depot companies and the 497th MVA Company made a second shift possible. In the first three months of operation Ashchurch assembled 5,000 trucks.[13]

On a smaller scale, Ordnance that fall began assembling 2½-ton trucks at Taunton and lighter cased vehicles, such as jeeps and water trailers, at Hedge End (Tidworth) and eight other depots and vehicle parks. Between May and the end of December 1943, Ordnance troops accounted for about 43 percent of the 60,703 general purpose vehicles assembled in England. But this kind of work began to slacken toward the end of 1943 because the cased vehicles of the most wanted types were not arriving in sufficient numbers. General Lee, commanding general of SOS, directed that the crates that came in were to be sent to Ministry of Supply plants in order to keep them operating at capacity, even though U.S. plants were idle, because the British plants would be badly needed in the spring when the theater's Number 1 priority would bring enormously increased shipments.

The location of most of the U.S. assembly plants caused a further cut-down in Ordnance assembly in the spring of 1944. The already overburdened British railways could not take on the task of transporting the heavy crates from ports to inland depots and parks. Eight of the U.S. plants closed down; by D-day only Ashchurch and Bromborough (O-631), established near Liverpool in January 1944, were left. Most of the seven MVA companies that arrived between January and May 1944 were sent to work in British case dumps near the ports.[14]

Preparations for a Short Sea Voyage

By the end of January 1944 the massed weapons of war were everywhere, strange against the background of the quiet English countryside: hooded 90-mm. guns in a farmyard; row after row of Sherman tanks and half-tracks in an open field, white stars camouflaged with splashes of mud; acres of trucks, with extra gas and water cans on their running boards, in a park where huge trees spread their bare branches; miles of steel ammunition bays along narrow lanes.[15]

In London, where night and the blackout closed in early on days already darkened by rain and fog, firm planning had begun for the landing on the coast of Normandy, described in the ETOUSA Preparation for Overseas Movement (POM) as a "Short Sea Voyage." General Eisenhower had arrived in the theater and approved Montgomery's recommendation to land five divisions on D-day, three British and one American on the Calvados coast, and one American on the Cotentin coast north of the

[13] (1) History G–25, pp. 70–78. (2) Ord Serv ETO, Class II and IV Supply, Annex 54, "TUP Assembly Plant, U.S. General Depot G–25."

[14] (1) Ord Serv ETO, Class II and IV Supply, pp. 72–74, 127–39; (2) Ltr, Maj Gen N. G. Holmes to Brig Gen Frank S. Ross, 14 Sep 43, sub: Import of Boxed Vehicles on Behalf of U.S. Forces. (3) Ltr, Col Leo J. Dillon to Chief Ord Officer, SOS ETOUSA, APO 871, 5 Dec 43, sub: Motor Vehicle Assembly in SBS; and 1st Ind, 8 Dec 43. Last two in ETO Ord Sec O.S. 451–A Assembly TILEFER, KCRC.

[15] *Life*, vol. 16 (21 February 1944), 67–72.



HOODED 105-MM. HOWITZERS STORED NEAR ASHCHURCH, ENGLAND

Carentan estuary. Eisenhower, who wanted "enough wallop in the initial attack," was also urging at least one airborne division, to be dropped behind the Cotentin force; this was not firm, but had to be taken into account in the planning. Also, D-day had been postponed until the end of May in order to gain an extra month's production of landing craft and increase the chance that the Russians would at the same time be attacking on the Eastern Front.[16]

At General Sayler's London headquarters, a handsome four-story town house at 38 Grosvenor Square with an iron-railinged areaway and long drawing room windows taped against bomb concussion, plans for the Ordnance support of the invasion were taking shape. Because of the unhappy experience of TORCH, when excessive emphasis on security had required Ordnance men to work with little factual information, planning for OVERLORD was to a very great extent delegated to the technical services. Detailed planning was also delegated to base sections, armies, corps, and air forces.[17]

General Sayler gave his "operating agencies"—ground forces and air forces Ordnance officers and the SOS Ordnance Section—the responsibility for determining basic data such as weight and volume of

[16] Pogue, *The Supreme Command*, pp. 111–18.

[17] (1) Ordnance History, vol. I, ETO Ord Sec, KCRC. (2) Col. A. T. McNamara, "The Mounting of 'Torch' from England," *Quartermaster Review*, XXVII (July–August 1947), p. 13.

units of supply and logistical factors; for nominating, training, and equipping Ordnance units; for regulating issues of Ordnance material and planning for waterproofing; for establishing the amount of ammunition to accompany troops; and for preparing weapon lists, vehicle lists, ammunition tonnages, and similar data. He gave his base section Ordnance officers the responsibility for nominating their own units and supplementing them when necessary with men from other supply services or with British civilians; for providing supply points, repair shops and temporary ammunition supply points in the concentration, marshaling, and transit areas; and for establishing procedures for issuing Ordnance supplies and ammunition to troops moving through those areas.[18]

Having drawn up a general plan outlining these areas of responsibility, Sayler then took action to co-ordinate the plans of his key Ordnance officers. Since December 1943 he had been distributing to them a weekly news letter and a useful Monthly Statistical Report containing the latest information on Ordnance organization, installations, manpower, and supplies, including forecasts of incoming cargo. Late in January he called the key Ordnance officers together for the first of a series of conferences held throughout the spring at 38 Grosvenor Square, against a background of damask walls, marble mantelpieces, and blackout curtains drawn night and day.

At the first conference, on 2 February 1944, there were present General Sayler and four members of his London staff; Colonel Holmes and eight members of his staff from Cheltenham; Colonel Medaris and his assistant, Lt. Col. John Ray; two Air Ordnance officers, Col. William R. Maxwell of the Ninth Air Force and Col. Selby H. Frank of the Ninth Air Force Service Command; the Ordnance officer of XV Corps, Col. William I. Wilson; and the four base section Ordnance officers, Col. Leo J. Dillon of Southern, Lt. Col. Arthur V. Harrington of Northern Ireland, Lt. Col. D. M. Pearson of Eastern, and Lt. Col. F. E. Smith of Western. There were also present that day representatives from two new organizations: Lt. Col. J. H. Reynolds from the G–4 section of General Eisenhower's Supreme Headquarters, Allied Expeditionary Force (SHAEF) and Lt. Col. Russell R. Klanderman, assistant Ordnance officer of Advance Section (ADSEC), Communications Zone.[19]

Established provisionally at the end of December 1943, under the command of Col. Ewart G. Plank, ADSEC had been created to follow the armies more closely than a base section was able to do. It was one of the fruits of experience in the Mediterranean campaigns, and in naming it the use of the word *base* was carefully avoided. Attached to First Army in the planning and invasion stage, ADSEC was to take over army rear installations about D plus 15 or plus 20 and from then until D plus 41, when the Forward Echelon, Communications Zone (FECOMZ), was to take

[18] (1) Tentative Draft of General Plan of Chief Ordnance Officer ETO for Mounting Cross-Channel Operations, 29 Jan 44, ETO Ord Sec 381 Plans, KCRC. (2) Ltr, Sayler to Distribution, 27 Jan 44, sub: Ordnance Plans for Mounting Cross-Channel Operations. (3) Ordnance Plan, 2 Feb 44. Last two in ETO Ord Sec O.S. 334 Meetings and Conferences General, KCRC.

[19] Hq ETOUSA Ord Sec, Notes on Conference to Develop Ordnance Plans for Mounting Cross-Channel Operations, 6 Feb 44, Incl 1, ETO Ord Sec O.S. 334 Meetings and Conferences General, KCRC.

over, it was to be the sole support organization on the Continent. After that it was to move forward across Europe with the armies. Mobility was the watchword. Ordnance in ADSEC had not only the responsibility for anticipating the needs of the combat forces and sending supplies forward, but for heavy maintenance work as close behind the armies as the tactical situation permitted. The Ordnance Section was activated on 25 January 1944 and the Ordnance officer, Col. Benjamin S. Mesick, worked closely with Colonel Medaris, first in Bristol and later in London.[20]

Two officers who were present at the first conference attended subsequent conferences in new roles. Col. Harold A. Nisley, Sayler's deputy in London, became Ordnance officer of First Army Group; and Col. E. M. Webb of the Cheltenham SOS Ordnance Section became Ordnance officer of the Forward Echelon, Communications Zone. Both were concerned primarily with the build-up on the Continent after the beachhead had been secured, and worked with 21 Army Group rather than First Army. Late in the spring another officer whose planning was directed toward the second phase of operations appeared at the conferences, the Ordnance officer of Third Army, which was scheduled to become operative in France in August. For a brief time Col. Levi M. Bricker had the assignment; he was soon succeeded by Col. Thomas H. Nixon, brought from Sicily by his old commander, General Patton.[21]

Throughout the vital planning months of February and March, interest centered on the three men most directly concerned with Ordnance in the invasion—Colonel Medaris, Colonel Maxwell of Ninth Air Force, and Colonel Dillon of Southern Base Section, where the U.S. troops were to stage before embarking. The heaviest burden fell on Medaris. He had three very important jobs: to equip First Army's troops; to train its Ordnance units; and to make detailed plans for the invasion. By 10 February, when he joined the NEPTUNE Planning Group in London to plan for Ordnance in the invasion, the equipping and training programs were well in hand.

Working closely with the Cheltenham Ordnance staff, he had established the methods by which First Army troops were to receive their T/E equipment from SOS depots and had made recommendations on the extra weapons and vehicles and on special equipment such as beach packs that would be required. He had furnished SOS with spare parts data based on experience in the Mediterranean, relating for example, gun tubes and artillery parts to rounds of ammunition and vehicle assemblies to expected miles of operation.[22]

He had also done some hard thinking on ammunition supply. On his recommendation, a board of officers composed largely of tactical commanders established basic loads for all ground force units; his estimates

[20] (1) Memo, Col James H. Stratton for Chief of Services, 28 Dec 43, sub: Headquarters, Advance Section, Communications Zone, ETO Ord Sec O.S. 381 Plans, KCRC. (2) Col. Benjamin S. Mesick, "Feeding the Ordnance Flame," *Logistics*, I, 3 (April 1946), p. 21. (3) ADSEC COMZ, Office of the Ordnance Officer, Operational Memorandum No. 5, Ordnance Service, Advance Section, Communications Zone, 25 May 44, Ord Serv ETO, Plan & Organ, Annex 41.

[21] (1) 12th Army Group Report of Operations (Final After Action Report), vol. XII, pp. 119–20. (2) Hq ETOUSA Command and Staff Conf, 7 Mar 44, Admin 456, Staff Conference Notes. (3) Minutes, Meetings of Ordnance Officers, 21 Apr, 19 May 44, 12th Army Group 337 Administrative Meetings.

[22] First Army Rpt I, Annex 13, pp. 95–97.

were used by the theater in determining the theater level of ammunition supply and in preparing a new unit of fire. He realized the futility of some of these efforts, for he was aware that ammunition supply was, after all, a tactical problem rather than a problem of supply.[23] General Patton, speaking before General Lee's staff conference at Cheltenham on 31 January 1944, pointed out that some days the Army did not fight, "some days you fight a good deal and some days part of the Army fights and others all of the Army fights." Units of fire, said Patton, applying a quotation from Bernard Shaw on policy, were "designed by knaves to make a trap for fools." [24]

Medaris had made preparations for training his First Army Ordnance units. On 15 February 1944 his office published a Standing Operating Procedure for Combat, issued well in advance of the landings so that the men might become familiar with it. A copy went to every unit commander in First Army.[25] Ordnance battalions destined to land in Normandy with the Engineer special brigades were trained at ETOUSA's Assault Training Center on the Devon coast. When Medaris' army depot and ammunition companies arrived in England, he trained them in SOS depots until army depots and ammunition supply points could be established. He put his heavy maintenance companies to work modifying tanks and other equipment on which changes had to be made and gave them special mass-production jobs to be performed in an almost impossibly short time. One was the installation of Quad 50 machine guns (four heavy .50-caliber machine guns mounted on the M45 turret, usually carried on a wheeled trailer) on 321 surplus half-tracks—an Ordnance field modification, unrecognized and unauthorized, which antiaircraft units and even assault troops were to find surprisingly valuable in Europe. Another job of this kind was armor-plating the floors of 510 armored cars. To selected mechanics, intensive training was given in antiaircraft, tank gyrostabilizer and DUKW maintenance. After several amphibian exercises early in the year demonstrated the need for more training on DUKW's, Ordnance SOS headquarters set up a school at Breandown, on the south side of Bristol Channel.[26]

The theater Ordnance staff was in a position to help considerably in the important problem of waterproofing. In April 1943 Sayler had established an Ordnance Experimental Station (O-617) on the north Devon coast at Bideford, the "little white town" where Kingsley had written *Westward Ho!*; at a neighboring seaside resort called Westward Ho! the British had been working on the problem since 1942. The Ordnance station under the command of Lt. Col. Ray C. Conner, an officer who had had considerable experience in the Mediterranean, tested and improved materials and prepared instruction manuals. Begin-

[23] (1) *Ibid.*, pp. 64–65. (2) Col. J. B. Medaris, "Field Service in the First Army," *Army Ordnance*, XXVIII (January–February 1945), p. 66.

[24] ComZ Staff Confs 3 Jan–25 Jun 44.

[25] Ltr, First Army Commander to All Unit Commanders, United States Army, sub: Ordnance Standard Operating Procedure for Combat, 21 Feb 44, and Incl, OHF.

[26] (1) Hq ETOUSA Ord Sec, Notes on Conference to Develop Ordnance Plans for Mounting Cross-Channel Operations, 6 Feb 44, ETO Ord Sec O.S. 334 Meetings & Conferences General, KCRC. (2) ComZ Staff Confs, 3 Jan–25 Jun 44, notes for 7 Feb, 3, 30 Apr 44. (3) First Army Rpt I, Annex 13, p. 91. (4) Ltr, Maj Gen J. B. Medaris (USA Ret) to Brig Gen Hal C. Pattison, 28 Oct 63, OCMH. (5) Report of Ordnance Projects 1 Jan 1944 to 1 Jun 1944, Ordnance Reports First Army Misc, Jun–Aug 44, OHF.



TESTING WATERPROOFED ¾-TON TRUCK, ENGLAND

ning in December 1943, the station trained Ordnance troops to instruct the individual drivers, who were to do the actual waterproofing on their own vehicles. By May 1944 the school had trained more than a thousand First Army officers and men.[27]

A new contribution to amphibious warfare that was attracting a good deal of attention in these busy months of preparation was the DD (duplex-drive) swimming tank. The British had developed a canvas float, or water wing, that would enable a tank to leave its LCT, swim to the beach, and go in firing. It was one of several new devices tested by Maj. Gen. Sir P. Hobart of the British Army and his 79th Armoured Division at their research center on the coast of Suffolk. The British called these contraptions "Hobo's funnies." Some had been designed to make a tank more effective against infantry, others to aid the assault Engineer units in detonating mines and removing other obstacles. The Crocodile tank carried a flame thrower; the

[27] (1) Ltr, Sayler to OCO, 4 Nov 44, sub: Report of Waterproofing Activities . . . 15 March 1943 to 15 July 1944, O.O. 350.05/15/43. (2) Presentation by Col Holmes, 21 May 44, ComZ Staff Confs 3 Jan–25 Jun 44. (3) Ord Serv ETO, Ord Tech Services, Sec VI, Annexes 1–13. (4) Report, Maj William E. Renner, Ordnance in ETO-USA Jun 45 (hereafter cited as Renner Rpt), pp. 8–11, OHF.



TESTING AN AMPHIBIOUS TANK

CDL (Canal Defense Light, a name given to mislead the enemy), a powerful searchlight to illuminate the battlefield and blind enemy troops; the Crab, a revolving flail for exploding mines; the Bulldozer, a blade that could dig up mines and do many other useful jobs. Not all were British inventions; some were American or American adaptions of British devices.[28]

These and other new developments, such as the Snake—lengths of pipe filled with explosives for the demolition of mines, wire, and other obstacles—were studied by a First Army board, of which Colonel Medaris was senior member, established to consider the adoption of specialized equipment. The board also studied an interesting little vehicle, the Weasel, or M29 light cargo carrier, a small tracked carrier that had been developed in 1942 to carry supplies over snow during possible operations in Norway. Little was known about it in England, but the fact that it was said to operate successfully in mud and swamps as well as snow indicated that it might be

[28] (1) Maj. Gen. Sir Francis de Guingand, *Operation Victory* (London: Hodder and Stoughton, Ltd., 1947), pp. 352–53. (2) Liddell Hart, *The Tanks*, II. 321–28. (3) Bradley, *A Soldier's Story*, pp. 255–56. (4) For use of the bulldozer tank, or tankdozer at Anzio, see above, p. 198. (5) The Japanese had used tanks with searchlights in their attack on Milne Bay in New Guinea in late August 1942. Milner, *Victory in Papua*, p. 83.

useful in the invasion, especially on the swampy Cotentin coast.[29]

Bomb Disposal

One highly secret subject that demanded a good deal of attention in plans for the invasion was bomb disposal. Within the United Kingdom agencies such as the Royal Engineers, Royal Navy, and Royal Air Force had the responsibility for neutralizing unexploded bombs (UXB's), but when the armies moved to the Continent, the task in the U.S. communications and combat zones would fall on U.S. Ordnance.

It was a particularly troublesome problem because at the beginning nobody had realized all of its ramifications. After the 1941 London blitz, the Ordnance Department had set up a bomb disposal school at Aberdeen Proving Ground, under the directorship of Col. Thomas J. Kane, to train men to destroy enemy bombs that might fall on the United States. In July 1943 a bomb disposal company got into action in the Mediterranean, in Sicily with Seventh Army. For TORCH there had been available in ETOUSA only a few Engineers, hastily trained. After TORCH some training had been possible in England, with the help of the British, directed by Col. Philip Schwartz, Ordnance officer of the Eighth Air Force, who supplied some bomb disposal men to the Twelfth Air Force in North Africa.[30]

General Sayler had early foreseen the importance of the UXB work and by May 1943 had on his staff a bomb disposal officer, transferred from Eighth Air Force, to plan for ground and service forces as well as air forces. As reports came in from the Mediterranean, it became clear that the bomb disposal men would have to deal with bombs that had been dropped by Allied aircraft as well as those dropped by the enemy, and with artillery duds, booby traps, captured enemy ammunition, and other hazardous matériel. Also, experience showed the value of teaching all troops to recognize and report the hazards when they saw them—a subject called *bomb reconnaissance.* A school for this purpose was set up at Bristol under the operation of V Corps, with a miniature village, a museum of objects dropped from the air, and instructors from the Royal Engineers school at Rippon. When the first bomb disposal company sent to England, the 234th, arrived in the fall of 1943 it was given the responsibility for all training in bomb reconnaissance.[31]

Colonel Kane arrived in England to be-

[29] (1) Ltr, Medaris to CG First U.S. Army, 2 Feb 44, sub: Adoption of Specialized Equipment for Use Within First Army, and Incls, 12th Army Group, 337 Conferences. (2) On the development of the Weasel and its use in Italy, see National Defense Research Committee, *Transportation Equipment and Related Problems (Summary Technical Report of Division 12, NDRC, vol. I)* (Washington, 1946), pp. 141–43, 115; also, Clark, *Calculated Risk,* p. 417.

[30] (1) Ltr, Kane to Statistical and Historical Section, P&R Division, Nov 44, sub: History of the Bomb Disposal Organization in the European Theater of Operations (hereafter cited as Bomb Disposal History) Ord Serv ETO, Ord Tech Services, Sec V, Annex 8. (2) Rpt Seventh Army, p. K–6. (3) Ltr, Schwartz to CG Eighth Air Force, 19 Dec 42, sub: Review of Accomplishments of Ordnance Section, O.O. 350.05/2221–2300 1943.

[31] (1) Bomb Disposal History. (2) History Ord Service MTO, vol. II, ch. VII, p. 323. (3) Ltr, Chief Ord Officer to Commandant, Bomb Disposal Hq, Aberdeen, 1 Oct 43; sub: Bomb Reconnaissance Training in the United Kingdom, Ord Serv ETO, Ord Tech Services, Annex 16. (4) Ltr, Col Kane to Maj Martin L. Ehrmann, 20 Jun 44, no sub, Ord Serv ETO, Ord Tech Services, sec. V, Annex 13.

come Sayler's bomb disposal officer in March 1944, bringing with him eleven officers from the Aberdeen school. Some of them were assigned to base sections and armies, some to Sayler's Bomb Disposal Division. This division issued an information bulletin, called *Fuze News,* and did a great deal of liaison on equipment with the Royal Navy, Royal Engineers, and Royal Air Force. Though the British had been in the business nearly five years, they adopted several American tools and procedures. The most striking difference between U.S. and British equipment was in weight: the British weighed nearly two tons, the American only 200 pounds. The supply of the equipment to the users was managed almost singlehanded by Capt. Schuyler V. C. Larkin of the Bomb Disposal Division.[32]

Colonel Kane's greatest problem was the organization of the men who were to do the dangerous job on the Continent. The War Department was sending them to the theater in squads of one officer and six enlisted men, instead of in companies. This decision was the result of observers' reports on the Sicily Campaign that the bomb disposal company wasted manpower. After arrival in England, the squads were given on-the-job training by the British; but, in Kane's opinion, the War Department had not made adequate provision for the administration and housekeeping of these units, which he thought were likely to be "kicked about as a step-child" by units to which they were assigned or attached. He recommended that the 234th Bomb Disposal Company, broken down into platoons, be utilized for administration. As time for the invasion drew near, Colonel Medaris suggested earlier phasing of the bomb disposal company to the Continent, in order to support the squads.[33]

The Ordnance Plan for Neptune

On D-day the Americans were to land in Normandy on two beaches divided by the Carentan estuary. The beach on the right, going in, was called UTAH. The force landing here, VII Corps under Maj. Gen. J. Lawton Collins, had First Army's first mission, to advance up the Cotentin peninsula and capture the port of Cherbourg. Collins was to land with the 4th Division; two airborne divisions, the 82d and 101st, were to be dropped inland; and in the week following D-day, two more infantry divisions, the 90th and the 9th, were to land on UTAH. The beach on the left, called OMAHA, adjoined the British beaches. Here the V Corps, commanded by Maj. Gen. Leonard T. Gerow, with the 1st Division and an attached regiment of the 29th Division on D-day and the 2d and 2d Armored to follow in a few days, was to advance south to Caumont and hold while VII Corps captured Cherbourg and the British held the German forces near Caen. Then V Corps, assisted after D plus 6 by XIX Corps with the 28th and 30th Infantry Divisions and the 3d Armored, would be joined by VII

[32] (1) Ltr, Kane to Ehrmann, 20 Jun 44. (2) Bomb Disposal History. (3) Ltr, Sayler to Campbell, 5 Jun 44, sub: Report on ETO Ordnance Activities, O.O. 350.05/12435.

[33] (1) Kane to Ehrmann, 20 Jun 44. (2) Bomb Disposal History. (3) Min, Conf of Ordnance Officers held 21 Apr 44, Office Chief Ord Officer, ETO, 12th Army Group 337 Administrative Meetings. (4) For the recommendation on the bomb disposal company following the Sicily Campaign, see above, p. 171.

Corps after the capture of Cherbourg. First Army with three corps abreast would, in General Bradley's words, "pivot on the British position like a windlass in the direction of Paris," advancing first to the south to isolate the Brittany peninsula, then east to the Seine.[34]

Colonel Medaris planned to place the greatest weight of Ordnance manpower —nine battalions— on OMAHA Beach to support the main Army effort to the south. He intended this group to be, eventually, the forward support organization in the march across France. UTAH was to receive an Ordnance group of five battalions. Later the UTAH group, transferring its forward support battalions to the OMAHA group in exchange for rear support battalions, would become responsible for all Ordnance service in army rear.

Except for OMAHA's main army rear depot and heavy shop battalions, the organization of the two groups was at the outset roughly the same: an ammunition battalion, the first to be landed; a forward third echelon maintenance and battlefield clearance battalion for each corps; an army support battalion to back up each forward battalion with fourth echelon maintenance, a field depot, a collecting point, and evacuation facilities; and an army intermediate battalion to back up the support battalions, repair army trucks, evacuate damaged matériel to rear shops, and handle bomb disposal in the Army area. The fourteen battalions in these two groups were all to be ashore by D plus 15, and were carefully phased to provide Ordnance support within three days after the arrival of the tactical units. The forward battalions had definite assignments to support certain corps; the medium maintenance companies of these forward battalions had assignments to support specified divisions.[35]



COLONEL MEDARIS

Remembering the confusion that had existed on the beaches in Sicily, Medaris planned to place a considerable amount of Ordnance support behind the men who had the task of getting the troops and supplies ashore. Behind each of the three engineer special brigades (one to handle UTAH, two for OMAHA) he placed a battalion consisting of an ammunition company, a medium automotive maintenance company especially trained on DUKW's and LVT's (landing vehicles, tank), and a bomb disposal squad. This insured

[34] (1) Bradley, *A Soldier's Story*, pp. 239–41. (2) Harrison, *Cross-Channel Attack*, pp. 180–88.

[35] First Army, Opn NEPTUNE, Annex 8, Ordnance Plan, 25 Feb 44 (hereafter cited as Ordnance NEPTUNE Plan). (2) First Army Rpt, I, Annex 13, pp. 56–60.

enough Ordnance men to repair vehicles on the spot or dig them out of the sand and drag them to collecting points; to handle ammunition over the beaches and place it in inshore dumps; and to assist Medaris' staff in identifying and loading Class II supplies.[36]

Medaris was determined that the combat forces would not be starved for Ordnance supplies in the crucial early days of the invasion. Very early in his planning, while the experience in Sicily was still fresh in his mind, he provided that Ordnance units going into the forward areas would carry with them as many supplies as they could. In NEPTUNE they would even drive or tow ashore the vehicles and wheeled guns that would be needed as replacements, and the reserve vehicles would be packed with spare parts and other Class II supplies. In this way enough could be carried in to last fifteen days. The arrangement economized on lift; more important, it kept vital items in Ordnance hands. One obstacle stood in the way of the plan: there were more replacement vehicles than there were Ordnance men to drive them. Medaris overcame it characteristically. Realizing that the First Army G–1, Col. Joseph J. O'Hare, had the problem of providing transportation for the men who were going to France as replacements, Medaris borrowed the replacement men to drive the replacement vehicles, first putting them through a program of driver training. The planning for Class V was more difficult. Because of the limited capacity of the beaches there were arbitrary tonnage limitations that did not provide much insurance against abnormal losses. Assault divisions were authorized to carry quantities in excess of their basic loads if they had the transportation; and to this problem DUKW's provided the answer.[37]

In planning the operation of Ordnance service in NEPTUNE Medaris was able to profit from two important lessons he had learned in North Africa. One was the need for collecting companies to bring back damaged matériel from the battlefield. He had had to improvise such a company in Tunisia but now had four evacuation companies (TOE 9–187) that could be converted into collecting companies by adding more trucks, wreckers, and tank recovery vehicles and subtracting tank transporters. In the process he gained manpower, for the evacuation company had fifty-eight more enlisted men and one more officer than the collecting company required. He used the men thus gained to put into effect the second important lesson—the need for a radio net between Ordnance units in the field. The men were sent to Signal Corps schools and the network was set up in the United Kingdom before D-day.[38]

Toward the end of the planning period Medaris relieved all nondivisional Ordnance troops except bomb disposal squads from attachment to corps. While authorizing each corps Ordnance officer to communicate directly with the commander of the battalion supporting his corps and the

[36] Ordnance NEPTUNE Plan.

[37] (1) Minutes, Ord Conference, 15 Nov 43, ETO Ord Sec O.S. 381 Plans, KCRC. (2) Ordnance NEPTUNE Plan. (3) Colonel O'Hare agreed to lend his replacement men very reluctantly, because he was afraid he would not get them back. Actually, every one of them was returned to him in Normandy. Interv, Maj Gen Floyd A. Hansen, 15 Sep 60.

[38] First Army Rpt I, Annex 13, pp. 84–86.

commander of the corps ammunition supply points, and delegating to the battalion commander authority to locate his elements in accordance with the direction of the corps Ordnance officer, Medaris kept in his own hands the control of his Ordnance men.[39]

Colonel Medaris was convinced that it was an "absolute necessity" for him to have direct command of First Army Ordnance troops, believing strongly that subsidiary control exercised through staff channels would cause delays that might be disastrous. But he was faced with the same problem Niblo had had. First Army headquarters, like that of Fifth Army, was still organized under the T/O 200–1 of 1 July 1942, with an Ordnance Section that was woefully inadequate. How was Medaris to exercise command without a headquarters competent to issue orders? He thought the T/O 9–200–1 for an Army Ordnance Command, Headquarters and Headquarters Company, proposed in November 1942 by Col. Robert W. Daniels, AGF Ordnance officer, which provided 19 officers, 2 warrant officers, and 80 enlisted men, would serve his purpose, if 6 enlisted men to operate a switchboard and wire net were added. As yet T/O 9–200–1 had not been published—held up, visitors from Washington told him, until the complete T/O for army headquarters was approved and published.

Pending final approval, Medaris asked First Army for authority to reorganize his Ordnance Section under T/O 9–200–1 provisionally. He was refused and had to be content with a slight increase in staff. Starting with 18 officers, 1 warrant officer, and 33 enlisted men, he gained 3 officers and 12 enlisted men in April 1944, following the revision of T/O 200–1 in December 1943. The antiquated table of organization was not the only handicap. There was also the difficulty of obtaining officers who were qualified to tackle the complicated problems posed by OVERLORD. For that reason the First Army Ordnance office was not completely organized until after D-day.[40]

On 18 March 1944 General Bradley gave his special staff officers "operational control" of their troops, a concept borrowed from the British. He delegated to them certain specific functions: transfer of men between units, except in unusual cases; movement of troops within the army zone; issuance of normal operating orders and training directives; reallocation of supplies; and recommendations on such matters as efficiency reports, promotions, and reclassifications. Colonel Medaris did not consider that this arrangement gave him actual command—"the complete command set up" that Niblo had in Fifth Army—but it did eventually give him complete freedom of action with respect to his troops, and wide latitude for operation in the technical channel, mainly because he had a good working relationship with his two commanders, first Bradley and then

[39] Ltr, Medaris to Ord Officers, V, VII, XIX Corps, 6 Apr 44, sub: Army Ordnance Battalions in Support of Corps, app. 6 to USFET Bd Rpt 101.

[40] (1) Ltr, Medaris to Daniels, 8 Nov 43, ETO Ord Sec 320.3 Organization of British Army, KCRC. (2) Ltr, Medaris to CofS First Army, 23 Oct 43, sub: Command of Ordnance Units Assigned or Attached to Army, ETO Ord Sec 320.1 Organization of Ordnance Department, KCRC. (3) Ltr, Connerat to Ord Officer AGF, 9 Nov 45, sub: Ordnance Organization Within Army Headquarters, Incl 1, 1st Ind, Folder, Organization of Army Ordnance, AGF Ord Off Files.

Lt. Gen. Courtney H. Hodges, who commanded First Army after General Bradley left in August to take command of 12th Army Group. Medaris learned early in the campaign that the confidence of his commander was his greatest asset.[41]

The policy of operational control was adopted in all the armies in the European campaign—Third, Seventh, Ninth, and Fifteenth as well as First. Still, none of the army Ordnance officers had the complete command that Niblo exercised. The effectiveness of operational control varied according to the men and their commanders. Colonel Nixon, Patton's Ordnance officer in Third Army, considered that it amounted to actual command. At the other extreme, there was "the Ordnance Officer who cannot breathe without G–4 approval, who does not receive a single document without its coming in and out through G–4 and who cannot issue a single instruction unless over the signature of the AG . . . ," as Medaris noted in November 1944. He felt that such compartmentation led to decisions by men unqualified to make them, for the average G–4 had no Ordnance training; also it hampered the army Ordnance officer in his dealings with Ordnance officers at corps and division level. Medaris continued to believe that the Ordnance officer of an army ought to be given by T/O a command organization that was so definitely intended for the purpose that his army commander would have to conform. With this contention General Campbell, Chief of Ordnance, was in "complete agreement." [42]

Yet the question of a command organization for the army Ordnance officer was not answered during the war or even in the postwar period. Though the Ordnance section of the USFET Board favored such an organization and recommended that it take the form of a brigade headquarters and headquarters company, nothing was done. Tactical commanders generally opposed it, including Medaris' own commanders. General Sayler felt that it would never come about and that the only practical solution was for the Ordnance officer to work through his commanding general. Brig. Gen. Harold A. Nisley, Ordnance officer of the 12th Army Group, agreed. Nisley came to believe that if the Ordnance officer of a major field force "sold himself and Ordnance service properly to his own Headquarters" and if the Ordnance officers at lower echelons were properly indoctrinated with the idea of liaison and co-operation with the Ordnance officer at the higher level, most of the problems would be solved.[43]

"The Best Equipped Fighting Force"

Though Medaris lacked Niblo's command organization, he had the advantage of First Army's prestige as the spearhead of a campaign on which everything hinged. He had based his plan for NEPTUNE

[41] (1) First Army History I, pp. 16–17; (2) Ltr, Medaris to Campbell, 8 Nov 44, Folder, Medaris Report to General Campbell, OHF. (3) Medaris, "Field Service in the First Army," *Army Ordnance,* XXVIII (Jan–Feb 45), p. 67.

[42] (1) USFET Bd Rpt 101, app. 5, p. 2. (2) Ltr, Medaris to Campbell, 8 Nov 44. (3) Campbell Comments.

[43] (1) USFET Bd Rpt 101, p. 28. (2) For Niblo's advocacy of the brigade, see above, p. 189. (3) Interv, Maj Gen Henry B. Sayler, 19 Mar 58. (4) Personal Ltr, Col Harold A. Nisley to Brig Gen J. H. Hinrichs, 15 Jul 52, in File, Rpt of Frank Panel, OHF.

on the assumption that the men he needed to operate Ordnance service would be furnished him; and they were, even though there was a general shortage of Ordnance troops, not only in the theater but in the United States. It was done by taking units from SOS and even Third Army, which would not become operational on the Continent until August and therefore had a longer time for build-up.[44]

The theater made strenuous efforts to bring Medaris' two group headquarters from the United States in time. The group headquarters designed to administer battalions in support of field forces—the organization that Niblo had fought for so long—did not have a table of organization (TOE 9–12) until 15 April 1944. Two group headquarters were available in the United States, the 51st and the 52d. After urgent cables from General Eisenhower, who even suggested shipment by unescorted ship, the 52d was scheduled to arrive before the end of April; but the 51st could not possibly arrive until late May, too late for NEPTUNE. As a substitute for the 51st, Medaris was given the 224th Base Group Headquarters (T/O 9–312), which had been assigned to FECOMZ.[45]

In the matter of supplies, the theater went to great lengths to equip First Army. An important supply mission that included the theater chiefs of all technical services was sent to the United States in March. As a member of this mission, Sayler speeded action on the advance shipment of T/E equipment and depot stocks, and the dispatch to the theater of ammunition (principally for artillery), PROCO projects, and such special non-status items as tool sets. He urged that some of the ships scheduled to carry supplies direct from the United States to the Continent (the floating depots devised to solve the problem of port congestion in the United Kingdom) be loaded by commodity or "type," and he obtained approval for loading 30 ships solely with trucks and 11 with ammunition. This would enable him as Ordnance officer of the Communications Zone to call forward specific cargoes quickly on demand of the using arms.[46] The European theater gained an immense advantage when it convinced Army Service Forces and the New York Port of Embarkation that it had a good stock control system. As a result, in Europe the Ordnance supply officers had far less trouble with the editing of requisitions than had those in the Mediterranean.[47]

The ETOUSA supply men paid tribute to the "magnificent job" done by Army Service Forces and New York Port of Embarkation in meeting their demands.[48] In the United States a close check was kept

[44] (1) Minutes, Conf of Ordnance Officers APO 887, 28 Mar, 21 Apr, 19 May 44, 12th Army Group 337 Administrative Meetings. (2) 12th Army Group (FUSAG) Daily Journal, Ordnance Section, Mar–Jul 44.

[45] (1) Msgs, Eisenhower to AGWAR, 3 Apr, 14 Apr 44. (2) Msgs, Marshall to Eisenhower, 12 Apr, 16 Apr 44. (3) Ltr, Eisenhower to FUSAG, FUSA, FECOMZ, and ADSEC, 20 May 44, sub: Ordnance Troop Requirements and Assignments, Incl 1. All in 12th Army Group 322 Ordnance Units. (4) Min, Conf of Ordnance Officers, APO 887, 21 Apr 44.

[46] (1) Ltr, Brig Gen Royal B. Lord to Gen Somervell, 1 Apr 44, sub: Rpt on ETOUSA Supply Mission to United States, Incl 8. (2) Digests of Teletype Confs, 29 Apr, 1 May 44. Both in ASF Planning Div, Theater Br. (3) Ord Serv ETO, Class II & IV Supply, pp. 88, 526, and Annex 1.

[47] (1) Sayler Interv. (2) Lt. Gen. Leroy Lutes, "Supply: World War II," Part II, *Antiaircraft Journal*, vol. 96 (January–February 1953), p. 3.

[48] Daily Journal, ACofS G–4, 16 May 44, Admin 475.

on shortages and shipments were expedited if necessary. When word came from the theater that the DUKW's, which were wearing out from use in training and amphibious exercises, would need more parts than had been anticipated, ASF shipped six tons of critical parts by air. The War Department released additional quantities of ammunition. As D-day drew near, very few shortages existed either in spare parts or ammunition, and those were caused by shortages in the United States. Special arrangements were made for shipping scarce types, such as 81-mm. mortar ammunition, as soon as they became available. Missions from ASF, NYPE, and the technical services were sent to England throughout the spring to check on supplies and demonstrate new types of equipment. Experts came over to help solve special problems. Late in March 1944, when 21 Army Group became concerned about the difficulty of segregating 105-mm. howitzer ammunition by lots, Ordnance sent Col. Leslie E. Simon, director of the Ballistic Research Laboratory, to the theater to conduct test firings, and the data he obtained was used successfully to classify the ammunition.

Certain Ordnance items, chiefly vehicles, that could not be sent in time from the United States were obtained, one way or another, in England. First Army got tank transporters from the British and 2½-ton trucks from the Red Cross and even from SHAEF headquarters, swapping 1½-ton trucks for them. For other items that were not available anywhere, such as 10-ton ammunition trailers, there were substitutes that would do. Perhaps the most serious shortage was in Ordnance shop trucks, which were in demand not only for their original purpose but, as in the Mediterranean, for mobile command posts. Some were obtained by robbing Third Army and the Field Force Replacement Service. With these, the Ordnance men trusted that they could get by for the first thirty days after the invasion, when more shop trucks were expected from the United States.[49]

Toward the end of the cold, uncomfortable English spring of 1944, the troops moved into their marshaling camps in southern England. Taking stock, the men at headquarters began to feel repaid for the months of hard work and worry. The chief of operations of ASF, General Lutes, came to England to make an exhaustive last-minute survey of the plans and preparations; he assured General Eisenhower that the invasion could be supported. General Sayler reported to General Campbell that First Army was "probably the best equipped fighting force in the history of warfare." Medaris and the combat commanders seemed satisfied.[50] Indeed, at the last high-level conference at General Montgomery's headquarters three weeks before D-day, attended by King George VI himself, Prime Minister Churchill was somewhat alarmed by "the amount of paraphernalia." He was reminded of

[49] (1) Memo, CG ASF for Maj Gen John E. Hull, 29 Apr 44, sub: Supply Situation for the European Theater of Operations, ASF Planning Div, Theater Br. (2) Ltr, Holmes to Campbell, 5 Jun 44. (3) Daily Journal ACofS G-4, Mar–May 44. (4) Hq ComZ Staff Conference Notes 1944, 10 Apr 44–21 May 44. (5) 12th Army Group (FUSAG) Daily Journal, Ordnance Section Mar–Jul 44.

[50] (1) Lutes, "Supply: World War II," Part II, *Antiaircraft Journal*, vol. 96 (January–February 1953), p. 9. (2) Ltr, Sayler to Campbell, 12 Jun 44, sub: Report on ETO Ordnance Activities, O.O. 350.05/12489. (3) Ltr, Holmes to Campbell, 5 Jun 44.

Admiral Cunningham's story of seeing dental chairs being landed at Algiers during Operation TORCH. And remembering the swarm of vehicles on the Anzio beachhead, he even became concerned about what he called "an excess of motor-cars." [51]

The conference ended; the top commanders began a round of visits to the troops waiting for D-day in the marshaling areas; and Churchill wrote in General Montgomery's "private book," "on the verge of the greatest adventure with which these pages have dealt, I record my confidence that all will be well. . . ." [52]

[51] Churchill, *Closing the Ring*, pp. 615–16.

[52] *Ibid.*, p. 616.

CHAPTER XIV

The Far Shore in Normandy

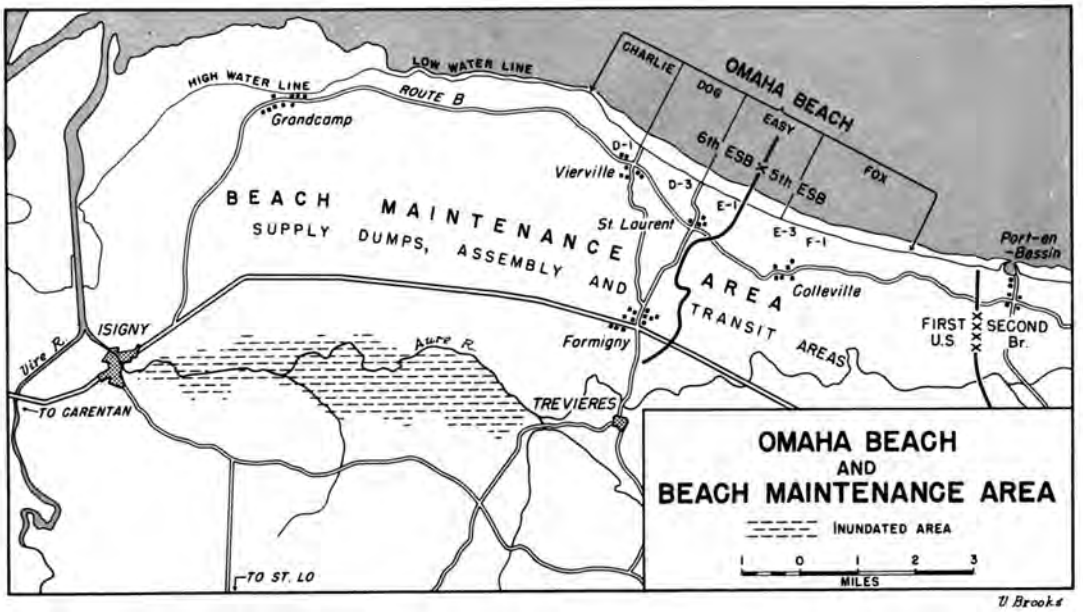
Waiting their turn on D-day to make the 11-mile run from the transport area in the English Channel to OMAHA Beach, the Ordnance ammunition team aboard LST 376 looked over the side with mounting concern. The first waves of the invasion —the tank-laden LCT's (some carrying DD swimming tanks) and the infantry— had gone off on schedule in the darkness; but as day broke, a hazy, misty morning, the men saw that there was a nasty chop in the Channel with swells running high, and that the small craft circling around their LST were having trouble.

A few minutes before H-hour (0630), Lt. James N. McPartland, the commanding officer of the 56-man team, started for the shore to reconnoiter for an ammunition dump site, getting rides for himself, Sgt. Sam Godino, and Pvt. Albin E. Petrovich in DUKW's carrying 105-mm. howitzers. Their destination was Fox Green Beach, in the eastern sector of OMAHA, but they did not get very far. Sergeant Godino's DUKW became waterlogged and had to be towed back to the LST by a Coast Guard cutter. It sank just as the last man jumped onto the deck ladder. A few minutes later another Coast Guard cutter brought in Private Petrovich, who had been hauled out of his foundering DUKW. The men saw no more of Lieutenant McPartland and presumed him lost, though actually he had been rescued and carried back to England.

Shortly after the DUKW debacle the rest of the team headed for the shore in a Rhino ferry. This was a barge—made of ponton units and propelled by outboard motors—that was big enough to carry 2½-ton trucks as well as men. Towed across the channel by the LST's, the Rhinos were another innovation of this invasion. Unlike the swimming tanks, of which only 5 of the 32 destined for the eastern sector of OMAHA survived the heavy sea, the Rhinos were virtually unsinkable, but they were unwieldy and slow. During the long, rolling voyage the ammunition men, who had a good chance of being the first Ordnance men ashore, had time to review what they had been told about the terrain and the job they were to do.

Omaha Beach

The part of the Normandy coast forever to be known as OMAHA had a wide tidal flat with an embankment of coarse shingle. (*Map 2*) Beyond the shingle was a level shelf of sand with patches of marsh grass, then bluffs cut by four ravines forming exits to inland villages. Near Colleville, the village on the extreme east, to be located by its church steeple, the men on the Rhino were to set up a dump in support of the 37th Engineer Combat Battalion. They were the first team of the 616th Ordnance



MAP 2

Ammunition Company. About two hours later they were to be joined by the third team, attached to the 348th Engineer Combat Battalion, which was to set up another dump in the neighborhood. The second team, which the rest of the company called the "home guard," was to come in next day to reinforce the two dumps. All were a part of the 251st Ordnance Battalion, assigned to the 5th Engineer Special Brigade, and for months had been training in England with the Engineers. The first and third teams had participated in the FABIUS dress rehearsal in May.

About 1300, nearly three hours behind schedule, the Rhino approached the shore. The men saw shell explosions and vehicles afire on the beach. The barge ahead of them was hit several times and burst into flames. One LCI ordered them back; another told them to go in. The men put on their pistol belts and packs, loudly cursing the heavy loads, while praying under their breaths. When they approached the shore a second time, they were again warned by an LCI with a loud-speaker to "Get the Hell away from the beach."

"And so," as the historian of the company recorded,

> our rhino continued to meander amongst the myriad number of LCT's, LCI's, LCVP's, destroyers and cruisers. All this time the harsh, dry cough of the large naval guns aboard nearby French cruisers boxed our ears and caused us to jump nervously. We saw the powder flash before we heard the blasts. We timed the interval between the smoke and the blast to kill time. We cheered the destroyers as they spewed their small shells directly into the face of the enemy, while their hulls almost scraped along the sandy bottom. We were chilled and wet from the cold drizzle, as we huddled together in those two and a half ton trucks for



RHINO FERRY DISCHARGING MEN AND SUPPLIES ON A NORMANDY BEACH

warmth and the confidence breeded by close proximity with others.[1]

German shells were dropping in the water around them. After dark the beach was lit up by the fire of the enemy's big guns and mortars. Toward midnight the ammunition men found themselves in the midst of some LST's that had come close to the shore to take off the wounded. The Rhino tied up alongside one of them for the night, just as the Luftwaffe came over and dropped a bomb whose flight the men could follow by its "eerie, fear-striking whistle"; the bomb fell into the water. The men from the Rhino scrambled up the landing net to the top deck of the LST, found some blankets, and fell asleep to the racket of the antiaircraft guns. So ended D-day for the first team of the 616th Ammunition Company.

The third team got ashore on D-day. The men left the transport *Dorothea L. Dix* on LCVP's, which looked something like iron bathtubs. They were faster than the barges but less steady; most of those aboard were desperately seasick. The front ramps were lowered about 1330 into waist-deep water. Scuffling ashore, the Ordnance troops saw dead and wounded men sprawled on the shingle, and found themselves lying side by side with infantrymen

[1] History 616th Ord Ammunition Co, 19 Nov 43–Jun, Oct–Nov 44.

of the 1st Division's 26th Infantry. Shell fragments were hitting all around them, cutting trousers and lifting helmets from heads and bodies from the ground. The Ordnance men crawled behind a wrecked LCI and LCT, edged farther up the beach behind stalled half-tracks, and at last reached shelter at the base of the bluff, leaving three wounded men, one fatally, behind them on the rock-strewn sand. Meanwhile, another boatload of twelve ammunition men followed troops of the 26th Infantry up the hill to the outskirts of Colleville, where they tried to set up an ammunition supply point, but they found things too hot for them and returned to the beach. All dug in for the night and tried to sleep through the falling flak and German bombs. Just before dawn a messenger told the men to prepare to advance to the front lines as replacements for infantry, but nothing came of this.

The men on the luckless Rhino got ashore next day and were able to help the third team unload the first munition-laden LCT to come in. Working under mortar fire, they carried 155-mm. shells across the wide stretch of shingle and stacked them among the tarpaulin-covered dead.[2]

Before the day was over, the commanding officer of the 616th located a 9-man party from 251st Ordnance Battalion headquarters, which had landed on the wrong beach. These men had a harrowing story to tell. Capt. Harold G. Ordeman had landed in a DUKW at E–1 Beach on D-day at 0830, when the beach was still under small arms fire as well as mortar and artillery fire. He had to pull four men from a burning craft and extinguish the flames from the clothing of a sailor who had been knocked unconscious by an explosion. Maj. Karl H. Zornig came in at 1230 but was wounded and had to be evacuated to England. The rest of the party, landing later in an LCT in the midst of an artillery barrage that effectively pinned the men down, spent the afternoon helping the wounded. Sometime during the day a few men of the 3466th Medium Automotive Maintenance Company got ashore in an LCVP, but the rest of the company and the bomb disposal squad were held offshore in the cumbersome Rhinos.[3]

In the western sector of OMAHA, where the 74th Ordnance Battalion was assigned to the 6th Engineer Special Brigade, even fewer Ordnance men got ashore, but some of them could claim the distinction of being the first Ordnance men to land in Normandy, since the first team of the 3565th Medium Automotive Maintenance Company hit the beach forty-five minutes before H-hour. Later in the day a small party of two officers and sixteen men drawn from the 618th Ammunition Company and the

[2] (1) *Ibid.* (2) Ernest Hemingway, who was in one of the LCVP's that left the *Dix,* wrote a vivid account of the Fox Green Beach landings, "Voyage to Victory," *Colliers,* vol. 114, No. 4 (July 22, 1944), pp. 11–13, 56–57. (3) For the OMAHA landings see Harrison, *Cross-Channel Attack,* pp. 305–28. Unless otherwise indicated this chapter is based on Harrison's volume and on Ruppenthal, *Logistical Support of the Armies, I.* (4) Samuel Eliot Morison, "History of United States Naval Operations in World War II," *The Invasion of France and Germany: 1944–1945,* pp. 110–54.

[3] (1) History 251st Ordnance Battalion, 11 Feb–Aug 44. (2) History 5th Engr Special Brigade, Opn Rpt NEPTUNE, 6–26 Jun 44, p. 19. (3) Monograph, Capt Reynold A. Atlas, The Operations of Ammunition Depots in Normandy from D-Day to the Battle of St. Lô, 6 June–25 July 1944, The Infantry School, 1946 (hereafter cited as Atlas Monograph), copy in OHF.

27th Bomb Disposal Squad also landed in this sector. There was little they could do beyond helping the medics. When more ammunition men came in next day, the Engineers sent them to a point near Colleville to set up the first ammunition dump, with the help of ammunition men from the 5th Engineer Special Brigade. The dump planned at Vierville could not be opened for several days, and when it was opened it was so near the front lines that rounds were taken from their boxes at the dump and carried by hand to the artillery batteries.[4]

The second team of the 3565th Automotive Company got ashore D plus 1. The men had been trained mainly on beach recovery, and there was plenty of that type of work to do, for the beaches were strewn with flaming wrecks; but somehow in the confusion of the landing the company found itself counted as part of an infantry battalion. Marching inland with the infantrymen, the Ordnance men joined in the early mopping-up operations in the Vierville-Louvieres area and suffered heavy casualties.[5]

All along the 5-mile stretch of OMAHA, the invasion had been costly. The transports and LST's had been anchored too far offshore and in the strong current and high waves that followed the storm of 5 June, the small craft headed for the shore had been carried off course, so that hardly any units landed as planned. The Germans had good beach defenses, notably deadly underwater obstacles with mines attached, and they had a full infantry division whose presence had been missed by Allied intelligence. Nevertheless, the men on the beaches were pushing inland by the afternoon of D-day, climbing over the bluffs whenever they were stopped at the exits. Wave after wave of follow-up troops came in on succeeding days.

Among them were the battalions that Colonel Medaris had planned for the support of V Corps. Two companies of the 100th Ordnance Ammunition Battalion were ashore by early afternoon of 8 June, helping in the Engineer dumps until ASP 501 (later Depot 100) was set up a few days later at Formigny under the supervision of Colonel Ray, Medaris' ammunition officer, who had arrived at OMAHA early on D-day. The first job was sorting, for the ammunition had been unloaded so hastily that any effort to land it from the ships in separated types had been wasted. Trucks and jeeps drove up with the ammunition still in landing nets; men with cranes had simply picked up the nets, tossed them to the top of the pile, and pulled the nets from under. The result was a huge mass twenty feet high that included small arms ammunition, high explosives, blasting caps, chemical shells, and propellent charges. The Ordnance men set up a roller conveyor and began to dig their way through the pile. It was slow, dangerous work.[6]

Shortly after midnight on 11 June the headquarters of the 177th Ordnance Battalion, the First Army maintenance battalion attached to V Corps, was ashore at

[4] (1) History 6th Engr Special Brigade, 6 Jun–20 Jul 44. (2) 1st Sgt. Bernard W. Steele, ETO, Letter to Editor, *Firepower*, vol. II, No. 1 (June–July 1945). (3) History 100th Ord Ammunition Bn, p. 28. (4) Ord Serv ETO, Ammunition Supply, Annex 41, OHF.

[5] Col. W. R. Slaughter, "Ordnancemen Are Combat Troops," *Firepower*, vol. I, No. 5 (February–March 1945), p. 5.

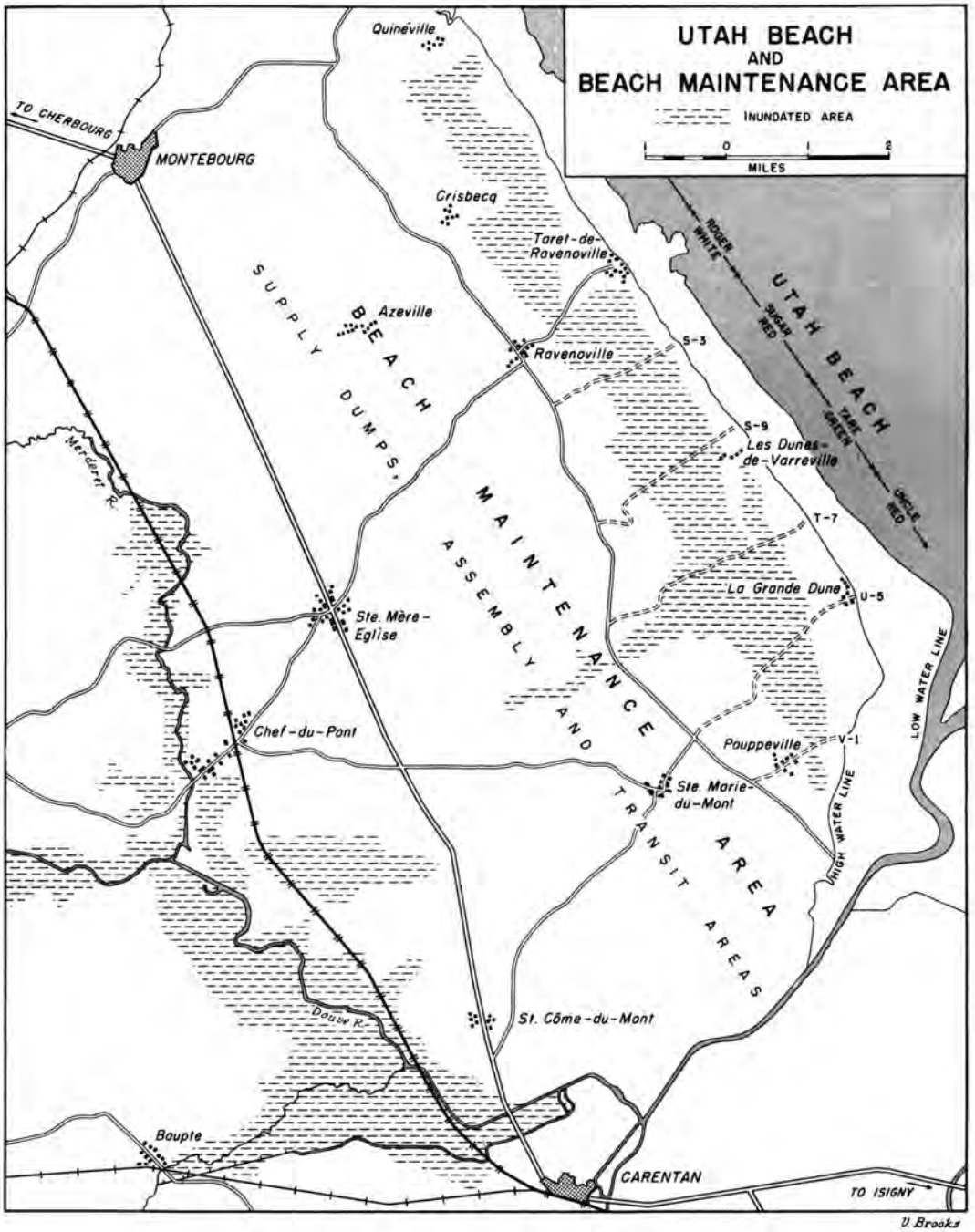
[6] (1) History 100th Ammunition Bn. (2) Interv, Lt Edwin J. Best, 618th Ord Co, with Maj William E. Renner, in Renner Rpt.



AMMUNITION DUMP BEHIND OMAHA BEACH

Dog Green Beach. When the commanding officer was able to get in touch with the command posts of V Corps and First Army Ordnance, he learned that he had lost an entire medium automotive maintenance company, the 3422d, and twenty-seven enlisted men of Detachment B of the 526th Heavy Maintenance Company (Tank) when LST 1006 was sunk in the English Channel by a German torpedo in the early hours of 9 June. Eleven men and two officers of Detachment B had been rescued but were carried back to England, and all the company's equipment had gone down with the ship. Two medium maintenance companies had come ashore safely, along with Detachment A of the 526th. In spite of its misfortunes, the 526th Heavy Maintenance Company "performed a heroic task in refitting, repairing, and keeping in operation badly needed tanks," according to a Bronze Star citation presented to its commanding officer, Capt. Francis F. Poppenburg. On the day after the arrival of the 177th Battalion headquarters, 12 June, Colonel Medaris organized First Army Ordnance Service at OMAHA.[7]

[7] (1) History 177th Ord Bn 1944. (2) History 526th Ord Heavy Maint Co (Tank) Jan–Dec 44. (3) History 72d Ord Group, 1944.


UTAH BEACH
AND
BEACH MAINTENANCE AREA
INUNDATED AREA
0
1
2
MILES
TO CHERBOURG
MONTEBOURG
Quinéville
Crisbecq
Turet-de-Ravenoville
Azeville
Ravenoville
SUPPLY DUMPS'
BEACH
MAINTENANCE
ASSEMBLY AND
TRANSIT AREAS
UTAH BEACH
ROGER WHITE
SUGAR RED
TARE GREEN
UNCLE RED
S-3
S-9
Les Dunes-de-Varreville
T-7
La Grande Dune
U-5
V-1
Pouppeville
Ste. Marie-du-Mont
Ste. Mère-Eglise
Chef-du-Pont
Merderet R.
Douve R.
St. Côme-du-Mont
Baupte
CARENTAN
TO ISIGNY
HIGH WATER LINE
LOW WATER LINE
V. Brooks

MAP 3

Utah Beach

Compared to the bloody landings on OMAHA Beach, the landings on UTAH Beach, on the Cotentin peninsula northwest of the Carentan estuary, were easy. The beach itself, nine miles long, was easier to cross. (*Map 3*) There was a gentle slope of wet sand, then a few yards of dry sand, and behind that a low concrete wall against a belt of dunes partly covered with beach grass. Inland were flooded pasture lands for a mile or two, crossed by causeways leading from the beach; to secure these causeways, two airborne divisions, the 101st and 82d, had been dropped beginning at 0115 on D-day.

The sea was calmer at UTAH than at OMAHA, beach obstacles were fewer and less formidable, and although artillery shelling continued for some time from the heights at the northern and southern end of the beaches and some damage was suffered from the Luftwaffe, the assault forces encountered nothing like the hail of enemy fire that had met the OMAHA landings. The Germans sent their remote-controlled miniature tanks to blow up the boats as they beached, but the little Goliaths were no more successful here than they had been at Anzio. By nightfall on D-day, most of the assault units of the 4th Division had reached their first objective on the main highway between Carentan and Ste.-Mère-Eglise, and dumps were quickly established in the dune area to relieve the congestion on the beach.

Ordnance troops assigned to the 1st Engineer Special Brigade got ashore early on D-day. At 1030 (H plus 4) an advance party of the 191st Ordnance Battalion and 4 officers and 56 men of the 625th Ammunition Company landed. The experienced team of the 625th had supported the engineers in Exercise TIGER.[8] Next morning, when the first of the preloaded ammunition LCT's came in, the whole 625th was ashore and the first beach dump was set up about 600 yards behind Tare Green Beach. That afternoon a British destroyer brought in the commanding officer and some headquarters men of First Army's 101st Ammunition Battalion, who had been rescued from the USS *Susan B. Anthony* twenty-two miles offshore when she struck an enemy mine and sank. In the next few days, through the joint efforts of the 101st Ammunition Battalion and the 1st Engineer Special Brigade, the first inland dump was established near Audouville-la-Hubert. In spite of some enemy shelling and bombing, mostly at night, the dump was soon operating smoothly.[9]

Most of the ammunition was brought to the beach by DUKW's. Some care was taken to see that these vehicles did not become overworked, as they had been in the invasion of Sicily. At transfer points on the beach the loads, still in cargo nets, were lifted out by cranes and placed in trucks that took them to the dumps; the DUKW drivers had such definite orders not to drive inland that even General Bradley, who visited UTAH on 7 June, was unable to get a ride in one to VII Corps headquarters. The 1st Engineer Special Brigade's DUKW maintenance company, the 3497th (vet-

[8] In TIGER, the 625th Company lost 12 men when their LST was sunk by a German E-boat, and shortly before the invasion 7 men were killed and 13 injured when the company's rear echelon CP at Falmouth was bombed. History 625th Ammunition Co 1 Dec 42–Jan 46.

[9] (1) Opn Rpt, 1st Engr Special Brigade, NEPTUNE Opn (UTAH Beach), 6 Jun 44–24 Oct 44, Annex 4, Incl B; Annex 6, Incl F. (2) History Hq & Hq Det 101st Ord Ammunition Bn, 27 Aug 42–12 Nov 45. (3) Atlas Monograph.

erans of Sicily) did not land until D plus 3, but was not needed earlier.[10]

The first Ordnance maintenance company on UTAH (except for the division light maintenance companies) was First Army's 2d Medium Maintenance Company, assigned to the 4th Division. This was Ordnance's oldest company, with a history dating back to Château-Thierry and the Meuse-Argonne in World War I; it was soon given a chance to show that it could live up to its traditions. Landing on 8 June, the 2d looked like a combat team, for according to Medaris' plan for maintenance companies to carry as many replacement items as possible, it brought artillery in calibers from 40-mm. antiaircraft guns to 155-mm. howitzers and almost every type of combat and general purpose vehicle, each vehicle combat-loaded with ammunition, gas for 150 miles, and food for three days. While the men were unloading this formidable cargo from their Liberty ships into pitching LCT's and Rhinos, with an M4 tank swaying in midair, German planes swooped out of the low-hanging clouds and attacked them with bombs and machine guns. When the men got to the beach they met severe fire from a German shore battery that killed three men of the company and wounded seven so seriously that they had to be sent back to England.

Until 15 June, when units of the 184th Ordnance Battalion arrived, the 2d supported not only the 4th Infantry Division but also the 9th and 90th Infantry Divisions, the 82d and 101st Airborne Divisions, and VII Corps troops. Its wreckers were almost immediately put to work clearing the littered causeways, and its replacement stocks were drawn on to reoutfit a complete battalion of the 90th Infantry Division that had lost all its equipment in the landings. The 2d Medium Maintenance Company set up the first Ordnance supply point on the Continent in two fields at St. Hubert, as well as the first Ordnance collecting point and medium maintenance shop. On 13 June, moving north on the heels of the 4th Infantry Division, the company opened a shop in a field only two and a half miles from Montebourg, where a hard battle was being fought. In the next field was a battalion of 155-mm. howitzers that made sleep almost impossible, but nobody had much time to sleep anyway, for the work went on long after dark by flashlight in blackout tents.[11]

Frustration in the Hedgerows

The two beachheads were joined on 13 June, the day after the 101st Airborne Division entered the town of Carentan. In the following two weeks VII Corps under General Collins sealed off the neck of the Cotentin peninsula and captured Cherbourg. General Bradley had scheduled a simultaneous attack east toward St. Lô by VIII Corps, committed on 15 June under Maj. Gen. Troy H. Middleton; but on 19 June OMAHA and UTAH Beaches were hit by a violent northeaster that continued for several days. Ammunition ships could not be unloaded, and it was Medaris' "unfortunate responsibility" to advise Bradley that

[10] (1) Atlas Monograph. (2) Bradley, *A Soldier's Story*, p. 281. (3) History 1st Engr Special Brigade, Annex 6, Incl F.

[11] (1) History 2d Ord Medium Maint Co, Jan–Dec 44. (2) Capt. Fred A. Tadini, "The Ol' 2nd," *Firepower*, vol. II, No. 2 (August-September 1945), pp. 2–3.

there was not enough ammunition to support two attacks. Bradley chose to postpone Middleton's attack.[12]

After the capture of Cherbourg, VII Corps, moving to the region south of Carentan, and VIII Corps, strung out across the Cotentin neck, began to prepare for the push to the highway that ran from Coutances to St. Lô along a ridge that roughly marked the end of the Normandy shoulder and the beginning of the main body of France. VII and VIII Corps would be aided on their left by XIX Corps (committed 13 June under Maj. Gen. Charles H. Corlett), separated from the VII Corps sector by the Carentan Canal. Left of XIX Corps, General Gerow's V Corps was in the relatively quiet part of the front that joined the British near Caumont. By the end of June, on the 40-mile U.S. front that stretched from the bulge at Caumont to the west Channel shore of the Cotentin, there were two airborne divisions (overdue for relief), nine infantry divisions, and two armored divisions. First Army now had more men than the combined forces of Patton and Montgomery in the Sicily Campaign.[13]

To provide Ordnance support for this huge force, Colonel Medaris had fourteen battalions in Normandy or en route. Behind each corps he positioned a battalion to furnish forward area support, operate a corps collecting point, and perform recovery and evacuation; within these forward battalions the medium maintenance companies had definite assignments to support specified divisions. Behind each forward battalion there was eventually to be an army support battalion to do fourth echelon work on weapons and vehicles, keep artillery and tanks in condition, and operate an army collecting point. The army area around Isigny was to receive a depot battalion for all Class II and IV supply, and near it a main army fourth echelon battalion and a battalion to inspect and recondition matériel in the hands of units relieved from combat. In the beach area was placed an army battalion to do antiaircraft maintenance, dispatch vehicles to the depot battalion, and generally perform liaison with the Engineer beach brigades. Of the two ammunition battalions, one was to operate Depot 101 and ASP's for VII and VIII Corps, the other to operate Depot 100 and ASP's for V and XIX Corps.[14]

In the VII and VIII Corps sector, all battalions, including ammunition, came under the 224th Ordnance Base Group; in the V and XIX Corps sector, they came under the 52d Ordnance Group when it set up headquarters in Normandy at Blay on 28 June, the day after its arrival from England. With the 52d headquarters came Col. Nelson M. Lynde, Jr., who had been acting as Medaris' deputy in England. Lynde became the maintenance and supply officer of First Army Ordnance Section. A capable officer with long experience in the Mediterranean, he added considerable weight to Medaris' staff at the time the major operation southward from the beachheads began.[15]

The advance began early in July, and it

[12] Ltr, Maj Gen J. B. Medaris (USA Ret) to Brig Gen Hal C. Pattison, 28 Oct 63, OCMH.

[13] Bradley, *A Soldier's Story*, p. 315.

[14] Hq Ord Service First U.S. Army, Operations Orders No. 3, 22 Jun; No. 5, 28 Jun; No. 6, 9 Jul; No. 16, 17 Jul 44, OHF.

[15] (1) Hq Ord Service First U.S. Army, Operations Order No. 5, 28 Jun 44; (2) History 52d Ord Group, 21 Aug 43–13 May 45.



COLONEL LYNDE

was evident from the first that terrain and weather were going to make the going painfully slow. First Army was in hedgerow country—orchards and pastures cut into tiny fields, each field fenced in by dense hedges of shrubs and small trees growing out of embankments up to ten feet high, often flanked by drainage ditches or sunken roads. Rain made lakes of the Cotentin marshes on the VII and VIII Corps fronts and turned even the high ground into sticky mud. And the weather prevented planes from giving close support.

The hedgerows could conceal anything from an enemy sniper to an antitank gun and could stop tanks, which, unable to climb the embankments without exposing their vulnerable underbellies, had to wait for openings to be blown with TNT. Hardly anywhere could a man see beyond the field ahead of him. It was frustrating, depressing warfare, almost like the fighting some of the officers had experienced on Guadalcanal. After a few days of it, General Bradley limited the objective considerably. The objective was now the highway between Lessay and St. Lô. Even so, it was not attained until 18 July, when St. Lô was captured. After seventeen days of heroic effort that cost some 40,000 casualties, First Army had not advanced more than seven miles at any point along the wide front.[16]

In the lonely skirmishes with a hidden enemy the troops had used a great deal of ammunition, "spraying the hedgerows" with machine gun bullets, one Ordnance officer noted, as though with a hose, and lobbing grenades and mortar shells over the embankments. They had also used a great many more smoke shells than had been expected. White phosphorus was useful to clean out nests of snipers, for it caused nasty burns and the Germans soon learned to dread it; and a good deal of smoke was used for signaling to aircraft. Watching the St. Lô attack, war correspondents were reminded of battlefields sketched in an illustrated history of the Civil War, with smoke lying in the valleys and hanging over the fields and little patches of woods.[17]

The reserves of infantry and artillery ammunition that had been accumulated during June were rapidly depleted. On 1[illegible]

[16] (1) Martin Blumenson, *Breakout and Pursuit* UNITED STATES ARMY IN WORLD WAR II (Washington, 1961), p. 175. (2) Pyle, *Brave Men* p. 256.

[17] (1) Interv, Maj Gen Floyd A. Hansen, 15 Sep 60. (2) Ord Office Jnl, XIX Corps AAR, 30 Jun 44, Annex D to sec. IV. (3) Pyle, *Brave Men* p. 302. (4) Ralph Ingersoll, *Top Secret* (New York: Harcourt, Brace, 1946), p. 173. (5) Robert J. Casey, *This Is Where I Came In* (New York: Bobbs-Merrill, 1945), p. 183.

July Bradley began to restrict the amount of these types that could be fired. This proved to be a satisfactory method of rationing, preferable to restricting the amount that was issued, but any kind of rationing was hated by the combat commanders and was naturally disheartening to Medaris and his ammunition officer, Colonel Ray, all the more so because they felt that they were not wholly to blame. They had predicted long before the invasion that such types as 57-mm. HE and 81-mm. mortar ammunition would be needed in quantity, but both were still scarce. No 57-mm. HE except the little they could borrow from the British was on the Continent. In the case of the 81-mm., they suspected that it was in fact available in the holds of ships lying offshore in the Channel, but because ships' manifests were either inaccurate or missing altogether, they could not be sure.[18]

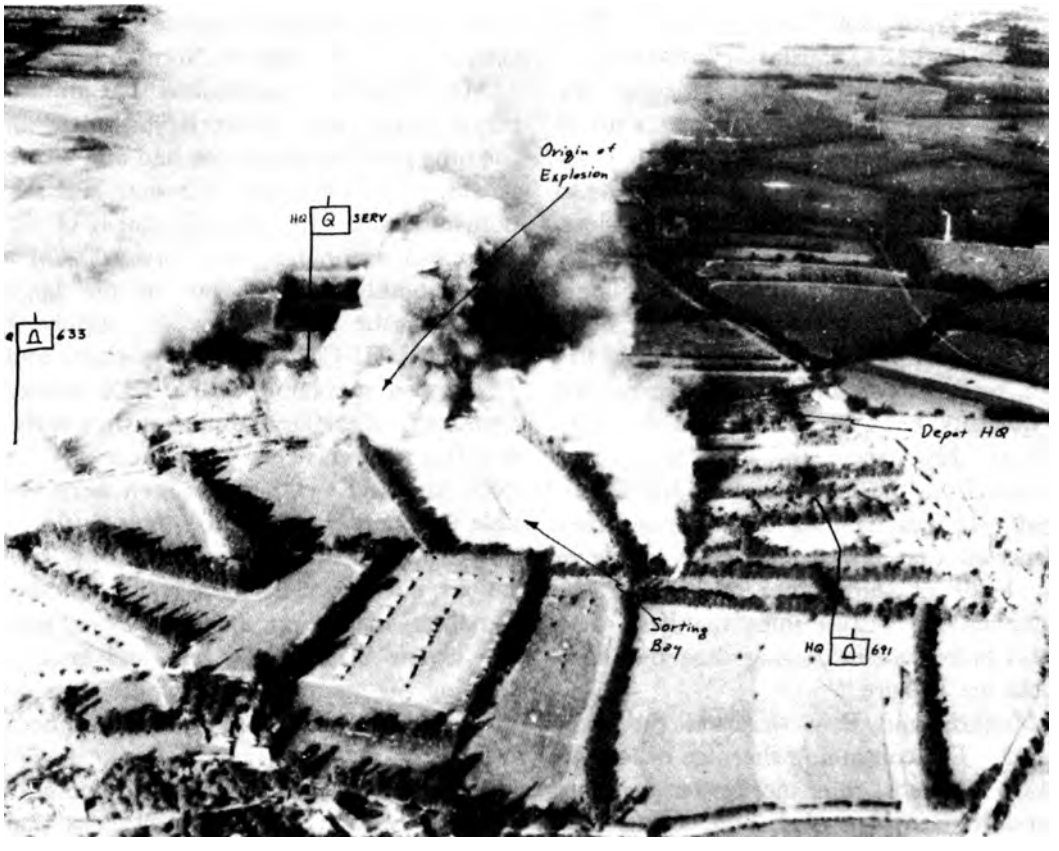
Medaris and Ray were on the right track. The continuing shortage of ammunition for the 81-mm. mortar—a common, standard item—puzzled Brig. Gen. Raymond G. Moses, 12th Army Group G–4, until an investigation revealed that the reason was not only a sudden increase in consumption but inaccurate records on the amount available. Hasty and indiscriminate unloading of ships offshore and the inability of the receivers to identify and thus report correctly on the huge stocks dumped on the beaches were problems that also affected supplies for weapons and vehicles, especially spare parts. But ammunition was First Army Ordnance's main concern in the early days in Normandy.[19]

Medaris always maintained that ammunition supply was simple if you knew all the time just how much you had and where it was. Unfortunately, this state was seldom attained. In the early stages of the European campaign, the forward ASP's ran smoothly enough, but in the large depots in the rear (Depot 101 supplying VII and VIII Corps in the UTAH area and Depot 100 supplying V and XIX behind OMAHA), where large tonnages were arriving from the beaches night and day, in good and bad weather, the men were unable to report accurately on their stocks.

Neither the men in the First Army battalions nor the men in Advance Section battalions that began arriving to take over the depots in mid-July had had enough training in handling ammunition under such hard conditions, nor had they been trained in fighting fires. When a fire broke out at Depot 101 on the afternoon of 12 July, with a chain of explosions that rocked the dump and jumped across the hedgerows, setting off artillery shells and strewing burning phosphorus, the men fled and made little or no effort to fight it. The fire burned for almost four hours before Medaris could arrive with bulldozers, tankdozers, and Engineer troops to apply the dirt-throwing techniques that Ordnance had learned in the Mediterranean. It was not brought under control until 0200 of the next day, and then just short of an area containing 450 tons of TNT. As it was, several of the night shift ammu-

[18] (1) First Army Rpt I, Annex 13, p. 70. (2) Ltr, Ray to Ord Officer, First United States Army, APO 230, 11 Aug 44, sub: Ammunition Supply Report, France, 1–31 July 1944, Folder, Ordnance Reports First Army Misc Jun–Aug 44, OHF. (3) AGF Board Rpt No. 114, Ammo and Weapons for 1st Army, 14 Jul 44.

[19] (1) Entry for 24 Jul 44, 12th AG Daily Jnl, Ord Sec. Mar–Jul 44. (2) Ltr, Medaris to Pattison, 28 Oct 63. (3) Hansen Interv.



THE FIRE AT DEPOT 101 IN THE HEDGEROWS BEHIND UTAH BEACH

nition men sleeping in the bivouac area were killed and about 1,500 tons of ammunition were lost.[20]

Compared with the difficulty of ammunition supply, the maintenance burden in the hedgerow battles was not heavy. The forward medium maintenance companies were mainly concerned with the truckloads of muddy, rusting, sometimes bloodstained rifles that came to their small arms sections. In this congested area, little truck maintenance beyond the repair of battle damage was needed. The Ordnance units had time to improvise several field expedients to help the infantrymen break through the hedgerows. One successful effort provided a more sensitive fuze for the bazooka projectiles, thus enabling the weapon to blow gaps in the hedgerows; another modified the carbine to deliver brief bursts of full automatic fire, thereby increasing the quick reaction of infantry firepower in this type of fighting. In the rear, First Army's

[20] (1) USFET Board Rpt, Ammunition Supply and Operations, European Campaign, Ordnance Section, Study Number 100, app. 4. (2) Ltr, Ray to Ordnance Officer, FUSA, APO 230, 11 Aug 44. (3) Atlas Monograph. (4) History 101st Ammunition Bn.



TANK WITH HEDGEROW CUTTER AND SANDBAGS

heavy shop battalion, the 25th, manufactured a number of devices requested by the combat commanders—a sight for the rifle grenade launcher, special mounts for machine guns, a simple type of periscope for peering over the hedgerows, and, most important of all, an attachment to enable tanks to penetrate the hedgerows.[21]

The Hedgerow Cutters and the Cobra Breakthrough

By mid-July, budding inventors in the First Army had produced several devices to be attached to the front of a tank to dig into the hedgerows. The best was contributed by Sgt. Curtis G. Culin, Jr., of V Corps' 102d Cavalry Reconnaissance Squadron, a light tank unit. The contrivance itself, a strong iron fork with five straight tines, was developed by an officer

[21] (1) Pyle, *Brave Men,* pp. 286–87. (2) Intervs, Capt Homer C. Doman, Maintenance Officer, 83d Ord Bn; Lt Col Howard M. Elliott, CO 25th Ord Bn; by William M. Hines, Sr., in Hines, History of the General Purpose Vehicle 1941 to 1945 (hereafter cited as Hines History), pp. 299–302, OHF. (3) Lt. Col. James D. Sams, "Ordnance Improvisation in the Combat Zone," *Military Review,* XXVIII, 2 (May 1948), pp. 32–36. (4) Ltr, Medaris to Pattison, 28 Oct 63. (5) First Army Rpt I, Annex 13, p. 91.

of the squadron's maintenance unit, Lt. Steve Litton, who used the angle iron bars or tetrahedrons that the Germans had emplaced off the beaches to rip the bottoms out of landing boats. At a demonstration attended by General Bradley and Colonel Medaris, the hedgerow cutter, or Rhinoceros, showed that it could slice through the matted roots in the embankments, enabling the tank to pass through the hedgerow instead of climbing it. The vulnerable underbelly of the tank was not exposed, and the nose was down, so that the guns were in a better firing position.[22]

The hedgerow cutter model came at a providential time, less than a week before the planned jump-off for Operation COBRA. COBRA was the breakthrough south of the Periers–St. Lô road by three VII Corps infantry divisions to open a gap through which a motorized infantry division was expected to dash fifteen miles southwest to Coutances, bottling up the Germans that were blocking the VIII Corps front; two armored divisions were to go on to Avranches and turn the corner into Brittany. Beyond the Periers–St. Lô road the armor had to cross a belt of hedgerow country—the hilly, true *bocage*—before it could get to the plains beyond; it was essential that the tanks get through the *bocage* quickly. Bradley ordered Medaris to put hedgerow cutters on as many COBRA tanks, light and medium, as possible. As it turned out, the jump-off had to be postponed for a week because poor weather conditions grounded the bombers; but there was still not much time.[23]

Medaris arranged a demonstration at his 25th Battalion headquarters. He organized a large crew of welders and skilled mechanics from his maintenance companies, pooling their facilities for mass production, and sent his tank transporters to the beaches to round up tetrahedrons. They were plentiful enough. The critical item was welding material. Medaris had requisitioned what seemed to the supply agencies enormous amounts of it during the preparations for OVERLORD. Experience had taught him that it would be needed by the service sections of his maintenance companies because they would have to do a great deal of manufacture whenever the inevitable crises in supply arose. With the backing of Colonel Wilson, the First Army G–4, he not only cleaned out all the welding rod in the depots in England, carrying to the Continent every pound he could, but he took action to increase the supply. His foresight was rewarded. When he flew back from Normandy to obtain enough welding rod to make the hedgerow cutters, it was available; emergency action would have been useless at this point. The evening Medaris left for England, a sudden and acute shortage of oxygen-acetylene cylinders was discovered. Though scarce in the United Kingdom, the cylinders were rounded up and delivered by air before breakfast next morning, an operation that was watched with amazement by Montgomery's chief of staff, Maj. Gen. Sir Francis de Guingand, who was visiting at Bradley's headquarters at the time. In forty-eight hours First Army Ordnance

[22] (1) Martin Blumenson, *Breakout and Pursuit*, p. 206. (2) Operations Report, Ordnance Section V Corps, 6 Jun–31 Jul 44, p. 4. (3) W. L. White, "Sergeant Culin Licks the Hedgerows," *Reader's Digest*, vol. 56, no. 334 (February 1950), 81–84.

[23] Bradley, *A Soldier's Story*, pp. 330, 342.

men made nearly 300 hedgerow cutters, and in a week three out of every five tanks to be used in the breakthrough were equipped with them.[24]

Many of the tanks equipped with hedgerow cutters also carried on their fronts piles of sandbags or extra pieces of armor plate, for the crews knew that the tanks, which had been used up to now largely as mobile pillboxes, did not have armor thick enough to withstand the German guns. This had been discovered in North Africa. Also, neither the 75-mm. gun on most of the Shermans nor the 138 new 76-mm. guns (in reality 3-inch guns specially designed for tank use) that arrived in Normandy on 20 July would penetrate the frontal armor of the German Tigers and Panthers. The tankers could only hope that after the Shermans broke out of the *bocage* and got on the plains beyond, they could outmaneuver the German tanks, whose long guns made them hard to handle. For the artillerymen the picture was much brighter. When the COBRA breakthrough began on 25 July, First Army had some of the big pieces that had been so prized in Italy, eighteen 240-mm. howitzers and six 8-inch guns. They also had 48 of the new self-propelled 155-mm. gun, M12, the first self-propelled field gun sent overseas.[25]

Supplies and service troops had been pouring in over the beaches while the frustrating hedgerow battles were being fought. By 25 July there were 18 divisions of combat troops on the Continent (the two airborne divisions had been withdrawn). Though the build-up of service troops was not in proportion, it was still enough to enable Medaris to reinforce and improve his First Army Ordnance service. By the end of July he had three new group headquarters—the 51st, 71st, and 72d. The 51st relieved the 224th (released to ADSEC) as the forward organization paralleling the 52d Group; the 71st took over the ammunition battalions and the task of supervising all army ammunition operations, including ASP's and army depots; and the 72d assumed the operations in the main army area, commanding four battalions that ran the main shop and depots and did the inspection-and-refitting and evacuation work.[26] (*Chart 4*)

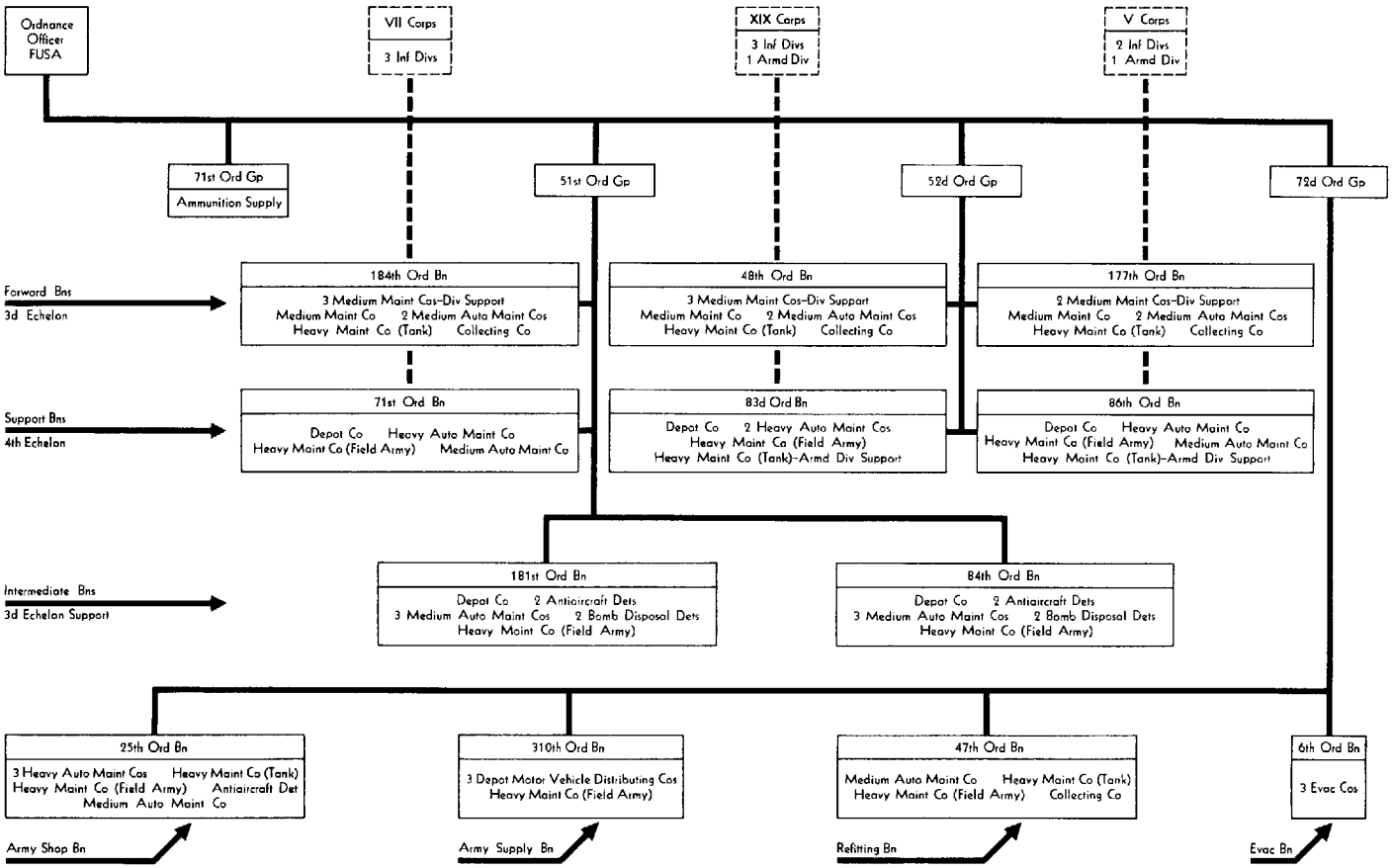
The evacuation battalion, formed in mid-July, was a tribute to the usefulness of tank transporters, not only for hauling tanks but for moving all kinds of cumbersome supplies, like the tetrahedrons that were used in making the hedgerow cutters. The huge vehicles, with their long skeletonized trailers, were awkward and slow, and on the narrow, twisting roads of the hedgerow country were cursed by the convoys that piled up behind them; but they were invaluable. By pooling his three evacuation companies Medaris had a tremendous

[24] (1) First Army Rpt I, Annex 13, p. 92. (2) History 177th Ord Bn 1944, Journal Entries 14–23 Jul 44. (3) Ltr, Medaris to Pattison, 28 Oct 63. (4) Col J. B. Medaris, "Field Service in the First Army," *Army Ordnance*, XXVIII, 148 (January–February 1945), p. 67. (5) De Guingand, *Operation Victory*, p. 395. (6) On the use of the tank transporters see Sgt. S. W. Dobrans, "Nellie's a Lady," *Firepower* (June–July 1945), p. 7.

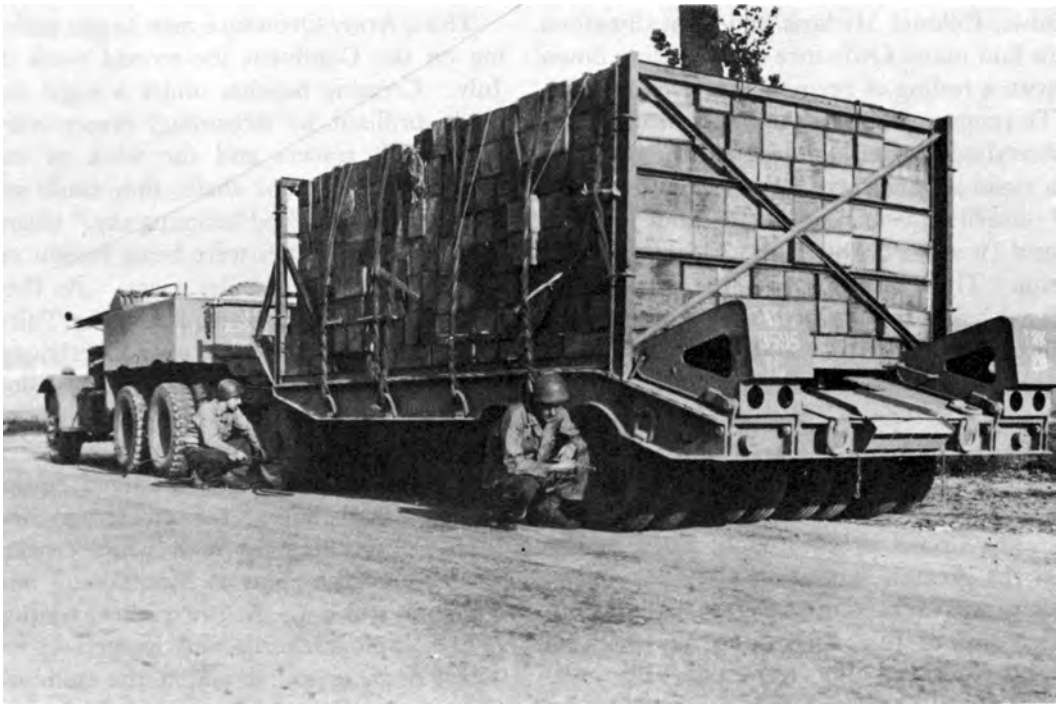
[25] (1) Col W. R. Slaughter, Report of Observations in ETOUSA [14 Jul–4 Sep], 20 Sep 44 (hereafter cited as Slaughter Rpt), p. 30. (2) Memo, Gen Barnes for General Campbell, 11 Oct 44, sub: History of Tank Guns. Both in Barnes File, OHF. (3) Bradley, *A Soldier's Story*, pp. 322–23. (4) First Army Rpt I, Annex 13, p. 80. (5) Green, Thomson, and Roots, *Planning Munitions for War*, pp. 316–17.

[26] (1) FUSA Ord Service, Operations Order 19, 30 Jul 44, OHF. (2) First Army Rpt I, Annex 13, p. 88.

Chart 4—Ordnance Group Organization for First U.S. Army, 15 August 1944



Source: Col W. R. Slaughter, Report of Observations in ETOUSA (14 July–4 September 1944), 20 Sep 44.



A Tank Transporter Hauling Ammunition, France

amount of lift that could be used for a mass movement in an emergency. Normally the battalion brought heavy matériel back from collecting points, moved supplies between main shop and depot and out to the forward units, and in a pinch helped the forward collecting companies.[27]

The crews of the forward collecting companies, known as the "Diesel Boys" from their diesel-powered M19 tank transporters, operated close to the front, often under fire, employing road patrols with wreckers to clear broken-down tanks and vehicles from main routes of advance under severe enemy bombardment. Ernie Pyle, who accompanied crewmen from the 974th Evacuation Company (Collecting) when they retrieved a German tank on the Carentan front one night in July, was impressed by their bravery and skill. He also noted their ability to make themselves comfortable back in the bivouac area, in tents strung out along the hedgerows. One driver even had a feather bed that he had got from a French family. "The average soldier couldn't carry a feather bed around with him," commented Ernie, "but the driver of an M-19 could carry ten thousand feather beds and never know the difference." [28]

During the slow fighting in the hedge-

[27] (1) FUSA Ord Service, Operations Order 16, 17 Jul 44, OHF. (2) Slaughter Rpt, p. 24.

[28] (1) History 974th Ord Evacuation Co (Coll) Feb 43–May 45. (2) Pyle, *Brave Men*, pp. 290–95. (3) Slaughter Rpt, p. 4.

rows, Colonel Medaris had been disturbed to find many Ordnance units settling down with a feeling of permanence, even in tents. To prepare them for the breakthrough that everybody hoped would open the door for a rapid advance across France, he frequently issued movement orders without warning and (it seemed to the troops) without reason. These moves jarred the men out of fixed habits and helped them to regain the flexibility of thought and action that were going to be needed after St. Lô.[29]

Expansion After Cobra: Third Army

The COBRA breakthrough, aided by one of the greatest saturation bombings of the war, was a brilliant success. In the last five days of July, First Army captured not only Coutances but Avranches, the gateway from Normandy into central France. General Eisenhower had directed on 25 July that U.S. ground troops on the Continent be regrouped into the First and Third Armies, the two armies to be controlled by 12th Army Group, which would be commanded by General Bradley. On 1 August Bradley went to 12th Army Group, leaving First Army (V, VII, and XIX Corps) under the command of General Hodges. Third Army (VIII, XV, and XX Corps) was given to General Patton, who had been impatiently waiting on the Cotentin peninsula since early July.[30]

Third Army Ordnance men began arriving on the Continent the second week in July. Crossing beaches under a night sky made brilliant by streaming, crisscrossing antiaircraft tracers and the wink of the high-altitude 90-mm. shells, they could see in the distance a "red booming sky," where the hedgerow battles were being fought on a front only a few miles away. As they proceeded inland to Bricquebec, the Third Army concentration area near Cherbourg, they saw evidences of what the invasion had cost—"heaps of rubble where houses had once been, things which had once been men, piles of shell cases, scattered equipment, crashed gliders," the cemetery at Ste.-Mère-Eglise filling up with white crosses. They found the ruins of Montebourg and Valognes still hot. At Bricquebec, waiting in the apple orchards and hedgerows for Third Army to go into action, the ammunition men collected abandoned U.S. and enemy ammunition, and the maintenance men made hedgerow cutters for Patton's tanks, obtaining welding material through the good offices of the Navy, which not only supplied tons of welding rod and many bottles of oxygen and acetylene from its own stocks, but procured quantities of these scarce articles for Third Army in England, delivering them at Cherbourg.[31]

By 1 August there were about 10,000 men in Third Army Ordnance Service, including the men that were transferred from First Army (most of them supporting VIII Corps). Those assigned but not yet arrived would bring the number to around 15,000. Colonel Nixon, Patton's

[29] Medaris, "Field Service in the First Army," *Army Ordnance,* XXVIII, 148 (Jan–Feb 45), p. 67.

[30] (1) Pogue, *The Supreme Command,* p. 204. (2) After-Action Report, Third U.S. Army, 1 August 1944–9 May 1945 (hereafter cited as Third Army Rpt), vol. II, Staff Section Reports, Command, p. 2.

[31] (1) Third Army Ordnance Unit Histories, ETO Ord Sec Histories, KCRC. (2) Third Army Rpt, vol. II, Ordnance, p. 6. For strenuous attempts to obtain welding material in France, see History 984th Depot Co, ETO Ord Sec, KCRC.

Ordnance officer, had organized them in England under the now familiar group system, the forward maintenance and supply battalions (each battalion supporting a corps) and the intermediate battalions (supporting the forward battalions as well as corps and army troops) under a forward group; the fourth echelon battalions under a rear group; and the ammunition battalions under an ammunition group.[32]

Because of personnel shortages in the United States and the higher priority accorded First Army and ADSEC, Nixon had been forced to improvise. He had only two group headquarters, the 69th controlling the forward and intermediate battalions and the 70th controlling the rear shops and depots, and both had been obtained by converting battalion headquarters already in the theater into group headquarters. He had no ammunition group headquarters until September, when the 82d was organized; in the meantime, the 313th Ammunition Battalion acted as a group headquarters. By mid-May, after First Army and ADSEC had been satisfied, all types of Ordnance units were scarce and the War Department had informed the theater that the units expected in the next three months would be fewer than had been anticipated because they were not available in the United States. Nixon's most serious shortages were in depot, evacuation, heavy tank maintenance, and ammunition companies, and ammunition battalion headquarters. A few maintenance companies were furnished to him from FECOMZ, but he had to supplement his single ammunition battalion headquarters by converting three maintenance battalion headquarters to ammunition.[33]

An even more serious cause for concern was supply. Again the reason was low priority. In England in the spring of 1944 First Army's requirements had so drained the theater's stocks that Third Army Ordnance Service had only about 50 percent of its basic load, and had no reserves of major items. The planners intended to fill its needs from the huge stocks being shipped from the United States, but congestion at the British ports made this impossible. During May, tonnage made available to Ordnance amounted to only 31 percent of that expected. The commodity-loaded ships that were to go directly to the Continent would probably relieve the situation, but there was little hope from this quarter until late in the summer. In the meantime, it was doubtful whether Third Army would receive more than 75 percent of its T/E vehicles before it went into combat.[34]

As a result of the "poor relation" position of Third Army in England, many of its Ordnance units arrived on the Continent in July with shortages not only in their basic load of spare parts but in such

[32] Third U.S. Army Outline Plan, Opn OVERLORD, Annex 2, Troop Basis, Third Army Rpt, vol. I.

[33] (1) Third Army Rpt, vol. II, Ordnance, pp. 2–6. (2) Memo, CofS for CG AGF, 12 Jun 44, sub: Activation of Hqs and Hqs Detachment, Ordnance Group. (3) Ltr, Secy War to CG ETO, 20 Jun 44, sub: Activation of Headquarters and Headquarters Detachments, Ordnance Groups. Last two in ASF Planning Div, Theater Br. (4) Rpt of Meeting of Ordnance Officers, 19 May 44, 12th Army Group 337 Conference Meetings. (5) 12th U.S. Army Group (FUSAG) Daily Journal, Ordnance Section, 19 May 44.

[34] (1) Intervs, Col Nixon, 25 Aug 45; Col Harry H. Gibson, CO 79th Ord Bn, 26 Jul 45, in Hines History, pp. 303, 306. (2) USFET Gen Bd Rpt No. 99. (3) Bykofsky and Larson, *The Transportation Corps: Operations Overseas*, p. 109. (4) 12th Army Group (FUSAG) Daily Journal, Ordnance Section, 6 May, 9 May 44.

essentials as shop trucks and tools; the 79th Battalion at Bricquebec, for example, had only between 60 and 70 percent of the tools it needed. These shortages were relieved to a great extent by the efforts of a representative that Nixon had left behind in Cheltenham, who arranged for most of the scarce articles to be brought to the Continent by units arriving later. Again the evacuation companies with their big tank transporters came in handy for hauling supplies. Several truck companies were used to deliver spare parts, not only for the Third Army depot and maintenance companies, but for the 2d French Armored Division attached to Third Army. This division, commanded by Maj. Gen. Jacques Leclerc and composed in part of the famous Leclerc Column that had fought in Tripolitania and Tunisia, was to be committed after the breakout, an earlier commitment than was at first planned. To expedite its equipment, as well as to speed the supply of tools and equipment of his own Ordnance units, Nixon made two trips to England in July.[35]

When Third Army became operational on 1 August, its Ordnance supply units had little stock other than organically carried replacement items, spare parts, and ammunition. But there was the probability that additional stocks could be obtained from ADSEC. Brig. Gen. James H. Stratton, COMZ G–4, had established a policy that all First Army stocks in COMZ depots on the Continent that were excess to First Army's needs would be released at once to Third Army. On supplies requested by both armies, urgent command action would be taken, and allocation between the two armies would be made by 12th Army Group, which had just set up headquarters in a bombed-out orphanage building at Périers. On the whole, except for a few shortages, the situation was considered fairly good at the beginning of August. Huge stocks were piled under tarpaulins on the beaches, which were now able to handle 30,000 long tons a day. Cherbourg had been opened on 19 July; and high hopes existed that Brest and other Brittany ports —prime objectives in the OVERLORD planning—would soon be in American hands.[36]

The task of capturing Brest was given to Patton and Patton generated confidence. Bradley reported to General Eisenhower that he and his men felt "pretty cocky" about the future.[37] After the dank battles in the hedgerows, the southward sweep of the armies was exhilarating. First Army turned southeastward toward Vire to drive back the enemy's center and hold open the corridor at Avranches. Third Army drove southwest into Brittany and made brilliant progress. By 4 August, Patton had captured Rennes and had armored units as far as Loudeac, in the center of the peninsula. The weather turned warm and clear, so that air support was always possible; the enemy seemed shattered in this region, and the French Maquis were rising.

[35] (1) Third Army Rpt, vol. II, Ordnance, p. 6. (2) Interv, Gibson, in Hines History. (3) On the 2d French Armored Division, see Marcel Vigneras, *Rearming the French*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1957), p. 10; and Pogue, *The Supreme Command*, p. 239.

[36] (1) Col. T. H. Nixon, "Across the Beachheads," *Army Ordnance*, XXVIII, 150 (May–June 1945), p. 398. (2) 12th Army Group (FUSAG) Daily Journal, Ord Sec, 1–5 Aug 44. (3) Rpt on General Weaver's Conference of 15 Jul 44, ETO Ord Sec O.S. 334 Meetings and Conferences General, Feb 43–Jul 44, KCRC.

[37] Pogue, *The Supreme Command*, p. 200.



SHELLS STACKED BY TYPE TO FACILITATE ISSUE, FRANCE

Things looked so good that General Montgomery, who until 1 September, when SHAEF arrived on the Continent, was to have operational control of all Allied forces, made a major change in the tactical plan. Using First Army as a holding force, he ordered Third Army to leave only one Corps, the VIII, to clear Brittany and to make its main effort in a wide sweep eastward from Rennes toward Laval and Angers. Eisenhower reported to Marshall "Patton has the marching wing . . . ." [33]

[33] *Ibid.*, p. 209.

CHAPTER XV

The Race Across France

"The time you saw the American Army on the move was after Avranches," wrote an observer. After the capture of Avranches on 31 July 1944, bulldozers and scrapers were clearing the roads of the German wreckage left in the wake of the great sweep of Allied bombers and strafers. The main roads were almost bumper to bumper with vehicles. There were long trains of 2½-ton trucks, sometimes forty or fifty in a train; tank transporters with huge cabs; refrigerator trucks like boxcars; trucks piled high with telegraph poles or little nests of boats, stacked like saucers, for river crossings. There were generals' caravans and service units' mobile workshops. Between the supply convoys, batteries of artillery squeezed themselves, and sometimes there was a tank on its own treads, though more often the tanks took the side roads or made their own roads across the fields to keep from blocking the march. In and out among the big vehicles scurried the jeeps, climbing the sides of the roads to get through.[1]

On the run, Colonel Nixon took over the Ordnance units supporting VIII Corps, which was by then already headed for Brest. The story of the 665th Ammunition Company shows how fast things were moving. For the breakout after COBRA, one officer and 25 men of the 665th (they called themselves the Secret 25) had been selected by Medaris to operate a rolling ASP on ten tank transporters, each loaded with fifty tons of ammunition, to follow the armored columns and make issues directly from the transporters. This plan was abandoned because of the quick success of the breakout and the small amount of ammunition expended; but the company marched close on the heels of the 4th and 6th Armored Divisions, and was so far ahead of the mine sweeping Engineers that on 29 July the men had to drive cattle through their ASP site at Muneville to clear it of mines. Here they set up another rolling ASP on 198 Quartermaster trucks and continued south at a fast clip. At the one bridge leading into Avranches they ran into heavy German bombing. Two men, Technician 5 Robert H. Bender and Pvt. Joseph Reyes, remained all night at this dangerous spot to direct the trucks to their next ASP south of Avranches. The company arrived at its new area so early that it had to clear the site of snipers. Two days later, on 5 August, the 665th was attached to Third Army.[2]

Through the bottleneck at Avranches Colonel Nixon brought the bulk of his Ordnance units down from Bricquebec on 6–7 August. With only a few hours' notice, the

[1] Ingersoll, *Top Secret*, p. 192.

[2] (1) History 665th Ammunition Co, in ETO Ord Sec, KCRC. (2) Slaughter Rpt, p. 3.

men threw their duffle bags into their trucks, skinned their shins jumping on tailgates, and were off on the long journey down dusty, bombed-out roads that became progressively more obstructed with the traffic of combat units and the wreckage left behind by the Germans. The historian of one depot company moving through La Haye du Puits, Coutances, and Gavray to Avranches found "each town an awful monument to hell itself. The stench of unburied bodies lying in the unmerciful summer sun was overpowering at times, as the convoy rolled slowly on through a red clay dust which clung savagely to the skin and blinded the eyes." To avoid the jam of military traffic, one Ordnance battalion took a back road not on any map; others moved by edging into traffic with about seven vehicles at a time; and some had to wait in line by the hour to cross bridges or intersections.[3]

The Ordnance men arrived at Avranches in the middle of the severest air bombardment Third Army had ever received. The Germans, counterattacking at Mortain in an attempt to drive a wedge between First and Third Armies, not only bombed and strafed the bridge at Avranches but plastered the neighborhood. Near midnight on 6 August, just after the 573d Ammunition Company arrived at Depot 1 in an apple orchard near Folligny, the Luftwaffe came over and destroyed about a thousand tons of ammunition. Explosions rocked the area for days. Ordnance depot and maintenance companies moving through Avranches down to the Forêt de Fougeres in Brittany passed through St. Hilaire-du-Harcouet while it was still burning and were bombed and strafed on the road. The 344th Depot Company had nine men killed and eighteen wounded.[4]

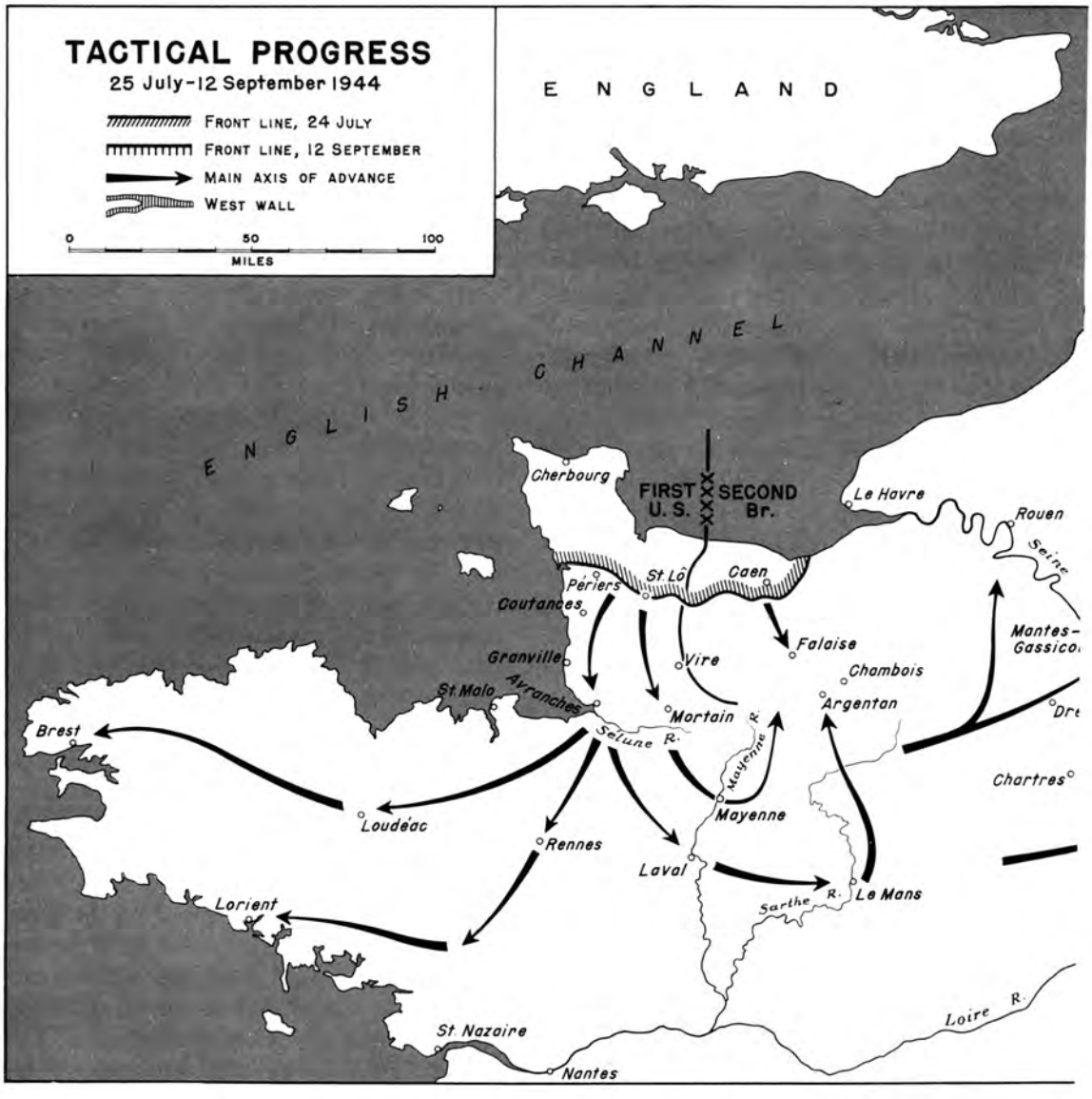
Having assembled his rear group—his heavy maintenance companies and main army depots—under the trees at Fougeres, Nixon's first effort was to bring down more supplies from Normandy. His units in the Bricquebec area, with little stock on 1 August other than the organic replacement items they carried, spare parts and ammunition, had been able to draw on the ADSEC depots in the Cotentin to some extent. Bringing additional supplies down through the Avranches bottleneck was not easy. Ammunition was brought forward on what became virtually a day-to-day basis, and in emergencies tank transporters and the trucks of maintenance units were used.[5]

After Avranches, Nixon faced a logistician's nightmare—the support of an army that was split into two segments, traveling very fast in opposite directions. The VIII Corps was headed west through Brittany, the XV Corps was headed east toward the Seine. By the time Nixon had got his three heavy depot companies down to Fougeres on 8 August, more than 200 miles separated VIII Corps' 6th Armored Division, which was at the gates of Brest, and XV Corps' four divisions (90th and 79th Infan-

[3] (1) Col. T. H. Nixon, "Across the Beachheads," *Army Ordnance,* XXVIII, 150 (May–June 1945), p. 398. (2) Histories, 904th Heavy Automotive Maint Co, 841st Depot Co, 314th Bn, and other histories in ETO Ord Sec, KCRC.

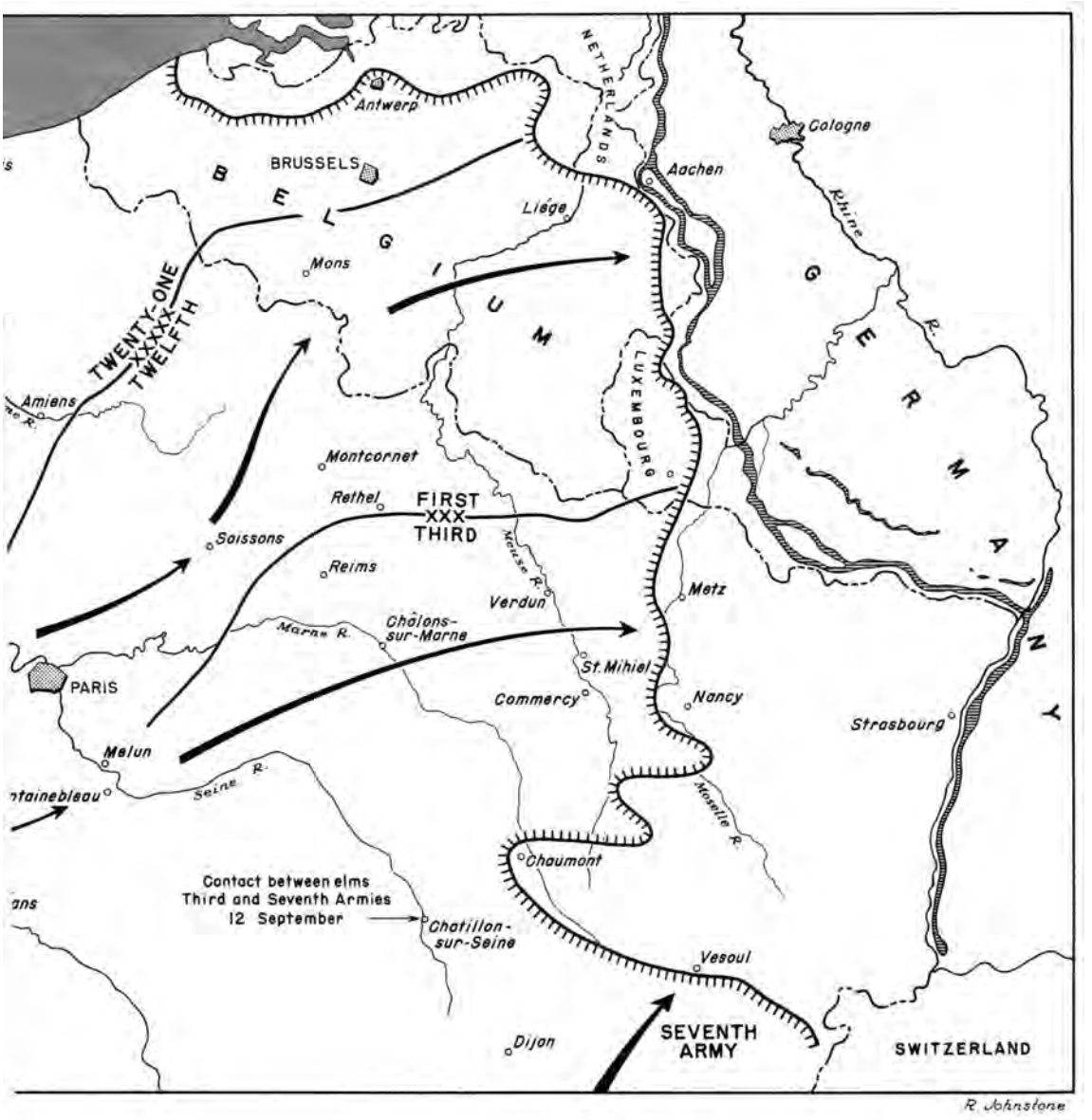
[4] (1) George S. Patton, *War As I Knew It* (Boston: Houghton Mifflin Co., 1947), p. 101. (2) Histories in ETO Ord Sec, KCRC. (3) Nixon blamed the ammunition losses at Depot No. 1 on the mistake of stocking the depot according to "the book." Thereafter stocks were spread out, 8 tons (2 truckloads) to a stack and no other serious losses occurred. Nixon Comments.

[5] Nixon, "Across the Beachheads," p. 398.



MAP 4

try, 5th Armored and 2d French Armored) at Le Mans. By that time the newly organized XX Corps' one infantry division was advancing south to the Loire. With Nixon's main source of supply eighty miles north in Normandy, his line of communications began to look like an inverted, distorted T. His solution to his problem was to hold the



main stock of supplies at pivotal points so that even if it became necessary to operate daily convoys west and south, the bulk of the supplies was never moved far from the road east, the road that the supplies would eventually follow when the main part of the army advanced toward the Seine. This axis of advance had been explained to

Nixon by Patton when they were still in England, about a week before they embarked for Normandy.[6] (*Map 4*)

The Campaign in Brittany

The VIII Corps was fighting in the west for the Brittany ports, with elements of the 6th Armored Division near Brest, the 4th Armored Division approaching Lorient on the southern coast, and a reinforced infantry division attacking St. Malo on the north. The VIII Corps mission lessened in importance as Third Army drove east. Even if the Breton ports were usable after being pounded by American air and artillery and wrecked by the Germans, they would still be so far to the west that they would place an intolerable burden on transportation. But Eisenhower and Bradley were unwilling to write off the ports and the attack continued, though it became more or less a subsidiary operation with low priority. The VIII Corps began to feel like an orphan.

Most of the Germans were contained in the ports, but there were pockets of resistance throughout the peninsula, stragglers and snipers who roamed the countryside like brigands, concealing themselves in the woods and hedgerows. Supply convoys had to have armed escorts; to some Americans the supply trucks racing along in clouds of dust were reminiscent of stagecoaches making a run through Indian country. Everyone had to know how to fight. Eleven Ordnance men of the 531st Heavy Maintenance Company (Tank) on the way to Brest to deliver tanks and combat cars were ambushed by the enemy at Pontlion. Pursuing the Germans into the woods, they bagged 3 German officers and 99 enlisted men, and released a captured Air Forces captain.[7]

The Ordnance officer of VIII Corps, Lt. Col. John S. Walker, had been warned that the forces in Brittany could not expect much in the way of supplies. No more tanks, either light or medium, or tank tracks were to be forthcoming from Third Army. An appeal to Third Army for ten jeeps and trailers met with no encouragement. Walker was told that the divisions would be refitted at the end of the peninsular campaign, and he got the impression that Nixon thought the campaign would not last long. In the meantime, the corps would have to get along with what it had. Once in a while the men of the 24th Ordnance Battalion supporting the corps were able to pick up some German supplies. The 300th Antiaircraft Maintenance Company, for example, got some badly needed electrical equipment from an abandoned German broadcasting station near Brest, braving mortar fire to enter the building. This find was a matter of luck. The captured German depots were generally disappointing.[8]

Soon Walker's greatest cause for concern was a shortage of ammunition. The attack on St. Malo beginning 6 August had been unexpectedly costly. The Germans were dug in behind the thick walls of an ancient

[6] (1) Blumenson, *Breakout and Pursuit,* pp. 380–82, 424–29. Unless otherwise noted, this chapter is based on that source and on Ruppenthal, *Logistical Support of the Armies, I* and *II.* (2) Nixon, "Across the Beachheads," p. 398. (3) Nixon Comments, p. 14.

[7] (1) R. W. Grow, "An Epic of Brittany," *Military Review,* vol. XXVI, No. 11 (February 1947), p. 9. (2) History 531st Heavy Maint Co (Tank), p. 8. (3) Slaughter Rpt, p. 3.

[8] VIII Corps, Misc Jnls, Aug 44, Ord Sec of G–4 Jnls.

citadel and had not only 88-mm. guns but 210-mm. coastal guns turned around to fire inland. The attackers, with the bulk of VIII Corps heavy artillery, including two battalions of 8-inch guns and one of 240-mm. howitzers, were hampered by a shortage of artillery ammunition at the start of the 10-day siege. For several days some of the heavy pieces had to be restricted to four rounds a day. By mid-August, when St. Malo surrendered, partly as a result of direct hits by 8-inch guns, VIII Corps was convinced that even more heavy artillery and considerably more artillery ammunition, would be needed for the all-out attack on Brest.[9]

As the big siege weapons moved westward toward Brest, Colonel Walker and Col. Gainer B. Jones, the corps G–4, drove to Third Army headquarters near Le Mans to submit VIII Corps ammunition estimates—an initial stockage of 8,700 tons, plus maintenance requirements totaling 11,600 tons for the first three days. Colonel Nixon felt that Walker's demands were excessive and if satisfied would jeopardize support of Patton's advance to the east. He informed Colonel Jones that VIII Corps was basing its figures on more troops than it would have for the operation. Walker inferred that Third Army intended to reduce the attacking force because it had calculated that Brest would surrender about 1 September, after only a show of force. In the end, Nixon allotted VIII Corps only 5,000 tons of ammunition.[10]

The VIII Corps commander, Maj. Gen. Troy H. Middleton, "raised all manner of hell," sending an urgent request personally to 12th Army Group and finally going straight to General Bradley, who with General Patton made a flying visit to Middleton's headquarters and agreed that the newly opened Brittany Base Section would take over the supply of VIII Corps, which would be authorized to deal directly with COMZ without going through army. This did not help matters much, for there was still the problem of poor transportation, complicated by the gasoline shortage; inadequate communications; and, toward the end, little enthusiasm for the operation on the part of COMZ planners, who regarded the costly siege of Brest as wasteful and unnecessary after the capture of Antwerp and Le Havre on 4 and 12 September, respectively. It took repeated and vigorous action by Middleton, including refusal to resume the attack on Brest until his ammunition supply was assured, to get results. Ammunition supply began to improve beginning 7 September. Large shipments came by rail and also by LST's from England, which were unloaded on an emergency beach near Morlaix on the northern coast of Brittany. The ammunition company that supported the siege from a huge dump near Pleuvorn calculated that 22,500 tons were expended by the time Brest fell on 18 September. Some 11,000 tons were left over to be shipped east by rail to the German border, and in the meantime the dump was even able to fill a rush

[9] Third Army Rpt, vol. II, Arty Sec, pp. 3–4.

[10] (1) Ltrs, Gainer B. Jones and Col John S. Walker to R. G. Ruppenthal, 9 Jun 50, 15 May 50, Folder, Ruppenthal Ltrs, OCMH. (2) Interv, Col Thomas H. Nixon (USA Ret), 19 May 61, and Nixon Comments, p. 16. (3) A second request from VIII Corps for 3,500 tons, made directly to 12th Army Group a few days later had no better luck. The Group Ordnance Section recommended approval, but Colonel Nixon and the Third Army G–4 persuaded the Group G–4 to take no action. 12th AG Ord Sec Daily Jnl, 21 Aug 44.

order for 270 truckloads to support Patton's dash eastward across France.[11]

To the Seine and Beyond: First Army Ordnance

While Third Army was in Brittany and making its spectacular end run to Le Mans, First Army was intent on taking the important road junctions of Vire and Mortain. These junctions were needed in order to contain the bulk of the German forces, which were in First Army's sector, and provide protection for the Avranches corridor. According to the original plan First Army would then join with the British and Canadians on the north in a drive to the Seine.

The plan was changed, at General Bradley's suggestion, when the Germans launched their strong though unsuccessful counterattack at Mortain on 7 August, because it then appeared possible for the Americans and British to encircle the Germans and trap them. The upper jaw of the vise would be a line from Tinchebray east to Falaise; the lower jaw, a line from Flers east to Argentan. By closing the gap of fifteen miles or so between the two easternmost towns, the Allies hoped to trap the bulk of the German forces in France in an area that would later be known as the Argentan-Falaise pocket. Both American armies were involved. In the First Army area, a corridor curving south and east between 21 Army Group and Third Army, the plan was for XIX and VII Corps to make a converging attack in the Mortain area and then move north toward the 21 Army Group line at Flers and Argentan, respectively, and for V Corps to move southeastward from Vire to Tinchebray. In the Third Army sector, Patton's XV Corps at Le Mans was to make a 45-degree turn north and advance toward Argentan. (*See Map 4.*)

Getting under way on 10 August, Third Army's XV Corps, spearheaded by the 5th Armored and 2d French Armored Divisions, was in the neighborhood of Argentan on 13 August. The First Army attack started on 12 August, when the Germans withdrew from Mortain. By 15 August V Corps had Tinchebray, XIX Corps was making contact with the British several miles west of Flers, and VII Corps was in position to protect the XV Corps left near Argentan. On that day Bradley directed Patton to turn the bulk of XV Corps eastward toward the Seine, leaving the 2d French Armored and one infantry division to hold the "Argentan shoulder," aided by an infantry division from Third Army's XX Corps. Next day, 16 August, the Germans in attempting to force their way out of the Argentan-Falaise gap launched a series of strong counterattacks at the shoulder; and though V Corps had been brought down from Tinchebray, the three First Army corps and the British were unable to prevent part of the German forces from escaping through the gap between 18 and 20 August.

[11] (1) Ltr, Lt Gen Troy H. Middleton (USA Ret), to R. G. Ruppenthal, 19 Jun 50, Folder Ruppenthal Ltrs, OCMH. (2) 12th AG Ord Sec Jnl, 23 Aug 44. (3) History 665th Ammunition Co, ETO Ord Sec, KCRC; for support by an Ordnance observer of the ammunition company's figure on expenditures, see Ltr, Col Theodore A. Weyher to Col G. M. Taylor, 26 Sep 44, no sub, O.O. 350.05/16317. (4) USFET Gen Bd Rpt No. 58, Ammunition Supply for Field Artillery, pp. 21–23. (5) The best account of the supply troubles in Brittany and indecision about the ports is in Ruppenthal, *Logistical Support of the Armies, I,* pages 528–37, *II,* pages 46–49.

Then the pursuit began—to the Seine and beyond. The XV Corps already had a bridgehead across the Seine at Mantes-Gassicourt on 20 August; on 24 August it was passed to First Army and with XIX Corps was given the mission of aiding the British to cut off the enemy on the lower Seine. First Army's V Corps was given the mission of liberating Paris. Its VII Corps bypassed Paris on the right and headed north. In the last days of August, Bradley turned First Army north to Belgium to block the German retreat, and by 2 September XIX Corps, moving infantrymen in trucks taken from artillery and antiaircraft units, was in Belgium at Tournai. That same day, the day after SHAEF became operational on the Continent, Eisenhower directed First Army to an axis between Cologne and Koblenz, pointing Third Army toward a line from Koblenz to Mannheim. South of Paris, Third Army with XX, XII, and XV Corps, the last lately returned from First Army, began its rapid dash eastward to the Moselle.

The advance across France by First and Third Armies was one of the swiftest in the history of warfare. The armies came out of the hedgerow country to the hills, then down into the plain; through pockets of German resistance and through towns that were ruined and towns untouched. History was being made each day, but "was never noticed," Ernest Hemingway reported, "only merged into a great blur of tiredness and dust, of the smell of dead cattle, the smell of earth new-broken by TNT, the grinding sound of tanks and bulldozers, the sound of automatic-rifle and machine-gun fire, the interceptive, dry tattle of German machine-pistol fire, dry as a rattler rattling; and the quick spurting tap of the German light machine guns—and always waiting for others to come up." [12]

At the time First Army began the movement designed to trap the Germans in the Argentan-Falaise pocket, Medaris' Ordnance Service had taken the shape that it was to retain, with few modifications, throughout the European campaigns. Behind each corps were two battalions, one a forward battalion to do third echelon maintenance and operate a collecting point, the other a support battalion that not only did fourth echelon repair and heavy tank maintenance as required, but operated a forward depot. Medaris was a firm believer then and always in the integration of supply responsibilities with maintenance responsibilities in the forward area. The battalions behind XIX and V Corps came under the 52d Ordnance Group. Normally those under VII Corps would also have come under that group, but in the action to close the Argentan-Falaise gap and in the first week or so of the pursuit they were too far away. Therefore until early September, when VII Corps arrived in the neighborhood of Paris, its Ordnance battalions were placed under the 51st Ordnance Group, whose primary mission was support of army troops—divisions in reserve, army artillery, army tank battalions, Quartermaster trucks. This was to be the pattern for the future: when distances or road conditions made it impracticable for the 52d to cover all corps areas, or when as many as four corps were fighting under First Army, the 51st Ordnance Group took on support of a corps; likewise, when necessary, 52d Ordnance Group supported army troops located in corps areas. The 72d Ordnance Group ran the main army shop and

[12] Ernest Hemingway, "The G.I. and the General," *Collier's*, vol. 114, No. 19 (November 14, 1944), p. 11.

the supply, refitting, and evacuation battalions. The 71st Ordnance Group controlled two ammmunition battalions of six companies each, one battalion to operate forward ASP's, the other to run the main army ammunition depot that held army reserve ammunition and stocked the ASP's.[13] (*See Chart 4.*)

In the very rapid advance of First Army from the St. Lô area to the western border of Germany between 1 August and 12 September 1944, First Army Ordnance troops had their first experience of blitzkrieg warfare. Medaris furnished the group commanders with excellent planning data by giving them timely information on the tactical situation and prescribing phase lines that Ordnance units had to clear at specified times in order to furnish proper support to the combat elements. After the pursuit began around 20 August, the forward Ordnance units, which had been kept highly mobile, made long jumps forward with relative ease during the good summer weather. On 22 August the command post of the 52d Ordnance Group moved 70 miles, from Beaumesnil to Les Mesles-Sur-Sarthe; two days later, 120 miles to La Loupe, where it stayed only six days before displacing forward 70 miles to the Paris area. From Paris, where the 52d took on the support of VII Corps in addition to that of V and XIX Corps, group headquarters moved on 5 September 90 miles to Laon, and on 18 September made another 90-mile jump forward that took it over the Belgian border. By that time, some of the Ordnance companies supporting the XIX and VII Corps were well into Belgium. A few days later those supporting V Corps were in the Ardennes near Bastogne.[14]

At the beginning of September, when elements of the 52d Ordnance Group were starting to move north of Paris, units of the 51st and 72d Groups (as well as the 71st Ammunition Group) were still near the army service area at La Loupe. But a new army supply area far to the north, at Hirson near the Belgian border, was opened on 6 September and soon these rear and army support groups were also on the move, some of the elements covering as much as 200 miles a day. The movement of the main army Ordnance depot under the 72d Group was immeasurably aided by the addition to the evacuation battalion of 64 trucks late in August, when it was decided that much of the depot stock was unsuited to hauling by tank transporters. The trucks not only moved between three and four thousand tons of depot stocks but were also extremely useful in such tasks as carrying supplies from rear to forward units and hauling ammunition.[15]

To get the ammunition forward when First Army began the swing east in mid-August 1944, Medaris organized behind the fast-moving VII Corps a mobile ASP—the only large-scale mobile ASP operated to any extent by any of the armies. For this pur-

[13] (1) FUSA Rpt of Opns, 1 Aug 44–22 Feb 45 (hereafter cited as First Army Rpt 2), Annex 9, p. 14. (2) Ltr, Maj Gen John B. Medaris to Lida Mayo, 2 Dec 63, OCMH. (3) History, 52d Ord Group, 21 Aug 43–13 May 45. (4) FUSA Ord Sec Opns Order No. 26, 4 Sep 44, in First Army Ord Rpts 1–30 Sep 44, AAR's (monthly) First Army (hereafter cited as FUSA Ord Monthly Rpts), KCRC.

[14] (1) First Army Rpt 2, Annex 9, p. 13. (2) Histories – 52d Ord Gp, 1944; Hq & Hq Det & Med Det, 48th Ord Bn, 1944; 252d Medium Maint Co, 10 Apr–Dec 44; 71st Ord Bn, 1944; and 177th Ord Bn, 1944.

[15] (1) First Army Rpt 2, Annex 9, p. 13; map, app. 5. (2) Unit History 72d Ord Gp 1944. (3) Evacuation and Transportation Sec, app. III to FUSA Ord Monthly Rpt Sep 44.

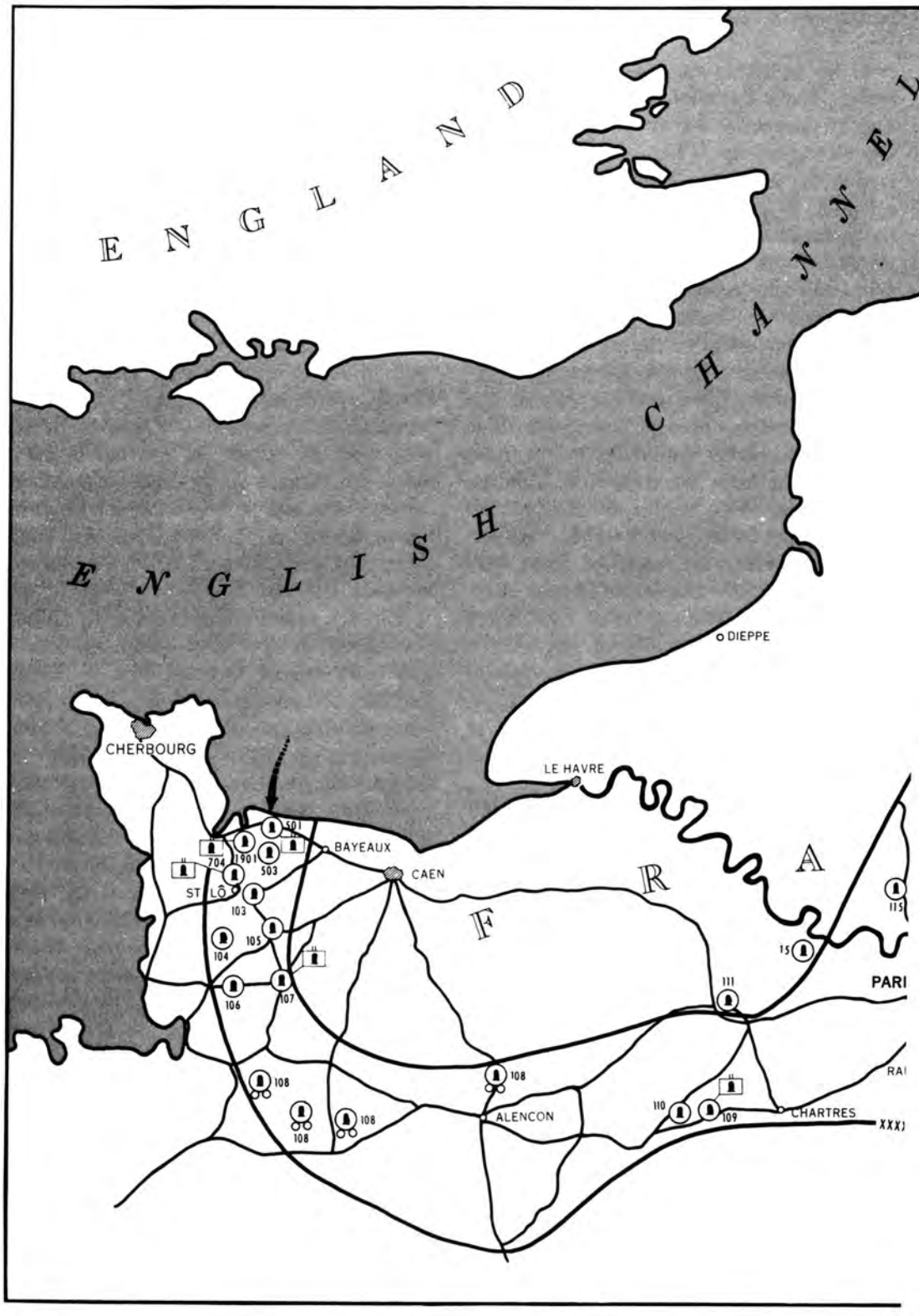
pose he arranged for the 102d Quartermaster Truck Battalion with five companies and 225 trucks to be attached to the 71st Ordnance Group. The ASP was organized in two echelons. The forward echelon, operated by the 619th Ammunition Company, issued directly to combat units from its 125 trucks, sometimes at the gun positions, and sent its empty trucks and requests for ammunition back to the rear echelon, about twenty miles to the rear. The rear echelon, operated by the 587th Ammunition Company, filled the requests of the forward echelon and sent convoys back to Depot 106, about 100 miles to the rear. Starting out from the area of St. Hilaire-du-Harcouet on 15 August, the ASP moved seventy miles in five days to Sees, via Corron and Lassay, and remained there until the closing of the Argentan-Falaise gap, when the eastward progress of First Army made necessary the opening of a new depot at La Loupe. In its 11-day period of operation, from 14 to 25 August 1944, the mobile ASP handled 13,156 tons of ammunition—6,615 received and 6,541 issued.[16] (*Map 5*)

Front and rear echelons of the mobile ASP were protected by a battery each from the 197th Antiaircraft Automatic Weapons Battalion (Self-propelled). This battalion possessed some weapons that were of particular interest to the Ordnance Section of First Army. They were the M16B half-tracks with the quadruple .50-caliber (Quad-50) machine guns, improvised in England before the invasion. Sixteen had been allotted to each antiaircraft automatic weapons battalion assigned or attached to First Army. Lightly armored and clumsy though they were, the M16B's had distinguished themselves in the beachhead phase, not only in antiaircraft defense but as assault weapons in support of infantry. Beyond the Seine, as the skies began to clear of German planes, they were frequently used in a ground role and were notably effective later on at Aachen. The 197th Antiaircraft Automatic Weapons Battalion, after its support of the mobile ASP and a short stay at Le Bourget Airport outside of Paris, was attached to the 71st Ordnance Group on 5 September and continued the protection of ASP's established beyond the Seine.[17]

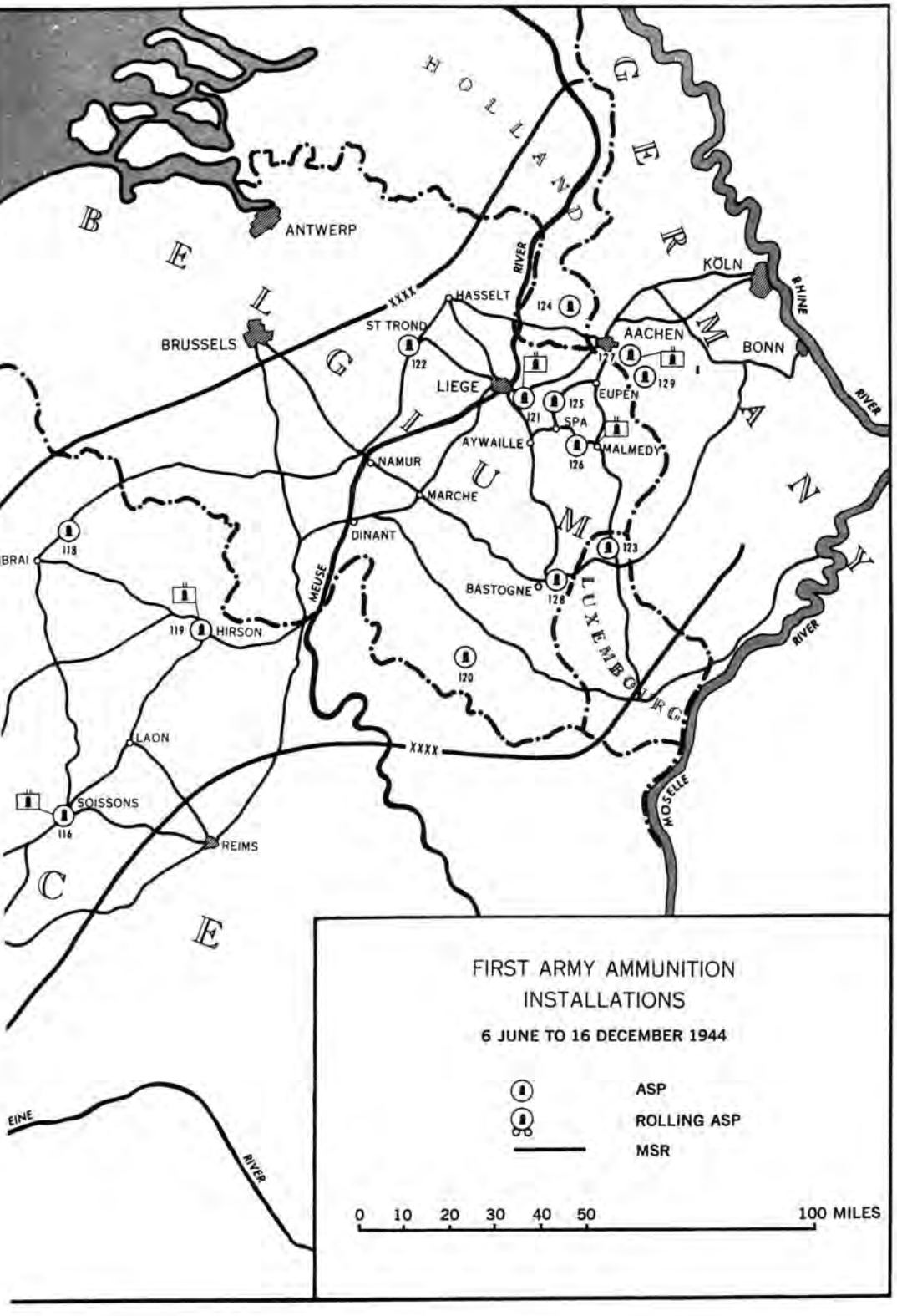
The new ammunition depot at La Loupe was hardly in operation before the stocks had to be moved forward, first to Hirson and then to Liège, in Belgium. This movement required nearly a thousand trucks. Quartermaster battalions fell far short of this number and had to be helped by trucks taken from heavy artillery and antiaircraft units temporarily immobilized behind the Seine. For the lift from the Seine to Hirson, army Ordnance vehicles of all types were used. The 71st Ammunition Group, though inexperienced in large-scale trucking, managed to establish an army ammunition depot near Liège by 11 September. Shipments began to come in almost immediately by rail: for the first time since

[16] (1) Hist 100th Ammunition Bn, pp. 41, 77, 97. (2) AGF Bd Rpt No. 1150, USFET, Ordnance Questionnaire, 31 Jul 45. (3) First Army Rpt 2, Annex 9, pp. 3, 53. (4) FUSA Ord Monthly Rpts, Ammunition Supply, Rpt 1–31 Aug 44 and Incl "SOP for Motorized Ammunition Supply Points," OHF. (5) Orgn Hist 587th Ord Ammunition Co, 30 Dec 42–Dec 44. (6) History – 197th AAA AW Bn (SP), Jun–Dec 44.

[17] (1) History 197th AAA AW Bn (SP), Jun–Dec 44. (2) First Army Rpt 1, Annex 11, p. 261. (3) Ltr, Medaris to Pattison, 28 Oct 63, OCMH. (4) For the conversion of the quad .50-caliber machine gun mount M51 to the M16B self-propelled mount, see above, p. 228.


ENGLAND
ENGLISH CHANNEL
DIEPPE
CHERBOURG
LE HAVRE
BAYEUX
CAEN
ST LÔ
FRANCE
ALENCON
CHARTRES
PARI
501
704
901
503
103
104
105
106
107
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108
108
111
15
115
110
109

MAP 5


HOLLAND
GERMANY
BELGIUM
LUXEMBOURG
FRANCE
ANTWERP
BRUSSELS
HASSELT
ST TROND
LIEGE
AACHEN
KÖLN
BONN
EUPEN
SPA
MALMEDY
AYWAILLE
NAMUR
MARCHE
DINANT
BASTOGNE
HIRSON
LAON
SOISSONS
REIMS
MEUSE
MOSELLE
RHINE
RIVER
XXXX
118
119
120
121
122
123
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127
128
129
116
FIRST ARMY AMMUNITION
INSTALLATIONS
6 JUNE TO 16 DECEMBER 1944
ASP
ROLLING ASP
MSR
0 10 20 30 40 50 100 MILES

D-day First Army had a good railhead close to the front.[18]

During the period of breakout and pursuit in late August and early September, there were times when front and rear Ordnance units were 200 miles apart, and at one time during the fast advance through northern France and Belgium, the distance increased to 375 miles. The link that held these units together was the radio net that Medaris had planned and prepared for back in England. He had kept it in operation during June and July mainly for training purposes, since it had not been really needed in the beachhead phase. Now it came into its own, saving hours, sometimes days, in the transmittal of requests and the delivery of critical supplies to far-flung combat units and performing invaluable services in many ways; for example, ammunition men on the march could be directed to establish new ASP's as far forward as possible. Above all, the radio net provided firm control of all types of supplies. Medaris and his staff knew at all times what was on hand, where it was, and what was needed.[19]

In attempting to get the supplies forward in the period of fast pursuit, First Army Ordnance men had a taste of battle more than once. A maintenance unit delivering half-tracks to the combat forces on the road to Paris ran into a German column and lost fifteen men; another, on 29 August near Chartres, captured 48 Germans. The men following closely behind XIX Corps on its rapid march north to Tournai risked even more encounters, for they were cutting across one of the main routes of the German retreat. On 2 September two officers who were making a reconnaissance for an ASP, Capt. Allan H. Reed of the 100th Ammunition Battalion headquarters and Maj. Jack C. Heist, XIX Corps ammunition officer, were ambushed by German troops near Thiant and both were killed, along with the driver of their jeep, Technician 4 Zan D. Hassin.[20]

Next day, while Colonel Medaris was sitting in his office in a partially wrecked building outside Charleroi in Belgium, reading the depressing report on the death of the ammunition men and their jeep driver, he himself had a narrow escape. Suddenly the windows were rattled by a violent explosion, followed by a deep rumble that sounded like thunder, though the day was warm and sunny. One of the Germans' new giant rockets, the V–2, had passed over the house and buried itself in a ravine nearby. Against the earlier V–1 —the buzz bomb—antiaircraft guns gave some degree of protection, but against this monster, carrying a ton of high explosives in its nose, there was no defense. Medaris reflected that the missile was probably not aimed at First Army headquarters. Intelligence reports had indicated that the Germans intended to use the V–2 against cities, and Medaris concluded that it had simply fallen short of its target. But he now had

[18] Hist 100th Ammunition Bn.

[19] (1) Sams, "Communications in Army Ordnance Service," pp. 48–49. (2) Medaris, "Field Service in the First Army," p. 67. (3) Ltr, Medaris to Pattison, 28 Oct 63. (4) First Army Rpt 2, Annex 9, pp. 14–15. (5) In contrast to the reliable information on stocks possessed by First Army Ordnance, the lack of such information on the part of Third Army Ordnance (which had no radio net) was criticized by 12th Army Group Ordnance during this period. Entries 26 Aug to 11 Sep 44, Daily Jnl Ord Sec 12th Army Group.

[20] (1) "Report from France," *Firepower*, vol. I, No. 3 (October, 1944), pp. 2–3. (2) Hists, 3456th Ord MAM Co and 100th Ammunition Bn. (3) Jnl Ord Sec, Annex D to sec IV, AAR Hq XIX Corps, 30 Sep 44.

firsthand evidence that the V–2 was at last operational. After examining the shattered fragments of the rocket in the ravine, he instructed his technical intelligence officer to inform technical intelligence teams in the forward area, and combat troops as well, of the discovery, and to alert them to be on the look-out for V–2 "hardware." Medaris then turned his attention to the more urgent problem of supplying ammunition to the advancing forces.[21]

The ammunition men were doing their best to keep up in the race. A day or so after the V–2 incident, a party of about fifty men of the 57th Ammunition Company, commanded by Capt. Jack Carstaphen, routed 47 members of the *22d Grenadier SS Regiment* from some barricaded farmhouses on the outskirts of Driancourt. With the loss of one man, Pvt. Allen Johnson, killed by a direct grenade hit, and one wounded, they killed 35 Germans and captured the rest. Such an encounter, a small-scale replica of the unexpected VII Corps battle at the Mons pocket, was more or less accidental. The real resistance on the First Army front would come later, at the Siegfried Line.[22]

Third Army Ordnance in the Dash to the Moselle

While XV Corps was crossing the Seine at Mantes and passing to First Army, General Patton's two corps to the south, the XX and newly formed XII Corps, were bypassing Paris. Having cleared the south flank along the Loire, the XX Corps with the 7th Armored and 5th Infantry Divisions turned north and liberated Chartres on 18 August; crossed the Seine and liberated Reims on 30 August; and by 1 September was across the Meuse at Verdun. The XII Corps, with the 4th Armored and 35th Infantry Divisions, left Le Mans on 15 August and was in Orléans the next evening; after a short halt to protect the southern flank and wait for supplies to come up, it was on its way again. Advancing abreast of XX Corps to the south, XII Corps had three bridgeheads over the Meuse by 1 September. (*See Map 4.*)

This Third Army sweep across France was faster than any of the planners had anticipated. No sooner had Nixon drawn a line beyond which his 69th Group would operate—furnishing Ordnance service to all troops passing through the forward area, providing roadside repair patrols to keep the roads clear of wrecks, helping corps to set up collecting points for damaged matériel and captured weapons—than the line would have to be moved eastward again. Nixon himself, visiting corps to straighten out administrative tangles in his forward battalions or dashing back to Laval to 12th Army Group to get help on supply, was on the road most of the time. Because of the long supply lines and very fluid situation, the combat troops had been authorized to carry ammunition in excess of their basic loads, using Quartermaster trucks, for it was extremely hard for the ammunition trains to catch up. Sometimes ammunition convoys were diverted to points as much as 20 miles beyond their original destinations and when they arrived at a new area they would have to wait while it was cleared of enemy troops. Often the

[21] (1) Maj. General John B. Medaris, U.S. Army, Ret., *Countdown for Decision* (New York: G. P. Putnam's Sons, 1960), pp. 48–52. (2) Hansen Interv.

[22] History 57th Ord Ammunition Co, 6 Feb 41–31 Mar 45.

first stocks for an ASP would remain on wheels for three or four days.[23]

The 573d Ammunition Company supporting XX Corps operated a rolling ASP of about 500 tons from 28 August to 2 September, issuing from its trucks direct to using units. Crossing the Marne at Fontainebleau on 30 August the company "rolled," according to its historian, "into the Wine incident." Near La Neuville the men saw a soldier coming out of a large cave carrying a case of wine. Jumping out of the trucks, they raided the cave (over the halfhearted protests of their lieutenant) and loaded up. "Then the 'Rolling ASP' rolled on. Half of the wine was given away to the French people and other 'GI's' along the highway but there was enough left in the Company for four 6x6 trucks to haul." After "a wineful night" at La Neuville, the company went on 200 miles to set up an ASP near a World War I cemetery at Dombasle-en-Argonne, five miles behind a hot fight at Verdun. A squadron of German fighter planes roared in on the tail of the convoy but did no damage. The ASP was soon set up with the help of a hundred truckloads of ammunition from a big depot just established at Nemours, in the forest south of Fontainebleau.[24]

The forward maintenance battalions behind XX and XII Corps had the problems that had arisen in the earlier experience behind XV Corps at Argentan. The battalion commanders had to move their companies so fast that there was not time to clear each movement with the commander of the 69th Ordnance Group. After a conference on 31 August with the commander of the 185th Battalion behind XII Corps, the group commander, and the corps Ordnance officer, Nixon decided that army would establish the general direction of the movement and the battalion commander would disperse the companies forward on the request of the corps Ordnance officer.[25]

It was hard to keep the intermediate battalions close enough behind the forward battalions to be of much help, especially since Nixon (unlike Medaris) had no radio net to enable the group commander to keep in close touch with his far-flung forces. One intermediate antiaircraft maintenance company, the 305th, spent the last week of August bivouacked on a steep hill near Pinthiviers, accessible only by roads too primitive to take heavy equipment. No work came in. An object of great curiosity to the French farmers, who came in droves every day to stare at them, the men spent their time swimming in a stream nearby, "card playing, and cooking as we had by this time started to trade for eggs and potatoes and the odor of French fries hung over the area at all times." The idyll was over on 31 August, when the company was dispatched across the Seine a hundred miles to Sommesous. Some of the heavy maintenance companies in the intermediate battalions were not sent forward but were transferred to the Third Army rear echelon group to help in the vehicle shops.[26]

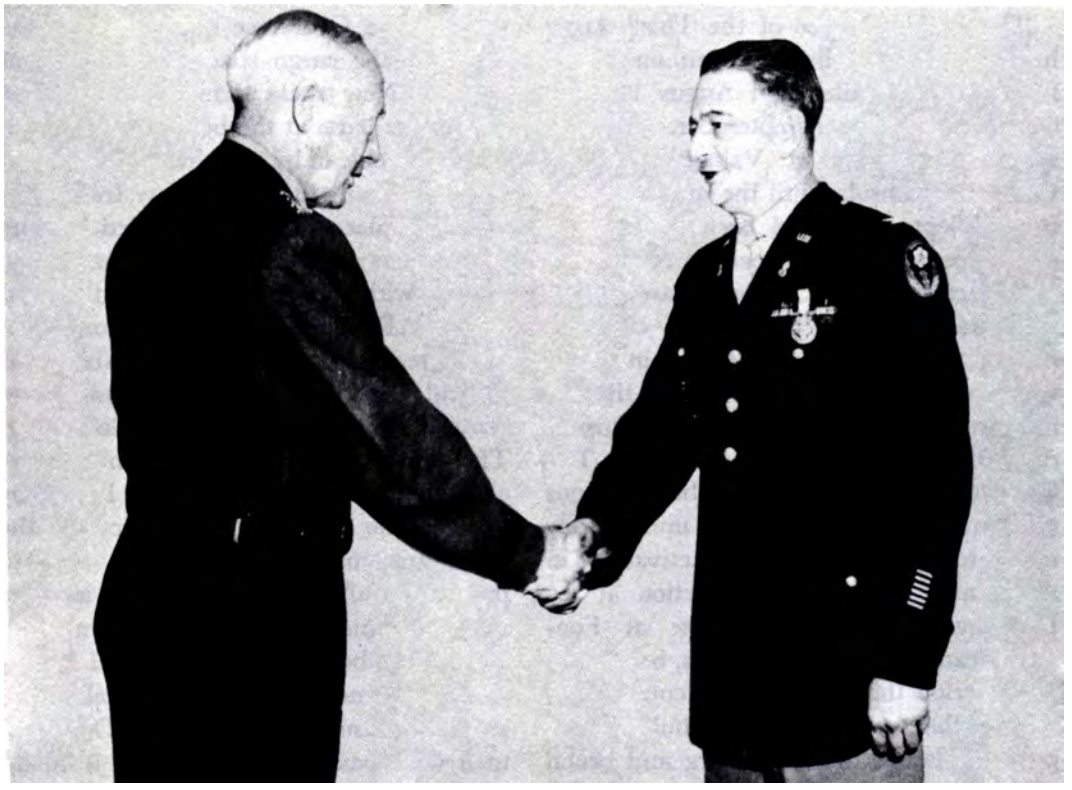
By the end of August Nixon had brought his rear group—his heavy shops and main

[23] (1) Third Army Rpt II, Ord Sec, pp. 7–8, 10. (2) Slaughter Rpt, pp. 4–5, 20. Nixon's staff, like Medaris', had been augmented in England. USFET Bd Rpt 101, p. 4.

[24] (1) History 573d Ammunition Co, ETO Ord Sec Histories, KCRC; (2) Third Army Rpt vol. II, Ord, p. 12.

[25] XII Corps Jnls, Ord Jnl, 31 Aug 44.

[26] Histories, 305th Maint Co (Antiaircraft); 902d Heavy Auto Maint Co, ETO Ord Sec, KCRC.



GENERAL PATTON AND COLONEL NIXON

army depots—more than a hundred miles forward, from Le Mans to the forest south of Fontainebleau. The group had gained considerable experience in a 10-day stay at Le Mans, where for the first time the men had encountered vehicles damaged by use rather than enemy action. At Nixon's direction they had set up a control point, to which all material meant for repair, exchange, and salvage was taken and then assigned to maintenance companies, so that the flow of work was regulated and controlled. This experience was invaluable when they got to Fontainebleau, for there, as one battalion commander later remembered, "the maintenance job really began to bloom." Into the control point a steady stream of wreckers dragged enormous quantities of tanks, trucks, and weapons damaged by enemy guns and mines and by hard wear in the fast pursuit. To do the big repair job the mechanics cannibalized to the utmost, for Third Army still lacked its basic load of spare parts. The unexpectedly heavy demand for tracks on light tanks, tires for the tank transporters, parts for artillery, and motors for medium tanks could not be met at all, and awaited more support from the rear.[27]

[27] (1) Gibson Interv in Hines History. (2) Histories, 904th HAM Co, 889th HAM Co, ETO Ord Sec, KCRC. (3) Third Army Rpt vol. II, Ord, p. 9. (4) Third Army G–4 Rpts 29 Aug, 5 Sep 44, 12th AG 319.1 G–4 Rpts (TUSA) vol. I.

The rapid advance of the Third Army had stretched the line of communications from about 50 miles on 1 August to more than 400 miles by 1 September. COMZ, with headquarters at Valognes on the Cotentin peninsula until the move to Paris in mid-September, had been able to get only three base sections opened: Normandy Base Section in the Cherbourg area; Brittany Base Section in the rear of VIII Corps; and Seine Base Section in Paris, which was concerned mainly with the administration of civil relief and the supply of COMZ installations in the city. The first week in September two base sections that might have been more immediately useful to Third Army were activated (in addition to Channel Base Section in the Le Havre–Rouen area)—Oise at Fontainebleau and Loire at Orléans, but in this early period they had all they could do to support their own units. The bulk of supplies still lay in the Cherbourg and beach areas; the railways that might have carried them eastward to the Seine had been pretty well knocked out by American bombers.

The fast Red Ball truck operation inaugurated by Brig. Gen. Ewart G. Plank of ADSEC with the remark, "Let it never be said that ADSEC stopped Patton when the Germans couldn't," [28] brought 89,000 tons of supplies from beaches to army dumps in the Chartres–La Loupe–Dreux triangle between 25 August and 5 September but most of this cargo consisted of rations, gasoline, and ammunition.[29] For spare parts and other maintenance needs, the forward Ordnance depots had to depend on the cargo space in replacement vehicles. New trucks and jeeps were loaded with spare parts at the beaches and driven to Fontainebleau by men from replacement companies sent to Third Army from England. Replacement tanks, hauled by tank transporters in order to conserve tracks, arrived with spare tracks wrapped around them. ADSEC helped when it could, but for a great many of his supplies Nixon had to send Third Army trucks and tank transporters all the way back to Cherbourg. The journey of three days or more over congested roads was made even harder by the gasoline shortage. The trucks of the main armament depot company had to travel 250 miles back to the beach in order to get gasoline to haul weapons from Cherbourg.[30] About this time General Patton heard a rumor which he "officially . . . hoped was not true" that his Ordnance men were passing themselves off as members of First Army in order to draw gasoline from First Army dumps. He commented, "To reverse the statement made about the Light Brigade, this is not war but it is magnificent." [31]

After a halt of five days because of the gas shortage in early September, Patton's army continued its advance toward the Saar. It was stopped at the Moselle on 25 September by Eisenhower's decision to immobilize Third Army in order to throw all

[28] Interv, Lt Col V. H. Williams Jr., Transportation Sec ADSEC, by William M. Hines, Sr., in Hines Hist, vol. II, p. 319.

[29] For a breakdown on Red Ball tonnages 25 August–5 September, see COMZ G–4 Hist III, pp. 3, 7, Admin 553.

[30] (1) Nixon Interv. (2) Third Army Rpt II, G–4, p. 12, Ord Sec, p. 9. (3) Third Army G–4 Rpts, 29 Aug 44, 12th Army Gp 319.1 G–4 Rpts (TUSA), vol. 1. (4) Rpt of Lt Col Nathan B. Chenault, Supply Officer Ord Sec COMZ, quoted in Hines History, vol. II, p. 334. (5) Histories 3537th Ord Medium Automotive Maint Co, 458th, 471st, 489th Evacuation Cos, and 344th Depot Co, ETO Ord Sec, KCRC.

[31] Patton, *War As I Knew It*, p. 125.



550TH HEAVY MAINTENANCE COMPANY, VERDUN

support to the drive to the Ruhr in the north by the British and the First U.S. Army. When Patton's advance was stopped, XII Corps had crossed the Moselle at Nancy and established a bridgehead beyond. The XV Corps, which had by then returned to Third Army from First Army and was protecting the southern flank, was beyond the river at Charmes and was abreast of XII Corps in the neighborhood of Luneville. On the northern part of Third Army's front, XX Corps had a bridgehead at Arnaville, but had been unable to take the heavily fortified city of Metz. Thereafter, restricted to limited objective attacks, the army could do little until November, when the offensive was resumed. Across the Lorraine border in Germany, Patton was slowed down by the Siegfried Line and by the increasing shortages in men, ammunition, and tanks.[32]

By mid-September Nixon's rear group was on the move again, from Fontainebleau to the Moselle, some 225 miles east, where Third Army was besieging Metz in an area that was studded with place names recalling World War I—Verdun, St. Mihiel, the Argonne. Nixon did not move all the companies forward at once, but with the help of ADSEC employed a leapfrogging system that he was to use ef-

[32] (1) Bradley, *A Soldier's Story*, p. 423. (2) For Third Army operations 1 Sep–15 Dec 44, see H. M. Cole, *The Lorraine Campaign*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1950).

fectively for the rest of the campaign in Europe. He sent a maintenance company of his rear group into the forward area to work in each collecting point and to repair matériel, if possible, rather than subject it to further damage by evacuation. When this company moved on, it left its unfinished work to be taken over by a company from a rear control point. The second company left its unfinished work to an ADSEC maintenance company that had been assisting it at the control point.[33]

During the lull in operations beginning in mid-September, Nixon was able to organize a group for ammunition supply, the 82d, using men from the headquarters of his 313th Battalion, which had been acting as a group until that time. Another innovation in Third Army ammunition supply that took place about this time was the use of roadside storage. This strung out the ASP's, increasing the total mileage, and hampered operations in areas far forward when tactical units had to use the roads. For example, it took an armored division two whole days to pass through the ASP of one company, causing the ammunition men (according to their historian) "very much grief and sorrow," but roadside storage took the dumps out of fields that were every day becoming deeper and deeper in mud.[34]

The fine weather that had made Fontainebleau so attractive (along with the first post exchange issue, first mail, and, for most of the men, a day's visit to Paris) continued only a week or so in Lorraine. Toward the end of September the autumn rains began. The men were operating their shops and dumps in the open, for Patton had never permitted them to use garages or other shelters in towns, fearing that they would lose their mobility, but French mud, as much a reminder of World War I as the trenches that still gashed the fields, soon made work all but impossible. Trucks had to be winched out of it and jacks sank. Rain filled foxholes and soaked clothing. Men's fingers were numb with cold. By October the decision to stay in the open had to be rescinded. There was a scramble for shelter in the towns, all units competing for factories, garages, stables, and the French barracks or caserns that were numerous in this fortress region. The forward battalions found buildings around Pont-à-Mousson and the rear were divided among St. Mihiel, Commercy, Toul, Neufchâteau, and Nancy. Many of the buildings were in bad shape, without roofs or windows, between German demolitions and U.S. bomber attacks, but the Ordnance mechanics knew how to repair the damage, and even manufactured stoves as winter came on. After the Ardennes breakthrough in December, units moved on to Luxembourg, but some of the rear companies went into even better accommodations at Metz and stayed until spring.[35]

[33] (1) Third Army Rpt vol. II, Ord, p. 10; (2) Nixon Interv.

[34] (1) Msg, AGWAR, from Marshall, to ETOUSA to Eisenhower, 25 Aug 44, WAR — 84540; Ltr, Eisenhower to CG 12th Army Gp, 11 Sep 44, sub: Activation of 82d Headquarters and Headquarters Detachment, Ordnance Group; and Memos, 12th Army Gp Ord for G–4, and G–4 for G–3, 19 Sep 44. All in 12th Army Gp 322 Ordnance Units. (2) History, 82d Ord Gp, 27 Sep–Dec 44. (3) Histories, 573d, 574th, 620th Ammunition Companies.

[35] (1) Unit Histories ETO Ord Sec, KCRC. (2) Gibson Interv, in Hines History, vol. III, pp. 427–29, OHF. Gibson, noting that mud was bad all the way back to the ADSEC area, told of the order from a general to the commander of the 78th Ordnance Battalion (ADSEC) to "get rid of the dirty mud." *Ibid.*, p. 427.



INSPECTING DUCKBILL EXTENSIONS ON TANK TRACKS

During the fall of 1944, working within sound of the big guns blasting away on the Third Army front between Metz and Verdun, the Ordnance men tried to repair the damage done in the race across France and to get Patton's army ready for the next offensive. To give the tanks better flotation in the mud, they widened tracks by welding to the end connectors four-inch-square metal cleats called duckbills or duckfeet. Back in Paris, Communications Zone had contracted with French plants to do the job, but the effort required to send the end connectors (there were 164 on each medium tank track) to the factories made it simpler for Third Army to do a great deal of the work in its own shops, obtaining the metal cleats from local manufacturers. Much needed help with tank engines came from the Gnome-Rhône works in Paris, which by October was well into production on engine overhaul, thanks to an early September contract with First Army. This contract was later taken over by Communications Zone. Increasing COMZ support, the opening of ADSEC shops in Verdun, better rail service from the ports, and cannibalization and the conversion of captured German weapons made it possible for Third Army to

make up most of its losses in tanks and weapons by December.[36]

Trucks were another matter. The story of the automotive maintenance men continued to be a story of "sweat and grease, of engines and axles, of wrecks and repairs." [37] Most of the wrecks came from the Quartermaster truck companies operating Red Ball and other emergency hauling projects. The heavy cost of the Red Ball operation, which had been extended until 16 November in order to move 315,225 long tons from Normandy to forward depots or to Paris for transfer to trains, was becoming all too plain. In the belief that the war would soon be over, Communications Zone had tacitly but deliberately abandoned preventive maintenance in the interest of speed and was admittedly paying "a terrific price." [38]

Careless drivers and reckless drivers fired by "push 'em up there" slogans had run their trucks day and night at high speeds over rough roads without giving them even the most elementary care. The trucks had been badly overloaded: the 2½-ton trucks had been made to carry six to ten tons. Overloading was ruinous to axles and hard on tires. Tires were already badly damaged from lack of care and the condition of the roads, which had become doubly hazardous from the jagged metal of C ration cans that the troops had thrown away.[39]

Tires for trucks and jeeps were scarce all over the world. Any real help on the problem in the ETO had to await the output of French factories that were just getting into operation as 1944 ended. No production in quantity could be expected for several months—not until bomb-damaged plants were repaired and raw materials delivered. The men in Third Army and ADSEC rounded up spares, robbed 1-ton trailers and even 37-mm. gun carriages, and did their best to save repairable tires with the meager amount of tire repair equipment they had. Until January 1945 the theater had only one tire repair company, the 158th, with enough equipment to operate. The company was split into six teams: two teams were attached to First Army, two to Third Army, and two remained with ADSEC.[40]

The idea of using small mobile tire repair units of one officer and 14 men (rather than companies) to go to the trucks and repair minor damage before it became major had been handed to the Ordnance Department by Quartermaster along with the responsibility for trucks in the summer of 1942. Nothing was done about it until

[36] (1) Ord Serv ETO, Local Procurement and Industrial Service, pp. 47–59, 73–86, OHF; (2) Unit Histories, ETO Ord Sec, KCRC; (3) Third Army G–4 Rpts Sep–Dec 44, 12th AG 319.1 G–4 Rpt (TUSA), vol. I.

[37] History 992d HAM Co, ETO Ord Sec, KCRC.

[38] COMZ G–4 History, sec. III, pp. 10, 15, Admin 553.

[39] (1) *Ibid.*, pp. 33–45; (2) Intervs, Brig Gen James H. Stratton, COMZ G–4; Col James McCormack, Jr., Movements Br, G–4, 12th AG; by William M. Hines, Sr., in Hines History, vol. II, pp. 308, 341, 428–29. (3) Third Army G–4 Rpts, Oct–Dec 44, 12th AG 319.1 G–4 Rpts (TUSA) vol. 1. (4) USFET Bd Rpt No. 97, Operation of Ordnance Roadside Service Stations, p. 8.

[40] (1) For Ordnance tire procurement in France (which, along with rebuild of tank and truck engines and the manufacture of duckbills, constituted the three major Ordnance local procurement programs), see Ord Serv ETO, Local Procurement and Industrial Service, pp. 88–102, OHF. (2) COMZ G–4 History, sec. V, p. 48, Admin 553. (3) History ADSEC Ordnance, p. 18, ETO Ord Sec, KCRC. (4) The 156th Tire Repair Company arrived in southern France to support Seventh Army in October 1944, but had to wait for its equipment. Capt. Shelton C. Till, "Rubber Men," *Firepower*, vol. II, No. 1 (June–July 1945), pp. 8–9.

the fall of 1943, when experience in the Mediterranean, especially with the damage done to tires by the lava roads in Sicily, pointed the need for some change of system. Thereafter, it took a year of study, consultation, authorization, the development of electrical equipment, the preparation of a TOE, and tests, before procurement was even begun. In the meantime, the six teams of the 158th Tire Repair Company augmented their supplies with synthetic material captured from the Germans or bought locally, and improvised the extra equipment they needed. They made (according to the ADSEC Ordnance historian) "one of the most spectacular records of achievement in Ordnance Service."[41]

For truck and jeep parts, the Third Army Ordnance men combed collection points to obtain the most critical items—axles, transfer cases, and steering assemblies. Nixon sent searchers all the way back to Cherbourg, since as late as mid-December more than half of all Class II and IV supplies were still in Normandy and Brittany because of the priority that had been given to ammunition, food, and gasoline on the move forward. When parts were not available at all, Nixon's 79th Battalion employed French firms to make them, or made them in its own shops. The ingenuity of American mechanics was amply demonstrated in this area as in many others; for example, they made a tool for straightening bent axles and adapted British axles to American vehicles. One interesting example of ingenuity was a magnetic road sweep to be used by an Engineer construction battalion in clearing roads of the jagged metal litter so damaging to tires.[42]

Around Christmas, Third Army Ordnance men got some help on truck and jeep parts from a neighbor. In exchange for 40,000 duckbills, they received a quantity of brake hose and lining for trucks and distributor rotors and carburetors for jeeps from Seventh Army, which had just extended its western boundary to St. Avold in order to support Third Army during the German counteroffensive in the Ardennes. Seventh Army, mounted in Italy and landed near Marseille in Operation DRAGOON on 15 August 1944, had come north up the Rhône Valley in an advance comparable to First and Third Armies' race across France.[43]

Seventh Army in Southern France

A landing in southern France—first called ANVIL, later DRAGOON—was during most of 1942 considered by American planners an integral part of the cross-Channel attack. A force mounted in the Mediterranean theater was to land in the Marseille-Toulon-Riviera area on the Normandy D-day, drawing off German divisions

[41] (1) History ADSEC Ordnance, p. 18. (2) OCO, Requirements, Development, Production, Distribution and Conservation of Tires for Army Motor Vehicles — 1942–1945 (Project Supporting Paper No. 53), vol. I, ch. V, pt. 3, Mobile Tire Repair Platoon, OHF. (3) Memo, Ord APO 871 for Chief Ord Officer APO 887, 19 Dec 43, Folder Theaters Europe (ETO) Jan 43 to Dec 44. (4) Ltr, Holmes to CofOrd, 16 May 44, sub: Comments on Mobile Tire Repair Platoons, O.O. 451.92/4652.

[42] (1) Gibson Interv in Hines History, vol. III, pp. 428–29. (2) Unit Histories, ETO Ord Sec, KCRC. (3) Third Army G–4 Rpts, Oct–Dec 44, 12th AG 319.1 G–4 Rpts (TUSA), vol. I.

[43] (1) Third Army G–4 Rpts, 26 Dec 44, 12th AG 319.1 G–4 Rpts (TUSA), vol. I. (2) *Report of Operations, he Seventh United States Army in France and Germany 1944–1945* (Heidelberg, 1946) (hereafter cited as Seventh Army Rpt 1944–45), II, 495.

from the Normandy invasion and forming a pincers with First Army. The British had never been enthusiastic about the operation, for they disliked the thought of weakening the drive in Italy, and in the early spring of 1944, after the stalemate at Anzio and Cassino, they began actively to oppose it. But the American planners, from President Roosevelt down, never wavered in their determination to make the landing in southern France. The only change they would agree to was a postponement, and this was dictated late in March by necessity. Landing craft were too scarce to permit an attack in southern France simultaneous with the cross-Channel attack.

It was argued that DRAGOON would support OVERLORD; open the large port of Marseille; and give the French army now being equipped in the Mediterranean a share in the liberation of France. These arguments did not move Churchill, who continued to oppose DRAGOON, preferring to keep the forces in Italy strong enough to go on to Istria and Trieste. Montgomery at last endorsed DRAGOON, but halfheartedly. He came later to consider it "one of the greatest strategic mistakes of the war." [44]

Though the trumpet, on the British side at least, gave an uncertain sound, AFHQ prepared for the battle. Planning began at Algiers on 12 January 1944 in a rambling white building on a hill overlooking the city, the Ecole Normale of Bouzareah, behind a high security fence of rusty barbed wire. The planning staff, known as Force 163, was mainly composed of officers brought from Seventh Army headquarters in Palermo, for the Seventh was to be the American army in the invasion. On this staff the Ordnance representative was Colonel Nixon. A week or so later Rear 163, a small staff of logistical planners, was established in a department store in Oran, and here the chief Ordnance planner was Lt. Col. Herbert P. Schowalter, who had been Nixon's supply officer in Palermo.[45]

According to plans developed for DRAGOON in the spring of 1944, three crack American infantry divisions—the 3d, 36th, and 45th—were to be brought from Italy and organized under VI Corps with General Truscott as commander. DRAGOON would also have one mixed British and U.S. airborne task force. The French, coming in after D-day, were to contribute seven divisions, under the 1st French Army.

The Seventh Army commander was Maj. Gen. Alexander M. Patch, a newcomer to the theater, but well known for his Guadalcanal campaign. He had been in command of IV Corps, then in training in the United States, and he brought with him to Africa IV Corps officers to fill the Seventh Army staff positions left vacant when Patton went to England. General Patch arrived in March. His Ordnance officer, Col. Edward W. Smith,

[44] (1) Robert Ross Smith and Richard Kugler, Riviera to the Rhine, chs. I and II, MS in preparation for UNITED STATES ARMY IN WORLD WAR II. Unless otherwise noted, this section is based on this manuscript. (2) Marshall Interv of 25 Jul 49. (3) Winston S. Churchill, *Triumph and Tragedy* (Boston: Houghton Mifflin Company, 1953), pp. 57–71. (4) Vigneras, *Rearming the French*, p. 119. (5) *The Memoirs of Field-Marshal the Viscount Montgomery of Alamein, K.G.* (Cleveland and New York: World Publishing Co., 1958), p. 199.

[45] (1) Nixon Interv. (2) Ltr, Herbert P. Schowalter to Lida Mayo, 27 Jan 64, OCMH.

joined Seventh Army Ordnance at Oran in April.[46]

By the time Colonel Smith arrived, the Ordnance plans for the invasion of southern France were well along. They had been initiated by the Ordnance AFHQ staff in Algiers under Lt. Col. William H. Connerat, Jr., who had become acting Ordnance officer of AFHQ after Colonel Crawford's departure for the United States. His principal assistant was Crawford's executive, Lt. Col. Henry L. McGrath. Both men were thoroughly experienced. Connerat as Crawford's supply officer had been lent to Colonel Nixon for the Sicily Campaign and had made a careful study of the operations in Sicily, a study that was used in the planning for Salerno. McGrath was a veteran of three landings—Fedala, Sicily, and Salerno; in the Salerno landings he had commanded the AVALANCHE maintenance battalion.

Using Salerno as a guide, Connerat and McGrath computed basic loads and initial stocks of ammunition, major items, and spare parts, and figured troop requirements for DRAGOON. They were well aware from their own experience how important it was to get ammunition men, DUKW mechanics, and depot detachments on the beachhead as early as possible. For the move inland after the landing, they planned to support Seventh Army and 1st French Army with one ammunition battalion, the 62d, and two maintenance and supply groups—the 55th Ordnance Group for forward, third echelon work and the 54th in the rear for supply, evacuation, and fourth echelon repair. McGrath himself was to command the 55th Ordnance Group, and he hand-picked his battalions and companies from veterans of the Mediterranean campaigns. These AFHQ plans were turned over to Force 163. Nixon departed for Europe in April 1944, and the final planning, based on the AFHQ plans, was done by Colonel Schowalter in Oran. After the liberation of Rome in June, the troop list for the invasion became firm; VI Corps was moved down to Salerno for training, and in July AFHQ and Seventh Army planners went to Italy to supervise the mounting of DRAGOON from Naples.[47]

Airborne Ordnance Men

During the familiar flurry of preparing for another invasion, there was one new element—the training of airborne Ordnance men. In the Normandy landings, Ordnance support troops did not accompany the paratroopers but followed by sea. In DRAGOON the Ordnance men would go in by glider with the 1st Airborne Task Force, which was to be dropped behind the beach on D-day. The men selected came from the 3d Ordnance Medium Mainte-

[46] (1) Seventh Army Rpt 1944–45, I, 1–12. (2) Brig. Gen. Edward W. Smith, "Ordnance in Seventh Army," *Army Ordnance*, XXIX, 151 (July–August 1945), p. 66.

[47] (1) History Ord Service MTO, V, ch. V, 101–02, 174–76, and app. 22 to ch. VII, Ordnance in the North African and Mediterranean Theater of Operations as Recalled by Colonel Connerat (hereafter cited as Connerat Memoir), OHF. (2) Intervs, Crawford, 3 Jun 56, Col McGrath, 8 May 57, and Col W. H. Connerat (USA Ret.), 14 Aug 64. (3) Hq Force 163, Annex 4 to Ord Admin Instrs 1, p. 2, in AGF Bd Rpt, ETO, No. 761, G–4 Matters, 25 Mar 45, 4–3.761/45 (12866). (4) Connerat, 1st Ind to Ltr, Pattison to Connerat, 12 Sep 63. (5) At one point in the later planning phase, Colonel McGrath flew to England to arrange for quick transport of weapons to Naples. David Comments.

nance Company, the second oldest Ordnance outfit, which had supported the 3d Infantry ("The Marne") Division in World War I and again in Sicily in World War II. From a detachment of two officers and sixty-nine enlisted men who were sent in mid-July to the Airborne Training Center near Rome to service pack artillery, clean and issue small arms, install wire cutters on jeeps, and mount stretcher racks on jeep hoods, an advance echelon of two officers and twenty-five men was selected to fly in with the paratroopers and support them for the first seven days, until the rear echelon could come in by sea.[48]

This advance echelon of twenty-five men was to be split into three seven-man teams, each team equipped with a jeep and a quarter-ton trailer loaded with 750 pounds of parts and tools. On landing, each team would join one of the three 1st Airborne Task Force combat teams. Of the four men not on the teams two were to operate ammunition points upon landing and two were to accompany Maj. Christian B. Hass, task force Ordnance officer, and 1st Lt. Max E. Clark, commanding officer of the detachment, to set up a resupply point and perform liaison. The first week in August the men of the "airborne" group were sent to Marcigliano for three days of glider training, to learn how to load their jeeps and trailers aboard the glider and lash them down so that they would not break loose during flight. After this course they were given orientation flights and, finally, one practice landing. The men's excitement over the new experience mounted when they received orders making them bona fide glider troops, entitled to flight pay. They also acquired during training a mascot that their commanding officer described as "a congenial monkey." Having "distinguished himself greatly in the knots and lashings course," the monkey was inducted into the Army and christened "Jeepo." [49]

Jeepo was aboard when the seven gliders carrying the Ordnance men soared aloft from Lido di Roma airfield on the afternoon of D-day, 15 August, towed by a C–47 bound for France. Each of three gliders carried a jeep and one or two of the men; four carried a trailer and six or seven men each. The four-hour flight over the blue sea was smooth and uneventful. Fifteen minutes after they passed the coast line of France, which the men recognized by the breakers far below, they spotted their landing sites, very familiar from the aerial maps they had studied during training. They were over enemy territory but luckily there was no flak, only a lurch as the tow ropes parted.

Some of the gliders were damaged in the landing; several lost a wing when they struck a tree or another grounded glider, and the one carrying two men and Jeepo lost its undercarriage and most of its nose. No one was injured, however, and after a night in a wood exposed to German machine rifle and artillery fire, the Ord-

[48] (1) For Ordnance support of 101st Airborne Division in OVERLORD, see History 801st Airborne Ord Maint Co for Oct 42–45. (2) History 1st Airborne Task Force, Opn and Supporting Docs, 107–81.4 (18564 5 Aug 44). (3) "Second Oldest," *Firepower*, II, No. 1 (June–July 1945), n.p. (4) History 3d Ord Medium Maint Co, 15 Feb 1918–Dec 1944. (5) History 1st Det 3d Ord Medium Maint Co, Aug, 15 Sep 44.

[49] (1) History 1st Det 3d Ord Medium Maint Co, Aug, 15 Sep 44. (2) Opn Rpt 1st Airborne Task Force, 15 Jul–Sep 44, Sec I, 107–81.2. (3) History 1st Airborne Task Force, Opn and Supporting Docs, p. 8, 107–81.4.

nance teams with their jeeps and trailers joined their combat teams. They went to work at once, repairing pack howitzers, sights, small arms, jeeps, and captured vehicles and collecting plane-dropped ammunition, which they delivered under fire to the howitzer batteries. Enemy opposition was generally light, for the Germans had been surprised by the airborne landings and had been unable to bring up reserves. On 17 August the three Ordnance teams moved into a German quartermaster depot, acquired a German truck and sedan, and were able to make contact with the 3405th Ordnance Medium Automotive Maintenance Company on the beach.[50]

The Fast Pursuit up the Rhône

The landings on the three beaches, beginning at 0800 on 15 August, had been remarkably successful. The Ordnance planners at AFHQ considered them "textbook landings"—the best yet achieved in the Mediterranean. The timing was excellent. The German defenses were nothing like as formidable as in Normandy, the weather was fine, and the water was so shallow in most places that the waterproofing that had been applied was not needed. When Colonel McGrath arrived at the pink villa near the beach at Ste. Maxime where he had arranged to meet the VI Corps Ordnance officer, Col. Walter G. Jennings, at 0812, he found Jennings waiting with his watch in his hand. It showed that McGrath was exactly two minutes late.[51]

Attached to the 40th Engineer Regiment during the landings, McGrath and several members of his 55th Ordnance Group headquarters acted as observers and advisers at Ste. Maxime for a week, then moved forty-five miles inland to Brignoles to wait for the rest of the staff, who arrived with the executive officer, Lt. Col. Marshall S. David, on 27 August. By then, the forward army Ordnance companies (organized temporarily under the 45th Ordnance Battalion) supporting the three infantry divisions and VI Corps were accompanying the combat forces on their rapid march up the Rhône Valley in pursuit of the retreating German *Nineteenth Army.* It was 31 August before group headquarters, traveling some 178 miles in a single day, caught up with them at Crest, just northeast of Montelimar, and it was there that the 55th Ordnance Group was organized. It was composed of the 45th Ordnance Battalion with the 14th, 45th, and 46th Medium Maintenance Companies, and the 43d Battalion. The 43d, which consisted of an antiaircraft medium maintenance company, the 261st, a field army heavy maintenance company, the 87th, and a medium automotive maintenance company, the 3432d, had the task of supporting corps and army troops. Also attached to the group, but for operations only, were three French Ordnance battalions, now

[50] (1) History 1st Det 3d Ord Medium Maint Co. (2) Hist, 1st Airborne Task Force, Opn and Supporting Docs. (3) Opn Rpt, 1st Airborne Task Force 15 Jul–Sep 44, Sec III. (4) Lecture, Harris W. Hollis, The Operations of the First Airborne Task Force in the Invasion of Southern France — 15–20 August 1944 . . ., Armed Forces Staff College Library.

[51] (1) Truscott, *Command Missions,* p. 414. (2) Eric Sevareid, *Not So Wild A Dream* (New York: A. A. Knopf, 1946), p. 439. (3) Connerat Memoir. (4) Ltr, Maj L. Ballard to Chief Ord Officer NATOUSA, 4 Sep 44, sub: Observations in Ordnance Service and Supply in Southern France, Folder 319.1–1944, OCO–D Field Service Opns. (5) McGrath Interv.

advancing up the west bank of the Rhône with elements of French Army B. The French army had landed after Seventh Army and was mainly engaged in opening Toulon and Marseille.[52]

Like the medium maintenance companies, the army ammunition companies outstripped their controlling headquarters (the 62d Ordnance Ammunition Battalion), since they had been attached to the divisions on 20 August and had moved forward with them. This attachment was essential during the period of rapid pursuit, because the divisions carried a large supply of ammunition in addition to basic loads. By 27 August army had a sizable ASP in operation inland at Aix-en-Provence; and by 1 September the most forward ammunition company, the 66th, had succeeded in establishing an ammunition supply point as far north as Montelimar. Next day the companies were relieved from divisions and attached to the 45th Ordnance Battalion.[53]

At Montelimar the American forces had failed to trap the Germans, but American artillery and tanks had done considerable damage. For miles beyond, the road was lined with the shattered remnants of German tanks, trucks, guns, dead men and dead horses; and on the railroad to the north were hundreds of cars loaded with wrecked enemy weapons, including no less than six or seven railway guns like Anzio Annie—of great interest to the VI Corps veterans of Anzio. The pursuit continued, with VI Corps on the east bank of the Rhône and the French on the west trying to intercept and destroy the enemy before he could reach the Belfort Gap and withdraw to his West Wall fortifications. The generals were already planning a juncture with the U.S. Third Army around Dijon and a concerted drive east, perhaps through Strasbourg into Germany.[54]

Lyon fell on 3 September and the front continued to move so rapidly that in order to keep up with the Ordnance battalions the 55th Group headquarters had to move north 68 miles on 4 September to Bourgoin, about 45 miles southeast of Lyon. By this time the simple matter of distance had placed unusual responsibilities for supply on this forward group and made necessary several unorthodox methods. For one thing, the 77th Ordnance Depot Company, the field depot which had been attached to the 43d Ordnance Battalion and was also supporting the 45th, could not get resupply readily from the two depot companies in the 54th Ordnance Group, which by 3 September was only beginning to move north from the beaches. To maintain closer supervision over the supply situation, Colonel McGrath placed the depot company under his own group headquarters. By agreement with army Ordnance, still far to the rear, he also took on the job of allocating critical major items to replace battle losses and items sent back from the front in unserviceable condition, leaving only the TOE shortage

[52] Histories, 55th Ord Group, 15 Aug–Dec 44; 45th Ord Bn, May–Jun, Aug, Sep–Dec 44.

[53] (1) Memo, Col Walter G. Jennings for ACofS G–4, 19 Aug 44; and Col O'Neill's Jnl. Both in VI Corps G–4 Jnl, 1–31 Aug 1944, and supporting papers. (2) History Ord Service MTO, ch. V, pp. 172–73.

[54] (1) Seventh Army Rpt 1944–45, Vol I, pp. 213–17, 220–21, 249–50. (2) Donald G. Taggart, ed., *History of the Third Infantry Division in World War II* (Washington: Infantry Journal Press, 1947), p. 222. (3) Truscott, *Command Missions*, pp. 432–36.

problem for the army Ordnance Section. The new system made possible delivery of an item to the troops within twenty-four hours after the depot company received a requisition. It worked so well that it was continued even after army moved up; but it placed an additional drain on group headquarters, already too thin in officers because of an inadequate T/O. McGrath continually had to fill it out with officers from battalions and even companies.[55]

At Bourgoin, so far forward that one of the officers had to take time out to assist the French Maquis in the capture of two German snipers, the group not only felt the manpower pinch, but another and more painful one—the pinch of hunger. Ordnance companies were attached to corps and divisions and could draw from advance dumps, and normally Ordnance group headquarters could be attached to a company for rations; but the companies were spread out so far and were moving so rapidly that this was now impossible. Army dumps, some still on the beach, were the only resource, and in the period of fast pursuit, group headquarters had to send a truck back from 43 to 298 miles to bring up food. There were times when the men had only two K rations a day instead of the three they were allotted. Buying from the countryside was strictly prohibited.[56]

One other resource was discovered by a sergeant at group headquarters who was reading a copy of *Stars and Stripes* that arrived one day early in September. It contained the news that the Red Ball Express serving Third Army was operating on a route about 160 miles to the left of Seventh Army. Sergeant DeMartini pondered the story and then went to Colonel McGrath with a proposal that group do some "horse-trading." Though the group was poor in food, it was rich in souvenirs —helmets, pistols, rifles, dress daggers that the Germans were abandoning in their rapid retreat up the Rhône. These objects were of little interest to veterans of the Mediterranean campaigns, who already had all they wanted, but undoubtedly would interest men newly arrived in France. The sergeant proposed to load two trucks with souvenirs, take them to a Red Ball depot, and trade them for food. There was an order forbidding communication with Third Army, but Colonel McGrath, sorely tempted, consented, and the sergeant, accompanied by Capt. George B. Bennett and 1st Lt. Hueston L. J. Pinkstone of the Ordnance Technical Intelligence Team, took off with his two truckloads across the Rhône at a fast clip into the dangerous no-man's land—occupied neither by Allied nor by German forces—that lay between Seventh and Third Armies.

Three days later McGrath was awakened in the middle of the night with the news that the trucks had returned. DeMartini, smoking a cigar, pulled back the tarpaulins and displayed his trophies—huge sides of beef and mutton and whole pigs hanging from hooks; 200 boxes of cigars, and a truckload of 10-in-1 rations, candy, and cigarettes. He had got everything he wanted; and provided a story that would

[55] (1) History 55th Ord Group 15 Aug–Dec 44. (2) McGrath Interv. (3) The group headquarters, later expanded from 40 to 130 men, performed many functions normally army. It had a finance unit and dental team attached, and operated a very successful special service club for enlisted men. David Comments.

[56] (1) History, 55th Ord Gp, 15 Aug–Dec 44; and Daily Jnl, 5–6 Sep 44. (2) McGrath Interv.

be told and retold whenever group veterans got together.[57]

The Halt on the Upper Rhine

The official junction between Seventh and Third Armies took place on 11 September near Dijon. The DRAGOON phase in southern France was now over. On 15 September 6th Army Group, controlling Seventh Army and 1st French Army, was formed and placed under the operational control of SHAEF. At Marseille, which capitulated on 28 August, Continental Base Section had been set up and was soon to split into Delta Base Section and Continental Advance Section (CONAD)—the southern equivalent of ADSEC. But the changeover in logistical support from the Mediterranean theater to the European theater was very gradual. COMZ ETOUSA wanted control, and late in October set up a subcommand known as Southern Line of Communications (SOLOC) which became operational on 20 November. Theoretically the transfer to ETOUSA took place on that date; but pending the opening of Antwerp, the burden actually fell on COMZ MTOUSA until February 1945.

By the time the first Liberty ships berthed at Marseille on 15 September, the line of communications extended to the foothills of the Vosges Mountains, 425 to 500 miles to the north. Here, as in the OVERLORD area, railroad transportation could not be depended upon for some time because bridges and tunnels had been destroyed by Allied bombers and enemy demolitions. Therefore a tremendous strain was placed on trucks, which were needed not only for transporting supplies forward to the combat zone but for port clearance and other jobs incidental to setting up a base. In Marseille, space was found for Ordnance supplies on race tracks and exhibition grounds and excellent shop buildings in an automobile factory. Outside the city, twenty miles to the northwest at Mirimas, Ordnance officers discovered an ammunition depot that was literally made to order, with a railroad where a hundred European freightcars could be loaded at a time, permanent buildings fenced in for security, and 50,000 acres of flat, well-drained land plentifully supplied with roads. It was a depot built by the United States Army in 1918, but never used.[58]

To handle such huge installations, to serve the new divisions that were soon to land at Marseille, and to furnish forward support when CONAD moved north to Lyon, more Ordnance companies were needed than were available. Ammunition companies were particularly short; and CONAD was so hard pressed for depot companies that the Ordnance officer of Continental Base Section even considered requesting the 77th Ordnance Depot Company from Seventh Army. To a large extent the French, who were responsible for clearing Marseille, had been depended upon for service troops; but experience showed that the French Ordnance units, composed largely of French colonials—Senegalese, Indo-Chinese, and Goumiers—were only half as effective as their U.S. counterparts. Realizing that the southern forces were badly deficient in many types

[57] (1) McGrath and David Intervs. (2) Ltr, Col George B. Bennett to Lida Mayo, 10 Nov 59, OHF.

[58] Renner Rpt, pp. 32, 38–49.

of Ordnance units, General Sayler of ETOUSA arranged weeks ahead of the transfer to ETOUSA to send down a number of companies from 12th Army Group and ETOUSA COMZ, and to divert to Marseille several shipments from the United States.[59]

In the forward areas, pending the rehabilitation of the railroads, Seventh Army Ordnance Section mobilized all vehicles not in use, provided Ordnance drivers, and sent special convoys back to Marseille to pick up critical supplies. This emergency supply line, known as "The Flaming Bomb Express," used everything from jeeps to tank transporters, and was continued until 8 October, when a railhead opened in the Vesoul area. By the third week in October, rail shipments were arriving even farther north, at Epinal; but they were irregular and did not always deliver the supplies most needed. For some time to come, Ordnance trucks still had to make trips back to Marseille.[60]

In the Seventh Army area as well as that of Third Army local resources were thoroughly explored to keep men and supplies moving. The roads soon began to fill with strange vehicles ingeniously adapted in Ordnance shops—a German bakery van, a Paris bus, and civilian vehicles of all kinds. At Besançon one Ordnance company discovered some 300 European cars—Renaults, Fiats, and other makes—that the Germans had seized and stored in a warehouse. Many of them were little better than wrecks, but the mechanics by cannibalizing for parts were able to put about a third of them into shape. With a final coat of olive drab paint, they were soon in use as staff and command cars.[61]

After a lull during most of October, Seventh Army began in mid-November the offensive over the Vosges Mountains that brought it to the Rhine at Strasbourg early in December. The assault over rugged terrain in snow and mud, against German resistance that stiffened as the Allies approached the Rhine, was costly in matériel. Often trucks and jeeps had to be operated off the road over undergrowth or on roads littered with shell fragments, wire, and nails, which were ruinous to tires and tubes. There was a clamor for automotive spare parts. New divisions such as the 100th and 103d had arrived without their basic loads, and the trucks of the divisions that had fought through the Mediterranean campaigns were wearing out and needed not only parts but major assemblies and windshields. Tanks were also a source of worry, especially in the newly arrived 14th Armored Division, which had turned in its equipment in the United States and been supplied in Marseille with light tanks that the 2d French Armored had used in North Africa and Italy. One unexpected

[59] (1) Msg LAX 13230, COMZ NATOUSA ADV to Sixth Army Group, 30 Oct 44; and Ltr, Col D. C. Cabell, Ord Officer CBS, to Ord Officer SOS NATOUSA, 24 Sep 44, sub: Div of Troop Units Between Continental Advance and Delta Base Secs. Both in MTO Ord Sec, 370.5 Assignment of Troops, vol. III, KCRC. (2) Ltr, Sayler to CofOrd, 18 Oct 44, sub: Rpt on ETO Ord Activities, Barnes File Overseas Ltrs (Europe). (3) For French Ordnance units generally, see History Ord Service MTO, ch. V, "Comments on Ordnance Service Activities in the French Forces as Presented by U.S. Liaison Personnel on Duty with the First French Army," pp. 187–211, OHF.

[60] (1) History Ord Service MTO, ch. V, p. 182. (2) Seventh Army Rpt, 1944–45, II, 533–45.

[61] (1) Renner Rpt, p. 20. (2) T/Sgt Milton Lehman, "400 Miles of Trouble," *Firepower*, I, No. 4 (December 1944), 9.

demand was for grenade launchers needed by infantrymen for close-in fire support.[62]

The transfer of XV Corps (79th Infantry and 2d French Armored Divisions) from Third Army to Seventh on 29 September, the addition of the 44th Division shortly afterward, and the arrival of the 100th and 103d Infantry Divisions, 12th and 14th Armored Divisions, and elements of the 42d, 63d, and 70th Infantry Divisions before the end of 1944, placed a heavy burden on Seventh Army Ordnance Service because the new divisions seemed nearly always to arrive ahead of the Ordnance units sent to support them. Also, the changes in the tactical situation during December, requiring the movement and regrouping of shops and depots, complicated the task of support. Late in November General Eisenhower changed the direction of 6th Army Group's advance. After the capture of Strasbourg, 1st French Army was to concern itself with the liquidation of the Colmar Pocket, an area held by the Germans between Strasbourg and Mulhouse, and Seventh Army was to attack northward and assist Third Army in breaking the Siegfried Line west of the Rhine. But in mid-December, just as Seventh Army was preparing for its thrust into the Saar-Palatinate, the Germans struck in the Ardennes. Third Army had to be wheeled north to help First Army fight the Battle of the Bulge. Seventh Army, receiving Patton's right flank corps and responsibility for some twenty-five miles of the front on the Upper Rhine, went on the defensive until the big push into Germany got under way in March.[63]

In January 1945 an Ordnance observer from the States, Maj. William E. Renner, visited the headquarters of the 55th and 54th Ordnance Groups, then located within ten miles of each other near Sarrebourg in the Vosges, twenty-five miles forward of Seventh Army headquarters. He was impressed by their policy of "12-hour delivery"—the delivery of replacements for combat losses within twelve hours after the loss was reported. They had an excellent reputation for service. They had applied to good effect the techniques they had learned in the Mediterranean, the "Envelope System," for example, and the issuance of informative operations bulletins along the lines of those originated by Niblo. They had achieved a workable organization whereby the 54th's main mission was support of the 55th, the two groups operating close together geographically and functionally.[64]

They had worked under several handicaps. One was the inexperience of the Seventh Army Ordnance officer, Col. Edward W. Smith (a brigadier general before the winter was over); consequently, an unduly large share of the responsibility for Seventh Army Ordnance Service had of necessity fallen on his operations officer, Colonel Artamonoff, and the commander of his forward group, Colonel McGrath. Other handicaps were the weariness of the Ordnance men and the age of Seventh Army matériel. By February 1945 the 55th Ordnance Group had two companies

[62] (1) 6th Army Group, Weekly G–4 Periodic Rpts, Seventh Army, 14 Nov–1 Jan 45. (2) SHAEF, 6th AG 319.1 Daily Rpts, vol. I, 7 Nov–30 Dec 44.

[63] (1) Seventh Army Rpt, 1944–45, II, 396–503. (2) Histories 55th, 54th Gps, Aug–Dec 44. (4) USFET Board Rpt 101, app. 13, Memo from Capt J. C. Yates.

[64] (1) Renner Rpt, pp. 35–36. (2) History 54th Group for Dec 44.

that had served thirty months overseas. Trucks, tanks, and guns brought from the Mediterranean were wearing out, and some of the ammunition was old. Major Renner noted ammunition boxes and propelling charges that had been in Iceland, England, North Africa, Sicily, and Italy "and they looked it!" [65]

It had been difficult to get new supplies from the United States. The "southerners" felt that the War Department considered them stepchildren, and even the men in the OVERLORD area were inclined to agree. To 12th Army Group, the 6th Army Group operations, though acknowledged to be valuable and valorous, were still a "sideshow." Priority on supplies and men went to First Army, which all through the fall and winter had held the limelight in Belgium.[66]

[65] (1) Sayler, Crawford, and David Intervs and Interv, Harold R. Johnson, 22 Jun 61. (2) Hist 55th Ord Group. (3) Renner Rpt, p. 19.

[66] (1) Renner Rpt, p. 18. (2) Ingersoll, *Top Secret*, pp. 297–98. (3) Interv, Brig Gen Harold A. Nisley, 29 Oct 58.

CHAPTER XVI

At the Siegfried Line in Belgium

On the evening of 11 September 1944 elements of First Army were on the German border. Several V Corps patrols crossed the Our River and stood on German soil, where they gazed curiously at concrete pillboxes and hunted for souvenirs before they returned to their own lines. Next day the advance was halted all along the First Army front until the artillery ammunition needed to assault the Siegfried Line could be brought up, supposedly a matter of only a few days. By 11 September, Medaris' 71st Ordnance Ammunition Group had brought enough ammunition forward in its big trucking operation to establish a sizable army depot near Liège. At Liège for the first time since D-day army had a good railhead close to the front, and shipments began to come in almost immediately by rail. But a serious famine in all kinds of supplies, an aftermath of the fast pursuit, was about to affect all the armies. On the First Army front the halt at the Siegfried Line was to be a long one.[1]

In the army area around the Liège railhead Ordnance units found shelter as cold weather came on in schoolhouses, factories, and other buildings abandoned by the Belgians for lack of coal to heat them. One unit, the 51st Ordnance Group, found temporary billets in a moated château that the Germans had used as a "baby factory" —a home for unmarried Belgian girls who had children by German soldiers. Ammunition companies of First Army, like those of Third Army about this time, began to use roadside storage as fields became muddy, or they stacked their ammunition along village streets. These companies remained at the Siegfried Line during October and November when only limited gains could be made, such as the capture of Aachen by VII Corps on 21 October. The VII Corps then became First Army's northernmost, since XIX Corps passed to Ninth Army. When V Corps was pulled north to protect VII Corps' right flank in the Hürtgen Forest, VIII Corps was brought from Brittany to hold in the Ardennes.[2]

The Supply Famine

In late summer and early fall of 1944, First Army was feeling acutely the shortage of Class II and IV supplies—weapons,

[1] (1) Charles B. MacDonald, *The Siegfried Line Campaign,* UNITED STATES ARMY IN WORLD WAR II (Washington, 1963), pp. 1–14, 36–37. Unless otherwise noted, this chapter is based on this source and on Ruppenthal, *Logistical Support of the Armies,* vol. II. (2) History 100th Ord Ammunition Bn, p. 47.

[2] (1) Histories 25th Ord Bn, 590th Ord Bn, and 100th Ammunition Bn. (2) Medaris, "Field Service in the First Army," p. 67. (3) FUSA Ord Monthly Rpt, Sep, Annex II to sec IV. (4) Renner Rpt, p. 39.

trucks, and parts—which had been neglected in the rush to get rations, gas, and ammunition forward. More tanks, jeeps, light armored cars, rifles, mortars, and grenade launchers had been needed ever since the summer hedgerow fighting. During August and September the most critical shortages were medium tank engines, tank tracks, and tires. In the period of fast pursuit the tanks, described by Ernest Hemingway as "smashing around like so many drunken elephants in a native village," had suffered badly. First Army's precious supplies of tank engines and tracks, brought up over the beaches with so much effort, had been expended in the job of refitting the tanks of XV Corps when it passed temporarily from Third Army to First Army control late in August.[3] During October, because of the transportation crisis, trucks of all kinds became extremely scarce, and the stock of spare parts, as well as engines for trucks and jeeps, reached the lowest level of the whole European campaign. The assault on the Siegfried Line brought shortages in artillery matériel—gun tubes, equilibrators, and recoil mechanisms.[4]

Communications Zone opened Ordnance Base Depot O–619 in Cherbourg on 20 August and O–644 in Paris in October. Theoretically army placed its requisitions through a regulating station, which forwarded them to the theater's chief Ordnance officer, and Communications Zone sent the supplies in replacement vehicles, or, later, by rail. But First Army supplies either did not arrive, or, if they did, they were the wrong supplies. On one occasion near Liége, the army supply battalion simply took the locomotive off one end of the train, put it on the other end, and sent back the whole trainload of supplies. During September First Army received only 9.8 percent of its total requirements for Ordnance spare parts and assemblies. And even in early October there were no tires or tank tracks and parts in ADSEC depots, although these items had been critical for months.[5]

It is debatable how much better Communications Zone could have done, granted the sheer speed of the advance from St. Lô to the German border; the strain on truck transportation imposed by the destruction of rail lines by bombing; the failure to clear the ports; and bad guesses in the United States as to battle losses in tanks and the number of trucks and all kinds of vehicular spare parts that would be needed. Ordnance supply officers at Communications Zone, when taken to task by 12th Army Group, maintained that with the exception of a very few critical items their troubles were "purely transportation"; that the supplies were still afloat off the coast of France because G–4 did not give them a high enough priority for unloading. Their position was supported by Col. Waldo E. Laidlaw, Ordnance officer of the New York Port of Embarkation, who reported to 12th Army Group headquarters at

[3] (1) FUSA Ord Monthly Rpt. (2) Ernest Hemingway, "Battle for Paris," *Collier's*, Vol. 114, No. 14 (September 30, 1944), 67. (3) XV Corps G–4 Jnl, Annex 4, Aug 44. (4) Ltr, Medaris to Pattison, 28 Oct 63.

[4] First Army Rpt 2, Annex 9, p. 8.

[5] (1) FUSA Ord Monthly Rpt, Sep. (2) Interv, Lt Col Lyman O. Heidtke, CO 310th Ord Bn, by William M. Hines, Sr., 3 Aug 45, in Hines History, vol. III, OHF. (3) First Army G–4 Report No. 5, 6 Sep 44, 12th AG files, 319.1 G–4 Rpts (FUSA), Vol. 1. (4) Lt Alfred H. Marshall, Jr., "A History of ADSEC Ordnance," p. 13, ETO Ord Sec files, KCRC.

Verdun on 25 September that fifty-six ships containing Class II supplies were being held offshore because they could not be unloaded.[6]

These explanations did not satisfy First Army Ordnance officers, who stormed 12th Army Group headquarters repeatedly for help on supply. Some of their complaints were received with reservations: First Army had a reputation for asking for the moon. On the other hand, First Army Ordnance men felt that there were times when Communications Zone actually hindered supply. During the first two weeks in September, at the height of the pursuit, Communications Zone moved its entire 11,000-man headquarters from Valognes to Paris, upanchoring its operations and creating a major tieup in communications, transportation, and supply in general. Brig. Gen. Royal B. Lord, who was Lt. Gen. John C. H. Lee's chief of staff at Communications Zone and who had ordered the move, justified it on the necessity for better communications facilities than were available in Valognes. General Sayler agreed, emphasizing the need for closer liaison with the rear echelon in England. Eisenhower and Bradley sharply disapproved of the "stampede to Paris."[7]

One COMZ effort that was for a considerable time more of a handicap to Ordnance than a help (however useful to other services) was the operation of the Red Ball Express, which was extravagant of trucks, parts, and tires at a time when they were precious. First Army Ordnance accused COMZ depot men of the sin (unforgivable in Medaris' eyes) of not knowing what they had. The depot men on their part complained of the difficulty of determining what was wanted, because nomenclature on many army requisitions differed from nomenclature on depot stock cards. Whatever the cause, this stumbling block forced Medaris to place liaison men at Depots O–619 and O–644 to identify "lost" parts. At times both First and Third Army Ordnance Sections had to send their own trucks back to ports as well as to COMZ depots. On 4 October, for example, 25 First Army Ordnance vans with 100 drivers went all the way back to Cherbourg to pick up supplies. This was much too reminiscent of Sicily.[8]

Local Procurement

Experience in France and in the Mediterranean had taught Medaris an important lesson about supplies. He expressed it in two sentences: "Never base a plan of

[6] (1) Bykofsky and Larson, *The Transportation Corps: Operations Overseas*, pp. 301–18. (2) Interv, Maj Gen Everett S. Hughes by William M. Hines, Sr., 19 Jul 45, in Hines History, Vol. III, pp. 623–26, OHF. (3) Daily Jnl Ord Sec 12th AG, 15, 25 Sep 44.

[7] (1) Daily Jnl Ord Sec 12th AG, entries for September. (2) Intervs by R. G. Ruppenthal with Brig Gen Raymond G. Moses, G–4 12th AG, 13 Aug 51, and Maj Gen Royal B. Lord, 9 Aug 51; and Intervs by F. C. Pogue with Maj Gen Robert W. Crawford, G–4 SHAEF, and Lt Gen Walter B. Smith, CofS SHAEF, 5 May 48, all in OCMH Interviews. (3) Comments by Maj Gen Henry B. Sayler (USA Ret), Incl to Ltr to Brig Gen Hal C. Pattison, 8 Oct 63 (hereafter cited as Sayler Comments), OCMH. (4) Bradley, *A Soldier's Story*, p. 406. (6) Medaris Interv.

[8] (1) *Ibid.* (2) Sayler Comments. (3) For the world-wide obstruction to supply caused by mistakes in item identification, see Thomson and Mayo, *Procurement and Supply*, pp. 395–98. (4) First Army Rpt 2, Annex 9, p. 6. (5) FUSA Ord Monthly Rpt, Oct, Supply Div, p. 2. (6) Interv, Col Wilton B. Moats (USA Ret), CO of 51st Ord Group, 2 Mar 61, OHF. (7) Elliot Interv in Hines History, vol. III, p. 424. (8) For Third Army experience see Nixon Comments.

action on the theory that you will have enough. Base it on a probable scarcity and be ready to manufacture the supplies not on hand." [9]

Late in August he instructed his maintenance companies that fifth echelon repair would have to be the rule rather than the exception and that every available man would have to be used to place back in service as much equipment as possible. As army shop facilities were necessarily limited, Medaris then turned to French factories. Paris provided the first real opportunity for local procurement since very little had been possible in Normandy, where the few existing factories had been destroyed. On 6 September Medaris sent four officers to Paris to scout the possibilities for rebuilding tank engines; repairing and retreading tires; buying civilian cars; and obtaining oxygen and acetylene for gas cylinders.[10]

Though civilian cars were in short supply, considerable help came from purchases such as gas cylinder fillings and special helmets for tank crews, which are worn to protect heads from injury within the tank. A French helmet of pressed aluminum with a leather insert was approved by First Army's Armored Section and 278 had been delivered by mid-September. But factory output was severely limited by lack of electric power and materials, especially materials for rebuilding tires. The most immediate result of this effort at local procurement was the First Army contract to overhaul—not rebuild—tank engines. One afternoon Col. Nelson M. Lynde, Jr., Medaris' maintenance officer, and Col. Floyd A. Hansen, his executive officer, drove to Paris in a jeep to look for a site for an automotive dump. Along the way Lynde noticed the large Gnome-Rhône factory, which manufactured engines. He was immediately interested because he had 200 unserviceable tank engines that he had brought over to the Continent, having been unable to get them overhauled in England. He had carried the engines across France on tank transporters, awaiting the time when Ordnance companies could obtain enough parts by cannibalization to do the work. He found out that Gnome-Rhône was willing to take on the overhaul job, and after the first engines the company sent back to Ordnance for testing were found to be satisfactory, Gnome-Rhône was given a contract to overhaul the 200 engines at $500 an engine. The contract was filled in about two weeks, and First Army Ordnance got the tank engines in late September, the only ones it was to get for four months. After the engines were completed, Communications Zone took over the contract.[11]

When Communications Zone became operational in Paris the second week in September, its Ordnance Section's Procurement and Fiscal Division (later renamed the Industrial Division) undertook an engine rebuild program, contracting with other firms in and around Paris for both tank and truck engines. Truck engines were more and more in demand as the effects of Red Ball continued to be felt. But it took a long time to get the French shops started. Obtaining coal and electricity, training the workers, and above all,

[9] Medaris, "Field Service in the First Army," p. 67.

[10] FUSA Ord Monthly Report, Sep 44.

[11] (1) FUSA Ord Monthly Rpts, Sep and Oct. (2) Hansen Interv and Interv with Maj Gen Nelson M. Lynde, Jr. (USA Ret), 10 Nov 64. OCMH.

finding the parts (especially bearings) needed in rebuild involved a long and arduous process. No real results were possible until early 1945. For most of the autumn of 1944 the Gnome-Rhône plant was the only factory in production.[12]

In Belgium where big manufacturing centers were close behind the front and where industrialists would presumably be far easier to work with than German firms would be after First Army moved into Germany, Medaris started a local procurement program on a grand scale. At Liège he negotiated a sizable contract with Fabrique Nationale des Armes de Guerre, which had extensive metalworking facilities and also, as holder of all Browning patents, was able to make small arms and small arms parts as well as parts for heavy artillery carriages. Help on tire manufacture, recap and retread, came from the Liège plant of Engelbert and Company, which could handle work on tires and tubes of all sizes, even those for the huge tank transporters, especially after the capture of Malmédy brought into army stocks fifty tons of German buna and two tons of Japanese gum rubber.

During October, as these contracts began to bear fruit, other services, especially Quartermaster, began to take advantage of local facilities, but Ordnance was the leader and continued local procurement on a scale unheard of at army level. In spite of shortages in raw material, fuel, power, and skilled labor, and the destruction wrought by German V–1 bombs, between September 1944 and February 1945 First Army Ordnance obtained from firms in Liège and from others as far west as Brussels more than a thousand different badly needed items, some of them in considerable quantities. In November Medaris assigned the administration of this ambitious program to the 185th Battalion of the 72d Ordnance Group as its sole mission.[13]

First Army Improvises

During the halt at the Siegfried Line First Army Ordnance even managed with the help of civilian resources to improve some of its matériel. Combat forces had complained that 60-mm. and 81-mm. mortars, which had been scarce ever since the hedgerow battles in Normandy, were inaccurate. At the request of Colonel Lynde, COMZ sent 1st Lt. George L. Herter to investigate. Herter was energetic and inventive. By living with the mortar crews of several infantry divisions he found out the faults of the mortars, corrected them in two models, and had the models tested

[12] (1) For the COMZ Ordnance effort on engine rebuild, tires, and extended end connectors (the three major programs) see Ord Serv ETO, Local Procurement and Industrial Service, OHF, and Ruppenthal, *Logistical Support of the Armies, II*, 488–92. (2) An unsigned letter of 26 September 44, in FUSA Ord Monthly Rpt for September, by a First Army officer stationed at the Gnome-Rhône plant stated: "Evidently First Army has started something in engine rebuilding as General Christmas from Tank Automotive Center, Detroit, was here yesterday. He seemed well pleased. . . ." But the report of the Christmas mission to ETOUSA indicates that General Christmas was under the impression that the Gnome-Rhône operation was an undertaking of COMZ Ordnance Section. 80–S Report on Visit to ETOUSA, 10/23/44, Brig Gen John K. Christmas, Col. H. R. White and Col. T. A. Weyher, p. 7.

[13] (1) FUSA Ord Monthly Rpts, Sep, Oct, Nov 44; (2) First Army Rpt 2, Annex 2, pp. 116–17 and Annex 9, p. 11; (3) Ord Serv ETO, Local Procurement and Industrial Service, pp. 119–27; (4) Entry on visit of Col. Lynde, FUSA, to 12th AG Hqtrs on 16 Oct 44 (asking 12th AG to "force COMZ into more local procurement of critical items"), Daily Jnl Ord Sec 12th AG.

in combat. First Army then contracted with J. Honres Artillerie, a manufacturer near Liége that had formerly made the Stokes Brandt mortar, to rebuild all mortars according to Herter's specifications. This project, completed between September and December under the supervision of Herter and three inspectors from the 25th Ordnance Battalion, greatly improved the accuracy of the mortars and all but eliminated maintenance troubles. J. Honres Artillerie also manufactured from captured matériel more than 200 complete 60-mm. mortars and mortar sights.[14]

An important artillery item was also improved. Gas check pads had been wearing out at an alarming rate—a repetition of the experience in Italy, where the life of the pad was estimated at only about 300 rounds. An examination of two German gas check pads found with 155-mm. guns emplaced in the Maginot Line had revealed that they were quite different from their American counterparts, which were made of wire mesh, paraffin, and asbestos, and were so fragile that they had to be handled carefully. The German pads were made of synthetic rubber, were tough, and seemed to have an almost indefinite life. Tested in an American gun, one lasted 1,800 rounds before it was cut by a defective split-ring. Fortunately, the manager of Engelbert and Company was familiar with the composition used in the German pad and could duplicate it. Molds for all calibers were machined and production started at five per caliber a day. The new pads were cheap and relatively indestructible; their life exceeded that of the tube.[15]

Manufacture and Improvisation in Army Shops

Many of the items procured in Belgium were truck engine parts needed for First Army's own engine rebuild program. Medaris early planned a big assembly line operation in his own shops, for his experience had left him with little faith in supply from the rear. First Army's requirement for truck engines had been estimated at 800 a month. In the five months after D-day First Army had received only 562 from COMZ—actually the number was 162, for in July First Army Ordnance Section had turned in 400 to base depots because there was no transportation to move them. Later, when Medaris sent truckloads of damaged engines back to Paris, he found that they were disappearing into COMZ stocks—until he began sending them back under armed guard, two men to a truck, with orders to release damaged engines only in exchange for good ones. COMZ's engine rebuild program was just beginning to get under way in mid-December and any real increase in production had to await a big shipment of parts from the United States later in the month.[16]

[14] (1) FUSA Ord Monthly Rpt for Sep. (2) First Army Rpt 2, Annex 9, pp. 11–12. (3) For the assistant division commander's appreciation of the "splendid" new 60-mm. mortar, see Memo, Maj Gen John E. Hull, ACofS OPD, for Brig Gen William A. Borden, 29 Mar 45, sub: Comments on German Bazooka and Various American Weapons, OPD 471.61. (4) Lynde Interv.

[15] (1) First Army Rpt 2, Annex 9, p. 12. (2) Ord Serv ETO, Local Procurement and Industrial Service, pp. 123–24. (3) Lynde Interv.

[16] (1) FUSA Monthly Rpt for Oct, app. III, p. 2; (2) Medaris Interv. (3) Personal Ltr, Col Dillon, Chief Maint Div, Off of Chief Ord Officer, COMZ ETOUSA, to Gen Campbell, 12 Dec 44, no sub,

First Army rebuild of engines and other major assemblies for trucks, such as carburetors, starters, generators, axles, and transmissions, had began the second week of October at Verviers, a town at that time less than 12 miles from the front lines, which had been selected as headquarters for the main shop battalion because it was as far forward as the battalion could move until First Army crossed the Rhine. At Verviers Ordnance found two excellent buildings, each large enough to accommodate the complete shop of a heavy automotive maintenance company, with room to billet the men. There were also some valuable legacies from the Germans, who had used the town for rebuilding their own equipment. The two companies selected for the rebuild job, the 868th Heavy Automotive Company and the 900th, found benches, engine stands, shop racks, and even double-decker beds and wall lockers. Base shop equipment such as rigs and dollies they had to improvise, since they had only fourth echelon equipment. Working long hours, sometimes under blackout conditions, frequently in danger from buzz bombs, and constantly plagued for lack of certain parts that could not be obtained locally, the men made a remarkable record, rebuilding 783 major assemblies during October, of which 304 were engines.[17]

A good deal of work was done in First Army shops in the neighborhood of Liège on gun tubes, recoil mechanisms, and other artillery parts, because in the assault on the Siegfried Line artillery was playing an important role as it had in Italy. One major Ordnance effort, for which the artillerymen were grateful, was aimed at keeping the very few M12 self-propelled guns shooting. The M12, made by mounting the old 1918 French GPF 155-mm. gun on a tank chassis, had been developed by the Ordnance Department and accepted without much enthusiasm by Army Ground Forces, which had authorized the manufacture in the United States of only a hundred. First Army had three battalions and at first had been doubtful whether they would be of much use. But the mount proved to be remarkably sturdy and "the old GPF tubes," the Artillery officer reported, "again spoke with authority on French soil." The M12's had been able to keep up with the armored divisions in the race across France as no other medium or heavy artillery could. They were especially valuable at the Siegfried Line because they could be brought up to within a few hundred yards of the strong concrete fortifications, closer to the target than had hitherto been possible for heavy artillery.[18]

This employment in direct fire made possible a somewhat bizarre repair job on the tube of an M12 received one day in November in an Ordnance tank maintenance shop in Maastricht, Holland. The

O.O. 350.05/15446½. (4) Dillon, Report on Engine Rebuild, European Theater of Operations, 28 May 45, OHF.

[17] (1) FUSA Ord Monthly Rpt for Oct, app. III, Incl 1. (2) History 868th Heavy Auto Maint Co, 26 June 44–31 Dec 44. (3) Elliot Interv in Hines History.

[18] (1) Green, Thomson, and Roots, *Planning Munitions for War*, pp. 316–17. (2) For the "battle" by Ordnance to gain approval of even 100 M12's, see Campbell Comments. (3) Rpt Ltr Arty Off, First US Army, "The 155-mm. Gun SP M12," in "Memoranda, First United States Army Artillery Information Service," Dec 44, pp. 16–21, Barnes file, OHF. (4) Memo, Lt Col D. F. Hoppock for Tank and Motor Transport Div, 6 Mar 45, quoting AGF Bd Rpt MTO #A–281 Barnes file, OHF.

tube had been hit on its side about six inches from the muzzle. No replacement tubes were to be had, and the gun was badly needed. At the suggestion of the maintenance officer, with the concurrence of the artillerymen and the corps Ordnance officer, the problem was solved by sawing about a foot off the muzzle end of the tube, and the gun was returned to action.[19]

In the reduction of Aachen the M12's were invaluable. On 18 October one M12 battalion at a cost of only sixty-four rounds neutralized an observation post and nine buildings—one of them a movie theater occupied by a company of German infantrymen, all of whom were either killed or wounded. The German colonel who had commanded the city afterward spoke of the M12's with "considerable consternation," according to a G–2 report, swearing that a shell from one of them had pierced three houses before exploding and wrecking the fourth. The M12 carriages were so scarce (there were no replacements) that it was a real loss when one of them was put out of action by the enemy in October. First Army Ordnance men salvaged the gun, recoil mechanism, and top carriage, and installed them in a cargo carrier M30, an outstanding feat of improvisation, for the piece went back into action and worked well. The crew promptly dubbed it "Miss Carriage 1944."[20]

[19] Lt. Col. James D. Sams, "Ordnance Improvisation in the Combat Zone," *Military Review*, XXVII, 2 (May 1948), p. 35.

[20] (1) Rpt by Artillery Officer, First US Army, "The 155-mm. Gun SP M12." (2) FUSA Ord Monthly Rpt, Oct 44, app. III, Incl 4. (3) Ltr, Maj Gen Henry B. Sayler to OCO, 7 Nov 44, sub: Supplementary Reply to Technical Information Letter Number 17, dtd 31 Aug. 44, O.O. 350.05/15254.

Frustration at the Ports and Depots

Shortly before midnight on 3 October a telephone call from Colonel Ray, Medaris' ammunition officer, to 12th Army Group headquarters at Verdun gave warning of a crisis in ammunition supply. Ray was thoroughly angry. The day before, First Army had received a TWX from 12th Army Group granting for the period 5–13 October somewhat larger expenditure rates for scarce artillery ammunition than had hitherto been possible. That same day General Hodges had jumped off for Aachen. Then Communications Zone had placed zeroes opposite requisitions for virtually all of the ammunition. As an example, Ray cited the case of the HE shell for the 105-mm. howitzer M3. The 12th Army Group had authorized 25,000 rounds but COMZ had been unable to fill requisitions. What was the use, Ray wanted to know, of authorizing expenditures if the ammunition was not available? He believed that 12th Army Group did not in fact know what was available or what effect the expenditures would have on stocks in reserve.[21]

Ray was a little hard on 12th Army Group. General Moses, Group G–4, had suspected that COMZ's figures on availability were too optimistic and had simply decided to call its bluff. COMZ was the real culprit, for it had counted as assets stocks on ships still afloat off the Normandy beaches and ports, placing too much confidence in a program it had begun the last of September to accelerate unloading. Communications Zone could not deliver for two reasons: at Cherbourg higher au-

[21] Daily Jnl Ord Sec, 12th Army Group, 2–3 Oct 44.

thority gave priority to troop debarkations, and at the beaches autumn storms had virtually stopped operations. There were thirty-five ammunition ships offshore that could not be unloaded. These facts were brought to light at the next 12th Army Group allocation meeting on 9 October, which because of the crisis was attended by the ammunition officers of First, Third, and Ninth Armies.

As a result of this meeting and a high-level conference held at 12th Army Group on 11 October, two steps were taken to see that the armies were supplied. First, 12th Army Group sent a planeload of officers to Paris to get authority from General Lee to speed up unloading; second, it declared a moratorium on supply to the armies until stocks were built up in COMZ depots at Soissons, Liège, and Verdun. The end date of the build-up was set at 7 November on the following basis: 10 days to set up priorities and get the ships berthed; 10 days to unload; 4 days for shipment to COMZ depots; and 8 days for armies to place requisitions and start receiving.[22]

Not only the ammunition shortage but the very critical shortage of Class II supplies, especially trucks, was threatening to delay the November offensive. The supply conference General Bradley called on 11 October brought together representatives of SHAEF, 12th Army Group, and First, Third, and Ninth Armies to find a way out of the crisis. Bradley later remembered with some amusement that when Patton, accompanied by his chief of staff and G–4, arrived and saw Medaris he immediately sent for Colonel Nixon, warning his chief of staff to be on his guard against Medaris and Wilson, the First Army G–4. "I know them both," he said, remembering II Corps, "they once worked for me." [23]

As the conferees explored the supply situation, it became plain that there was little that could be done for the moment, beyond prodding Communications Zone to step up port operations. During most of the fall of 1944, shipping was the bottleneck. To make way for such high-priority items as weapons, tires, antifreeze, and spare parts, virtually no general purpose vehicles were shipped in November and December; the War Department had cut down on shipping because of the theater's inability to unload. Ships were actually being returned from the ETO partially unloaded; by mid-November some 36,000 tons of supplies—the unloaded cargoes on some thirteen to fifteen vessels—were being set up for return to the United States.[24]

General Bradley, impatient with what he called Field Marshal Montgomery's "tardiness" in the north, believed that the remedy for the ammunition shortage lay in opening Antwerp, the port nearest the front lines. Captured early in September, Antwerp could not be used until the Germans had been cleared from the approaches to the Schelde estuary. But opening the port (the first vessel docked there on 28

[22] (1) Interv, Moses by R. G. Ruppenthal. (2) 12th Army Group Rpt, Vol XII, p. 141. (3) Min, Ammunition Allocation Meeting of 9 Oct 44 and Rpt of Trip to ComZ 14 Oct 44 in Daily Jnl 12th AG Ord Sec 9, 14 Oct 44. (4) Nisley Interv. (5) USFET Bd Rpt No. 28, Ammunition Supply for Field Artillery, pp. 24–29.

[23] (1) 12th AG Ord Sec Jnl, 11 Oct 44; (2) Bradley, *A Soldier's Story,* p. 431; (3) Patton, *War As I Knew It,* p. 129.

[24] (1) Ruppenthal, *Logistical Support of the Armies, II,* p. 243; (2) Memo, Maj Gen LeRoy Lutes, Director, Plans and Operations, ASF, for the Director of Supply, ASF, 22 Nov 44 [no sub], ASF Distr Div 400 ETO.

November) helped ammunition only indirectly. Buzz bomb attacks by the enemy made the harbor too dangerous for ships loaded with explosives, so that very little ammunition was ever landed there except 90-mm. antiaircraft shells for the defense of the city. The diversion to Antwerp of other classes of supply did free Le Havre and Cherbourg to handle more ammunition than had hitherto been possible.

By January 1945, it had become all too plain that there was not enough production in the United States of badly needed mortar and artillery shells. This fact came out in answers to Eisenhower's urgent cables in the fall of 1944, in the findings of the Bull Mission that he sent back to the States in November, and in the investigation by General Somervell when he visited the theater in January, accompanied by General Campbell. Somervell came home convinced that all the resources of the United States ought to be directed toward supplying the European theater with the critical calibers of ammunition it needed. By then, time was running out. Production started up, but the effect would not be felt in the theater until April, when expenditures were dropping. Again, ships were turned around and sent home unloaded—completing the cycle of frustration at the ports.[25]

Using a great deal of German ammunition, some of it fired from captured German guns, and employing tanks, tank destroyers, and antiaircraft guns (all of which had fairly plentiful stocks of ammunition) as artillery, the armies somehow managed on their scanty rations until COMZ stocks were built up. At the end of November enough ammuntion had accumulated to allow VII Corps, which was pushing slowly to the Roer against strong defenses, to fire reasonable amounts of nearly all types, though V and VIII Corps were still inadequately supplied.[26]

By mid-December, thanks to the belated build-up, the level of Ordnance general supplies in the armies was the highest since D-day, with the exception of a few items like truck engines. In the case of First Army, the Ordnance Section took a good share of the credit for bringing supplies forward from depots. While admitting that there was some improvement in rail transportation during November, Medaris' staff attributed most of the improvement in supply to its active liaison with COMZ and its continued use of army transportation and army drivers to haul supplies to the front.[27]

This view was supported by Maj. Gen. LeRoy Lutes, Director of Plans and Operations, Army Service Forces, when he made a visit to the European theater early in December. He found 53 percent of the scarce Class II and IV items far back in Normandy and Brittany, and noted that

[25] (1) Bradley, *A Soldier's Story*, p. 431. (2) Ord Serv ETO, Ammunition Supply, pp. 91–93, 161–62. (3) Bykofsky and Larson, *The Transportation Corps: Operations Overseas*, p. 322. (4) Cables 1 Oct 44–12 Mar 45 in vol. 12, General File, BOLERO, ASF Theater Br, Planning Div files. (5) Diary (unsigned) of General Campbell's trip to Europe and Italy 6–31 Jan 45, Barnes file, OHF. (6) For problems in ammunition manufacture and supply, see Lt. Gen. Levin H. Campbell, Jr., *The Industry-Ordnance Team* (New York: McGraw-Hill Book Co., Inc., 1946), pp. 255–74.

[26] FUSA Ord Monthly Rpt, Nov 44, app. I.

[27] (1) 12th AG Rpt, Vol XII, p. 144. (2) FUSA Ord Monthly Rpt, Nov 44, app. IV. During November FUSA received by rail 172 tanks and full-tracked vehicles, 129 other vehicles, and 2,229 tons of bulk supplies; by Army Ordnance vehicles and drivers, 1,510 vehicles and 1,133 tons of bulk supplies. *Ibid.*

Medaris was employing a hundred men as field agents to follow up First Army shipments. To General Somervell, who backed up Lutes's findings on his own visit to ETO a month later, the worst reflection on Communications Zone that came to his attention was the fact that Medaris was forced to have "100 bloodhounds ranging over the entire Communications Zone in order to locate the items for and fill his requisitions." [28]

The Battle of the Ardennes

At half past five on the morning of 16 December, a black winter morning, German artillery shells began to light up the sky all along the broad front held by VIII Corps in the hitherto quiet region of the Ardennes. Later in the day shells from long-range railway guns similar to Anzio Annie began falling on supply dumps in the rear, at Roetgen, Eupen, Malmédy, Verviers, and St. Vith—not only in the VIII Corps sector but also in the southern half of the V Corps front; by nightfall there were indications that a strong German counteroffensive was under way in the lightly held section between the two corps.[29]

Danger at Malmédy

The first Ordnance units threatened were those at Malmédy, supporting V Corps in its drive to the Roer dams. At Malmédy were the headquarters of the 86th Ordnance Battalion and the 100th Ordnance Ammunition Battalion; several miles to the east near Waimes was ASP 126, operated by the 57th Ordnance Ammunition Company. By the morning of 17 December it seemed quite possible to First Army headquarters that this ammunition supply point, which was strung out for three miles along a hard-surfaced road running northeast out of Waimes, would be overrun by the enemy. Medaris ordered the commander of the 100th Battalion to get ready to blow up all mines, bangalore torpedoes, grenades, and other items likely to be of use to the Germans, and to evacuate, if it was not too hazardous to men and equipment, the rest of the ammunition, especially scarce artillery and mortar shells. Reports that came in to First Army were more and more alarming. Shortly after noon, Colonel Ray took off in his jeep to supervise the evacuation.[30] (*See Map 5.*)

As soon as the commanding officer of the 100th, Maj. Alfred G. Garr, received Medaris' order, he sent Capt. John N. Lee of his staff to ASP 126. Lee found the enemy close at hand. Stationing guards around the perimeter to warn him of the approach of the Germans, he sent two officers and ten men of the 57th Ordnance Ammunition Company to prepare mines and engineer demolition materials for the destruction of the ASP. This they accomplished in forty-five minutes, using three miles of prima cord. No matériel could be evacuated because the forty-five trucks arranged for by the Ordnance officer of V Corps could not get through the traffic on the congested roads and never arrived. Neither did Colonel Ray, for he was captured by the Germans near Waimes.

At 1430 small arms fire as well as artil-

[28] Rpts by Lutes and Somervell quoted in Hines History, vol. III, pp. 562–79, OHF.

[29] (1) First Army Rpt 2, p. 103. (2) For a detailed tactical account of the Battle of the Ardennes, see Hugh M. Cole, *The Ardennes: Battle of the Bulge*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1965).

[30] History 100th Ammunition Bn, p. 58.

lery fire could be clearly heard at the ASP office, and the guards reported that the enemy was about a mile away. Captain Lee drove out to investigate, saw enemy troops supported by tanks, and gave orders to fire the prima cord and evacuate the ASP. With a great roar some 200 tons of explosives went up. The 57th loaded its men, its records, and some primers and fuzes on its own trucks and began to pull out for Depot 125 near Liège—just in time, for the Germans were closing in on their bivouac area.[31]

Next morning four men who went back to make a final check of the company quarters—Captain Carstaphen, the company commander (who had led a charge that killed thirty-five Germans at Driancourt early in September), 1st Lt. Arnold O. Putnam, M. Sgt. Chester A. McKinney and Pfc. Daniel Barber—narrowly escaped capture. Putnam and Barber were surprised by two German soldiers and forced to get down from their jeep and walk toward the enemy lines, hands over their heads. They broke away and managed to make their way to safety through a hail of machine gun bullets. Hearing the gunfire, Captain Carstaphen ran to the door of the building he had been inspecting, opened fire with his submachine gun, and killed both Germans.[32]

Pulling the 86th Ordnance Battalion out of Malmédy was an extremely difficult operation, for it was the back-up battalion for V Corps, and its depot company, the 202d, had some 600 tons of stock that had to be saved. Aware of the situation by noon of the 17th, Medaris called on the 72d Ordnance Group at Verviers to provide the lift, and with the help of the tank transporters of the main army evacuation battalion (the 6th) and the trucks of the main depot battalion (the 310th) the job was done by nightfall. The last man out of Malmédy was said to be the commanding officer of the 202d. While the loading was going on, the area was under artillery fire, and some of the men of the 86th got into combat. Members of its heavy maintenance (field army) company, the 514th, took two tank destroyers out of its shops to help stop the enemy. They lost the tank destroyers, but claimed two Panther tanks.[33]

Malmédy was saved by the valor of a few men from an Engineer combat battalion, the 291st, who defended the roads with such skill and tenacity that the Germans bypassed the town on the south. But by the evening of the 17th the main First Army Ordnance depot at Aywaille was threatened. When Pfc. William Coleman of the 334th Ordnance Depot Company, who had been helping at Malmédy, got back to his company with his truck—after a circuitous 7-hour drive in blackout during which he had a close call from being captured—he was given a bazooka and sent to help hold a crossroads against German tanks.[34]

Defense of Aywaille

The defense of Aywaille was in the capable hands of Colonel Lynde, who had been sent to the depot by Medaris with orders to

[31] (1) History 100th Ammunition Bn, p. 58. (2) V Corps Ord Sec Rpt for Dec, AAR, Ord Sec, V Corps, European Campaign, Aug–Dec 44.

[32] Hist 100th Amm Bn, pp. 58–59.

[33] FUSA Ord Sec Monthly Rpt for Dec, app. II, pp. 6–7; app. III, p. 1; app. IV, p. 2.

[34] (1) First Army Rpt 2, Vol I, p. 105. (2) Booklet, *The Flaming Bomb: The Story of Ordnance in the ETO*, p. 23, OHF.

hold out as long as possible in order to buy time for evacuation of the considerable stocks—6,000 tons of bulk stock on the ground and 1,518 vehicles in the vehicle park. Lynde organized a task force composed of the four depot companies and one motor vehicle distributing company of the 310th Ordnance Battalion; the automatic weapons antiaircraft battalion that had been protecting the vehicle park; a company of Engineers; and a Belgian guard company. Some armed with bazookas, others manning depot tanks, these men set up roadblocks around the depot.[35]

Shortly after noon on 18 December Lynde received word from First Army Ordnance that his task force would be bolstered by the 740th Tank Battalion, due to arrive that evening. The catch in this piece of good news was that the 740th had no tanks. It was one of four tank battalions under 9th Armored Group that had been in training for the highly secret Canal Defense Light (CDL), a project to employ powerful searchlights mounted on M3 medium tanks to illuminate the battlefield and blind the enemy. The project had been abandoned by 12th Army Group and the CDL tanks put in storage. The 740th was to be converted to a standard tank battalion but as yet had not received any Shermans and was being used to flush German paratroopers out of the woods around First Army headquarters at Spa. By the time the commander of the 740th reported at Aywaille, about dark on 18 December, Lynde had received a report that German armor was less than twelve miles to the east. He directed the Ordnance vehicle park to issue to the 740th anything the men could drive and shoot. The tankers found about 15 medium tanks that could be made operable. They worked on them all night and all next morning, and also acquired from the park an assortment of tank destroyers, assault guns, and light tanks, including two new M24's that had just arrived from the United States. Thus equipped, by noon on 19 December they were in position to defend Aywaille. Two hours later, on orders from General Hodges, the 740th was pulled out and attached to the 30th Infantry Division, which was having trouble with advancing German armor.[36]

The original "Lynde's Task Force" manned defenses until 22 December, when combat forces arrived on the scene. By that time the depot stocks had been evacuated under the direction of Lt. Col. Lyman O. Heidtke, the 310th Battalion commander, who had been ordered to find a suitable spot west of the Meuse River and set up his depot. With the help of the tank transporters of the 6th Evacuation Battal-

[35] (1) FUSA Ord Monthly Rpt for Dec. (2) Ltr, Maj Gen Nelson M. Lynde, Jr., to Brig Gen Hal C. Pattison, 10 Oct 63 (hereafter cited as Lynde Comments), OCMH. Lynde believed that Aywaille was a target for the Germans because one of the depot companies had numerous drums of antifreeze that were mistaken from the air for POL. *Ibid.*

[36] (1) Lynde Comments. (2) For the disbandment of the CDL project see ltr, Lee to CG UK Base, 24 Sep 44, sub: Reorganization of 9th Armored Group, 12th AG Files 913, and below, p. 321. (3) Lt. Col. George Kenneth Rubel, *Daredevil Tankers: The Story of the 740th Tank Battalion, United States Army* (n.p., 1945), pp. 53–56, 242–43. The tankers called the M24's "Panther Pups" because of their resemblance to the German Panther tank, *Ibid.*, p. 107. These two M24's were in the depot by mistake, somehow diverted from the first shipment of 20, all consigned to Ninth Army. There was considerable consternation when the head of the familiarization mission discovered that the 740th Tank Battalion had carried them off. Memo, Col James E. B. McInerney for Col Walter W. Warner, Ord Officer NUSA, 28 Dec 44, in folder ETO (McInerney) (Rpt of Visit), 4 Jan 45, X–577–O, OHF.

ion, whose drivers maneuvered their big clumsy rigs skillfully through heavy traffic, and with the co-operation of Advance Section, which promptly furnished fifty-four additional truck-tractors needed to move the vans, all critical items were behind the Meuse by the evening of 19 December and three days later most of the rest of the stocks had been moved. By that time the temperature had dropped to freezing. The last of Heidtke's vans cleared the hills behind Aywaille only minutes before ice made the roads impassable. As for the Germans, they never arrived, but at one time had been within five miles of the depot.[37]

The VIII Corps Sector

In the meantime, the prong of the German thrust had penetrated deep into the VIII Corps sector, seriously threatening and in places overrunning the Ordnance units supporting the corps, which were strung out along the Luxembourg border from St. Vith south to Neufchâteau. In this hilly, wooded, snow-covered country the attack was like a nightmare. Before dawn on 16 December, 14-inch shells from railway guns began falling on St. Vith; up ahead on the 106th Division front in the Schnee Eifel, red and green flares flickered over the treetops, a strange light, like moonlight, came down from the low clouds that the German were using as reflectors for searchlights; and German infantrymen in white snow suits advanced yelling (someone said it sounded like the Rebel yell) ahead of white tanks.[38]

The 106th Division held in the Schnee Eifel for the time being; but artillery shells continued to crash down on St. Vith. A good many of them fell in the area of the 92d Ordnance Medium Maintenance Company. This unit, dispatched to St. Vith only a few days before by the 590th Battalion to support the 106th, was pulled back fifteen miles to Gouvy, but the German tide, flowing north and south around the island of resistance at St. Vith, soon caught up with the 92d. Shortly after noon on the 18th as the men were finishing chow, "all hell broke loose." A German column came up and began directing artillery, mortar, and small arms fire on the company, while panzers poured fire into the shop area. The 92d took off for Rochefort, fifty miles to the rear; but when it reached there two of its officers and sixty-three men were missing. These men had stayed behind at Gouvy to finish shop work on artillery and tanks, and they continued to work under shelling all afternoon. At night under cover of darkness they made their way to a low hillside behind the shop area and held it for five days, setting up roadblocks with wrecked and burning vehicles and killing the German patrols that came up the road.[39]

On the same day as the attack at Gouvy, 18 December, the Germans overran ASP 128, a few miles north of Bastogne. Here again, the Ordnance men stayed as long as they could. Men of the 619th Ordnance Ammunition Company were issuing ammunition in Subdepot 1 while the fighting was going on in Subdepot 3, but soon they had to pull back to Champlon, abandoning

[37] (1) Lynde Comments. (2) FUSA Ord Monthly Rpt for Dec, p. 2 and app. II, pp. 13–14; app. III, p. 2; app. IV, p. 2. (3) *The Flaming Bomb*, p. 22.

[38] Col. R. Ernest Dupuy, *St. Vith: Lion in the Way* (Washington: Infantry Journal Press, 1949), pp. 21, 28.

[39] History 92d Ordnance Medium Maint Company for Dec 1944, ETO Ord Sec, KCRC.

almost 2,000 long tons of ammunition to the enemy. They did, however, manage to take with them stocks of a very important secret item—the POZIT or VT (proximity) fuze. This new fuze, radio-operated and triggered by reflection from the target, had been developed early in the war, but in order to keep the design out of the hands of the Germans its use had been restricted to use by the Navy in antiaircraft fire over water and by a few antiaircraft batteries in England until October 1944, when it was released by the Combined Chiefs of Staff for ground warfare. Eisenhower intended to employ the fuzes in artillery shells for the first time in Europe on Christmas Day 1944, at the beginning of a new drive into Germany. Teams of instructors had been visiting the front for several weeks, and in the comparatively quiet VIII Corps sector, served by ASP 128, a demonstration had been planned for 18 December. The fuzes were evacuated from the dump just in time to save them for an important role in the Battle of the Ardennes.[40]

The Germans were advancing with astonishing rapidity. Hardly was ASP 128A at Champlon established when it too was in danger of being overrun. By 20 December the VIII Corps sector was cut in two. Because of the split and because of his concern for the safety of the Ordnance troops in this precarious situation, Medaris attached the ammunition companies and the 590th Maintenance Battalion to the VIII Corps Ordnance officer, Colonel Walker. On 21 December along with VIII Corps they passed to Third Army.[41]

The last link between the VIII Corps Ordnance units and First Army was Major Garr, the commanding officer of the 100th Ordnance Ammunition Battalion. Starting south from Aachen on 19 December to check on operations at ASP 128A, he discovered at VIII Corps headquarters that ASP 128A would have to be evacuated. A large rail shipment had been diverted from ASP 128 to 128A, and Major Garr found himself involved in the desperate attempt to shuttle the shipment—110 freight cars carrying 45,000 rounds of 105-mm. howitzer and 10,000 rounds of 155-mm. howitzer ammunition—to Bertrix. Arriving at the Bertrix railhead early on the morning of 20 December with the men and equipment evacuated from ASP 128A—2 ammunition companies, a Quartermaster service company, an antiaircraft battery, a platoon of armored infantry with 5 half-tracks, 20 Quartermaster trucks, and 4 MP's—he organized this force for the defense of the railhead, set up his command post in the office of the stationmaster, and began issuing ammunition out of the freight cars to VIII Corps units.

Later on in the morning he co-ordinated plans for defense with Lt. Col. George H. Wells, the commanding officer of the 590th Maintenance Battalion, which had arrived in Bertrix from Neufchâteau the day before, setting up its shops and bins in the town square and opening its mess facilities to casuals and stragglers. Wells took four medium tanks and a half-track out of his heavy maintenance shop, manned them with an officer and 20 mechanics of the

[40] (1) History 100th Ammunition Bn, p. 59; (2) FUSA Ord Rpt Dec 44, p. 3 and app. II, p. 7; (3) Green, Thomson, and Roots, *Planning Munitions for War*, pp. 363–66; (4) AGF Bd Rpt, ETO, No. 457, Pozit Fuzes, 15 Dec 44, 4–3.457/44; (5) Dupuy, *St. Vith: Lion in the Way*, p. 25.

[41] (1) History 100th Ammunition Bn, p. 59. (2) Medaris, Letter of Instructions No. 3, 19 Dec 44, FUSA Ord Monthly Rpt, Dec 44, app. II.

553d Ordnance Heavy Maintenance Company (Tank), and sent them out to set up roadblocks at vital junctions; but shortly after noon enemy tanks were reported and the 590th got ready to pull out. Garr was left with the job of defending Bertrix until he could get his freight train rolling again. Sending out his armored infantrymen and antiaircraft battery to take over the roadblocks, Garr persuaded the Bertrix *chef de gare* to supply him with some locomotives and got his train on the road south about midnight. At Florenville he received instructions from Colonel Walker to proceed to the railhead at Virton, on the French border. Arriving there the next afternoon, he again organized his task force for defense and spent the night issuing ammunition to units of the 28th Division. Next day an advance party of Third Army's 150th Battalion arrived to take over, and Major Garr returned to First Army.[42]

North of the Bulge

When he returned he found that all of First Army Ordnance Service except the direct support units was pulling back behind the Meuse, roughly in the area from Liège west to Namur and north to Tongres and St. Trond, with the 72d, 51st, and 52d Group headquarters centered around Huy, the new location of First Army headquarters, and the main ammunition depot now located at Advance Section Depot O–610 west of Liège. Medaris had ordered the move on 19 December in order to clear the roads for the tactical troops. The situation north of the bulge was still of the kind described in dispatches as "fluid." For example, ASP 126 near Waimes had been officially evacuated early in the battle, but every day a detachment of one officer and twenty enlisted men from the 57th Ammunition Company was able to return and issue ammunition from one end of the ASP, although it was under enemy artillery and machine gun fire. There is a story that while the Americans were issuing at one end, the Germans were issuing at the other. True or not, it illustrates the fantastic character of this battle.[43]

Alarming rumors were spreading through the First Army area, and some of them were true. Medaris passed along a warning from G–2 that 150 Germans in American uniforms, in American jeeps, with identification tags and papers, were behind the Allied lines. These were the men of Otto Skorzeny's *Operation GREIF* sent to spy on vital installations, disrupt communications, change road signs, and generally cause confusion. One of the Germans impersonated an MP at a road junction and directed an entire American regiment down the wrong road as it was hurrying south to fight. At Aywaille on the night of 18 December three of the *GREIF* men in a U.S. jeep, with GI dogtags and drivers' licenses, $900 in American money and 1,000 British pound notes, and plenty of demolition material, were caught in the 178th Ordnance Depot Company area by three men of the company, S. Sgt. Erling N. Salvesen, Technician 5 John E. Pavlik, and Technician 5 Harcourt W. Swanson. German paratroopers were also dropped behind the lines. None

[42] (1) History 100th Ammunition Bn, pp. 59–62. (2) VIII Corps Ord Sec Jnl for Dec 44, in VIII Corps Staff Sec Jnls, L540, Envelope 29. (3) History 553d Ord Heavy Maint Co (Tank), ETO Ord Sec, KCRC.

[43] (1) FUSA Ord Monthly Rpt Dec 44, app. II, pp. 5–12, and Exhibit 23, FUSA Ord Serv Letter of Instructions No. 3, 19 Dec 44; (2) History 100th Ammunition Bn, p. 59.



COLONEL BLISS SALUTES SERGEANT SALVESEN AND TECHNICIANS PAVLIK AND SWANSON *after they received Bronze Stars for capturing three German spies of Operation* GREIF.

of these spies did any great damage, but they contributed to the shock and confusion of the sudden enemy attack that had already scattered units and disrupted communications.[44]

Telephone communications from First Army headquarters were either uncertain or suspected of being tapped by the enemy, and close to the front they had broken down entirely; the last wire communication the 52d Group had with any of its units was the telephone call that ordered the 86th Battalion to withdraw from Malmédy on the afternoon of 17 December. Teletype was out more often than not, and messenger service was all but impossible, what with the constant movement of units, the uncertainty of the battle, and the traffic congestion on the rough and icy roads. Radio was the only dependable means of getting reports and issuing orders.[45]

Medaris' radio net, which had been extremely useful in the two or three weeks of fast pursuit in August and early September, was not really needed after the Ordnance units settled into semipermanent installa-

[44] (1) Robert E. Merriam, *Dark December* (New York: Ziff-Davis Publishing Co., 1947), pp. 126–30. (2) FUSA Ord Monthly Rpt Dec 44, app. II, p. 14. (3) Hist 178th Ord Depot Co, 21–31 Dec 43–1944. (4) Hist 334th Ord Depot Co, 20 Nov–Dec 43–Dec 44.

[45] (1) FUSA Ord Sec Monthly Rpt, Dec 44, app. II, p. 3. (2) Col. James D. Sams, "Communications in Army Ordnance Service," *Military Review*, XXVII, 1 (May 1947), p. 53.

tions before the Siegfried Line because wire communications were good and messenger service was excellent. Daily messenger service was maintained between the 52d Ordnance Group and the First Army Ordnance officer and between the group and each of its six battalions. After 1 October, teletype—a tremendous saving in time over delivery by messenger—came into use between army Ordnance, groups, depots, and ASP's for conveying allocations and supply status reports, which were too long for transmission by radio.[46] Following the capture of Aachen on 21 October, wire communications became so reliable, except in the remote Ardennes area, that army radio circuits to V and VII Corps were closed down.[47]

The fact that the Ordnance radio net was not really needed during the long autumn pause at the Siegfried Line did not pass unnoticed at First Army headquarters. Hodges' chief of staff, Maj. Gen. William B. Kean, was critical of Medaris' "radio empire" and finally, about the middle of the second week in December, ordered the Ordnance net taken off the air. There was nothing to do but comply: Medaris issued written orders closing down the net. But at the same time, he issued verbal orders to retain all equipment and personnel.[48] By that time he had a number of well-trained men; First Army Signal Service for some time had been operating a school especially for training Ordnance personnel as radio operators.[49]

When the Germans struck suddenly in the Ardennes, threatening the First Army supply dumps, General Kean sent for Medaris and ordered him to pull his supplies back. Medaris pointed out that he could not because he had no radio net. Kean knew Medaris well, for he had served with him a long time. He said, "I'll bet you could put it back in two hours. Now do it, and don't come back to me." Within two hours, Medaris was sending out orders by radio, and within two days, after operators had been recalled to headquarters and additional equipment procured from Signal, the whole net (except for the previous hookup with corps), was in operation.[50]

With the aid of the radio net, Medaris got about 85 percent of his depot stocks out of reach of the enemy, and for the duration of the Battle of the Bulge never lost contact with his First Army Ordnance units. He could keep the men from panicking; could pick up the radio and reassure them, telling them where the Germans were and what to do. This kind of central control and reassurance was immensely valuable. And the radio net came to be valuable not only to Ordnance but to G–3, which relied on it at times for information on where the combat units were.[51]

Medaris' first order over the radio net was: "Evacuate . . . but stay in business. Our troops need your service now, more than ever." His men responded bravely. Depot men, even while they were loading up their stocks to pull out, continued their task of supply; at Aywaille, for example, they issued directly to combat units, some of whom were quoted as expressing "no little pleasure at having the Main Army

[46] (1) *Ibid.* (2) Hist 100th Amm Bn, p. 110. At one time the 100th tried to use pigeons, but without much luck. *Ibid.*

[47] First Army Rpt 2, Annex 8, Signal Section Rpt, p. 177.

[48] Medaris Interv

[49] First Army Rpt 2, Annex 8, Signal Sec Rpt, p. 183.

[50] (1) Medaris Interv. (2) FUSA Ord Monthly Rpt Dec 44, app. II, p. 3.

[51] Medaris and Nisley Intervs.

Depot so handy for the first time since the Normandy days." [52] Ammunition men kept ASP's open as long as they could, even while under enemy fire; and maintenance men made repairs on the run. The 590th Battalion, for instance, managed to complete 4,000 repair jobs on the 100-mile trek from St. Vith to Neufchâteau. The recovery crews followed close on the heels of the infantry counterthrusts over the icy, foggy, roads to drag back big guns and tanks that had been knocked out by the enemy or abandoned by retreating units. One crew saved eight huge 240-mm. howitzers, in good working order, that had been abandoned. Another brought back a great trophy—a German 71-ton Tiger Royal tank.[53]

Every American tank that could be recovered and put back in operation was a triumph, because First Army units that bore the brunt of the first Bulge attacks had suffered heavy losses in armor. Every replacement tank in Ordnance stocks was immediately committed, but there was still a serious shortage—all the more serious because the First Army command felt that tanks would be the determining factor in restoring its position later. There was one resource within the theater—the plentiful Shermans held in reserve by Field Marshal Montgomery's 21 Army Group. On 19 December, Medaris, who knew how ample these stocks were, went to 21 Army Group headquarters at Brussels to appeal to Montgomery's "Q" (Quartermaster—in American terms, G–4) for the loan of a moderate number. He was turned down on the ground that every tank Montgomery had was vitally needed by his own group.[54]

The next day, 20 December, as a result of Eisenhower's decision to place all American forces north of the Bulge under Montgomery, First Army passed temporarily to 21 Army Group. The following morning, some 300 Shermans were rolling out of Brussels to the shops of Medaris' 72d Ordnance Group at Landres, together with a number of British 25-pounders with 30 days of ammunition. Then began a strenuous effort to get the tanks ready for battle. By friendly agreement between Medaris and the First Army Signal officer, Col. Grant Williams, Signal radio installation and repair teams were already operating with Ordnance tank maintenance companies. With their assistance and that of a few hundred Belgian laborers and volunteers from a battalion of Irish Guards, three Ordnance companies made the tanks battle-ready—U.S. radios installed, tanks combat-loaded with rations and ammunition, and duckbill tracks applied—in the remarkably short time of ninety-six hours. After the production line went into operation, tanks were being issued out the front door of the shop as fast as others came in the back.[55]

In the realignment of forces that took place on 20–21 December, VIII Corps went to Third Army and First Army received XVIII Airborne Corps. This corps consisted of an airborne division hitherto

[52] FUSA Ord Monthly Rpt for Dec, app. II, p. 14.

[53] (1) "Bulge Battle," *Firepower,* Vol. I, No. 6 (April–May 1945), p. 9; (2) Merriam, *Dark December,* p. 132; (3) FUSA Ord Sec Monthly Rpt, Dec, app. III, Incl 4.

[54] (1) During December First Army lost about 400 medium tanks. First Army Rpt 2, I, p. 64, and Annex 9, p. 23. During the Battle of the Bulge, the total First Army tank losses were 510. USFET Board Rpt, Ord Sec Study No. 96, Requirement for Ordnance Recovery Company. The 21 Army Group's reserves in the United Kingdom totaled 1,900. Ruppenthal, *Logistical Support of the Armies II,* p. 241. (2) Ltr, Medaris to Pattison, 28 Oct 63.

[55] (1) *Ibid.* (2) Lynde Comments.

held in reserve, the 82d; scattered remnants of the 106th Division; Combat Command B of the 9th Armored; and the 7th Armored Division. Its mission was to hold north of the Bulge. To suppore XVIII Corps, Medaris took the 83d Battalion that had been backing up the 590th (now far south at Neufchâteau with VIII Corps) and converted it to a forward battalion, stationing it south of Liège; to back up the 83d he used the 178th, which had hitherto been employed only administratively to augment the 52d Group headquarters, as a backup battalion, assigning to it the usual depot, automotive maintenance, and heavy tank maintenance companies. Thanks to Medaris' training program, the changeover was accomplished smoothly.[56]

A maintenance company supporting 7th Armored Division had already covered itself with glory. On the afternoon of 19 December, Company C of the 129th Ordnance Maintenance Battalion had manned a roadblock on the Ourthe River at Ortho, using three bazookas, two machine guns, twenty riflemen, and a half-track salvaged from a knocked-out antiaircraft unit. Company C held the riverbank under shellfire from a German self-propelled 88-mm. gun and two tanks until early evening, when help arrived. Actions like this, according to the official tactical history of the battle, "contributed mightily to the German decision which turned an entire armored corps from the road west and plunged it into profitless adventures in a side alley." [57]

Bastogne and Third Army Ordnance

While the action at Ortho was taking place, the 101st Airborne Division was setting up its defenses at Bastogne. Along with the 82d Airborne Division, the 101st had been pulled out of SHAEF reserve on 17 December; but instead of going to First Army with the XVIII Airborne Corps, the 101st had been sent from Mourmelon, its rest camp near Reims, to bolster the shattered VIII Corps front. The division left in such a hurry that it lacked a good deal of its individual equipment, such as overshoes and helmets; its ammunition and grenade pouches were not full; and it had only a few truckloads of 105-mm. howitzer shells.

Brig. Gen. Anthony C. McAuliffe, acting commanding officer of the 101st, was not, however, particularly worried. COMZ had been notified by 12th Army Group to equip the 101st on highest priority, and with the help of Oise Section the division's organic 426th Airborne Quartermaster Company and 801st Airborne Ordnance Company were putting together a convoy of eighty vehicles loaded with supplies. On the morning of 19 December the convoy started east from Mourmelon to Bastogne. The Ordnance company traveling with it was thoroughly experienced; it had been supporting the division since the landing at UTAH Beach, including the drop in Operation MARKET-GARDEN in which fifteen men of the company had gone in by glider.[58]

[56] FUSA Ord Monthly Rpt Dec 44, app. II, pp. 11–12; and Incl 19, FUSA Ord Sec Operations Order No. 38, 22 Dec 44.

[57] (1) History 129th Ord Maint Bn, Sep, Oct, Nov 18–21 Dec 44, Jan–Aug 45. (2) Cole, *The Ardennes: Battle of the Bulge,* p. 320.

[58] (1) Cole, *The Ardennes: Battle of the Bulge,* p. 461. (2) 12th Army Group, Daily Jnl Ord Sec, 18 Dec 44. (3) History 426th Airborne QM Co, 101st Airborne Div, 6 Jun–12 Jul, Dec 44–Feb 45, Apr–May 45. (4) History 801st Airborne Ord Maint Co, Oct 1942–45.

After a journey of more than a hundred miles through rain and snow, the convoy reached the division rear area about five miles west of Bastogne near midnight and was told to remain at a crossroads in the woods. The men had just parked their trucks on Highway N4 facing west when a German armored patrol attacked. Two of the end vehicles received direct hits; four more were abandoned by their drivers, who took to the woods. Pulling out in the greatest confusion, the convoy headed west, then south, winding up at VIII Corps headquarters at Neufchâteau next morning. En route the 801st Airborne Ordnance Company had lost several jeeps, trucks, howitzers, and trailers, including a valued British airborne arc-welding trailer. The men did not give up the attempt to reach their division. The commanding officer of the 801st, Capt. John L. Patterson, managed to make his way to Bastogne with two trucks containing 500 gallons of gasoline. He went back to bring the rest of the convoy forward, but by this time the Germans had closed the road. On 21 December, VIII Corps ordered the Ordnance and Quartermaster companies out of Neufchâteau, which was becoming too congested, and sent them ten miles south to Orsainfaing. There they remained until after the Third Army, coming up from the south, had opened a narrow corridor into Bastogne on 26 December.[59]

[59] (1) History 801st Airborne Ord Maint Co, Oct 1942–45, and AAR, 6 Jun 44–Dec 45. (2) History 426th Airborne QM Co, 101st Airborne Div, 6 Jun–12 Jul, Dec 44–Feb, Apr–May 45. (3) Colonel S. L. A. Marshall, *Bastogne, The Story of the First Eight Days* (Washington: Infantry Journal Press, 1946), pp. 71–72. Marshall's account is taken from an interview with Lt. Col. Carl W. Kohls, G–4 of the 101st.

The news of the crossroads debacle in the service area on the night of 19–20 December came to McAuliffe in the form of a laconic message, "Evidence indicates service troops have disappeared." He immediately sent a message to corps asking for Quartermaster and Ordnance help. He had already explored the resources in Bastogne itself. Slim stocks of food and ammunition had been left behind by VIII Corps, and the tankers had even discovered eight new undelivered tanks, complete with their Ordnance crews, which were forthwith inducted into Combat Command B, 10th Armored Division. On the first day of the siege a young supply sergeant of the 101st had made a dash to the rear and brought back about 1,550 rounds of M2 105-mm. howitzer ammunition through German shelling and small arms fire. McAuliffe knew by then that his supply route was closed. But he was full of confidence on the morning of 22 December when he replied "Nuts!" to the Germans' demand for surrender. He had received word that Third Army's 4th Armored Division was on its way north to relieve him and he had been promised resupply by air. The first drop, on the 23d, was disappointing, for it did not bring in enough artillery ammunition, McAuliffe's greatest need; at one time on 24 December the airborne batteries were down to 10 rounds per gun and the field artillery units were running low. But the drops on the 24th and 26th (the biggest airlift day, with 289 planes) eased the shortage and on the 26th the 4th Armored Division opened its 300-yard corridor into the town, through which next day a convoy of more than a hundred vehicles, escorted by 4th Armored Division tanks, arrived



TANKS OF THE 4TH ARMORED DIVISION NEAR BASTOGNE

from Orsainfaing.[60]

The siege of Bastogne was over, but the battle was not. When the 801st Airborne Ordnance Company arrived in Bastogne over snow-covered roads at dusk on 29 December, it was greeted by an enemy artillery and strafing attack that continued for days. On that fateful day of 26 December when the siege was lifted, the main German thrust toward Antwerp had been blocked by First Army at the Meuse, and the Germans had turned south to attack Bastogne in force. Now the task of stopping them belonged to Third Army, which was battling its way north through Luxembourg.

General Bradley had ordered Third Army to the relief of Bastogne on the night of 18 December. In less than a week Patton turned the bulk of his army, with its guns, supplies, and equipment, from its bridgehead at the Saar north into the new offensive, a trek of 50 to 75 miles over difficult terrain and in bitter cold. From his office window in the city of Luxembourg Bradley watched the Third Army columns as they marched north, day after day, night after night through the streets of the city, the tank commanders at their turrets with their faces wrapped in woolen scarves, the troops huddled in their canvas-

[60] (1) Marshall, *Bastogne: The First Eight Days*, pp. 70–71, 133–34. (2) Cole, *The Ardennes: Battle of the Bulge*, pp. 467–70, 480. (3) Leonard Rapport and Arthur Northwood, Jr., *Rendezvous With Destiny* (Washington: Infantry Journal Press, 1948), pp. 596–97.

topped trucks, wearing heavy overcoats still caked with the mud of the Saar. This 90-degree movement of an army on very short notice was a remarkable feat of generalship; and it depended to a great extent on what Bradley characterized as a "brilliant effort" on the part of Patton's staff. Patton himself gave his Ordnance officer, Colonel Nixon, a large share of the credit.[61]

In breaking the news to his staff, Patton said, "You will support this operation even though it is impossible to do so." Nixon himself felt that Ordnance support was made possible then, as in previous crises, by Patton's custom of keeping his Ordnance officer fully informed of his plans and authorizing him to act in his general's name. If information had had to go through orthodox G–4 channels, support would have arrived too late.[62]

Within thirty minutes after Patton gave his order, Nixon had runners out to block the roads and turn the ammunition trucks toward Luxembourg. He also quickly diverted all incoming rail shipments of ammunition to the northern flank of the Third Army boundary, detailing a maintenance battalion headquarters to help co-ordinate the shipments. Nixon used every kind of transportation he could lay his hands on to move forward ammunition that was on the ground. By 26 December he had opened at Mamer an ASP to support the two Third Army corps that were attacking to the north, the III and XII Corps, and another near Robelmont to support VIII Corps in conjunction with the rail siding at Virton. Behind corps ASP's, Depot 32 near Audun-Le-Roman, previously scheduled to be turned over to ADSEC, was now heavily restocked and immediately became very active; ADSEC Depot O–611 was instructed to make retail issues to combat units regardless of existing credits. All types of ammunition had to be provided at as many points as possible, since Nixon did not know the exact composition of the troops that had become dependent on Third Army for support.[63]

First Army tactical and service troops that had become separated from their commands now came under Third Army, with the Ordnance units directly under Nixon's control. Some of the combat organizations were badly crippled, not only from battle losses but from accidents on the icy roads.[64] One observer in the Ardennes reported that "you would have thought an armored column had gone mad to watch its vehicles careening off trees, crashing through the corners of houses on turns. The thirty-three-ton tanks spun crazily on the gentlest slopes, sometimes turning completely around two or three times before they came to rest. In a day's move, an armored division might lose several hundred of its vehicles, wrecked, mired, overturned. The maintenance crews blew on their fingers and sweated with their gear as they came up behind and tried to find places to anchor their cables so that they could pull the casualties back onto something on which they could run." [65] To

[61] (1) AAR, 801st Airborne Ord Maint Co., 6 Jun 44–Dec. 45. (2) Bradley, *A Soldier's Story*, pp. 472–73. (3) Col. William Whipple, "Logistical Problems During the German Ardennes Offensive," *Military Review*, XXVIII, 1 (April 1948), 23. (4) Patton, *War As I Knew It*, p. 196.

[62] (1) Interv, Col Thomas H. Nixon (USA Ret), 18 Feb 64, OCMH. (2) Nixon Comments, pp. 20–21.

[63] (1) Nixon Interv of 19 May 61. (2) Third Army Rpt II, Ord Sec, p. 18. (3) History ADSEC Ordnance, p. 20.

[64] Third Army Rpt II, Ord Sec, p. 17.

[65] Ingersoll, *Top Secret*, p. 248.

provide better traction, the maintenance companies welded steel "tacks" or cleats to the tracks, scrounging welding equipment from the neighborhood when they lacked it, improvising the cleats, and working night and day. One unit, by cutting steel cubes from the side of the track itself and welding them on the track face, was able to report: "Within a few days every tank on our schedule was equipped and clopping across the ice like a mountain goat." [66]

Freeing his forward group for work in the north, Nixon turned over all maintenance west of the Moselle and south of Luxembourg to his rear group, the 70th, which got considerable help from a COMZ base armament maintenance battalion (the 607th) at Nancy on supplies and repair work in the area south of Metz. From his own office in Nancy he sent several men to Luxembourg to act as a forward liaison group and report on troops, installations, and shortages.[67]

The effort involved in getting Third Army Ordnance support forward in a hurry is illustrated by the experiences of the 841st Depot Company and the 32d Medium Maintenance, both assigned to the forward Ordnance battalion behind XII Corps, the 314th. The commanding officer of the 841st received orders on 21 December to move his entire depot, as well as a pool of combat vehicles and heavy trucks, to Luxembourg at once from Saaralbe (east of the Saar River in France), a distance of a hundred miles. The convoy was on the road by noon—163 vehicles, more vehicles than the company had men, manned by every driver they could borrow. On the way, the convoy was strafed twice by German planes, but incurred no damage and arrived that night at Dudelange on the Luxembourg border. Finding the town covered with snow in the light of a full moon the men parked their vans around the town hall. By morning they had issued 25 tons of parts and small arms and several combat vehicles. That night the 32d Medium Maintenance convoy arrived, having traveled ninety miles from Oermingen (near Saare Union), and set up shop in a school yard on a windswept hill.

By New Year's Day of 1945 both companies had pushed north again, the 841st to the city of Luxembourg (rendering "splendid service" to XII Corps, according to the commanding officer, Maj. Gen. Manton S. Eddy). The 32d had traveled even farther, over a winding road through a forest to the village of Gonderange, where it remained—working in the cold streets, or in cowsheds or any covered space they could find—until the Battle of the Bulge was won and Third Army had moved on to take its place in the movement of all the armies into Germany.[68]

[66] (1) Third Army Rpt II, Ord Sec, p. 20; (2) Capt. Fred A. Tadini, "The Ol' 2nd," *Firepower*, II, 2 (August–September 1945), p. 4.

[67] Third Army Rpt II, Ord Sec, pp. 17–20.

[68] (1) Capt. Lenard C. Fuller, CO of the 841st, Letter to the Editor, in "Mail and Record," *Firepower*, II, 2 (August–September 1945). (2) Histories, 841st Ord Depot Co., pp. 73–81, 96; 32d Ordnance Medium Maint Co. Both in ETO Ord Sec Histories, KCRC.

CHAPTER XVII

Lessons of the Roer and the Ardennes

In preparing for the coming battle for Germany, army commanders had some sobering reflections on the quality of some of their weapons—notably tanks. Painful lessons had been learned not only in the Ardennes but in Ninth Army's offensive on the Roer plain in November 1944. In this short but bloody battle Ninth Army, the latest to enter the European campaign, had earned the respect of the seasoned veterans of First and Third Armies and justified its proud code name, CONQUER.

Ninth Army Ordnance

"Unlike the noisy and bumptious Third and the temperamental First, the Ninth remained uncommonly normal," according to General Bradley.[1] One reason for the normality of Ninth Army was its youth. Though it resented being called a new army, because its headquarters had worked together for two years, first in the United States and later in England, in terms of the European campaign it was young, and in a sense it was like a family's youngest child that arrives when father is coming up in the world. Not until mid-November did Ninth Army have the responsibility for supporting a full-scale offensive. By then, the worst of the period of hard times in supply was over, and the opening of Antwerp a few weeks later heralded the beginning of the era of plenty.

Arriving on the Continent at the end of August, the Ninth's headquarters on 5 September assumed command of one corps, the VIII, with the mission of reducing the Brittany peninsula and protecting the south flank of 12th Army Group along the Loire. At that time VIII Corps was operating as an independent corps with direct access to Communications Zone, an arrangement that continued until the reduction of Brest on 18 September. After Brest and the mass surrender of the German forces along the Loire following DRAGOON, Ninth Army was sent with VIII Corps to a quiet sector in southern Belgium and Luxembourg between First and Third Armies, with a defensive mission only; it remained there for most of October, a small army indeed, for VIII Corps had only two divisions. Then the Ninth was ordered to take over a small portion of the 12th Army Group zone north of Aachen to build up for a drive to the Rhine in conjunction with First Army. Relinquishing VIII Corps to First Army, Ninth on 22 October moved its command post to Maastricht, in the Dutch panhandle, taking over XIX Corps, which was already in position near Aachen with two infantry divisions, the 30th and 29th, and one armored, the 2d. On 8 November, a second corps was added, the XIII. Ninth was still a small army compared with

[1] Bradley, *A Soldier's Story*, p. 453.

First and Third, and was to be concentrated on a very much narrower front than either.[2]

The Ordnance officer of Ninth Army, Col. Walter W. Warner, had not been affected by the supply famine in September and October on anything like the same scale as Medaris and Nixon; nor had he shared their unhappy experiences in the Mediterranean. For his part, Warner ascribed his good supply situation mainly to his excellent relationship with Communications Zone, which he cultivated by refusing to blame COMZ for all deficiencies, and by refraining from demanding priorities. When Medaris' executive officer, Col. Floyd A. Hansen, noted one day that Ninth Army was receiving more supplies than First Army and telephoned COMZ to ask why, he was told that the men at COMZ were going to look after Warner because they figured Medaris and Nixon could look after themselves.[3]

If Ninth Army's late arrival in the theater was an advantage in terms of supply, it was a disadvantage in terms of service troops, for it occurred at a time when 6th Army Group in the south was clamoring for supporting units. Warner arrived on the Continent with one medium maintenance company only, and had to build up his Ordnance service from scratch. When the long move from Brittany to Belgium took place, most of the companies he was to acquire were still with First and Third Armies, and others were en route from England or the United States. No sooner had he begun the concentration of men and supplies in Belgium and Luxembourg than orders came to move to Holland. Communications Zone and Advance Section came to his assistance with transportation and supplies, but the supplies that poured in added to his manpower problem because he had only one depot company.[4]



COLONEL WARNER

When the Ordnance Ninth Army manpower build-up began around Maastricht, the next problem was to find locations for the Ordnance companies in an area crowded with American and British troops and soggy with November rains. Ammunition depots and vehicle parks were set up at roadsides. Maintenance and depot com-

[2] (1) Renner Rpt, p. 37. (2) *Conquer: The Story of Ninth Army, 1944–1945* (Washington: Infantry Journal Press, 1947), pp. 20–82. (3) Ord Serv ETO, Class II and IV Supply, pp. 465–68, OHF. (4) For the plans for the drive to the Rhine, see MacDonald, *The Siegfried Line Campaign*, pp. 390–407.

[3] (1) Interv, Col Walter W. Warner, USA Ret, 12 Jun 64. (2) Hansen Interv.

[4] (1) Ruppenthal, *Logistical Support of the Armies, II*, pp. 299–301; (2) Col. W. W. Warner, "Ordnance at the Front," *Army Ordnance*, XXIX, 151 (July–August 1945), pp. 99–101.

panies found shelter in factories, or even caves, or worked in the open on paved streets. In the congested Maastricht area, many of the newly arrived Ordnance troops saw their first German V–1 bombs, at night, a steady, orange-red flame against the black sky, and day and night heard their motors, variously described as a "roaring thunder" or a "guttural burble." Most of the V–1's passed over on their way to Antwerp, but some exploded in the neighborhood of Maastricht. There were many random explosions of mammoth shells fired from giant artillery weapons like the V–3 (*Vergeltungswaffe*), which had been originally designed by the Germans to fire on London from the Belgian and Dutch coasts.[5]

In organizing his Ordnance service, Colonel Warner favored the system adopted by Medaris of having two forward maintenance and supply groups. At the time Warner arrived in Maastricht, he had two group headquarters, the 59th and 60th, which he intended to use as forward groups. Shortly before XIII Corps became operative, Warner asked 12th Army Group for an additional group to supervise his base operations. Since none was available, he had to revise his plans. Keeping the 59th as a forward group, he reorganized the 60th as a rear group. It was February of 1945 before he was authorized his third maintenance and supply group, the 79th. At the time the big push began in February, his 59th Ordnance Group had the job of supporting XIII and XIX Corps and certain Ninth Army troops; the 79th had the task of supporting the newly added XVI Corps, the bulk of the Ninth Army troops, and all troops operating with the British Army. In both cases support of corps followed the now familiar ETO pattern of two battalions behind each corps, one for direct third echelon, the other a backup support battalion with depot and heavy maintenance companies.[6]

Warner had no ammunition group. Instead he used two ammunition battalions, one to operate forward ammunition supply points, the other to operate the army ammunition depot. By mid-February his 65th Ordnance Ammunition Battalion with six companies was operating a depot serving all army troops as well as XIX Corps; his 335th Ordnance Ammunition Battalion (whose headquarters had been converted from a maintenance battalion headquarters) with four companies was operating ASP's behind XVI and XIII Corps as well as supplying all U.S. troops under the operational control of the British Second Army. Both battalions were administered by the ammunition section of Warner's office, and in his opinion placed too heavy a load on the section. Consolidation under a group headquarters would have been an advantage; but no ammunition group headquarters was available.[7]

[5] (1) *Ibid.*, p. 100. (2) *Conquer,* pp. 110–11. (3) Hist 300th Ord Maint Co AA, KCRC. (4) John Toland, *Battle: The Story of the Bulge* (New York: Random House, 1959), p. 352. (5) Leslie E. Simon, *German Research in World War II* (New York: John Wiley and Sons, 1947), pp. 191–93.

[6] (1) 12th Army Gp Daily Jnl Ord Sec, 13 Nov 44. (2) Ltr, CG NUSA to CG 12th Army Gp, 13 Nov 44, sub: Request for Ordnance Support and Inds; ltr, Eisenhower to CG 12th Army Gp, 10 Jan 45, sub: Activation of Headquarters and Headquarters Detachment, 79th Ordnance Group, all in 12th Army Gp, 322 Ordnance Units. (3) Organization Br, G–4, Hq 12th Army Gp, Notes on Service Troops, 18 Jul 45, Gen Nisley's File. (4) NUSA Ord Office History Period Ending 31 January 1945, Ninth Army G–4 Rpts.

[7] (1) Hq Ninth US Army, Adm Order 7, 25 Feb 45, in AGF Bd Rpt, ETO, No. C–Misc–60.

Certain types of Ordnance companies remained scarce, notably ammunition, depot, evacuation, heavy tank maintenance, and heavy automotive maintenance. For these there was active competition between 12th Army Group and COMZ, group maintaining that COMZ could depend on civilian labor, and COMZ countering with the argument that the civilian labor pool had run dry.[8]

Before the November offensive began in the Ninth Army sector, Warner received three companies that had an interesting history, one depot, the 333d, and two heavy tank maintenance, the 554th and 538th. They had been training under heavy security wraps for eighteen months to support the American force that was part of the British Canal Defense Light project. When 12th Army Group, unable to find any use for the CDL tanks because of the fast-moving action in the fall and summer of 1944, disbanded the project force on 4 November, two of the project's four battalions were converted to standard tank battalions and the rest to mine exploder battalions equipped with dozer tanks, Crabs, Centipedes, and mine exploders T1E1 and T1E3. The need for some means of dealing with mines became plain when the Allies began to invade Germany. On home soil the Germans reacted strongly with belts of mines, as well as crack panzer divisions.[9]

Ninth Army's first offensive, in conjunction with First Army, took place across the Roer plain—a right-angle triangle of about 200 square miles bounded by the Wurm River, the Roer, and a line northeast from Aachen. On the Ninth's north flank, XIII Corps with two infantry divisions, the 84th and the 102d, and the 7th Armored Division in reserve, was to cross the Roer at Linnich. To the south, XIX Corps with the 29th and 30th Infantry Divisions and the 2d Armored Division was to seize a crossing of the Roer at Juelich. Once across the Roer, both corps were to push northeast to the Rhine at Duesseldorf. The attack was to be spearheaded by the 2d Armored Division. Its first job was to attack toward Linnich, seizing the high ground around Gereonsweiler, a mile or so short of Linnich, and holding it until XIII Corps was committed. Then the division was to move to the Juelich area and prepare to help the infantry make a river crossing there.[10]

Behind XIX Corps, which was to make the first and the main effort, was the 59th Ordnance Group's 48th Ordnance Battalion, with a medium maintenance company behind each infantry division, a medium automotive maintenance company to repair corps vehicles, a medium maintenance company for corps artillery, and a heavy tank maintenance company behind the 2d

(2) Ltr, Warner to Ray, 7 Dec 45, no sub, AGF Ordnance Officer's Files, Organization of Army Ordnance.

[8] Ltrs from 12th Army Gp Comdr to CG ETO, 18 Aug 44, sub: Ordnance Troops and 1st Ind, and to SHAEF, 19 Feb 45, sub: Allocation of Ordnance Service Troops, 12th Army Gp, 322 Ordnance Units.

[9] (1) Msg 12th Army Gp to CG COMZ, 28 Oct 44, QX 22914, 12 AG 322 Ordnance Units. (2) 12th Army Gp 319.1 G-4 Rpts (NUSA), No. 9, 14 Nov 44. (3) Ltr, Capt Marshall T. White, CO 538th Ord HM Co (Tk) to CG Ninth U.S. Army, 23 Nov 44, sub: Status of this Organization, and Inds, 12th Army Gp 322 CDL. (4) Final Hist Rpt, Armored Fighting Vehicles and Weapons Sec, Hq ETO, USA . . . 6 June 1944 to 24 May 1945 (hereafter cited as AFV&W Sec Rpt), pp. 2–3, ETOUSA & USFET/ Armored Fighting Vehicles & Weapons Sec files, KCRC.

[10] For the tactical history of the battle of the Roer plain, see MacDonald, *The Siegfried Line Campaign*, pp. 497–574.

Armored Division's own maintenance battalion. The 48th Ordnance Battalion had come to Ninth Army from First Army along with XIX Corps, which the battalion had been serving since its arrival in France in mid-June.[11]

For the coming offensive Ordnance preparations consisted mainly of inspecting artillery tubes and replacing worn-out end connectors and duckbills on the 2d Armored Division's tanks. These preparations were dictated by terrain, weather, and experience. Unlike the Hürtgen Forest, the Roer plain was tank country—a low, flat tableland of beet and cabbage fields that provided excellent fields of fire though little concealment. The fields were criss-crossed by roads connecting numerous small villages whose thick-walled stone houses would make splendid defensive positions for the Germans. Not the least consideration was the mud created by November rains. Without the duckbills, the narrow-tracked American tanks would be road bound and would be unable to use the flanking tactics that were their best hope of defeating German armor.[12]

During the First Army breakthrough battles in July and August, the 2d Armored Division tankers had learned how to fight German Panther and Tiger tanks with their M4 Shermans. They knew that the ammunition of the 75-mm. gun with which most of the M4's were armed (a low-velocity shell about 13 inches long, as compared with the 28- to 30-inch high-velocity 75-mm. shell of the Panthers) would not penetrate at any range the thick frontal armor of the Panthers and Tigers, but could damage the sides and rear. Therefore the tankers had used wide encircling movements, engaging the enemy's attention with one platoon of tanks while another platoon attacked from the rear. They had suffered appalling losses: between 26 July and 12 August, for example, one of 2d Armored Division's tank battalions had lost to German tanks and assault guns 51 percent of its combat personnel killed or wounded and 70 percent of its tanks destroyed or evacuated for fourth echelon repair. But by using flanking tactics and by enlisting artillery support to fire directly on enemy tanks, the Americans had won their battles and even managed to inflict heavy losses on the Germans.[13]

By the time the Roer offensive began, the 2d Armored Division's firepower had been stepped up to some extent. About half the division's M4's were armed with the 76-mm. gun.[14] With this gun, firing the new but scarce tungsten-carbide-cored HVAP ammunition, the tankers could penetrate the front belly plate of the Panther at 300 yards and at 200 yards had a sporting chance (about one to four) of penetrating the front slope plate. The division's tank destroyer battalion had also recently been equipped with the new M36 destroyers mounting the 90-mm. gun. And

[11] Hist, Hq & Hq Det & Med Det, 48th Ord Bn 1944.

[12] (1) XIX Corps After-Action Rpt, Sec IV, Ord Sec Jnl, Nov 44. (2) Lt Col E. A. Trahan, ed., *A History of the Second United States Armored Division, 1940 to 1946* (Atlanta, Ga.: Albert Love Enterprises, n.d.), ch. V, no pagination.

[13] (1) *Ibid.* (2) First Army Ordnance Service pamphlet, How to Kill a Panther (based on actual tests against captured Panther tanks), FUSA Ord Sec Monthly Rpt Jan 45, Incl 9 to app. III, KCRC.

[14] Armored School Research Report, Hell on Wheels in the Drive to the Roer (Fort Knox, Ky., May 1949), p. 12. This report is largely drawn from firsthand accounts by members of the 2d Armored Division.



REPLACING TRACKS ON A SHERMAN TANK

XIX Corps was strong in artillery support, with thirteen corps battalions of which three were allotted to the 2d Armored Division. There seemed to be no good reason why 2d Armored should not repeat the successes of its tank battles in France; that is, assuming it was not bogged down in the mud. At the Wurm River in October one of the tank battalions had 63 percent of its M4's knocked out when they were slowed down by mud. Therefore, when the 2d Armored moved out onto the Roer plain on 16 November, three-fourths of the tanks had duckbills, and as added insurance against being mired, all of them carried, lashed to their rear decks, bundles of slender nine-foot logs that could be placed under the tracks.[15]

General Simpson warned his Ninth Army staff to expect "one hell of a fight"; but that was what a general was expected to say before an offensive. Actually the commanders were optimistic. They anticipated only a delaying action on the Roer plain; most of them thought XIX Corps could reach the Roer in five days. What they did not know was that the Germans were determined not to allow a breakthrough, for they were already planning their December counteroffensive in the Ardennes.

[15] (1) How to Kill a Panther. (2) *History Second Armored Division,* ch. VI. (3) Hell on Wheels, p. 11. (4) AFV&W Sec Rpt, p. 20.



M36 TANK DESTROYERS OF 2D ARMORED DIVISION ON DUG-IN RAMPS *near the Roer River.*

Moving out on 16 November, immediately after an air effort in support of First and Ninth Armies, involving more than two thousand American and English heavy bombers—the largest close support bombing of the war—XIX Corps gained up to two miles, capturing seven small towns. Only half of the 2d Armored Division, Combat Command B, was committed. Its tankers found they could traverse the mud in second gear, and soon the countryside was littered with the jettisoned logs. A few tanks were mired down. More were immobilized by mines, but they were not totally lost, for only the tank tracks were damaged, and they could be replaced in twenty-four hours.[16]

By midafternoon the northernmost of Combat Command B's three task forces had captured Immendorf and the southernmost task force was entering Puffendorf, an important crossroads village. It was in the center, at Apweiler, the town nearest the high ground at Gereonsweiler, that the first serious resistance was encountered. Here the center task force ran into such violent antitank fire that it had to fall back and dig in for the night. The medium tank company lost fourteen of its sixteen tanks. No German tanks had yet been sighted, but throughout the night outposts reported that tanks could be heard churning behind the enemy lines.[17]

[16] On 16 November, Combat Command B lost 14 tanks to mines and only 6 to mud. Of these, 2 of the mired tanks were back in action before the day's end; and 8 victims of the mud or mines came back the next day. MacDonald, *Siegfried Line Campaign,* p. 530.

[17] Hell on Wheels, pp. 28–38.

The Tank Duels on the Roer Plain

On the 17th, shortly after dawn, as two tank battalions of the 2d Armored Division's 67th Armored Regiment were drawn up on a slope outside Puffendorf, ready to attack toward Gereonsweiler, the men of the 1st Battalion saw long, high-velocity shells plowing furrows in the soft earth between their tanks. Then out of the heavy morning mist came a German tank; two Tigers and four Panthers moved out of the woods on the western fringe of Gereonsweiler. There was a hit; one of the Shermans went up in flames, then another and another and another, as the Germans got the range. Soon the tanks of the 2d Battalion were also being thinned by murderous fire from the big tanks. The Germans, alarmed by the speed of the American advance on the first day of the offensive, had brought up elements of the strong *9th Panzer Division*—veteran of the Russian front—to Gereonsweiler and were attacking at Puffendorf with a force estimated by 2d Battalion at twenty to thirty Panthers and Tigers.[18]

The battle at Puffendorf was tank against tank: on both sides the infantry was pinned down by artillery fire. The Germans had the advantage of position: the Americans were hemmed in by sloping ground that made flanking movement impossible. The Shermans fought back desperately, stepping up to attempt to slug it out with their 75-mm. and 76-mm. guns, but the tanks that got close enough for their guns to be effective were quickly cut down by enemy fire. And when the American tankers did score direct hits on the German tanks, their shells ricocheted off the thick armor and went screaming into the air. One Sherman fired fourteen rounds of 76-mm. ammunition at a Tiger before it had any success at all—and the next moment was destroyed by another Tiger. When some companies were down to three or four tanks and ammunition was running low, both battalions sent back for the 90-mm. tank destroyers to come up. With the help of these "can-openers," as the tankers called the tank destroyers, the Germans were beaten off, but at heavy cost to the two battalions in tanks and men. The second day's action on the Roer plain cost the 2d Armored Division 38 medium tanks, destroyed or knocked out, and 19 light tanks; 56 men killed, 281 wounded, 26 missing; and all but a few of these losses were incurred at Puffendorf.[19]

At the end of the day the American tanks were ordered to withdraw to the protection of the stone buildings of Puffendorf. The Germans did not counterattack. They were exertmely short of infantry; their own tanks were having trouble getting through the sticky mud caused by con-

[18] (1) *History 67th Armored Regiment* (Brunswick, Germany, 1945) pp. 105, 200. (2) Total commitment of Panthers and Tigers on 17 November was estimated by Ninth Army at 45. *Conquer*, p. 89.

[19] (1) *History 67th Armored Regiment*, pp. 106–08, 198–99. (2) Hell on Wheels, p. 45. (3) MacDonald, *The Siegfried Line Campaign*, p. 533. (4) Total German losses at Puffendorf are difficult to determine. 67th Armored Regiment's 1st Battalion claimed only 4 German tanks (2 to Shermans, 2 to tank destroyers). *History 67th Armored Regiment*, p. 107. Whether any of these were Mark IV's is not known. There were some Mark IV's at Puffendorf. AAR, 67th Armd Regt Jun–Dec 44. The 702d Tank Destroyer Battalion claimed 25 German tanks destroyed between 16 and 30 November, at a cost of only eight of the battalion's M36 (90-mm.) tank destroyers. See Maj M. L. Zimmerman, Report on 90-mm. Gun Motor Carriage M-36, 16 Dec 44, p. 6, Incl to Memo, Borden for OCO, 11 Jan 45, Folder C–555–S, ETO, 11 Jan 45, OHF.

tinuing rains; and their commanders knew that the 2d Armored Division's Combat Command A, with the 66th Armored Regiment, had arrived on the evening of 17 November.[20] But though the Germans failed for whatever reason to follow up their advantage, they stopped 2d Armored Division's attack cold for two days. Not until 20 November did enough ammunition and reinforcements arrive to make possible a successful three-task-force attack on Gereonsweiler, preceded by intense artillery concentrations; and it was not until 28 November, after six days of bitter, house-to-house fighting in Merzenhausen, that the 2d Armored Division reached the Roer.

Artillery, according to *The Siegfried Line Campaign,* played an important part in the battle of the Roer plain. Artillery had pinned down the German infantry, and according to the Germans the weakening of their infantry was responsible for their loss of ground. Artillery had also cost the Germans some tanks. And the big "heavies," the battalion of 8-inch guns and two battalions of 240-mm. howitzers under the 34th Field Artillery Brigade, played a spectacular role. With the help of observer planes furnished by the XXIX Tactical Air Command, they demolished two important enemy bridges over the Roer with a remarkably small expenditure of their scarce ammunition.[21]

The American tanks came off less creditably in the battle of the Roer plain. The tankers, deprived by the terrain and mud of their ability to outflank the enemy, by the congestion in the area of their usual artillery direct support, and by bad weather of much assistance from the air, had fought magnificently; but they had become disillusioned about the ability of their tanks to defeat German armor. "Our men no longer have as much confidence in their armor and guns as they used to have," one of the 2d Armored Division tankers said two days after the Roer plain offensive. Another said, "The Germans have been improving steadily ever since we met them in Sicily," and "Our Ordnance Department needs to get on the ball." [22]

This was not merely a momentary reaction from battle-weary men. After the war an Armored School report, prepared with the assistance of 2d Armored Division tank commanders who had participated in the action, stated that the most important factor in the set-back at Puffendorf on 17 November—"the biggest tank battle in 2nd Armored experience"—was "the inferiority of our tanks in guns, armor, and maneuverability." [23]

At the time of the Roer plain offensive the tankers had been impressed by the superiority of the wide German tank tracks, which barely sank in the ground, while the American tracks made trenches. The tankers complained that the Shermans were too slow to get quickly out of the way of antitank fire (as the light tanks could); that their suspensions, of the volute spring type, adversely affected maneuverability

[20] Hell on Wheels, p. 47, and app. II.

[21] (1) MacDonald, *The Siegfried Line Campaign,* p. 562. (2) Hell on Wheels, app. II. (3) Histories, 34th FA Brigade; 702d TD Bn; 265th and 256th FA Bns; and 211th FA Group. (4) *Conquer,* p. 94.

[22] Interview with seven officers and men of 2d Armored Division, in Ninth Army Operations IV, Offensive in November, Part Two, ch. 15, pp. 253–54.

[23] Hell on Wheels, pp. iii, 5, 56.

(most considered the torsion bar suspension superior in maneuverability and reliability); that their silhouette was too high; and that their armor was not much better than that of the tank destroyers. Above all, the tankers complained of their guns. They had seen their 75-mm. and 76-mm. shells bounce off the front plate of the Panthers as well as the Tigers—"like hitting them with a pea-shooter." The 76-mm. gun was better than the 75-mm. but did not have enough velocity to keep the tank out of the range of the more powerful German tank guns, which were effective at 3,000 to 3,500 yards. At practical ranges the 76-mm., even with HVAP ammunition, would not successfully penetrate the glacis plate of the Panther. "The guns are ineffective, the crews know it, and it affects their morale," the tank commanders stated. They concluded that the British had the right idea when they threw away the 75-mm. guns on their lend-lease Shermans and mounted their 17-pounders. The 2d Armored Division tankers believed that their own Shermans could easily mount a 90-mm. gun.[24]

Some assessment of the 90-mm. as an antitank gun was possible after the commitment of the 702d Tank Destroyer Battalion's M36 tank destroyers in the November Roer plain battles. The shell of the 90-mm. gun would ricochet off the 7-inch front armor plate of the Tiger tank at 3,000 to 3,500 yards; to be effective, the tank destroyers had either to get closer or attack the more vulnerable sides, and this fact the enemy evidently knew, for he had usually managed to keep his Tigers at a distance and expose only their heavily armored fronts.[25] But to say that the 90-mm. would not defeat the frontal armor of the Tiger is not to condemn it as an antitank gun. The Tiger, cumbersome and underpowered for its great weight, was mainly valuable when the Germans were in a commanding position, as at Puffendorf, dug in on the defensive. Against the Panther, which most experts considered the Germans' best tank, the 90-mm. gun was far more effective than the 76-mm. In the tank battles on the Roer plain during November, the 67th Armored Regiment with three battalions of Shermans could claim only five Panthers; the 702d Tank Destroyer Battalion armed with 90-mm. guns claimed fifteen.[26]

Not only on the Roer plain, but to a lesser extent in the Hürtgen Forest, where the wooded, boggy terrain kept the tanks road-bound, was there growing frustration with the performance of the Shermans, especially those with the 75-mm. gun.[27] And in the Battle of the Bulge, one division commander's wish for a tank with armament to cope adequately with the German Panthers and Tigers was echoed "prayer-

[24] (1) Interviews, Ninth Army Operations IV, Offensive in November. (2) AGF Board Rpt, ETO, No. 572, Proposed Changes in Organization and Equipment, 28 Jan 45, 4-3. 572/45. (3) How to Kill a Panther.

[25] History 702d Tank Destroyer Bn, Jun–Aug, Sep–Dec 44; Jnl 17–21 Nov.

[26] (1) A/A Rpts 67th Armored Regiment and 702d TD Bn. (2) For opinions on the superiority of the Germans' Panthers over their Tigers see: B. H. Liddell Hart, *The Tanks*, II, 455 and app. V; Col. G. B. Jarrett, "The Combat Efficiency of Tanks—Can It Be Expressed Numerically?", *Armored Cavalry Journal*, LIX, 2 (March–April 1950), p. 9; and Bradley, *A Soldier's Story*, p. 322.

[27] MacDonald, *The Siegfried Line Campaign*, pp. 421–24. For losses in the Hürtgen Forest from mines, mud, and antitank guns (German armor was not committed here to any great extent) see pp. 448–63.

fully or profanely—wherever the enemy panzer divisions appeared out of the Ardennes hills and forests." [28] Lacking such armament, the tankers stalked the German tanks, maneuvering to get a shot at flank or tail from behind the protection of walls and buildings, or lying in wait in a village lane until a German tank, advancing usually under cover of darkness or fog, got close enough for a kill broadside. With these tactics, with the help of individual heroic actions by tankers and by infantry with bazookas, and with the assistance of the ever-dependable artillery, the onrushing tide of the big German tanks was stemmed; but at great cost in American men and tanks. Between 20 November 1944 and 28 December 1944, losses in 75-mm. and 76-mm. Shermans amounted to 636.[29]

Attempts to Provide a Better Tank

By 1945 the tankers urgently needed a more powerful gun than the 76-mm. Firepower was their first consideration. The second was speed. Armor came off a poor third, for most believed there was more safety in speed and maneuverability than in armor. Maj. Gen. Ernest H. Harmon, commander of 2d Armored Division and one of the foremost armored commanders of the war, spoke for the majority of his fellow tankers when he described the characteristics the tank should have as "First: gun power; Second: battlefield maneuverability; Third: as much armor protection as can be had after meeting the first two requirements, still staying within a weight that can be gotten across obstacles with our bridge equipment." [30] The main reason the tankers welcomed the 200 up-armored M4 (M4A3E2) "assault tanks" (promoted by Army Ground Forces but opposed by Ordnance) that got into action in the fall of 1944 was that the tankers needed more armor in order to get close enough to the German tanks for their 75-mm. and 76-mm. guns to be effective.[31]

An attempt by the Armored Force Board in the fall of 1943 to provide the M4 with a more powerful gun, the 90-mm., had failed. Ordnance had begun development work on the 90-mm. antiaircraft gun to adapt it for use on tanks and gun motor carriages early in the war, after reports from Cairo had indicated that the Germans in Libya were successfully using their 88-mm. gun against tanks, and the new antitank 90-mm. was standardized as the M3 in September 1943. Thereupon, the Armored Force Board, believing that the M4 tank was the one tank that could be delivered in time for the invasion of

[28] Cole, *The Ardennes: Battle of the Bulge*, p. 125.

[29] (1) *Ibid.* (2) Telephone conversation between Gen Lutes and Gen Somervell in Record of Telephone Conference Held on 1 January 1945 at 1550 at Paris, ETO Ord Sec, Misc 1943–45, KCRC. (3) For statements by tank commanders, taken immediately after the Bulge, on the superiority of German tanks to American tanks, see the Armored Force Command and Center, Study No. 27 (hereafter cited as Study No. 27), p. 33, Historical Section, Army Ground Forces, 1946.

[30] (1) Letters to Editor, "Sum and Substance," *Armor*, vol. LIX, No. 4 (July–August 1950), pp. 22–29. (2) Ltr, McInerney to Campbell, 20 Dec 44, no sub, Overseas Letters (Europe) Barnes File, OHF.

[31] (1) For the development of the M4A3E2 see Maj. D. L. McCaskey, The Role of the Army Ground Forces in the Development of Equipment, Study No. 34, pp. 43–45, Hist Sec, AGF. (2) Ltr, Col Colby to Mr. F. Gordon Barber, 14 May 47, no sub, Barnes File, OHF. (3) MFR, G–4 for CofS Army Gp, 31 Dec 44, sub: Assault Tanks, 12th Army Gp, G–4 File 87 Tanks and Armored Cars.

Europe, recommended that the 90-mm. gun be installed on a thousand M4A3 tanks. Maj. Gen. Gladeon M. Barnes, chief of the Ordnance Department's Research and Development Service, refused to go along with the recommendation; and General McNair turned it down on the advice of his G–3, Brig. Gen. John M. Lentz.[32]

Barnes had nothing against the 90-mm. gun; on the contrary, he and Col. Joseph M. Colby, chief of the Development and Engineering Department at the Ordnance Tank-Automotive Center in Detroit, had done everything they could to get it to the battlefield on a gun motor carriage, over the determined opposition of Army Ground Forces, whose New Developments Division continued to insist that 75-mm. and 76-mm. guns were adequate. Thanks largely to Barnes's efforts, backed up by the Tank Destroyer Board, the M36 self-propelled 90-mm. got to Europe in time to play its part in the Roer plain battles. But Barnes did not want the 90-mm. on the M4 tank. He believed that the gun was too heavy for the tank; that it produced "too much of an unbalanced design." [33]

At the time, Barnes was in the thick of a fight, which he still hoped to win, to get a better tank than the M4 to the battlefield in 1944. The new T20 series tank, authorized by Services of Supply (later ASF) in May of 1942, was designed with more armor protection, lower silhouette, and more speed than the M4. By early spring of 1943, the Ordnance effort was concentrated on the T23. Wider, heavier, and lower than the M4, with wider tracks and therefore lower ground pressure, it had a rear drive and an electrical transmission, which made it much easier to operate. The T23 was highly maneuverable and could do 35 miles an hour, as compared with the 29 miles of the fastest M4; its frontal armor was 3 inches thick, about an inch thicker than that of most of the M4's.[34] The design, according to an impartial observer, "would have kept the United States in the forefront of medium tank development." [35] In April of 1943, ASF authorized Ordnance to procure 250 of these new tanks.[36]

Very early in the development work on the new medium tank, in the fall of 1942, Ordnance found that it was possible to mount the 90-mm. gun on the T23. Barnes was all for it, and was strongly supported by General Campbell, Chief of Ordnance; but Maj. Gen. Jacob L. Devers, then commanding general of the Armored Force, refused to go along, and in the end the T23 mounted the 76-mm. gun. In an effort to get more firepower, Ordnance produced a second design, the T25 mounting the 90-mm. gun; and a third, the T26, with the 90-mm. gun, an additional inch of armor, and tracks five inches wider. Ordnance recommended

[32] (1) Ltr, Nisley to Sayler, 11 Jun 47, no sub, Barnes File, OHF. (2) Ltr, Brig Gen Joseph A. Holly (USA Ret) to Lida Mayo, 12 Dec 60, OCMH. (3) OCO Technical Division, Medium Tank T20 Series, Chronology, Entry for 13 Sep 43, OHF.

[33] (1) Barnes, MS on 90-mm gun; and Ltr to Gen. Campbell, 11 Oct 44, sub: History of Tank Guns. Both in Folder, Tank Guns (Over-all), Barnes file, OHF. (2) Medium Tank T20 Series, Entries for 13 Sept and 7 Oct 43. (3) Colby to Barber, 14 May 47.

[34] (1) Medium Tank T20 Series, May 42–Mar 43. (2) *Catalogue of Standard Ordnance Items: Tank and Automotive Vehicles,* 1 June 1945, p. 23.

[35] Richard M. Ogorkiewicz, *Armor: A History of Mechanized Forces* (New York: Frederick A. Praeger, 1960), p. 197.

[36] OCM 20342, 24 Apr 43.

that 40 of the 250 new tanks authorized be of the T25 type, and that 10 be T26's, and ASF approved. All had the electrical transmission.[37]

Then began the battle to get the new tanks accepted by the using arms. Unfortunately, the electrical transmission laid the tanks open to some cogent objections. It added about 3,800 pounds to the weight, increasing the ground pressure and adding to the difficulty of getting the T25 and T26 over Bailey bridges (and on European railroads), even after the revision of AR 850–15 in August 1943, raising the Engineers' tank weight limitation for bridges to 35 tons. Also, prolonged tests of the T23 at Fort Knox, Kentucky, by the Armored Board indicated that the electric drive would require excessive maintenance. For these reasons, the T23 was ultimately considered unsatisfactory by Army Ground Forces for use in overseas theaters. Because of the weight consideration, the decision was made in August 1943 to convert the T25 and T26 to torquematic transmission; in this form they were redesignated the T25E1 and T26E1.[38]

Even with the weight objection removed, it seemed all but impossible to sell Army Ground Forces on the new tanks. Ground Forces was sold on the M4, so easy to ship and to handle; it was committed to the "exploitation" role of armor; it had not as yet had any experience with armored operations comparable to that of the Germans in Russia, which had led the Germans to develop the Panther and Tiger tanks. General McNair had no objection to "experimenting" with 90-mm. tanks, but felt that by supplying them AGF would be encouraging tank versus tank battles instead of giving antitank work to the field artillery and tank destroyers to which he thought it belonged. In October 1943 General Barnes's urgent recommendation for immediate production of 500 each of the new tanks, T25E1 and T26E1, and the T23 was turned down.[39]

The first breakthrough in the T25E1 and T26E1 program came a few weeks later when General Devers cabled from London a request for the highest priority for the T26. In January 1944, ASF authorized an additional 250. Though this was better than 10, it was only a fraction of what Ordnance wanted, and Barnes continued to press urgently for a thousand 90-mm. tanks. But General Moore of the New Requirements Division, AGF, continued to oppose the program; as late as mid-April 1944, AGF came up with the astonishing request that 6,000 T25E1 and T26E1 tanks be produced with the 75-mm. and 76-mm. gun. It took action by the European theater to get the 90-mm. tank program moving. Shortly before D-day, the theater asked that 75-mm. and 76-mm. tank production be stopped, and that in the future 25 percent of the tanks be armed with the 90-mm. gun and 75

[37] (1) Medium Tank T20 Series, entries for 1 Oct 42; 11, 13, 15, 20, 29 Mar 43. (2) OCM 20342, 24 Apr 43.

[38] Medium Tank T20 Series, entries for 10, 23 Aug. 43, 10 Sep 43; and (on abandonment of T23), app., Memo, CG ASF to CofS, U.S. Army, 29 Apr 44, sub: Medium Tank T–23, Barnes File, OHF.

[39] (1) Ogorkiewicz, *Armor: A History of Mechanized Forces*, pp. 198–99. (2) General Heinz Guderian, *Panzer Leader* (N.Y.: Dutton, 1952), pp. 276–77. (3) The Medium Tank T20 Series, entries for 13 Sep, 4, 9 Oct 43; and app., Memo CG ASF for Ch of Ord, 4 Oct 43, sub: Employment of the Medium Tank, M4, Armed with the 76-mm Gun M1, Barnes File, OHF. (4) Campbell Comments.

percent with the 105-mm. howitzer. Maximum production was requested with the following priorities: (1) the T26E1 (now redesignated a heavy tank); (2) the T25E1; and (3) the M4A3 with the 90-mm. gun or 105-mm. howitzer. By January 1945 the ratio of 90-mm. gun tanks to 105-mm. howitzer tanks had been reversed. The theater wanted four 90-mm. gun tanks to one 105-mm. howitzer tank, primarily because of the greater penetrative power of the 90-mm., but also because combat experience had revealed several deficiencies in the 105-mm. howitzer tank, most important the lack of a power traverse.[40]

After D-day, the disillusionment with the 76-mm. gun increased with further experience on the battlefield. Bradley noted that the 76-mm. often "scuffed rather than penetrated" the heavy armor of the German Panthers and Tigers. Aware that the British could pierce the thick-skinned Panther with their 17-pounder mounted on the Sherman, which they called the Firefly, he asked General Montgomery to equip one M4 in each U.S. tank platoon with a 17-pounder. This effort came to nothing for two reasons: first, Ordnance in England was overloaded with British orders; and second, the combat units were too short of tanks to spare any to send to England for the purpose. Bradley's solution for the time being was to use towed 90-mm. guns to form a secondary line of defense behind his Shermans.[41]

When Brig. Gen. Joseph A. Holly, chief of ETOUSA's Armored Fighting Vehicles and Weapons Section, returned to the United States in July 1944 to urge the shipment of more self-propelled 90-mm. guns, he looked into the possibility of getting a tank mounted with the 90-mm. gun. Obviously, the best bet for quick results was still to mount the gun on the M4, the tank already in large production. In Detroit Holly saw an M4 modified by Chrysler to carry the 90-mm. and thought it had "tempting possibilities." But the T26E1 production had been initiated already and had such high priority that no delivery of the modified M4 could be promised before January 1945. By that time the T26E1 would be coming off the production line in limited numbers: 10 were scheduled for October, 30 for November, 50 for December, 125 for January, and 200 for February. The decision, therefore, was to abandon modification of the M4 and devote all facilities available to furthering the production of the T26E1.[42]

After the production of the first ten T26E1's, tests showed that certain modifications were necessary, including the provision for more ammunition stowage. After these changes were made, the tank was redesignated heavy tank T26E3, and was standardized as the M26 (General

[40] (1) The Medium Tank T20 Series, entries for 18 Oct; 10, 13, 16 Nov; 9 Dec 43; 20, 31 Jan; 10, 13 Apr 44; and appens, memo, CG ASF for Ch of Ord, 8 Jan 44, sub: Change in the Army Supply Program, Medium Tank, T-26; and ltr, CG AGF to CG ASF, 1 June 44, sub: New Production of Medium Tanks. (2) AFV&W Sec Rpt, pp. 9-10, and memo, Brig Gen Frank A. Heileman for TAG, 14 Dec 44, sub: Shipment of Medium Tanks to the European Theater of Operations, ASF Dist Div 400 ETO.

[41] (1) Bradley, *A Soldier's Story*, pp. 322-23. (2) First Army Rpt 2, Vol. III, p. 5. (3) AFV&W Sec Rpt, p. 21.

[42] (1) AFV&W Sec Rpt, p. 20; (2) Ltr, Gen Holly, AFV&W Sec ETOUSA, to Col E. K. Wright, Armored Sec FUSAG, 25 Jul 44, no sub, 12th Army Gp 470.8 Tanks and Armored Cars.

Pershing).[43] General Barnes insisted that of the first 40 off the production line, 20 be sent overseas simultaneously with the shipment of 20 to Fort Knox for tests. Army Ground Forces objected, urging that the tests be made before the tanks were shipped overseas; but Barnes (threatening to go to General Marshall if necessary) appealed to Maj. Gen. Russell L. Maxwell, assistant chief of staff G–4, and won his point. The 20 T26E3's were in Europe before the end of January 1945.[44]

The Zebra Mission of February 1945

As head of a technical mission (ZEBRA) to introduce the new tanks to the European theater, General Barnes, accompanied by Col. Joseph M. Colby of the Tank-Automotive Command, Col. George Dean of the Armored Branch, AGF New Developments Division, two Ordnance captains, a representative from General Motors, and a gunner from Aberdeen Proving Ground, arrived in Paris on 9 February 1945. First there were conferences with Eisenhower and other SHAEF and COMZ officers, including Sayler and Holly, at which it was decided to get the twenty tanks into action as soon as possible. Eisenhower assigned them to 12th Army Group, and Bradley sent them all to First Army, dividing them equally between the 3d and 9th Armored Divisions. By mid-February the tanks had been delivered to the 559th Ordnance Battalion at Aachen, training was under way, and Barnes had embarked on a series of visits to army group, army, corps, and division commanders.[45]

In addition to introducing the T26E3's, the purpose of the ZEBRA mission was to obtain as much information as possible on the performance of Ordnance matériel in Europe, especially such new matériel as the M24 light tank (armed with a new 75-mm. gun) that had begun to arrive in the theater in December 1944. Barnes was also very much interested in the performance of self-propelled field guns. As an improvement on the M12 with the M1918 155-mm. gun, which had given an excellent account of itself, he had sent to the theater one experimental model of a gun motor carriage, the T83, mounting the M1 (Long Tom) 155-mm. gun; and another experimental model, the T89, mounting an 8-inch howitzer. Both were sent to VII Corps for testing. Other items on which the planners in the United States wanted reports were bazookas and rockets fired from multiple rocket launchers. Before D-day, 4.5-inch artillery rockets (designed to be fired either from aircraft or from the ground) had been sent to the European theater. They were fin-stabilized, that is, stabilized in flight by fins that opened when the rocket left the tube. Two types of multiple launchers had been provided: the T27, an 8-tube launcher on a fixed framework mount, which could be fired either from the ground or the bed of a truck, and

[43] OCM 26038, 14 Dec 44, and OCM 27123, 29 Mar 45.

[44] (1) The Medium Tank T20 Series, entries for 12, 14, 18, 22 Dec 44. (2) Memo, Maxwell for CG ASF, and CG AGF, 19 Dec 44, sub: Shipment of T26E3 Heavy Tanks to the European Theater of Operations; Memo, CG ASF for CofOrd, 22 Dec 44, sub: Establishment of Priority for Issue of the Heavy Tank, T26E1; MFR. All in ASF Distrib Div 400 ETO. (3) AFV&W Rpt, p. 22.

[45] Ltr, Maj Gen G. M. Barnes to Maj Gen L. H. Campbell, Jr., 6 March 45, sub: Report of Heavy Tank Mission (hereafter cited as ZEBRA Rpt), OHF.

the T34, a 60-tube cluster to be mounted on the Sherman tank.[46]

In his conversations with the commanders in Europe, Barnes described new matériel that was not yet ready for shipment: a "supervelocity" 90-mm. gun, the T15, with which he said a large portion of the T26E3 tanks were to be equipped; and three heavy tanks, the T28, an "assault tank" weighing 90 tons with twelve inches of armor, mounting the new 105-mm. antiaircraft gun; and the T29 and T30, which were similar in chassis to the T26 series, but mounted, respectively, the 105-mm. gun and the 155-mm. Barnes also had photographs of the new 57-mm. and 75-mm. recoilless rifles and a wheeled mount for a multiple rocket launcher, the T66, which would fire a new 4.5-inch rocket that did not depend on fins, being "spin-stabilized"—rotated by a flow of gases through eight canted vents.[47]

The response to the ZEBRA mission showed plainly that theater needs could be summed up in two words: firepower and mobility. The commanders liked the T26E3 Pershing tank and would have liked it even better if it had carried the T15 90-mm. gun. They liked the light tank M24 very much. They had been converted to self-propelled field guns by the M12, and wanted large quantities of such guns of the Long Tom and 155-mm. howitzer type. They did not want the T23 tank with the electrical transmission. Most commanders were not very much interested in the very heavy T28, T29, and T30 tanks, for they did not see how these tanks could be got over roads and bridges. They were definitely interested in the recoilless rifles. On the performance of the bazooka, opinions varied. The general feeling was that it was good but ought to be better. One assistant division commander complained that "we're still using the model we started with" while the Germans have "taken our bazooka idea and improved upon it." The Germans had produced more deadly antitank weapons of this type in their *Panzerschreck* and *Panzerfaust,* both of which, however, were extremely dangerous to the user. The *Panzerfaust,* a recoilless weapon firing a hollow-charge grenade, would pierce seven or eight inches of armor plate. Some U.S. combat officers collected all they could get their hands on for their troops; one tank officer considered the *Panzerfaust* "the most concentrated mass of destruction in this war." [48]

The 4.5-inch ground rocket had been used very little. First Army, converting a 105-mm. howitzer battalion into a rocket battalion with the T27 launcher early in November 1944, had employed the rockets a few times in Hürtgen Forest in mid-November with "excellent results," accord-

[46] (1) ZEBRA Rpt. (2) Barnes, *Weapons of World War II,* pp. 185–86.

[47] (1) ZEBRA Rpt. (2) Green, Thomson, and Roots, *Planning Munitions for War,* p. 353. Spin-stabilization, which made the rocket more accurate, was copied from a captured German rocket. *Ibid.*

[48] (1) Ltr, Brig Gen R. B. Lovett for ETO Theater Comdr, to CG ASF, 7 May 45, sub: Report on Heavy Tank Mission, O.O. 350.05/19549. (2) Ltr, Barnes from Hodges, 11 Mar 45 app. I to ZEBRA Rpt. (3) Jarrett, Achtung Panzer, pp. 160–62, MS, Jarrett Collection. (4) Memo, Hull, ACofS OPD for Borden, 29 Mar 45, sub: Comments on German Bazooka and Various American Weapons, OPD 471.61. (5) Ltrs, 30 Oct 44, 14 Jan, 15, 23 Feb 45, 29 Apr 45, Personal Letters, Lt Col John K. Boles, Jr., Third Armored Division, copies in possession of Dr. Sidney T. Mathews. (6) On the need for a more powerful American bazooka, see AGF Bd Rpt, ETO, No. 572, 28 Jan 45, 4-3.572/45.



GENERAL BARNES, *during* ZEBRA *mission.*

ing to General Hodges; but the artillerymen were not enthusiastic, disliking the inaccuracy of the rocket and the smoke and flash that attracted counterbattery fire. Because of the smoke and flash, a "shoot and scoot" technique was evolved, using the launchers on trucks, weapons carriers, or, preferably, jeeps. The need for more inherent mobility in the mount and better accuracy in the rocket led commanders to believe that the new T66 launchers on a wheeled mount, firing the new spin-stabilized rocket, would be quite valuable. As to the T34 launcher on the Sherman tank, First Army did not want it because of the disadvantages of mounting the launcher on the tank. One Third Army tank battalion that did employ the T34 briefly was appreciative of the morale effect of this great concentration of firepower, but recommended that the launchers be mounted on light tanks rather than M4's. They had found the difficulty of jettisoning the launchers resulted in the loss of the Sherman tank as a fighting vehicle.[49]

At the time of the ZEBRA mission, interest naturally was centered on the Pershing tank. Although the theater refused to subscribe to a blanket statement that the Pershing with the M3 gun was superior to the Panther or Tiger, all commanders considered it a step in the right direction and wanted all the Pershing tanks they could get as soon as possible. In the meantime they would settle for the M4 with the 76-mm. gun and as much HVAP ammunition as was available. They emphatically wanted no more M4's with the 75-mm. gun.[50] When Colonel Colby tried to sell the battalion commanders of the 3d Armored Division on the Shermans they already had (being unable to offer them anything better on a large scale immediately), he ran into a hornet's nest. After the heavy casualties of the winter, they were beginning to regard the 75-mm. Shermans as deathtraps.[51]

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[49] (1) Ltr, Hodges to Barnes, 11 Mar 45. (2) The 4.5-inch T27 had been first introduced in combat in the Lorient sector in Brittany in mid-October 1944 by the 94th Division, but its use there was brief and inconclusive. Lt. Lawrence G. Byrnes, ed., *History of the 94th Infantry Division in World War II* (Washington: Infantry Journal Press, 1948), p. 48. (3) AGF Bd Rpt, ETO, No. 427, 4.5 Rockets and Launcher T-27, 5 Dec 44, 4-3.427/44. (4) Unit Rpt of Action - 18th Field Arty Bn, 4 Jul-Sep, Nov-Dec 44. (5) First Army Rpt 2, Annex 5, p. 50. (6) History 702d Tank Bn, Jan-May 45.

[50] (1) Ltr, Lovett for ETO Theater Commander to CG ASF, 7 May 45. (2) Ltrs to Gen Barnes from Gens Bradley, Hodges, Collins, Rose, and Palmer, 2-11 Mar 45, app. to ZEBRA Rpt.

[51] (1) Boles Ltrs, 27 Jan, 23-24 Feb, 1, 6 Mar 45. (2) At least one tanker in 2d Armored Division had six M4's shot out from under him during the war. Letters to Editor, "Sum and Substance," *Armor,* vol. LIX, No. 5 (Sep-Oct 50), p. 22.



CONVOY OF PERSHING TANKS MOVES THROUGH A GERMAN TOWN

Before Barnes returned to the United States, he asked General Campbell by teletype on 5 March 1945 to ship immediately all the Pershings available, as well as all available HVAP ammunition for the 76-mm. and 90-mm. guns; and to expedite the production of the T15 90-mm. gun and ammunition and the shipment of the twenty-five T83 self-propelled guns produced in February. Campbell promised to do "everything humanly possible" to get the Pershings to the theater on the highest priority, and was backed up by ASF's Theater Branch after a personal cablegram from General Eisenhower to General Somervell on 8 March. But the tanks would not effect the outcome of the war in Europe.[52]

On 23 March, 157 Pershings left the United States and another 53 were at port or en route. By the time they arrived, the armies were on their way into Germany. When General Borden, on a visit to the theater, caught up with Third Army in Frankfurt on 8 April, he discovered that Patton had not yet received any Pershings. Ninth Army had received nineteen by the end of March but as late as mid-April none had been issued to troops because Ninth's armored units had been moving so fast that they had not had time to spare

[52] Report of Teletype Conference, 5 Mar 45, app. F to ZEBRA Rpt.

tank crews to send back for training. In the last two weeks of April, the Pershings began to arrive in greater quantity. Third Army, for example, had ninety by the end of the month. On V–E Day there were 310 in the theater, of which about 200 had been issued to troops. But because of the difficulty of transporting them, and the time required to train crews in maintenance and operation, it is safe to say that the only Pershings that got into effective action were the 20 experimental models that First Army had received in February.[53]

As to the T15 90-mm. gun, only one got to the theater. When Borden visited SHAEF headquarters on 2 April, the first question General Eisenhower asked him was when the tanks with the "super guns" would arrive. The earliest date Borden could give him was June. Eisenhower said he hoped to have the Germans licked by then.[54]

Lacking the Pershings, the war was fought with the M4 Shermans, which continued to pour off the production lines. At the time of the Rhine crossings, 7,620 were in theater stocks. About 40 percent were of the 76-mm. gun type, but attempts to provide HVAP ammunition for the 76-mm. were hampered by the shortage of tungsten carbide. Because of production difficulties, receipts of HVAP before 1 March 1945 were less than two rounds per gun per month. By January 1945 there were enough M4's to enable the 12th Army Group to make a last-ditch effort to provide better firepower by installing the British 17-pounder. Here again the limiting factor was ammunition. British 17-pounder ammunition supply could support only 160 17-pounder American Shermans and by the time the first of them arrived in the combat area, the war was ending.[55]

Shortly before the drive into Germany, the American press broke the story that American tanks were inferior to those of the enemy. Hanson W. Baldwin in the New York *Times* and the editor of the Washington *Post* demanded to be told why; and the story traveled to Europe.[56] Questioned by American correspondents at a press conference in mid-March, General Patton publicly defended American tanks. He also wrote a letter to Lt. Gen. Thomas T. Handy, Deputy Chief of Staff, which the War Department released to the American papers, stating that while the Tiger would destroy the Sherman head on, the Sherman could usually manage to attack from the rear and avoid a slugging match; moreover, the Sherman was incomparably more reliable and long-lived, as well as easier to ship and handle, than the Tiger. Patton wrote the letter because he wanted

[53] (1) Ltr, Maj Gen G. M. Barnes to Col J. M. Colby, 23 Mar 45, no sub, Overseas Letters (Europe), Barnes file, OHF. (2) Trip Rpt, Brig Gen William A. Borden and Lt Col Harry Turner, 24 Apr 45, Borden Personal file, OHF. (3) AAR for Period ending 31 Mar 45, Ninth Army G–4 Rpts, Ord Sec. (4) 12th Army Gp Ord Sec Jnl, entries for 7 Apr–24 May 45. (5) Third Army Rpt, vol. II, Ord, pp. 27–28. (6) Major Supply Problems in Oversea Theaters During the Fiscal Year 1945 and ASF Performances in Meeting Oversea Supply Needs, p. 5, ASF Planning Div, Theater Br files. (7) AFV&W Sec Rpt, p. 22. (8) On the length of time required to train crews in maintenance and operation see Ltr, G. B. Jarrett to Lida Mayo, 11 Dec 63 and incl, Ltr, Col Robert J. Icks (USA Ret), to G. B. Jarrett, 8 Dec 63, OCMH.

[54] (1) Ltr, Lovett for ETO Theater Comder to CG ASF, 7 May 45. (2) Borden Rpt, 24 Apr 1945.

[55] (1) Ruppenthal, *Logistical Support of the Armies*, vol. II, pp. 454, 457–58. (2) AFV&W Sec Rpt, pp. 20–21.

[56] Green, Thomson, and Roots, *Planning Munitions for War*, p. 278. The Baldwin article appeared in the New York *Times* of January 5, 1945.



HOW CARTOONIST BERRYMAN SAW THE TANK CONTROVERSY. *From the Washington, D.C., Evening Star, March 25, 1945.*

to stop what he called "the foolish criticism" of American tanks which he believed was having a bad effect on the morale of the soldiers at the front.[57] But privately he had stated to a visiting Ordnance officer, just after the Battle of the Bulge, "Ordnance takes too God Damn long seeking perfection at the expense of the fighting men, and you can tell that to anyone at Ordnance." The officer believed that Patton was expressing the feelings of the

[57] (1) Green, Thomson, and Roots, *Planning Munitions for War*, p. 278; (2) Washington *Post*, 28 Mar 45 and Washington *Evening Star*, 27 Mar 45; (3) Patton, *War As I Knew It*, p. 263.

using arms.[58] It was natural enough for the tankers at the front to blame Ordnance for the heavy casualties they had suffered fighting in the Shermans.

Who was to blame? The Army Ground Forces New Developments Division criticized Ordnance for spending too much time on developing and promoting the T23 tank with the electrical transmission, which was not wanted, and the heavy tanks M6, T28, T29, and T30, which the AGF had turned down repeatedly because of road and bridge limitations.[59] General Barnes and Colonel Colby maintained that the best American tank of the war, the Pershing, had been developed in the face of "bitter opposition" by the using arms. Colby believed that if AGF had given the go-ahead early enough, the Pershing could have been available in quantities for the beachhead landings on D-day; and the record supports his belief.[60]

The pros and cons of the tank controversy have usually been discussed in terms of the argument between Army Ground Forces and Ordnance tank designers in the United States. Ordnance officers in the European theater recognized a third point of view—that of many officers of the Armored Force, especially those in the theater. While it was true that the Armored Force officers could not wholly agree among themselves, there was a strong feeling among them that the Pershing could not (for whatever reason) be got to the theater in time to be of any real value, and therefore the first priority on tank development should be to eliminate the bugs from the M4 and then to modify it to take the 90-mm. gun.[61] If only as insurance against the failure of the Pershings to get into action, this modification of a thousand M4's might well have been attempted when it was first proposed by the Armored Force Board in September 1943. In retrospect it seems to have been worth trying, and if successful it would in some measure have provided the tankers with the firepower they needed in Europe, from the breakout to the last defenses on the Rhine.

[58] Ltr, Capt Cleves H. Howell, Jr., to Chief, Research & Development Service, OCO, 2 Feb 45, sub: Overseas Mission, OHF.

[59] McCaskey, The Role of Army Ground Forces in the Development of Equipment, pp. 37–61.

[60] (1) Col. Joseph M. Colby, "From Designer to Fighter," *Armored Cavalry Journal*, LIX, 1 (January–February 1950), p. 14. (2) Ltr, Colby to Barber, 14 May 47. (3) See T20 Chronology cited above, p. 329, n32(3). The AGF's objection to the electrical transmission had been removed as early as August 1943, when torquematic transmission was installed in the T26.

[61] Ltrs, Nisley to Sayler, 11 Jun 47; Holly to Mayo, 12 Dec 60; and Medaris to Pattison, 28 Oct 63.

CHAPTER XVIII

Victory in Germany

By mid-February 1945 the time had come for simultaneous blows against Germany from east and west. In the east, the Red Army, having renewed its winter offensive in mid-January and captured Warsaw, had reached the Oder. On the western front, in the center the U.S. First and Third Armies had driven the Germans from the Bulge and in the south, U.S. Seventh and French 1st Armies had driven them out of the Colmar Pocket, their bridgehead on the upper Rhine. In the north, Ninth Army, operating with the British 21 Army Group, had pushed the Germans across the Roer in the narrow but stubbornly held region between Linnich and Düren.

Supplies for the Last Campaign

On 24 February 1945 General Sayler called a meeting in Paris of all the top Ordnance officers in Europe—the first such meeting since the invasion in June 1944. From SHAEF, army groups, armies, Continental Advance Section, Advance Section, and base sections they came to the six-story Marignan building at 33 Champs Elysees that housed the Communications Zone Ordnance office. Over the building flew an Ordnance flag—the familiar yellow flaming bomb on a red field; and as the conferees passed through the lobby they saw over the elevators a sign that read: "Let no soldier's ghost ever say —Ordnance service let me down." [1]

Col. Benjamin S. Mesick came from SHAEF, General Nisley from 12th Army Group, and Col. William I. Wilson from 6th Army Group. For the first time, both army groups were looking to Communications Zone for support, for on 12 February the Southern Line of Communications supporting U.S. Seventh and French 1st Armies had been dissolved. This added Continental Advance Section and Delta Base to the COMZ sections. Brig. Gen. Selby H. Frank, formerly Ordnance officer of SOLOC, had become Sayler's deputy, and was presiding at the conference; General Smith, Ordnance officer of Seventh Army, was present, accompanied by Colonel Le Troadec of 1st French Army and Colonel Artamonoff. From the northern group of armies came Medaris and Nixon, and also Lynde in a new role as Ordnance officer of Fifteenth Army, which was not yet operational, although its command post had been set up in Paris early in January. Warner was absent, for he had pressing business elsewhere. The day before,

[1] (1) Min, Ordnance Staff Officers Meeting. . . February 24–25, 1945 (hereafter cited as Ord Staff Offs Mtg) Ord Serv ETO, Plan and Organ, Annex 43, OHF. (2) "Planned Victory: Top Ordnance Officers Confer in the European Theater," *Army Ordnance,* XXIX, 151 (July–August 1945), p. 74. (3) Sayler's flag is now in the Ordnance Museum, APG.



THE ORDNANCE CONFERENCE IN PARIS, FEBRUARY 1945. *Left to right, Colonel Lynde, Fifteenth Army; Colonel Wilson, 6th Army Group; Colonel Le Troadec, 1st French Army; Colonel Medaris, First Army; Colonel Nixon, Third Army; General Sayler, Chief Ordnance Officer, ETO; General Frank, Deputy Chief Ordnance Officer, ETO; General Nisley, 12th Army Group; Brig. Gen. Edward W. Smith, Seventh Army; Col. G. S. Kennedy, representing Colonel Warner, Ninth Army.*

Ninth Army (attached to Field Marshal Montgomery's 21 Army Group) had launched its attack across the Roer that signaled the beginning of the American final push in Germany.[2]

How well would the coming campaign be supported? COMZ officers indicated that little improvement could be expected in ammunition supply until fall; on specific wanted items like HVAP and POZIT fuzes, everything depended on unpredictable shipments from the United States. On the other hand, the weapons situation was good except for a few items such as heavy artillery tubes. Automotive supply —a matter of the greatest importance in a war of movement—was improving. Truck engines would be short until sometime in May, but tires and tubes were coming off production lines in France and Belgium in increasing numbers: 35,000 were expected in February as compared with 5,000 in January. On the whole, Communications Zone considered the supply situation "very favorable." [3]

The assembled officers were assured that the armies could count on well-stocked general supply depots. There were four types of depots handling Ordnance Class II supplies on the Continent: (1) base, of which there were two, one at Cherbourg and one at Marseille, both with the function of relieving the ports and supporting

[2] (1) Ord Staff Officers Mtg; (2) Hist Ord Serv ETO, Plan and Organ, pp. 192, 200–202, 236, OHF.

[3] (1) Ord Staff Officers Mtg, p. 26; (2) For details on the ammunition and Ordnance Class II and IV supply situation at this time see Ruppenthal, *Logistical Support of the Armies*, Vol II, pp. 441–43, 453–54.

the intermediate depots; (2) intermediate, to support the armies; (3) distribution, to support COMZ units; and (4) advance or mobile depots to follow the armies. The Ordnance officers of the armies were most interested in the intermediate depots; Medaris, for one, stated bluntly that as far as First Army was concerned, advance depots were of no value. They were told that there would eventually be three intermediate depots on the Continent. One, O–644 at Paris, had been in operation for some time; O–656 had just been completed at Antwerp and would be open on 15 March to take over from O–644 the job of serving First and Ninth Armies; a third was to be located in the neighborhood of Nancy to serve the U.S. Seventh and French 1st Armies.[4]

Communications Zone's optimistic forecasts were received with reservations by the Ordnance officers at army level, for most of them had been badly disillusioned by their experiences with supply in the fall of 1944. Considerable skepticism on Communications Zone's ability to support the offensive adequately was aired during the discussions on the second day of the conference. One problem had been plaguing the armies for some time—the shortage of Ordnance service units, particularly tank and other heavy maintenance companies, depot, evacuation, and ammunition companies. COMZ agreed at the conference to assign to the armies from its own service troops a limited number of those most urgently needed.[5]

Toward the end of the meeting, there was a lively discussion on a topic that had been introduced by Colonel Mesick of SHAEF—what to do with captured or surrendered enemy matériel. The basic directive had been issued in September 1943 by the Combined Chiefs of Staff. It provided that all usable captured enemy matériel that the theater commander did not need was to be reported to the London Munitions Assignments Board and that all unusable matériel, or battle scrap, would be reported to the Combined Raw Materials Board. After the Normandy invasion, especially after the optimistic predictions at the end of September 1944 that there would be a collapse or surrender of the enemy, SHAEF had attempted to set up guidelines for implementing the directive; the latest directive, then being formulated, declared that disposal would be a COMZ responsibility, with ADSEC and CONAD troops taking over progressively from army troops. The catch in this, as Mesick admitted, was that SHAEF did not plan for ADSEC and CONAD to go into Germany. The heavy burden would presumably fall on the armies, and would take a tremendous amount of Ordnance manpower, especially the task of collecting and guarding captured ammunition.

The disposition of enemy matériel, "the most difficult thing ahead of us," according to Medaris, was not settled at the conference. In discussing it Medaris made an interesting estimate of the coming cam-

[4] (1) Ord Staff Officers Mtg, pp. 17–19; (2) For a discussion of problems of Ordnance ETO depot operations in the spring of 1945, including the changeover in the stock numbering system, see a trip report by Lt. Col. Gerard M. Ives of the Ordnance Department, 12 Apr 45, quoted in Hines History, vol. III, pp. 546–61, OHF.

[5] (1) Ord Off Mtg, pp. 50–53, 74. (2) 12th Army Gp Ord Sec Rpt, entries 17 Dec 44 to 9 Mar 45. (3) Ltr, CG 12th Army Gp to SHAEF, 10 Feb 45, sub: Allocation of Ordnance Service Troops, 12th Army Gp, 322 Ordnance Units.

paign: "In the Armies we do not see any possibility of formal surrender. I do not think we quite see eye to eye with the statement that we will fight our way to the Russian lines. From our G–2 reports we expect a progressive collapse . . . perhaps a platoon will surrender one day, a battalion another, a Division the next and then a Regiment." The coming defeat of Germany, he believed, would not end in "the type of surrender where you sit on a rampart and wave a white flag." [6]

Across the Rhine

Ninth Army crossed the swollen Roer in the rain before dawn on 23 February as part of Operation GRENADE, 21 Army Group's offensive from the Roer to the Rhine. The first elements, infantrymen of the 30th, 29th, 102d, and 84th Divisions, crossed in assault boats, preceded by a 45-minute artillery preparation from a thousand guns that shook the earth and illuminated the sky along the narrow 30-mile Ninth Army front from Düren on the south to Roermond on the north. Next day, after the infantry had established a bridgehead, tanks, tank destroyers, field artillery and division supply trains crossed on bridges constructed by the Engineers.[7]

Thanks to Ninth Army Ordnance, the firepower of the tank destroyers and tanks had been considerably increased before the Roer crossing: two tank destroyer battalions had been converted from 3-inch guns to 90-mm. guns; one M5 light tank battalion had been supplied with the new M24 tanks; and the 76-mm. gun had been substituted for the 75-mm. in the M4A3E2 "assault tanks." The advance armor met stiff resistance on the east bank of the Roer by remnants of several German panzer divisions, but this was momentary. Time was running out for the enemy. Some of the German tankers were forced to fight as infantry because they had no gasoline; and on 28 February, when the weather cleared, the panzers suffered punishing attacks from American fighter-bomber pilots who claimed sixteen tanks. At one point fighter pilots swooped down on a slugging match between Shermans and Tigers and damaged six of the Tigers.[8]

By 11 March, Ninth Army's XIX, XIII, and XVI Corps had closed to the Rhine, and GRENADE was over. But Ninth Army had lost its chance to capture a bridge when the last one in its sector was blown by the Germans on 5 March, and its chance of being the first American army over the Rhine, for First Army crossed over its bridge at Remagen on 7 March. By order of Field Marshal Montgomery, who wanted the crossing co-ordinated with that of his British and Canadian armies, Ninth's Rhine crossing (code name FLASHPOINT) was not to take place until 24 March.[9]

Colonel Warner's efforts to provide Ordnance support for both GRENADE and FLASHPOINT were essentially similar, for both operations involved a river crossing with a fast-moving action anticipated on the far bank. Also, in both operations there was a delay of about two weeks before the jump-off (in GRENADE to allow the Roer to subside after the dams were broken, and in FLASHPOINT because of Montgomery's plan) that gave him time to

[6] Ord Staff Officers Mtg, pp. 38–43, 69–73.
[7] *Conquer*, pp. 161–75.
[8] (1) NUSA Ord Rpt, 15 Feb 45. (2) *Conquer*, p. 181.
[9] *Conquer*, pp. 199–243.

bring up supplies. He was able to keep his ammunition stocks at around 40,000 tons. His Class II and IV supply situation was good at the time of the Rhine crossing, partly because losses at the Roer were lighter than expected, partly because he had expedited the flow of tanks and other items by close liaison with COMZ depots and by using army personnel to bring supplies into the army area. In February and March, Ninth Army received 484 Sherman tanks. To provide the armored forces with quick replacements, Warner set up a mobile depot to supply armored equipment to front-line troops, operating it with a converted antiaircraft maintenance company, the 300th. The forward issue depot was so successful in GRENADE that it was repeated in FLASHPOINT. It was not easy to keep the heavy equipment moving. For one thing, the Class 40 Engineer bridges over the Rhine would not take a tank transporter with its load. Drivers had to unload tanks at the bridge, drive them across, and load them again on the opposite side. But in spite of these and other troubles, the forward issue depot managed to keep within usable distance of even the speedy 2d Armored Division in its dash to the Elbe, and for this feat received a handsome commendation from the tankers.[10]

The versatility of Ordnance maintenance companies was also demonstrated by the use of a heavy tank maintenance company to process and test the hundred LVT's used by XVI Corps in the initial Ninth Army Rhine crossing. The company was augmented with all the Ninth Army Ordnance men who had had any experience with LVT maintenance, and the problem of nonexistent spare parts was met by cannibalizing the LVT's that had been wrecked in the Roer crossing. The LVT's were especially valuable in the Rhine crossing because they required no special river entrances or exits. The other Navy landing craft that were used, the LCM's and LCVP's, and the Seamules were much heavier and harder to handle.[11]

Evacuation companies with M25 tank transporters were used to help the Navy bring the assault boats up to the Rhine. This was done not only in the Ninth Army crossing but in Third Army crossings around Mainz on 22–23 March. The Navy men would lash a huge cradle to the transporter with ropes, lift the big LCM with a crane so that the transporter could drive under it, and then lower the craft into the cradle, creating "a monster on wheels" (as one Third Army historian described it), seventy-two feet long and more than seventeen feet high. For the first time, the big M25 tank transporters looked small. When the strange, unwieldy convoys made their journeys to the Rhine, towns had to be bypassed because the rigs could not turn sharp corners, roads had to be widened, bridges reinforced, communications wires lifted so that they would not be torn down, and obstacles ahead blown up by demolition squads. When the monsters reached the Rhine, leaving behind them in places a wake of branches from trees along

[10] (1) NUSA Ord Rpts for Feb, Mar, Apr; (2) Hist 300th Maintenance Company AA, with ltr, Lt Col Allan L. Harts, Ord Off 2d Armored Division to Ordnance Officer NUSA 26 Apr 45, sub: Commendation, in ETO Ord Sec Files, KCRC; (3) Hist 486th Evac Co, 23 May 45, ETO Ord Sec, KCRC.

[11] (1) NUSA Ord Sec Rpt 15 Mar 45. (2) Hist 561st Ord HM Co (Tank), 15 Feb 43–7 Nov 45. (3) *Conquer*, p. 246.

the roads, the transporter crews backed them into the water and unloaded the landing craft, working up to the zero hour under shellfire from German 88's across the river. Sometimes they had trouble shaking off their loads. One Ninth Army transporter after being hit by an 88 shell had to be completely submerged before the landing craft could be pulled free.[12]

When Seventh Army crossed the Rhine in the Worms area on 26 March, all of the four front-line American armies were on the far bank, leaving the Fifteenth behind as a semioccupation army. First Army, breaking out of the Remagen bridgehead, joined elements of Ninth Army at Lippstadt on 2 April, thus encircling the huge Ruhr industrial area. First Army then sent III and XVIII Corps west and north to join with other elements of Ninth Army in cleaning out the Ruhr pocket and directed V and VII Corps east toward Leipzig and the Hartz Mountains. Part of Ninth Army also kept going east; on the evening of 11 April, 2d Armored Division's Combat Command B, having covered 226 miles in nineteen days, was at Magdeburg and Schönebeck—the first Americans to reach the Elbe. By 19 April all resistance in the Ruhr pocket had ceased and First Army's V and VII Corps stood on the west bank of the Mulde River, where a few days later they made contact with the Russians. Meantime, Third Army had been turned south to aid Seventh in mopping up southern Germany.[13]

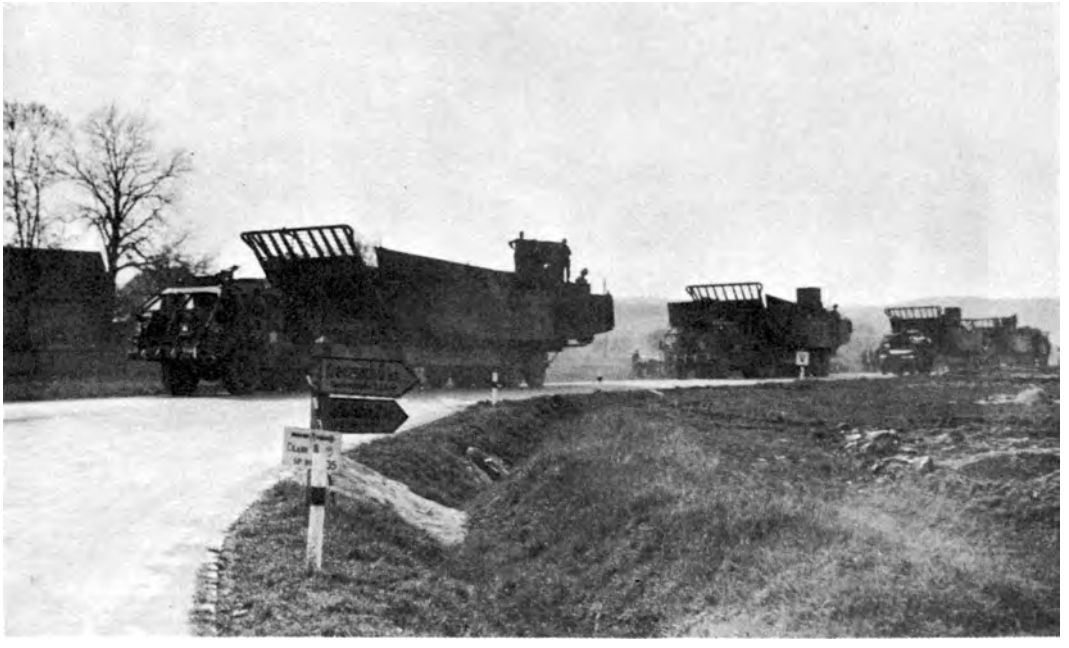
Ordnance service to all the armies was mainly concerned with pushing supplies forward and keeping the trucks rolling. By the second week in April two rail bridges were in operation over the Rhine, one at Wesel, the other at Mainz, but rail traffic beyond the Rhine did not supplant truck transportation until about the last two weeks of the war in Europe, after the armies in the north were halted at the Elbe and Mulde.[14] With the help of Quartermaster truck companies, the considerable lift provided by the tank transporters of the evacuation battalions, which carried not only tanks but gasoline and ammunition, and by loading the Ordnance companies and replacement vehicles with all they could carry, the armies moved their supplies forward. The main problem was keeping up with the fast-moving combat troops along a 200-mile front. Enemy resistance—consisting toward the end mainly of sporadic fire from 88-mm. antiaircraft guns, small arms, and *Panzerfausts*—grew weaker every day.

When the supply and maintenance trains set out the roads were bad, disintegrating from the spring thaw and from the winter's pounding by heavy military vehicles; but once the trucks got past the West Wall and onto the Rhine plains they could make excellent time. Sometimes the Ordnance units were ahead of the infantry and armor, getting into combat and taking prisoners; sometimes, bypassing pockets of enemy resistance, they even got ahead of the Germans. One Third Army ammunition company (the 620th) had its ammunition supply point overrun by German troops at-

[12] Histories 458th, 471st, 486th, and 498th Ord Evacuation Cos, KCRC.

[13] (1) Seventh Army Rpt, Vol III, pp. 755–837; (2) Bradley, *A Soldier's Story*, pp. 528–31; (3) *Conquer*, p. 298; (4) FUSA Ord Sec Rpt 1 Apr–8 May 45.

[14] Ruppenthal, *Logistical Support of the Armies*, Vol II, pp. 409–12.



LCM's Being Moved to the Rhine for Third Army Crossing

tempting to escape to the east, and lost to the enemy eleven men killed or wounded.[15]

Speeding over the autobahns, the Ordnance men were reminded of the race across France the preceding fall. The autobahns were wide enough for ammunition supply points to be strung out along their edges, though the ASP's were hardly set up until they had to be moved forward. Everywhere the men found excellent, if temporary, shop space and living quarters in factories, breweries, and German barracks, and thanks to their earlier experience they were veterans, able to move forward with what First Army Ordnance Section described as "almost circus-like" precision, breaking bivouac and setting up shops and ASP's in new areas without interrupting their service to the combat forces.[16] And victory was in the air. By mid-April 12th Army Group was rounding up trumpets and drums for the V–E Day celebration, instructing the armies to supplement their meager supplies of band instruments with German instruments to be found in the huge stocks of enemy matériel that were being overrun in every sector.[17]

[15] (1) Histories 974th Ord Evacuation Co (Coll) Feb 43–May 45; 107th Medium Maint Co, and other unit histories. (2) Third Army Rpt II, Ord Sec, p. 29.

[16] (1) FUSA and NUSA Ord Sec Rpts, March, Apr 45; (2) Seventh Army Rpt III, pp. 735–77; (3) 12th Army Gp Ord Sec Rpt 10 Mar–9 May 45; (4) ADSEC Ord Sec Hist, pp. 21–26; (5) Histories 7th, 107th, 126th, 255th, 302d MM Cos; 300th and 305th MM Cos (AA); 889th HAM Co; 85th and 552d HM Cos (Tk); 100th and 101st Amm Bns.

[17] SHAEF Daily Report from 12th Army Group, 11 Apr 45, SHAEF G–4 319.1 Daily Reports to ACofS G–4–12th Army Group Vol I 1945.



COLONEL MEDARIS EXAMINING CAPTURED GERMAN WEAPONS

Captured Enemy Matériel

German towns yielded stacks and piles of rifles, pistols, shotguns, knives, bayonets, ammunition, demolition charges, hand grenades, and *Panzerfausts* that had been turned in to the burgomeister by the townspeople; the Ruhr and other manufacturing regions yielded big industrial plants; and as the armies penetrated deeper into Germany they came upon ordnance depots, ammunition dumps, and proving grounds abandoned by the fleeing Wehrmacht. The tactical units who discovered these great stores had the job of protecting them, particularly such items as small arms, explosives, grenades, *Panzerfausts,* and booby trap components that could easily be used by enemy snipers or saboteurs. Thereafter, procedures for handling captured weapons, ammunition, and other ordnance items varied between First, Ninth, and Third Armies—the three armies in whose areas the greatest amounts of captured enemy matériel were found.

Anticipating the size of the job, on 17 March 1945—a few days before the breakout at the Remagen bridgehead—Medaris set up in his First Army Ordnance Section an Enemy Property Division, consisting of three officers and six enlisted men, and gave it responsibility for enemy matériel.

For the task of locating, guarding, controlling, inventorying, and disposing of it, he used a new battalion headquarters just assigned to him, the 190th, placing under it an evacuation company (collecting), a depot company, an ammunition company, a heavy maintenance (field army) company, and a bomb disposal platoon and squad. Augmented with hired Italian displaced persons and additional trucks, and working under the Enemy Property Division, the battalion collected, examined, and catalogued enemy installations and matériel, on occasion sending out search parties to supplement the information received from tactical units. In April, as hundreds of installations of an ordnance nature were uncovered, the search teams were given "targets"—especially vital factories, plants, and dumps—to look for; and the battalion received another ammunition company and two bomb disposal squads to help evacuate and safeguard vast quantities of enemy ammunition and explosives. Ammunition was found not only in enemy dumps, but around gun positions, along roads, on rail cars, and underground, and was the greatest problem of all.[18]

Ninth Army early in April gave its three corps the responsibility for policing captured and overrun matériel, instructing them to use for this purpose any units under their control that were not engaged in combat and to use a minimum of army Ordnance units. Corps collecting points for this type of matériel were to be operated separately from army collecting points. Later in the month, when combat had virtually ceased, corps delegated the job to the divisions.[19] In Third Army, beyond assigning to the 82d (Ammunition) Ordnance Group the task of disposing of captured or abandoned equipment that threatened security, Nixon did not set up any special machinery for dealing with captured enemy matériel, but by the end of April the problem had become so great that he was contemplating the assignment of an Ordnance battalion to handle it. In Seventh Army, the job was handled by the forward Ordnance Group, the 55th, which was furnished by the rear group with a heavy automotive company to provide men for investigating, inventorying, guarding, and evacuating captured enemy matériel.[20]

In all the areas, a great deal of enemy ammunition was exploded under the supervision of the heroic, indispensable bomb disposal squads. For this dangerous work the squads had not been adequately trained. Their training had been directed toward handling enemy bombs, which were the big threat at the time the squads were formed. But very early in operations on the Continent, after the Luftwaffe was all but driven from the skies, "bomb disposal" became a misnomer (except for the Air Forces units), because the main job was the disposal of enemy munitions on the ground. This was especially true of units serving the armies: between D-day and V–E Day the work of Army bomb disposal squads in terms of tonnages was 92 percent munitions and only 8 percent bombs; that of the COMZ squads was 82 percent munitions

[18] FUSA Ord Rpts Mar 45, apps. III and VIII and Apr 45, apps. II and VIII. A successful experiment with air searchers for ammunition proved that a trained observer could not only distinguish types of ammunition from the air but even estimate tonnages. App. VIII to Rpt of Mar 45, p. 3.

[19] (1) Ninth Army Ord Sec for period ending 30 Apr 45; (2) AAR XIII and XIX Corps Ord Secs Apr 45.

[20] (1) Third Army Rpt II, Ord Sec, p. 27; (2) Hist 55th Ord Group, Apr 45.

and 18 percent bombs. The lack of training in handling munitions was reflected in the very high casualty rate. Out of 972 U.S. bomb disposal men in the European theater, including officers and enlisted men, 111 were killed or wounded in their operational role. Thirty-nine were killed and 48 were wounded handling munitions, only 4 killed and 20 wounded handling bombs. In addition, four were killed and nine wounded in combat.[21]

Occasionally the German dumps and factories yielded artillery ammunition that could be fired from American guns. In some areas 88-mm. guns and 155-mm. enemy howitzers as well as ammunition were turned over to the American artillerymen to use in combat. At the Zeiss Optical Plant in Jena First Army picked up valuable optical equipment. On the whole, however, the armies used little captured equipment except motor vehicles and such automotive parts as springs, gaskets, and bearings. When First Army near Zehla Mehlis ran into one of the largest centers of small arms manufacture in Germany—more than fifty manufacturers of pistols, shotguns, and rifles—it evacuated most of the weapons to Communications Zone. On the other hand, in the advance toward the Elbe one First Army division, the 69th, was using 60 German sedans, 50 buses, 150 trucks, and 250 trailers.[22]

Of particular interest to Ordnance in the great stocks of captured matériel were the intelligence items—specimens of new German weapons that would be sent to the United States for study, notably the V–1, V–2, and other rocket weapons. They were found not only at factories, laboratories, and proving grounds, but in boxcars on railroad sidings and hidden in mines and tunnels. Investigating and reporting on these important finds was the job of the Ordnance Intelligence Teams that were attached to all the armies.

Ordnance Technical Intelligence

When combat troops came across new German weapons, normally they reported them to the army Ordnance officer, who passed the information on to the Ordnance Technical Intelligence Teams. By February 1945 each army had such a team, consisting of four officers and from four to six enlisted men (most on temporary duty from Aberdeen Proving Ground), as well as technicians, a clerk, an interpreter, and a draftsman. Often corps or division commanders called on the teams for information on the characteristics and capabilities of new enemy equipment, and this knowledge was immensely helpful to the commanders in planning tactics and developing countermeasures.[23]

Behind the army teams were smaller teams attached to ADSEC and CONAD and a 14-man COMZ team (5 officers, 9

[21] (1) Green, Thomson, and Roots, *Planning Munitions for War*, pp. 147–49; (2) Bomb Disposal squad histories in ETO Ord Sec files, KCRC; (3) Ord Serv ETO, Ordnance Technical Services, Sec V, Bomb Disposal, pp. 21–35; (4) USFET Bd Rpt, Ord Sec, Study No. 100, p. 38. (5) For early plans and organization in the ETO (pre-invasion) see above, pp. 231–32.

[22] (1) FUSA Ord Sec Rpt Apr 45, app. VIII. (2) Ord Serv ETO, Personnel and Public Relations, Annex 1. (3) AAR, XIX and XIII Corps Ord Secs, Apr 45. XIII Corps recaptured 15 American trucks near Klotze Forest and discovered that the Germans had taken excellent care of them. *Ibid.*

[23] (1) Ord Serv ETO, Ordnance Technical Services, Sec I, Enemy Equipment Intelligence, pp. 8–14, 19–21, OHF; (2) For background, recruitment, and training of the Ordnance Intelligence teams in the U.S. see Green, Thomson, and Roots, *Planning Munitions for War*, pp. 259–67.

enlisted men). All reported to COMZ Ordnance Section's Enemy Equipment Intelligence Branch (EEIB), headed by Col. Holger N. Toftoy, which consisted of 12 officers, 17 enlisted men, and a civilian technician, and was organized into seven units: Special Advisors, Field Coordinators, Shipping and Requirements, Drafting, Library, Reports, and a staff unit composed of specialists on ammunition, small arms, and automotive, artillery, fire control, and underwater-mine matériel.[24]

When the big push into Germany began, the armies advanced so rapidly that the tactical units did not have time to report new items; for this reason a good deal of enemy matériel was discovered by the men of the intelligence teams, who had a "search list" supplied them by EEIB's Shipping and Requirements Section. SHAEF had decreed that the first specimen of each item discovered be shipped to England, because the U.S. Army had no proving ground in Europe. The second specimen would be sent to Aberdeen Proving Ground. The EEIB men resented the arrangement but could do nothing about it, since higher authority refused to sanction the establishment of an American proving ground on the Continent.[25]

After the Rhine crossing, the teams were swamped. They had to investigate every lead, no matter how unprofitable; they had to explore huge installations, many of which were underground, and sometimes had to seek out the inventor of a new weapon in order to fill in the details; often they had to evacuate important items to safer areas. By mid-April the pressure on the army teams had become so great that most of the EEIB staff had to be sent forward to help them, and Sayler was cabling home for twelve more officers and twenty-two more enlisted men. Items of the geratest importance for future Ordnance research had been discovered—V–1, V–2 and other types of rocket matériel; new artillery, such as the German 128-mm. gun mounted on a Russian carriage; and new ammunition like the 88-mm. incendiary shrapnel antiaircraft shell—and time was short. With inadequate means and manpower, Colonel Toftoy soon felt, as he reported to Paris, like a "mouse trying to chew down a huge oak tree." His problems were increased rather than lessened with the arrival of the Combined Intelligence Objectives Subcommittee (CIOS) teams sent out by the Combined Chiefs of Staff early in 1945 because he had to furnish assistance to these groups. And the demands of the field forces continued up to V–E Day; for example, commanders were demanding identification photographs of Russian tanks in preparation for the meeting of the American and Soviet forces at the Elbe.[26]

After V–E Day

On the evening of 7 May 1945, the radio announced Germany's unconditional surrender. V–E Day, proclaimed as 8 May, was celebrated by Ordnance units in the five armies in various ways. Many were given a holiday—for some of the veterans of the Mediterranean in the Seventh Army

[24] Ord Serv ETO, Ordnance Technical Services, Sec I.

[25] *Ibid.*

[26] (1) Toftoy Report of Activities 1–15 Apr 45 in Ord Serv ETO, Ordnance Technical Services, Sec I. (2) On the search for rocket matériel and scientists see MS, William H. Peifer, Army Rockets, Missiles and Satellites, ch. III, Operation Paperclip, OCMH.

area, the first official holiday in more than two years of service overseas. In other areas the men attended special church services and then returned to work; or played ball, or held long discussions about what the future held for them. In First Army on 9 May there were company and battalion formations and addresses by Medaris and the group commanders. There was no wild rejoicing; many of the men took the news with "sober faces," feeling that their job was only half done.[27]

The immediate job for the maintenance men was to catch up on the backlog of work that had accumulated during the drive into Germany; the next was the inspection and repair of the weapons and vehicles that were going to the Pacific. Ninth Army inaugurated on V–E Day an ambitious program for the classification and calibration of artillery weapons. The work was done at Hillersleben, the great German artillery proving ground near Magdeburg, where the Ordnance men found technical facilities on a scale that had no counterpart in the United States—according to one unit, "a maintenance company's dream." Here the big guns and howitzers, some of which had been in constant service since the landings in North Africa, were test-fired, star-gaged, given new tubes and recoil mechanisms if necessary, and generally made ready to play their part in the war against Japan. The Hillersleben operation was singled out by a Senate subcommittee that visited the proving ground on 26 May as an example of the prompt, efficient, and generally "businesslike job" being done in reconditioning weapons for redeployment.[28]

Redeployment planning had begun in the United States at the end of July 1944, with 1 October 1944 as the assumed date of the collapse of Germany. Later revisions of mid-March 1945, in effect on V–E Day, had provided that economically repairable items going to the Pacific would be repaired in the European theater to the limit of available facilities. The major portion of this task fell obviously to Communications Zone, which set up collecting points in the ADSEC areas at which equipment turned in by combat units was inspected, classified, and shipped back to appropriate COMZ shops. Tanks and other heavy tracked matériel, for example, were to be turned in to Depot O–6022, set up in a steel mill at Butzbach near Frankfort, and then shipped back for fifth echelon repair to Depot O–690 in Brussels.[29] Ammunition—to the limit of packaging material available—was to be sent direct to the Pacific. Requirements for that area were greatest in heavy artillery ammunition (on which ETO had long had priority), mortar ammunition, grenades, rockets, and small arms.[30]

[27] Histories, 261st and 300 th MM Cos (AA), 553d HM Co (Tk), 45th and 212th Ord Bns, and 59th Ord Gp.

[28] (1) Ninth Army Ord Sec for period ending 15 May 45. (2) Col. W. W. Warner, "The Nazi Race for Superweapons: Hillersleben Proving Ground a Model of German Research," *Army Ordnance*, XXIX, 153 (November-December 1945), pp. 420–22. (3) The Hillersleben Proving Grounds, Ord Serv ETO, Personnel and Public Relations, Annex 1. (4) Hist 16th MM Co., 24 May 45, KCRC. (5) 79th Cong, 1st Sess, Senate Rpt No. 110, Part 2, Investigation of the National Defense Program, pp. 10, 30.

[29] (1) OCO, Office Chief of Planning, FS, "Field Service Plan for Demobilization and Redeployment," Book II [hereafter cited as FS Plan Bk II] app. B, sec. III, p. 4, OHF. (2) Hines History, Vol V, pp. E-353–54, E-362.

[30] FS Plan, Book II, Ord Amm Implementation of the ASF Basic Supply Plan, Period I, p. 2 and Revised Ammo Table, 15 Mar 45.

The hardest problem for the planners was what to do about wheeled vehicles—not the special purpose type like DUKW's and tank transporters, which had to be reconditioned and redeployed to the maximum because they were scarce in the United States—but the general purpose vehicles. Most of these had seen hard service in Europe. How many were worth repairing? Ordnance planners estimated that 60 percent would be recoverable; of these vehicles, 30 percent could be shipped to the Pacific without major overhaul, 35 percent would be repaired in Europe before shipment to the Pacific, and the remaining 35 percent would be returned to the United States for repair and return to stock.[31]

These figures had to be revised drastically downward after V–E Day. To obtain a firsthand report on how many trucks were repairable, and whether there were enough factories, men, and parts overseas to do the job, General Somervell early in June 1945 sent to European and Mediterranean theaters a committee of civilians from industry, accompanied by Maj. Gen. Julian S. Hatcher, chief of Ordnance's Field Service. These men were asked to take into account the liberated areas' desperate need for trucks to haul such essentials as food, fuel, and building materials. Basing their findings on Ordnance serviceability standards for overseas shipment, they reported that only about 35 percent of the jeeps and trucks (excluding trailers) in the ETO could be reconditioned in the theater for redeployment. They recommended that the rest be turned over to the liberated areas. Discussions on the feasibility of returning trucks to the United States for repair continued in the United States throughout the summer of 1945. A study made in Ordnance Field Service after V–J Day, showing the cost of returning vehicles from the ETO, indicated that it was uneconomical to return to the United States any general purpose vehicles from overseas theaters.[32]

Long before decisions on the redeployment of matériel were firm, the machinery for the redeployment of men got under way. When First Army headquarters was pulled out of the line shortly after V–E Day, destined for the Pacific via the United States, First Army Ordnance units were assigned to Ninth and Third Armies. By the end of May a general reshuffling and realignment of Ordnance units in all the armies had begun.[33] Within the units, there were drastic changes brought about by the War Department's redeployment criteria, announced shortly after V–E Day. All men over forty-two years of age were eligible for discharge, as were all those with an Adjusted Service Rating (ASR) of eighty-five points, based on length of service, service overseas, combat service, and parenthood. The rest would be divided between Category I, men who would remain in Europe, and Category II, men who would be redeployed to the Pacific, either

[31] FS Plan, Bk II, Appendices on Quantities & Procedural Details, Second Revised Edition, 15 Mar 45, app. G–1.

[32] (1) Hines History, Vol V, pp. E–229–31 and Vol VI, pp. E–502–14. Of the 102,027 2½-ton trucks on hand in the ETO on 1 June 45 (after deduction of 15,394 for Army of Occupation and overhead) only 35,709 could be reconditioned. *Ibid.*, p. E–507. (2) ASF Maint Div Files, 451 Vehicles July 1945. (3) Hist, OCO Field Service, Vol XII, Part 1, Demobilization History, OHF.

[33] (1) G–4 Rpt No. 35, 15 May 45, 12th Army Gp, 319.1 G–4 Rpts (NUSA), Vol I. (2) 12th Army Gp Ord Sec Jnl, 7 May 45.

directly or through the United States.[34]

The point system played havoc with the Ordnance units, for like most service organizations they contained many older men with families, as well as many who had arrived in England or the Mediterranean early in the war. Some of the units were all but wiped out, especially in the Seventh Army area; for example, the headquarters of the 55th Ordnance Group had to be entirely reconstituted because all of the men were veterans with long service in the Mediterranean; their commanding officer, Colonel McGrath, with 136 points, was the lowest man in his unit on points. In all the armies, the replacements for high-point Ordnance men were generally unskilled and therefore unsuited to the enormous task of reconditioning the flood of damaged matériel that poured into Ordnance installations.[35]

In the case of the Ordnance men not eligible for discharge, some preferred going to the Pacific to staying with the Army of Occupation, for their memories of Europe were sad and bitter—"too many white crosses," as one First Army officer put it—too many friends killed or missing.[36] Among the missing, none had been mourned more sincerely than Colonel Ray, the First Army ammunition officer, who had not been seen after he left headquarters in his jeep for Waimes on that fateful December afternoon when the Germans struck in the Ardennes.[37] But Ray's story had a happy ending. Shortly before V–E Day he telephoned the First Army Ordnance office from a German prisoner of war camp in the Third Army area. A car was dispatched for him, and he was brought back amid general rejoicing (the memo from Bradley to Patton requesting his return received thirteen endorsements en route) in time to sail for the United States with the rest of the First Army staff, bound for the Pacific.[38]

At the staging areas for units going to the Pacific, the men were given maps and lectures on the climate and terrain. They were shown a movie, *On to Tokyo*. They studied Japanese tactics, and the island-by-island advance by the American forces on the other side of the world. Operations in the war against Japan had come a long way since the early victory in Papua.[39]

[34] FS Plan, Book II, apps. A, F.

[35] (1) USFET Bd Rpt No. 101, pp. 25–26, 30. (2) Hist, 3406th MAM Co, Jan–May, Aug–Sep 45. (3) McGrath Interv.

[36] Interv with Wilton B. Moats, former CO 51st Ord Gp, 2 Mar 61.

[37] See above, p. 304.

[38] Hansen Interv.

[39] (1) History 3544th Medium Auto Maint Co. (2) Seventh Army Rpt 1944–45, III, p. 837. (3) *Conquer*, p. 362.

CHAPTER XIX

From Papua to Morotai

At the time the Allied forces in England were arming for the grand campaign in Europe, the Allied forces in the Pacific were beginning the campaign that was to take them to the Philippines, Iwo Jima, and Okinawa. It was a two-pronged drive. In the Central Pacific the big push from Hawaii to Okinawa began with the capture of bases in the Gilbert Islands in November 1943.[1] In the Southwest Pacific by October 1943 the Allies, having landed at Lae and Salamaua and seized a good airfield at Nadzab, had advanced up the New Guinea coast as far as Finschhafen. This small advance accounted for only about 150 miles of the 2,500 miles that stretched north from Buna to Manila; but at least it was a beginning, and in the nine months that had gone by since the end of the Papua Campaign, the U.S. forces in SWPA had come a long way in terms of strength and experience.[2]

There was now an American army in the Southwest Pacific. General MacArthur's request early in 1943 for a tactical organization higher than corps had resultsd in the activation of Sixth Army under the command of Lt. Gen. Walter Krueger. The advance elements of its headquarters arrived in Brisbane by air on 7 February 1943. Among them were Krueger's Ordnance officer, Col. Philip G. Blackmore, and his Ordnance Section's automotive officer, Maj. Ray H. Brundidge, who had come over to Ordnance from the Quartermaster Corps. Five days later Blackmore's operations officer, 1st Lt. Clifton B. Nelson, and three of the Ordnance Section's fifteen enlisted men arrived at Brisbane on the second flight group and opened an office at Sixth Army's new headquarters at Camp Columbia, about ten miles west of Brisbane. The rest of Sixth Army's Ordnance Section came by sea, landing from the *Klip Fontein* on 17 April. Among them were two additional key officers: Capt. Joseph L. Douda, an expert on weapon and optical instrument repair; and 1st Lt. Clinton A. Waggoner, an ammunition expert.[3]

By the time the rear echelon arrived, Colonel Blackmore and the first group had had two months to get acquainted with the

[1] For Ordnance support in the Central Pacific, see below, pp. 445–53.

[2] For the Lae–Salamaua–Nadzab–Finschhafen operations, see John Miller, jr., *CARTWHEEL: The Reduction of Rabaul,* UNITED STATES ARMY IN WORLD WAR II (Washington, 1959), ch. XI.

[3] (1) History of Ordnance Section, Headquarters Sixth Army, 27 January 1943–15 December 1945 (hereafter cited as History Sixth Army Ord Sec), pp. 3, 7, OHF. (2) Comments on MS chs. XIX through XXI, Brig Gen Philip G. Blackmore (USA Ret) (hereafter cited as Blackmore Comments), OCMH. Douda, described by Blackmore as "a little fellow with a wonderful smile," was an experienced machinist. When Krueger was promoted to general, Douda made his 4-star insignia, using Australian silver money. *Ibid.*



COLONEL BLACKMORE

Ordnance men in USASOS and the base sections, to find out the amount and kind of Ordnance stocks in the theater; to become familiar with the Ordnance units that were going to be assigned to Sixth Army; and to learn something about the job ahead of them. Sixth Army was small to begin with, in comparison with the armies being readied for the European campaign, but it included all the tactical U.S. Army units in the Southwest Pacific Area, and they were widely scattered. Under Sixth Army came General Eichelberger's I Corps with the two divisions that had fought in Papua, the 32d and the 41st. The 32d had been sent back to Australia and was undergoing training near Brisbane; the 41st was still in the Dobodura region in Papua getting ready for further operations in New Guinea under Australian command. The 1st Marine Division (under General Krueger's operational control) had been sent to Melbourne after the hard fighting on Guadalcanal.[4] Among the smaller units under Sixth Army, some in Papua, some in Australia, were two antiaircraft brigades, a parachute infantry regiment, an infantry regiment, and a field artillery battalion. And up the coast from Brisbane in northern Queensland was a unit on which a great deal depended, the 2d Engineer Special Brigade, which was specially trained in amphibious operations.[5]

Amphibious landings were vital to MacArthur in the execution of his mission—Task 3 as ordered by the Joint Chiefs of Staff directive of 2 July 1942—the reduction of Rabaul, the great Japanese base in the Bismarck Archipelago. By amphibious landings, MacArthur would seize air and naval bases in the Bismarck Archipelago–eastern New Guinea–Solomons area, bases that would render Rabaul impotent. For his beach landings he needed amphibian engineers and he needed landing craft. The 2d Engineer Special Brigade arrived in Australia early in 1943 with the Southwest Pacific's first DUKW's, but getting the landing craft took longer. Because all deck space on cargo ships bound for Australia was needed for planes, the bulky LCVP's had to be shipped knocked down and it took a long time to get the assembly plant at Cairns in operation and then to accomplish training with the new craft. In May when the first detachment of amphibian engineers took off from Brisbane for Port Moresby no LCVP's were avail-

[4] (1) Hq Sixth Army, Rpt of Ord Activities for Feb–Mar 43, OHF. (2) For the Guadalcanal story see Miller, *Guadalcanal: The First Offensive.*

[5] (1) History Sixth Army Ord Sec, p. 7. (2) Gen. Walter Krueger, *From Down Under to Nippon* (Washington: Combat Forces Press, 1953), p. 6.

able. They took with them ten LCM's obtained from the Navy.[6]

The time was getting ripe for MacArthur's next move. Late in April, about a week after the Ordnance Section's rear echelon arrived at Camp Columbia, bits of information began trickling into the Ordnance office about a proposed operation to take two small islands in the Solomon Sea, Woodlark and Kiriwina, north of the southeastern tip of Papua. Troop dispositions were a regimental combat team reinforced with field and antiaircraft artillery and supporting service units, mounted for the assault on Woodlark from Townsville and on Kiriwina from Milne Bay. The Ordnance Section men assumed that it was only a command post exercise, but after two weeks of computing requirements for supply and resupply and planning Ordnance troop support, they learned that the operation was real. It was called CHRONICLE and D–day was set at 30 June 1943.

For the assault on Woodlark a 6,868-man task force composed of the 112th Cavalry reinforced by a Marine battalion and supporting units (including a U.S. Navy construction battalion to build an airstrip and roads) and appropriately designated LEATHERBACK was sent to Townsville from the South Pacific. The task force brought with it three officers and 102 enlisted men who were former members of the maintenance platoon of a South Pacific Quartermaster truck company but were now Ordnance. To this unit the Sixth Army Ordnance Section attached officers and men to handle ammunition work and repair weapons, thus creating a Provisional Ordnance Company of 5 officers and 112 enlisted men, which was to make an excellent record under the ingenious and expert leadership of Capt. Francis J. Connelly. For the assault on Kiriwina, BYPRODUCT Task Force (approximate strength 8,415), composed of the 158th Infantry reinforced with artillery units and service troops, including Army engineers to build roads and an airstrip, was assembled from various stations in the Australia–New Guinea area and concentrated at Milne Bay. For BYPRODUCT the Ordnance troop plans were almost the reverse of those for LEATHERBACK. The 158th Infantry had been intended for use primarily as an on-foot jungle scouting and patrolling unit; therefore its 35-man organic Ordnance maintenance detachment, the 4th, was designed only to repair weapons. A sizable detachment of motor maintenance men (3 officers and 72 enlisted men), as well as a 50-man ammunition detachment, had to be added, and even this relatively large force of automotive repair men was not able to overcome the handicap of miserable roads.[7]

After the plans for the operation were final, part of the Ordnance Section moved up to Milne Bay with a detachment of Headquarters, Sixth Army, in mid-June. The men found conditions at Milne Bay

[6] (1) Miller, *CARTWHEEL: The Reduction of Rabaul*, pp. 5–6. (2) Brig. Gen. William F. Heavey, *Down Ramp! The Story of the Army Amphibian Engineers* (Washington: Infantry Journal Press, 1947), pp. 28, 48–50. (3) Office of the Chief Engineer, General Headquarters, Army Forces, Pacific, "Engineers of the Southwest Pacific, 1941–1945," vol. IV, *Amphibian Engineer Operations* (hereafter cited as *Engineers of SWPA IV*) (Washington, 1959), pp. 38–48.

[7] (1) History Sixth Army Ord Sec, pp. 8–9, 11–12, and app. C. After Woodlark, the Provisional Ordnance Company was disbanded and its personnel transferred to the 3142d Ordnance Medium Maintenance Company. (2) Krueger, *From Down Under to Nippon*, p. 21. (3) Miller, *CARTWHEEL: The Reduction of Rabaul*, pp. 53–54. (4) Blackmore Comments.

(USASOS Base A) disheartening. In the Ordnance area at Waga Waga, muddy and full of water holes, the depot office was housed in a little thatched roof hut with a quarter wall of sago palm and a rough plank floor. Stocks of small arms, optical instruments, watches, and cleaning and preserving materials were crammed in two small canvas-covered frame structures, along with boxes of parts that had been broken open to make issues (there were no bins) or to search for parts (there were no exterior markings or packing lists). Other broken boxes were piled on dunnage, some of them covered with canvas, many open to the rain. All types of ammunition were piled together in the mud, exposed to the rain, and unrecorded beyond an estimate of the total tonnage of all types. There were very few men in the depot office, and only small detachments of maintenance, depot, and ammunition companies. To Colonel Blackmore and his staff the Ordnance situation was "very dark indeed." [8]

The picture was made even darker by a situation peculiar to Sixth Army. In their efforts to help mount CHRONICLE the Sixth Army Ordnance men were afflicted by a curious malady: a case of dual personality. In early May 1943, just before making his first moves against Rabaul, General MacArthur set up a U.S. task force directly under General Headquarters known as ALAMO Force (code name ESCALATOR) to conduct tactical operations in Woodlark, Kiriwina, and New Britain. Its commander was Krueger and its headquarters was virtually Sixth Army headquarters. This step removed Sixth Army from the control of Allied Land Forces, commanded by General Sir Thomas Blamey. The double role was to present Krueger and his staff with a great many perplexing difficulties. The use of three different designations (including ESCALATOR) created uncertainty and confusion; and Blackmore's men were not always sure in which capacity they were acting, whether as Sixth Army, for conducting administration and training not connected with tactical operations, or as ALAMO Force, for supporting tactical operations.[9]

The landings on Woodlark and Kiriwina went off on schedule 30 June 1943. There were no Japanese on the islands and the only opposition came in two small bombing attacks on Woodlark. The operation provided no real test of the Ordnance planning; for example, there was no way of knowing whether the ammunition estimates were correct because there were no expenditures except antiaircraft. But CHRONICLE was important because it was the first combat operation of ALAMO Force, and the orders from GHQ constituted standing operating procedure for subsequent landings. From the operation the Ordnance Section of Sixth Army learned two important lessons. One was the procedure for computing supply requirements. The other was a lesson that Ordnance men had learned in the Mediterranean by mid-1943 and in the European theater later: that effective supply from the rear (in this case USASOS) depended largely on the amount of personal co-ordination, including follow-up on the filling of requisitions and the loading of supplies,

[8] History Sixth Army Ord Sec, pp. 10–11.

[9] (1) *Ibid.*, pp. 9–10. (2) Krueger, *From Down Under to Nippon*, p. 10. (3) Miller, *CARTWHEEL: The Reduction of Rabaul*, p. 29.

that could be done by the Ordnance section of an army.[10]

The problems of furnishing good Ordnance service to the combat forces were compounded in the Southwest Pacific. In island warfare, the normal tasks of inspecting combat equipment before battle, repairing or replacing unserviceable weapons; assisting with supplies and ammunition; and seeing to it that the combat troops' supporting Ordnance units were up to standard became very complicated. Combat forces were staged on an island, in some cases two or more islands, at long, overwater distances from the army command post. Transportation, mostly by air, was uncertain and slow, for tropical rainstorms often held up flights and even when the weather was good there was always a tremendous backlog of high priority cargo and men. Officers sent out on inspection missions were sometimes absent from headquarters for considerable periods of time.[11]

Another drain on staff was caused by the tactics of the campaign. MacArthur's march to the Philippines involved a series of overlapping operations. Before one operation was completed, plans and preparations had to be made for the next one. While supporting the build-up of Woodlark and Kiriwina as air bases, for example, Blackmore and his staff had to make Ordnance plans for the landings on the island of New Britain, an operation which was to begin in December 1943 and was known as DEXTERITY. In the meantime the Ordnance Section had to help develop three important bases: Advance Base A, at Milne Bay (code name PEMMICAN); Advance Subbase B at Oro Bay (code name PENUMBRA); and Advance Subbase C at Goodenough Island (code name AMOEBA). This base effort was required because General MacArthur, on a visit to Milne Bay and Oro Bay a few days before D-day for CHRONICLE, was so disturbed by conditions at both bases that he placed Krueger in charge of developing them, and also of developing the base at Goodenough Island. In the intensive effort that followed, co-ordinated by Krueger's G–4, Col. Kenneth Pierce, Colonel Blackmore was one of the staff members who carried the heaviest load. Krueger gave these men credit for outstanding work.[12]

Developing the Bases

Milne Bay had a deep harbor that made it possible to bring Liberty ships to its docks direct from the United States; also, its sky was so often overcast that the harbor was protected to a great extent from air attack. It was encircled by mountains, but on the north shore at Ahioma there was a coastal plain a mile deep and six miles wide that provided space for shore installations and a staging area. In May of 1943 Ahioma had been selected for the main base and docks, replacing the earlier port of Gili Gili about fifteen miles west, which was thereafter used as a supply point for the Australians and the air units at the

[10] (1) History Sixth Army Ord Sec, p. 11. (2) For the best account of the CHRONICLE operation, see Miller, *CARTWHEEL: The Reduction of Rabaul,* pp. 49–59.

[11] (1) History Sixth Army Ord Sec, pp. 4–5. (2) Blackmore Comments.

[12] (1) Krueger, *From Down Under to Nippon,* p. 24. (2) Ltr, Krueger to MacArthur, 14 Jul 43, no sub, ALAMO Force—Operation DEXTERITY, G–4 Journal (hereafter cited as DEXTERTY G–4 Jnl), 11 May–15 Jul 43.

neighboring airstrips. Along with its advantages, Milne Bay had very definite disadvantages. It rained all the time, and the mountain streams that cut through the coastal plain at many points were subject to flash floods. There was mud everywhere. Disease was rampant, even among the natives; the place had the reputation of being one of the most deadly malarial regions in the world. By March of 1943 the base surgeon had brought the rate down to 780 cases per 1,000 men (from 2,236 per 1,000 at the time of the Papua Campaign), and Krueger's surgeon was to reduce it even more; but the threat of malaria and other diseases persisted, and the steaming heat was debilitating.[13] The heat, the monotony, and the creeping jungle with its hidden dangers (a soldier had been killed by a crocodile near Port Moresby) gave men, so one Ordnance officer reported, "a sort of growing horror of the place."[14]

Colonel Blackmore's immediate problem was to provide shelter for the Ordnance stores from the constant rain, and some form of hard flooring or dunnage for his shops, warehouses, and ammunition dumps. At times the mud was so soft and deep that bombs and heavy artillery shells were known to sink from sight.[15] All of the ammunition and, in the early period, most of the Ordnance supplies were stored on the south shore at Waga Waga, which was across the bay from Ahioma and accessible only by water because miles of swamps separated it from the north shore installations. Waga Waga had a wharf that would accommodate three Liberty ships and four miles of graveled or unimproved roads. Some 5,000 tons of ammunition were stored in the area in piles of 15 to 20 tons. Before the end of July the 636th Ordnance Ammunition Company, which had arrived 15 July, had got all but about 500 tons of it on coconut log dunnage and covered as much of it as they could with tarpaulins to protect it from the rain. Some twenty natives were employed to construct rough sheds, using tree trunks as supports and tarpaulins as cover until the supply of tarpaulins ran out, and then cutting bamboo, nipa, and other native grasses to make thatched roofs. To support the coming operations, about 52,000 tons of ammunition were planned for Waga. This meant enlargement and improvement of the wharf, the storage area, and the roads, and considerably more manpower to help load and discharge vessels as well. The native force used in constructing ammunition shelters was more than tripled.[16]

To take care of the expansion of general supply stocks and repair work necessary in the coming operations, warehouses and shops were to be constructed in the

[13] (1) Office of the Chief Engineer, General Headquarters, Army Forces, Pacific, "Engineers of the Southwest Pacific, 1941–1945," vol. VI, *Airfield and Base Development* (hereafter cited as *Engineers of SWPA VI*) (Washington, 1951), pp. 102–16. (2) Military History of Milne Bay, USASOS, Sep 42–May 44, p. 2.

[14] Lt Col Frederick G. Waite, Ordnance Service Support Problems in Tropical Warfare (hereafter cited as Waite Paper), pp. 12–13, MS, Armed Forces Staff College Library.

[15] Waite Paper, p. 15.

[16] (1) *Engineers of SWPA VI*, 107–08, 113, and see Map 8, *op. cit.* p. 103. (2) Ltr, Lt Col Michael F. Rockel, Jr., to CO Advance Subbase A, 25 Jul 43, sub: Status Report, Storage Area, Waga, DEXTERITY G–4 Jnl 3. (3) Rpt, Maj John F. McCarthy, Experience at Advance Base A, in Hist Base B Oro Bay Oct 42–Feb 44. (4) Memo, Col Kenneth Pierce for CofS, 9 Aug 43, DEXTERITY G–4 Jnl 4.

depot area around Ahioma on the north shore. By mid-July some prefabricated huts made in Australia were beginning to come in, but meantime shelters were built like those at Waga Waga, with thatched roofs and wide eaves. Colonel Blackmore wanted concrete floors for his repair shops and warehouses, but he usually had to be content with gravel, which was obtainable locally. Repair shops for vehicles got priority for the hardstandings because the most pressing need at Milne, as in every port and base around the world, was to keep the trucks operating, and here the climate and terrain worked against the mechanics. Mud cut out brake linings; salt water corroded parts; batteries were affected by heat and road shock; overloading and fast driving over rough roads broke springs; and carelessness about first and second echelon maintenance aggravated all these troubles and caused many more. The decision to ship crated vehicles direct to Milne in order to save time made it necessary to set up an assembly line operation. At first it was quite primitive, laid out along roads and protected only partially from the rain by canvas covers; but by November 1943 the Ordnance "Little Detroit" operation had been housed in prefabricated buildings and was turning out, working two shifts, as many as 120 vehicles a day. Combat troop labor was used to solve the manpower problem.[17]

Oro Bay, 160 miles by air up the New Guinea coast from Milne and 20 miles by road south of Buna, was in some respects potentially a better place for a base than Milne Bay. The terrain was more suitable and the climate was less oppressive. On the other hand, it was visited more often by Japanese bombers because it did not have Milne's habitually overcast sky. During the spring months of 1943 Oro Bay had suffered severely from Japanese bombers.[18] It was also far behind Milne Bay in port development: not until August were there docks for Liberty ships. A tremendous amount of construction was necessary, such as building a road to the air base deep in the interior at Dobodura, laying secondary roads to serve the dumps and depots around the port, and building shelters for supplies. A sizable Ordnance service center was planned on 150 acres of grassland along the Eroro River, and a new and improved ammunition area near Hanau, which was to become the important Hanau Ammunition Depot.[19] The immediate task was to furnish Ordnance support to the 41st Division, then engaged in the Lae-Salamaua campaign with New Guinea Force.[20]

Port and road conditions at Goodenough, a small mountainous island off

[17] (1) Memos between ALAMO Force G–4 and CofS, DEXTERITY G–4 Jnl, 31 Jul–6 Aug 43. (2) Historical Record Base A Ordnance Operations from November 1942 to April 1944, in History Milne Bay USASOS. (3) Incl to Memo, Borden for CofS, 9 Nov 43, sub: Summary of Observations SWPA and SPA, OHF. (4) *Engineers of SWPA VI,* p. 114. (5) For effects of the tropics on motor vehicle operation see Waite Paper, pp. 18–19. (6) Blackmore Comments.

[18] (1) *Engineers of SWPA VI,* pp. 116–34. (2) For the damage to shipping in the harbor from air attacks at this period see A Soldier's Diary, in Hq Base B (Oro Bay), History Port Det E, 22 Jun 42–May 43.

[19] (1) Corres., Blackmore and others, Jul–Aug 43, DEXTERITY G–4 Jnls 1, 3, 5. (2) McCree Rpt.

[20] For Ordnance support in the Salamaua campaign see Report on Ordnance Phase of Salamaua Campaign, by Major Ward C. Howard, Ordnance officer, 41st Div, OHF. Adequate support was not possible, in the opinion of Colonel Blackmore, because of the lack of small ships. Blackmore Comments.



HEADQUARTERS OFFICE, BASE ORDNANCE, ORO BAY, 1943

the southeast coast of Papua, were very similar to those at Oro Bay. Here also was a suitable harbor—Beli Beli Bay—but dock construction for Liberty ships was not possible until August, and a tremendous amount of road building and construction work was required.[21] In natural beauty, Goodenough lived up to its name and reputation of being one of the most beautiful of the western Pacific islands. To the historian of one Ordnance unit "it far surpassed expectations—rolling hills covered with alternate patches of tall rank grass and timber land . . . filled with cool, rock-filled mountain streams." [22]

New Weapons for Jungle Warfare

Late on the evening of 5 October 1943, about two months before the DEXTERITY operations were to begin, there arrived at Sixth Army headquarters in Brisbane a group of six experts sent out from the United States by General Marshall to find out what weapons were most needed for

[21] *Engineers of SWPA VI*, pp. 138–46.

[22] History 3469th Ord Medium Maint Co, 25 Oct 43–25 Feb 44.

jungle warfare. Col. William A. Borden of the Ordnance Department was in charge of the group, which was composed of Ordnance officers with the exception of one officer each from the Corps of Engineers and the Chemical Warfare Service. Borden brought with him in the plane several new items, the most important of which were the 4.5-inch rocket developed by Ordnance and the 4.2-inch mortar developed by the Chemical Warfare Service. These and other items were exhibited and tested at a series of demonstrations held in the Southwest and South Pacific Areas throughout October.[23]

Borden had high hopes of demonstrating that the 4.5-inch rocket would destroy Japanese coconut log bunkers such as those encountered at Buna. But the perverse rockets refused to perform as well as they had at the Aberdeen Proving Ground. They were erratic in flight, and were relatively ineffective. The men in the theater, who had been impressed by the performance of the lone 105-mm. howitzer at Buna, felt that the answer to the bunker was conventional artillery, especially 105-mm. and 155-mm. howitzers, and that the most pressing need was for tractors to get these pieces through jungle mud. General Krueger was very much impressed by the 4.2-inch mortar. The 4.2-inch mortar had been used to fire several types of shells, and had now been equipped by Chemical Warfare Service with a high explosive shell. The flame thrower, also a Chemical Warfare item, was well liked. Perhaps the most popular Ordnance item displayed was the rifle grenade, adapted from the 60-mm. mortar shell, affixed to the M1 rifle and used not only for firepower but for signaling. Little interest was manifested in the 4.5-inch rocket except for its possible use in barrage fire from landing craft. At a demonstration the preceding spring, Krueger had seen the 2d Engineer Special Brigade fire a 4.5-inch rocket projector mounted on a DUKW.[24]

In discussions with the commanders, Borden found generally that they were hesitant about introducing any new equipment for fear of increasing their supply problems, which were already serious enough, and that they were for the most part satisfied with the weapons already in the theater. They had achieved some success in the limited use of light tanks, and believed that both light and medium tanks could be used in the jungle if wider tracks were installed. Bazookas had yet to prove themselves in the Pacific, but there were plenty of them in the theater. In Africa the early models had been withdrawn from use in May 1943 because of malfunctions, and the necessary modifications had not yet been completed on all of them, but improved models continued to be produced. On the whole, SWPA felt that the most pressing need was for more weapons, immediately. General MacArthur, who was

[23] (1) Memo, Borden for CofS, 9 Nov 43, sub: Summary of Observations SWPA and SPA, OHF. (2) The 4.5-inch rocket was the early fin-stabilized type, developed primarily as an aircraft rocket. Green, Thomson, and Roots, *Planning Munitions for War*, pp. 443–50. See also, above, p. 332. (3) For development of the 4.2-inch mortar, first used in Sicily in July 1943, see Leo P. Brophy, Wyndham D. Miles, and Rexmond C. Cochrane, *The Chemical Warfare Service: From Laboratory to Field*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1959). In 1949 responsibility for the mortar was transferred to Ordnance. *Ibid.*, p. 129.

[24] (1) Memo, Borden for CofS, 9 Nov 43, sub: Summary of Observations SWPA and SPA. (2) *Engineers of SWPA IV*, p. 45.

"most appreciative of the effort being made to provide him better equipment" instructed Borden to "cut corners and red tape." Air shipment was authorized for large quantities of rifle grenades and 4.2-inch mortar matériel. Borden reported from SWPA: "All admit that the Buna campaign was on a shoestring, and they do not expect to operate that way." [25]

The Move Northward Begins With Dexterity

Early in August Colonel Blackmore had been called to Brisbane to co-ordinate with GHQ and other headquarters his plans for Ordnance support of DEXTERITY. The object of DEXTERITY was to seize Cape Gloucester on the northwestern tip of New Britain, the largest island in the Bismarck Archipelago. Establishing control over western New Britain would provide airfields for the capture or neutralization of the Japanese base at Rabaul on the northeastern tip of New Britain, and would protect the right, or Vitiaz Strait, flank of MacArthur's march up the New Guinea coast. Shortly before the main effort at Cape Gloucester, a diversionary landing was to be made on the southern coast of New Britain at a place near Gasmata that was thought to provide facilities for an emergency airfield. The Cape Gloucester Task Force, designated BACKHANDER, was composed largely of elements of the 1st Marine Division. The Gasmata Task Force, designated LAZARETTO, consisted mainly of the 126th Regimental Combat Team of the 32d Division. The rest of the 32d Division became ALAMO Force reserve. In October the combat units began the movement north from Australia to their staging areas: the 1st Marine Division moved from Melbourne to Goodenough Island and the Milne Bay and Oro Bay areas and the 32d Division from Camp Cable, Queensland, to Goodenough Island and Milne Bay and both began training in jungle warfare and amphibious operations. By 21 October Milne Bay had become so congested that Krueger moved ALAMO Force headquarters to Goodenough, where it was accommodated in tents and native huts. To the dismay of the headquarters men on Goodenough, in one 24-hour period they were drenched with 27 inches of rain.[26]

Plans for DEXTERITY were well advanced when GHQ discovered that the area around Gasmata was unsuitable for airfield development. The Gasmata operation was therefore canceled and LAZARETTO Task Force was dissolved. But General Krueger felt that a secondary landing on the south shore should still be made in order to divert the enemy's attention from Cape Gloucester, and Arawe was decided upon. Since only about 500 Japanese were known to be in the Arawe area, a smaller

[25] (1) Memo, Borden for CofS, 9 Nov. 43. (2) For later experience in New Guinea with tanks, see Capt Randolph V. Foster, Armor in Jungle Operations, 1 May 48, monograph, Armored School Library, Ft. Knox. (3) Rpt of Ord Activities, USASOS, Oct 43, OHF. (4) The bazooka turned out to be fairly useful against Japanese bunkers, mostly for concussion effect against the occupants; but battery failure was frequent because of jungle moisture. Tech Intel Rpts, 473, 2 Oct 44; 1275, 30 Nov 44; 115, 1 Dec 44, OKD 338/109, OKD 338/195, OKD 338/175.

[26] (1) Memo, Capt Clifton B. Nelson for ACofS, G–4, ALAMO Force, 8 Aug 43, sub: Planning for Next Operation, DEXTERITY G–4 Jnl 4. (2) ALAMO Force, Report of the DEXTERITY Operation (Arawe, Cape Gloucester, Saidor), 15 Dec 43–10 Feb 44 (hereafter cited as ALAMO Force, Rpt DEXTERITY Opn). (3) Blackmore Comments.

task force composed mainly of the 112th Cavalry Regimental Combat Team and called DIRECTOR was set up for the new south shore landing. The invasion date for DIRECTOR was set at 15 December; that for BACKHANDER was 26 December.[27] These dates represented a postponement of about a month from the original landing dates to allow more time for the development of Oro Bay as the major supply point for both task forces, and also to provide facilities for an advance staging area at Langemak Bay (code name REDHERRING) in the Finschhafen area, far up the coast of New Guinea and almost directly across Dampier Strait from Arawe. Finschhafen had been captured by New Guinea Force early in October.[28]

Cape Gloucester and Arawe

For the Sixth Army G–4 DEXTERITY planners at Goodenough, the principal problems were Ordnance problems—vehicle distribution and ammunition. Everybody was clamoring for trucks and jeeps. In October a truck company and two evacuation hospitals arrived at Milne Bay without any vehicles and had to be supplied. Everybody was pressuring, especially the marines. Refusing to credit any assurance of resupply, the 1st Marine Division insisted on having everything it would need issued to it at once. The marines presented another serious "headache for Ordnance"— they possessed trucks which were not Army issue. Parts for these had to be scrounged from other Marine outfits. As for ammunition, the quantities to be distributed to the task forces were a serious problem, since experience data were lacking. And even more pressing was the problem of keeping the ammunition dry. At Nassau Bay the 41st Division had been complaining that about 65 percent of its artillery ammunition had been received in such bad shape that the powder had to be removed and dried out and other work done before it could be fired.[29]

These problems and many others plagued Krueger's Ordnance staff in planning for support of DEXTERITY. The operation took place at a time when the planners had also to assist in the build-up of the bases at Milne Bay and Oro Bay, and at a time when the Pacific had low priority on supplies and service troops. The planners were hampered not only by a shortage in Ordnance supplies and troops but also by uncertainty as to the amount of supplies that were actually needed. In this respect they suffered from handicaps peculiar to SWPA. There was no Ordnance officer on MacArthur's tactical staff; therefore GHQ decisions were made without the benefit of expert Ordnance advice. There were changes and delays before the troop lists were made final. In any case, consumption rates in SWPA varied widely from the normal. In this dilemma the supply experts at Sixth Army Ordnance Section devised a simple but effective system for stocking maintenance

[27] Krueger, *From Down Under to Nippon,* p. 28.

[28] Logistic Instructions 39/SOS, Based on GHQ Operations Instructions 38, DEXTERITY G–4 Jnl 16, 3–6 Dec 43.

[29] (1) Memos, Col Kenneth Pierce and others, Aug, Oct–Nov 43, in DEXTERITY G–4 Jnls 4, 10, 12, 15. (2) Blackmore Comments. When the time came to sail, much of the Marine equipment had to be left behind because of the lack of ship's space. *Ibid.* (3) For a detailed discussion of the deterioration of ammunition in the tropics see Waite Paper, pp. 14–18.

and depot companies. They set the level of supply at thirty days and required the companies to submit requisitions every fifteen days for items required to maintain the level, computing quantities on the basis of consumption for the previous fifteen days. In putting the new system into effect, the experts had to surmount several obstacles. The first 15-day figures had to be multiplied by at least three to cover the necessary delay before a shipment could be received. Good requisition clerks were scarce. Mail service between bases was so poor that requisitions had to be delivered by officer courier. But this requisition system worked so much more satisfactorily than the "semiautomatic" system used by other supply services that the commanding officer of the U.S. Advanced Base, USASOS, was soon recommending that it be adopted by the other services.[30]

During 1943 the Sixth Army Ordnance Section did not have the help of a corps Ordnance staff (I Corps was not employed in combat operations until April 1944) and even lacked battalion headquarters to assist in the detailed planning for combat support. It had to make very detailed parts estimates to supply the maintenance companies. Another problem was that often Ordnance units would be pulled out of USASOS and placed under army control without sufficient time for conversion from base units to field units; and after one operation was over, would revert to USASOS until time for the next operation. The few available Ordnance units had to be torn apart and spread thin.[31]

The experience of the 622d Ordnance Ammunition Company was typical. Arriving at Milne Bay in mid-September (having landed in Australia from the United States only two weeks before), the company was attached to the First Provisional Ordnance Center in the Ahioma area and worked the rest of the month erecting warehouses and on other labor details. The men spent October at Waga Waga helping the 636th Ordnance Ammunition Company operate the Dingo Ammunition Depot. In November one officer and ten enlisted men were placed on detached service with the 3469th Ordnance Medium Maintenance Company to support the DIRECTOR (Arawe landing) force. The rest of the company sailed for Oro Bay to support the BACKHANDER (Cape Gloucester) force, along with the 263d Ordnance Medium Maintenance Company.[32]

The DIRECTOR force staged at Goodenough (ALAMO Base 1) and used RED HERRING, in the Finschhafen area (ALAMO Base 2) as a rear base. The 112th Cavalry Regimental Combat Team and other combat elements were to proceed to Arawe from Goodenough in APD's (high-speed destroyer-transports) and go ashore on 15 December in amphibian tractors, LVT(A)'s (Buffaloes), and LVT (1)'s (Alligators), landing craft, and rubber boats. On the invasion, one officer and fifty men of the 3469th accompanied the assault forces in LCT's to handle supplies and ammunition, another officer and twelve men went in to perform maintenance; and two ser-

[30] (1) History Sixth Army Ord Sec, pp. 13, 37. (2) Blackmore Comments. (3) Ltr, Col Emer Yeager to CG ESCALATOR, 12 Jul 43, sub: Supply of Intermediate and Advanced Bases from Base Section Depots, DEXTERITY G–4 Jnl 1.

[31] (1) History Sixth Army Ord Sec, pp. 14, 32–34. (2) Blackmore Comments.

[32] History 622d Ammunition Co, 1943–45.

geants from the ammunition company went along to supervise ammunition storage.[33]

Aided by a bombardment at first light by seven naval destroyers and accompanied by two DUKW's firing 4.5-inch barrage rockets—the first use of such rockets in a SWPA landing—the main assault force made a successful run to the beach at Arawe in Buffaloes and Alligators and had arrived at its final objective by midafternoon. Japanese planes bombed and strafed constantly, but the only serious opposition on land was directed against a smaller force in rubber boats attempting to land before dawn in another sector. Enfilade fire from enemy machine guns and a 25-mm. dual-mounted antiaircraft gun sank twelve of the fifteen boats, and some of the men drowned while they were trying to free themselves of their equipment. A single salvo from a destroyer finally silenced the enemy guns.[34]

One of the first jobs for the Ordnance shore party at Arawe was to supply rifles and submachine guns to the men who had lost their weapons in the sinkings, a job that was made easier by the nearness of the base at Langemak Bay. In all sectors weapons were generally either lost or completely demolished by bomb fragments, so that little repair work came in. The maintenance party spent part of its time collecting captured Japanese weapons, but most of it in disposing of enemy bombs. There was heavy bombing and little effective defense against it, because the long-expected battery of 90-mm. antiaircraft guns did not arrive until the end of January. The Ordnance men along with the combat troops lived on C rations and slept in rat-infested trenches. On the night of Christmas Eve, one of them looked up from his trench and saw a Japanese plane dropping a red and green flare, "as though he were helping us to celebrate Christmas." There were no casualties among the Ordnance troops, "but if men can be battle scarred without drawing blood," their historian reported when the first of these troops returned to Finschhafen, "these men were good examples, completely fagged, nervous, dirty, bedraggled but with good moral [sic] and grinning, glad to get back." [35]

The Ordnance men supporting the BACKHANDER force—two combat teams of the 1st Marine Division—did not suffer as much as those in DIRECTOR from Japanese air attacks but had to contend with another assault from the heavens in the form of torrential downpours of rain. When the invasion forces set out from Oro Bay on LST's on the afternoon of Christmas Eve, accompanied by sizable detachments from the 263d Ordnance Medium Maintenance Company and the 622d Ordnance Ammunition Company, the weather was clear and hot; but the day after the landing on 26 December (Christmas Day across the International Date Line) the northwest monsoon struck Cape Gloucester bringing solid walls of water that lasted for hours (and were to recur every day for months) and howling winds that sent huge trees crashing down in the jungle. And when the marines got over the narrow beaches and hacked their way through the jungle, they came upon a deep and treacherous swamp for which their maps had not pre-

[33] Hist, 3469th Ord Medium Maint Co, 25 Oct 43–25 Feb 44.

[34] (1) ALAMO Force, Rpt DEXTERITY Opn. (2) Hist, 3469th Ord Medium Maint Co has a description of a captured 25-mm gun.

[35] Hist, 3469th Medium Maint Co.

pared them. For this reason the Marine shore party (under which the Ordnance men worked) concentrated the dumps along the narrow strip of firmer ground just off the beaches. Supplies had to be carried forward in amphibious tractors; heavy artillery (the marines had 155-mm. guns) and Sherman tanks bogged down. But Japanese resistance was sporadic, and in the end the marines achieved a comparatively economical victory that contributed to the neutralization of Rabaul and made the coast of New Guinea safe from a Japanese land invasion across the Vitiaz Strait.[36]

To the men at Sixth Army Ordnance Section, the New Britain campaign was memorable for complaints from artillerymen about receiving mixed lots of artillery ammunition. This was the first Pacific campaign in which American artillery (as well as the medium tank) was used to any extent. Because the first shipments of artillery ammunition to SWPA had consisted of many lots of only a few rounds each, segregation by lot number had been as difficult there as in other theaters. Maj. Philip Dodge, the first ammunition storage expert sent out to SWPA, was able to give the artillerymen some helpful suggestions on fire adjustment; but any real alleviation of the situation had to await later shipments of larger lots.[37]

Saidor

The New Britain campaign had hardly begun when the attention of GHQ focused on a new landing on the coast of New Guinea, as a result of the successes of New Guinea Force at Salamaua, Lae, and Finschhafen. In mid-December ALAMO Force received a directive to add a landing at Saidor, 110 nautical miles up the coast from Finschhafen, to the DEXTERITY operation. For this purpose Krueger set up the MICHAELMAS Task Force, composed of the 126th Regimental Combat Team of the 32d Division (originally intended for the Gasmata landing), reinforced by artillery and antiaircraft units, Engineers, and other service units, placed it under the command of the assistant commander of the 32d Division, and gave it the job of seizing Saidor on 2 January 1944. The task force staged at Goodenough. By early morning of New Year's Day 1944 the APD's and LCI's carrying the assault forces were on their way, preceded by the slower LST's carrying heavy equipment and bulk supplies.[38]

[36] (1) Annex D to AdminO No. 2–43, BACKHANDER Force, Ordnance Plan, 14 Nov 43, in 1st Marine Division, Cape Gloucester Operation, Phase I, 1943–44. (2) History 622d Ord Ammunition Co, 1943–45. (3) Lt. Col. Frank O. Hough (USMCR) and Maj. John A. Crown (USMCR), *The Campaign in New Britain* (Historical Branch, Headquarters U.S. Marine Corps, 1952), Marine Corps Monograph, foreword by Gen. Lemuel C. Shepherd, Jr. Casualties on New Britain were 310 killed in action, 1,083 wounded; on Bougainville, under essentially similar conditions, a considerably greater number of marines facing considerably fewer Japanese lost 423 killed in action, 1,418 wounded. *Ibid.*, p. 183.

[37] (1) Blackmore Comments. (2) AGF Bd Rpt SWPA 55, Field Artillery in the Arawe Operation. (3) The 105-mm. howitzers performed well except for trouble with the recoil mechanism, caused mainly by neglect of preventive maintenance at the battery. The M10 tank destroyers and 90-mm. antiaircraft guns were also used as supporting artillery. AGF Bd Rpt SWPA 41, 29 Feb 44.

[38] (1) AdminO 5 to accompany FO 7, 22 Dec 43, and Annex 2 to AdminO 5, Ordnance Plan, 26 Dec 43, both in ESCALATOR (ALAMO Force) FO and AdminO 5 (MICHAELMAS (Saidor) Opn), 22 Dec 43–8 Jan 44. (2) AGF Bd Rpt SWPA 28, 19 Feb 44, Organization of MICHAELMAS Task Force.

Aboard one of the LCI's was the task force Ordnance officer, Capt. Argyle C. Crockett, Jr., commander of the 21st Ordnance Medium Maintenance Company, with eight men from his company and three officers to supervise ammunition operations, antiaircraft maintenance, and bomb disposal. Also aboard to assist in the initial landings was an 8-man detachment of the 59th Ordnance Ammunition Company, an experienced company with a long record of service in SWPA, which also furnished a 32-man detachment to operate an ammunition depot in the Cape Cretin area where the MICHAELMAS Force's resupply point (code name SHAGGY) was located. Along with the task force Ordnance staff, the assault forces were accompanied, for contact Ordnance work, by a detachment of thirty men from the 732d Ordnance Light Maintenance Company (the 32d Division's own Ordnance company) many of whom were veterans of the Papua Campaign. In several respects the Ordnance plans for Saidor differed from those for the other, smaller, DEXTERITY operations. For the first time, in recognition of the baleful effect of the tropics on fire control equipment, a small antiaircraft repair team went along. This policy was to be continued in future operations. Also, a much smaller proportion of ammunition men was allotted for the MICHAELMAS landings than for the other operations.[39]

[39] (1) History Sixth Army Ord Sec, app. C, p. 2. (2) History 59th Ammunition Co. (3) History 21st Medium Maint Co, ch. V. (4) At this period Ordnance antiaircraft mechanics who had been trained on the 3-inch antiaircraft gun were not proficient on the 90-mm, equipment used by antiaircraft troops in the theater. Later, teams of specialists trained at Frankford Arsenal on the 90-mm. director came out by air. Blackmore Comments; Rpt of Ord Activities, USASOS, Jun 43.

Saidor differed from the other DEXTERITY operations in another respect. It dispensed with a preliminary air bombardment to insure surprise. An effective naval bombardment was provided by the destroyers, and as the first landing wave of LCV's neared the beaches there was a rocket barrage, this time by LCI's rather than DUKW's. The landings met with little opposition. For the Ordnance area, including the ammunition dump, maintenance shops, and bivouac area, the staff selected a place in dense timber between two creeks, but the access road was so poor that the ammunition had to be dumped on the beach.[40]

On 8 January 1944 the bulk of the 21st Ordnance Medium Maintenance Company arrived at Saidor on an LST. After preparing their bivouac area by digging foxholes and covering them with logs and slinging hammocks from trees, the men set up their shop area, bulldozing a road through it and dispersing their working sections around the perimeter. But they had hardly begun work on their first repair jobs, and the evacuation of the Japanese matériel turned in to them, when the rains began on 14 January. The roads into and out of the shop area soon became impassable as torrents of rain continued to fall. In spite of efforts to bring in gravel to put down on shop floors, vehicles and other heavy equipment bogged down and even after repairs were made could not be returned to the combat men. Parts had to be hand-carried or hauled out in trailers towed by tractors. Men sank ankle-deep or even knee-deep in mud. Little work

[40] (1) Krueger, *From Down Under to Nippon*, pp. 36–37; (2) History 21st Ord Medium Maint Co, ch. V.

could be done, except repair of watches and instruments, until a new shop area was set up in mid-February on sandy, rocky soil.[41]

On 31 January Headquarters, ALAMO Force, moved from Goodenough Island to Cape Cretin (SHAGGY), where ALAMO Force Supply Point 2 was located. Here the 3469th Ordnance Medium Maintenance Company, reinforced with a 20-man detachment from a depot company, was operating the Ordnance maintenance and general supply facilities, and the 59th Ordnance Ammunition Company, using troop labor, was operating the ammunition dump. On 27 February Headquarters, Sixth Army, arrived at Cape Cretin from Brisbane. For the first time, the Ordnance Section was together and the men were spared the necessity of long trips for coordination. The ALAMO Force Ordnance staff, while continuing supervision over Ordnance operations at Kiriwina, Woodlark, Goodenough, Arawe, Cape Gloucester, and Saidor, had to plan for support of the assault on the Admiralties by Task Force BREWER, 29 February 1944, and for the first large-scale SWPA invasion, that of Hollandia, New Guinea, by RECKLESS Task Force early in April.[42]

Support of Brewer in the Admiralties

Capture of the Admiralty Islands, lying some 200 miles north and east of New Guinea and used during 1943 by the Japanese as staging points for aircraft flying between Rabaul and the northern New Guinea coast, would not only protect the Allied advance up the New Guinea coast, but would also provide an excellent offensive base for the march to the Philippines. Of the two main islands, the larger, Manus, was big enough for extensive shore installations and had an airdrome. There was also an airdrome at the very much smaller island of Los Negros, which was separated from Manus by a shallow, creeklike strait, and extended in a rough horseshoe curve to form Seeadler Harbor, one of the finest natural harbors in the world. The sights were set at first on the seizure of the Seeadler Harbor area, which MacArthur assigned to ALAMO Force in November 1943. On 13 February 1944, after planning was well under way, he expanded the mission to the seizure of all the Admiralties, with a target date of 1 April.[43]

The main combat element of BREWER was the 1st Cavalry Division, staging at Oro Bay. The division was "dismounted," having exchanged its horses for jeeps, but retained a good deal of cavalrylike *esprit de corps;* it was an old-fashioned square division, composed mostly of Regulars, and its regiments had proud histories of service in the Civil War and Indian wars. Reinforced with antiaircraft, artillery, and other support units, some of them furnished by the South Pacific Area, BREWER represented at this stage a huge force of more than 45,000 men. Colonel Blackmore planned to back up the division's own 27th

[41] History 21st Ord Medium Maint Co, ch. V.
[42] History Sixth Army Ord Sec, p. 16.

[43] (1) Historical Division, U.S. War Department, "American Forces in Action," *The Admiralties: Operations of the 1st Cavalry Division (29 February–18 May 1944)* (Washington, 1945), pp. 1–10. (2) Miller, *CARTWHEEL: The Reduction of Rabaul,* pp. 316–19. (3) For detailed maps, pictures, and description of terrain see *Engineers of SWPA VI,* pp. 208–22.

Ordnance Medium Maintenance Company (which he considered an outstanding company) with the 287th; to send in an entire ammunition company, the 611th; and because the early troop list included a company of medium tanks supplied by the Marine division at Cape Gloucester, he added an 11-man detachment of the 3608th Ordnance Tank Maintenance Company—the first tank maintenance detachment planned for an ALAMO operation.[44]

This planning for BREWER went out the window on 24 February when General MacArthur, having been informed by the Air Forces that Allied bombers flying as low as twenty feet over the Admiralties had not been fired on and had seen no signs of Japanese, ordered an immediate 1,000-man "reconnaissance in force" on Los Negros, with D-day set at 29 February. The landing was successful; but a sharp counterattack by the Japanese showed that they were on the island in considerable force. Reinforcements bringing the BREWER Force to more than 19,000 men were rushed in, and the battles, which expanded to Manus Island, continued until May. The changes in plan considerably altered the Ordnance support of the operation. In the scramble for transportation, the 287th Ordnance Medium Maintenance Company was left behind at Milne Bay. The main support of the 1st Cavalry Division came from its own organic company, the 27th, to which a 5-man detachment of the 267th Maintenance Company (AA) had been attached in January, before the 27th left Australia.[45]

Two contact parties of the 27th Medium Maintenance Company (each consisting of 2 officers and 24 men) landed on Los Negros with the second combat echelon on 9 March; the antiaircraft maintenance men landed next day. An 11-man detachment from the 611th Ordnance Ammunition Company had accompanied the early assault forces, but the ammunition company did not arrive until 13 March. In the meantime, ammunition had been successfully airdropped in considerable quantities to front-line troops by Quartermaster troops in B-17's, who followed the airdrop with strafing by machine guns, pinning down the Japanese long enough to allow the cavalrymen to retrieve their shells. A serious hazard to the Ordnance troops in BREWER was the presence of Japanese antipersonnel mines. Twenty minutes after one of the 27th Ordnance Medium Maintenance Company's contact parties landed at Momote Airdrome on Los Negros, an enlisted man of the party was killed by a mine and an officer was seriously wounded.[46]

Hollandia and Aitape

As soon as the Admiralties operation was successful, MacArthur ordered ALAMO Force to begin planning for a jump up the

[44] (1) Maj. B. C. Wright, *The 1st Cavalry Division in World War II* (Tokyo: Toppan Printing Co., Ltd., 1947), pp. 1–2. (2) Annex 1 to FO 9, 11 Feb 44, ESCALATOR (ALAMO Force) FO's 9–11, 13 Feb 44–1 Mar 44. (3) History Sixth Army Ord Sec, app. C, p. 2. (4) Blackmore Comments.

[45] (1) Miller, *CARTWHEEL: The Reduction of Rabaul*, pp. 319–50. (2) History 287th Medium Maint Co. (3) History 267th Medium Maint Co (AA) 26 Oct 43–Sep, Dec 44. (4) For the use of tanks in this operation see AGF Bd Rpt 62, Tank Employment in the Admiralty Islands.

[46] (1) Rpt, BREWER TF (Admiralty Islands) 24 Jan–18 May 44, RED VAULT–SWPA. (2) History 27th Ord Medium Maint Co. (3) History 611th Ord Ammunition Co. (4) For an interesting

New Guinea coast to the Hollandia area in Netherlands New Guinea, some 450 miles west and north of Saidor, a move that would bypass the concentration of Japanese at Wewak. The object was to develop at Hollandia a supply point and an air base from which heavy bombers could hit the Palau Islands and Japanese air bases in western New Guinea and on Halmahera Island. There were also good anchorages in the area at Humboldt Bay, on whose shore stood the little village of Hollandia, and at Tanahmerah Bay, twenty-five miles west. Between the two bays stood the formidable Cyclops Mountains; behind the mountains in the interior was a flat plain on which the Japanese had built three airfields. The general plan of the Hollandia operation was to achieve amphibious landings simultaneously at Humboldt Bay and Tanahmerah and to strike inland in a pincers movement to seize the airfields. The GHQ instructions, 7 March 1944, also directed ALAMO Force to effect a landing at Aitape in British New Guinea, about halfway between Hollandia and Wewak. The objective there was to seize airfields and provide flank protection for the Hollandia operation against a Japanese attack from Wewak. The code name for the whole Hollandia-Aitape operation was RECKLESS.[47]

account of ammunition airdrops in BREWER, as well as DIRECTOR and BACKHANDER, see William H. Peifer, *Supply by Sky,* Quartermaster Corps Historical Studies, Series II, No. 2 (Washington, 1957), pp. 44–47.

[47] A full account of the operation is in Robert Ross Smith, *The Approach to the Philippines,* UNITED STATES ARMY IN WORLD WAR II (Washington, 1953), pp. 13–83. Unless otherwise indicated the remainder of this chapter is based on Smith's volume.

Hollandia: "A Battle of Terrain"

The Japanese by March 1944 had developed the Hollandia area into their main rear base in New Guinea. Humboldt Bay was the New Guinea terminus of their supply line from Japan via the Philippines —the place where troops and supplies were landed from freighters and transshipped by small craft and barges down the New Guinea coast. It was not expected that the enemy would give it up without a stiff fight. General Krueger planned a sizable task force (code name BEWITCH) of about 56,000 men, commanded by Lt. Gen. Robert L. Eichelberger, and consisting mainly of I Corps with the 24th Infantry Division and the 41st Infantry Division (less the 163d Regimental Combat Team, which was going to Aitape). It also included a company of medium tanks from the 1st Marine Division. RECKLESS was to be the first U.S. operation of corps proportions in the Southwest Pacific Area since the Papua Campaign. The Humboldt Bay landing was to be made by the LETTERPRESS Landing Force from the 41st Division, that at Tanahmerah Bay by the NOISELESS Landing Force of the 24th Division. D-day for both was 22 April.[48]

In support of the Hollandia force Eichelberger's Ordnance officer, Colonel Darby, had the 35-man headquarters of the 194th Ordnance Battalion, which had arrived in Milne Bay from the United States at the end of January 1944. These men had spent two months training at Milne Bay, assigned to USASOS, and had then been

[48] (1) Krueger, *From Down Under to Nippon,* pp. 61–62. (2) Eichelberger, *Our Jungle Road to Tokyo,* pp. 100–102 .

sent to Finschhafen on 30 March to be assigned to I Corps.[49] By the beginning of 1944, the very tight situation in the Southwest Pacific on Ordnance troops was beginning to ease, thanks generally to high-level decisions in Washington to furnish the Pacific more support and especially to General Somervell's recommendations after his trip to the theater in September 1943. Using recent arrivals in the theater, General MacArthur's G–3 was able to allot to RECKLESS two ammunition companies, a depot company, and two medium maintenance companies, which, with antiaircraft repair and tank detachments and the 41st and 24th Divisions' organic maintenance companies, brought the Ordnance troop list for the operation up to 1,246 men, a very much larger proportion of Ordnance troops to combat troops than had been yet furnished for any SWPA operation.[50]

The main effort was to be made at Tanahmerah Bay, because Japanese defenses were thought to be concentrated at Humboldt Bay. The NOISELESS Landing Force, therefore, was given the heaviest weight of Ordnance troops—the headquarters of the 194th Ordnance Battalion; the 171st Ordnance Depot Company; the 410th Ordnance Medium Maintenance Company (plus two antiaircraft repair teams and one tank maintenance detachment); and the 642d Ordnance Ammunition Company— all in addition to the 24th Division's own 724th Ordnance Light Maintenance Company. The LETTERPRESS Landing Force at Humboldt Bay received the 287th Ordnance Medium Maintenance Company (plus two antiaircraft repair teams and a tank maintenance detachment) and the 649th Ordnance Ammunition Company, in addition to the 41st Division's 741st Ordnance Light Maintenance Company (minus the detachment going to Aitape). In both landings the first assault elements, on APD's or LCI's, were to carry with them as much ammunition as they could; the second elements on LST's, APA's (attack transports), or LSD's (landing ships, dock) would carry at least two units of fire; and the follow-up LST's in the assault echelons would carry enough ammunition to bring artillery, mortar, and grenade ammunition up to six units of fire, other types up to five units of fire. With regard to Class II supplies, the maintenance companies were to carry, in accordance with established ALAMO practice, 15 days of supply initially (the light maintenance companies for divisional troops, the medium maintenance for nondivisional); the depot company 30 days; resupply to both landings would be 15 days on the first available transportation and thereafter by requisition. The resupply point was Base F at Finschhafen.[51]

The convoy of transports, freighters, LST's, and LCI's that steamed through the Vitiaz Strait on its way to Hollandia, escorted by Navy battleships, cruisers, destroyers, and carriers, was incomparably the

[49] History 194th Ord Bn, Jan–19 Apr 44.

[50] (1) Maurice Matloff, *Strategic Planning for Coalition Warfare, 1943–1944*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1950), pp. 396–97. (2) Extract, SWPA Answers to Questionnaire Used on Gen Somervell's Trip 1943, 18 Oct 43. (3) 1944 Troop Requirements, 16 Sep 43. (4) 1st Ind, Maj Gen LeRoy Lutes to Control Div ASF, 28 Oct 43. Last three in Folder, Log. No. 59–134, OCMH. (5) Hist Sixth Army Ord Sec, app. C, p. 3.

[51] AdminO 7 to accompany FO 12, 6 Apr 44, and Annex 2, Ordnance Plan, 8 Apr 44. Both in ALAMO Force–Opn "G" (RECKLESS-Hollandia), G–4 Journal, 3–16 Apr 44.

largest yet to sail for a SWPA landing—so vast that it was almost unbelievable to General Eichelberger, who remembered the lean days in 1942. The Southwest Pacific seemed indeed to have broken what he had called "our lease in Poorhouse Row." [52] And the cargo aboard the ships, as well as the landing plans, showed that the RECKLESS planners had taken to heart the lessons in DEXTERITY and BREWER. Aboard were 155-mm. guns because it had been demonstrated that heavy artillery was needed to penetrate the jungle and destroy bunkers; medium tanks, because they had proved better than light tanks; and heavy engineer equipment for roadbuilding, to be put ashore promptly, because experience had shown that it was useless to land trucks without first building roads. Many of the trucks aboard the LST's were loaded with supplies, ready to be driven to the dumps and then unloaded and returned to their LST's, because the technique of "mobile loading," begun in CHRONICLE, had proved its worth. Previous operations had also shown the need for ample boat and shore engineer regiments of men trained to unload bulk cargo quickly; and the necessity for prompt resupply of all items.[53]

After steaming north on a 300-mile detour around the Admiralties to deceive the Japanese, the ships turned south and about midnight on 21 April, the task forces separated, NOISELESS reaching Tanahmerah Bay shortly before sunrise, and LETTERPRESS reaching Humboldt Bay about the same time. When the naval bombardment lifted there was little or no reaction from the enemy to either landing; it later turned out that the few Japanese on the coast had fled to the hills, some of them leaving their breakfast tea and rice still warm in their dugouts. The enemy had been taken completely by surprise.[54]

The task force landing at Tanahmerah Bay was in for a most unpleasant surprise: the nature of the terrain. Firsthand information had been lacking because a scouting party sent there in a submarine in March had not returned; and aerial photography had been misleading. The photographs failed to reveal that only thirty yards behind the main landing beach, Red Beach 2, was a mangrove swamp so deep as to be utterly impassable; in spots men sank to their armpits. This was the area that had been selected for the supply dumps. When the LST's ground to the beach and began to disgorge their cargo, the narrow beach was soon jammed. Strenuous efforts by the engineers to build a corduroy exit road across the swamp were useless. The tanks and artillery, first off the LST's, sank in the soft beach sand and mud. The mobile-loaded trucks had to remain on the LST's and impeded the efforts of the engineers to hand-carry the bulk supplies from the ships. The plan had been to move weapons and supplies immediately by road from Red Beach 2 to Red Beach 1 (a beach whose coral reef made it inaccessible to all except small landing craft), where there was thought to be a road leading inland to the airfields. This plan had to be abandoned because terrain between the two beaches

[52] Eichelberger, *Our Jungle Road to Tokyo*, pp. 97, 102–03.

[53] (1) ALAMO Force, Rpt DEXTERITY Opn. (2) Rpt, BREWER TF (Admiralty Islands) 24 Jan–18 May 44, RED VAULT–SWPA. (3) Krueger, *From Down Under to Nippon*, p. 41.

[54] Samuel Eliot Morison, "History of United States Naval Operations in World War II," *New Guinea and the Marianas: March 1944–August 1944*, vol. VIII (Boston: Little, Brown & Co., 1953), pp. 76, 81–82.

was so rugged that it defeated the efforts of the engineers to build a road quickly. Some equipment, including a company of medium tanks, was transported by LCM's and LCVP's to Red Beach 1; but there the tanks remained, for the road leading inland at the little settlement of Dépapré at Red Beach 1 turned out to be only a narrow track.[55]

Except for small teams of mechanics from the 724th Ordnance Light Maintenance Company attached to the munitions and motor officers of the regimental combat teams, the only Ordnance men in the Tanahmerah landings were those of the 642d Ordnance Ammunition Company. The 724th was not scheduled to land until D plus 2; by that time General Eichelberger had decided to divert all future landings, as well as his command post, to the Humboldt Bay area. For the first three days the 642d performed, according to the 24th Division Ordnance officer, "miracles of strength" at Red Beach 2 in cutting ammunition out of "the mess on the beach" and shipping it to Red Beach 1. On the fourth day an officer and ten men of the company were sent up the Dépapré trail to establish an ammunition dump for the 21st Infantry Regiment's drive to the interior airfields; but they found that it was impossible for even a jeep to negotiate the narrow, winding trail. All ammunition had to be hand-carried. Giving up any thought of a dump, they simply attached themselves to the ammunition officer of the 21st Infantry and kept going. Next day the infantrymen by pushing themselves to the limits of their strength reached the airfield area and were rewarded by an air-drop of ammunition.[56]

For the landings at Humboldt Bay better information on terrain had been available. Of the two sandspits at the entrance to Jautefa Bay, the northernmost contained White Beaches 1 and 2, the southernmost, White Beach 3. Within Jautefa Bay was Pim, a little settlement with a jetty, and from it a track led to the interior airfields. At Pim was White Beach 4. Pim was also connected with a track to the village of Hollandia, to the north of White Beach 1. Immediately north of White Beach 1, between it and Hollandia, was Pancake Hill, one of the first objectives to be seized after landing because Japanese artillery emplaced there could threaten all the beaches. But the Japanese had fled. The first Ordnance maintenance men ashore, two mechanics and a supply man from the 287th Ordnance Medium Maintenance Company, attached to the 41st Division, proceeded to Pancake Hill and found a Japanese anti-aircraft gun with the canvas covering still on it.[57]

On the beaches below, the unloading of the LST's proceeded without opposition. The 649th Ordnance Ammunition Company, attached to an engineer boat and shore regiment, landed early on the morning of D-day and worked all day and the next unloading ammunition from LST's and directing sorting and stacking. By the evening of D plus 1 the northern sandspit, on which White Beaches 1 and 2 were located, was becoming extremely congested.

[55] (1) Eichelberger, *Our Jungle Road to Tokyo*, has an account of the fate of the scouting party, pp. 128–34; (2) For the best account of the Red Beach 2 fiasco, see *Engineers of SWPA IV*, pp. 268–78.

[56] History, Tanahmerah Bay Landing Force, April 22, 1944–June 6, 1944, Annex 12, Ordnance Report.

[57] History 287th Ord Medium Maint Co, 3 Apr–23 May 44.

It was only 100 yards deep, and all along it were piles of Japanese supplies scattered by the air bombing and naval bombardment prior to the landings, some of them still smoldering. The engineers had made slow progress on exit roads because of swampy or rugged terrain; and the congestion was made even worse by the necessity for basing antiaircraft and artillery units along the sandspit. Sometime during the day a much larger detachment of Ordnance maintenance men from the 287th Ordnance Medium Maintenance Company arrived and joined the D-day group on Pancake Hill.[58]

By dark on D plus 1, the ammunition men had completed their LST unloading, started the movement of ammunition to their dumps, and then retired to the foxholes they had dug on D-day in the "slots" behind the seven D-day LST's. That night, sometime between 2200 and 2300, a lone Japanese bomber came over and, guided by the smoke from the Japanese stores, dropped a bomb on a Japanese ammunition dump below Pancake Hill, starting a fire that spread to an American gasoline dump and was soon completely out of hand, creating a night of terror for the men on the beach. Among those hardest hit were the Ordnance ammunition men. Of the 30 men and 1 officer in Slot 1, nearest the Japanese dump, the officer and about 18 men were wounded, and 7 were reported missing in action. The rest of the company, after evacuating the wounded men at the risk of their own lives, returned to help fight the fire, rolling gasoline drums into the ocean, attempting to build a fire break, and trying to evacuate equipment. Technical Sergeants Erickson and Kaltenberger manned bulldozers and succeeded in pulling out 40-mm. guns and equipment until one bulldozer was hit by a falling tree and the other disabled in the swamp behind the beach.[59]

The fire raged for two days. Observers in the offshore LST's, some of which had been diverted from the Tanahmerah Bay landing, saw for more than a mile along the sandspit great billowing clouds of smoke and walls of flame, creating a fierce, eerie glare in which rockets, signal flares, and white phosphorus shells sprayed out in all directions. They heard the spitting crackle of small arms ammunition between the crashing, rumbling roar of barrage after barrage of artillery shells.[60] Almost all of the supplies brought ashore on D-day and D plus 1 were destroyed, a loss estimated at $8,000,000; worse than that, in the opinion of the troops, was the fact that the combat men making their way over the trail inland from Pim had to get along on half rations and little ammunition until the offshore LST's could be unloaded. Of necessity, White Beach 3, the southern sandspit, had to be used, which added fresh trouble, for this beach had a gradual slope offshore that prevented LST's from coming closer than forty yards. Men had to wade out waist-deep to help unload; vehicles leaving the ramps were stalled or drowned out and damaged by the salt water, for

[58] (1) *Ibid.* (2) History 649th Ord Ammunition Co, 18 Apr–20 May 44. (3) *Engineers of SWPA IV*, pp. 284–96.

[59] History 649th Ord Ammunition Co, 18 Apr–20 May 44.

[60] (1) Office of the Chief Engineer, General Headquarters, Army Forces, Pacific, "Engineers of the Southwest Pacific, 1941–1945," vol. VIII, *Critique* (hereafter cited as *Engineers of SWPA VIII*) (Washington, 1950), p. 157. (2) Hollandia Opn, 1st Corps Hq Co, 22 Apr–5 Jun 44.

only D-day vehicles had been waterproofed. When another detachment of the 287th Ordnance Medium Maintenance Company and the 741st Ordnance Light Maintenance Company arrived on White Beach 3 on 25 April, acting as a composite company, the men found that salt water rust and corrosion accounted for most of their repair work.[61]

Gradually the congestion on White Beach 3 lessened as the engineers managed to shuttle equipment and supplies in LCM's and LCVP's across shallow Jautefa Bay to White Beach 4. General Eichelberger came ashore on D plus 3 and set up I Corps command post at Brinkman's Plantation; next day, 26 April, the combat troops of the 41st Division met those of the 24th Division, and the airfields were secured. Much mopping up remained and much work was needed before Hollandia became a great base, but RECKLESS had succeeded. Critics pointed out the great cost in supplies, the folly of landing too much too soon in too small an area. The tanks, for example, could not be used, and aircraft gasoline had been landed in quantities immediately when it was known that it would be several days before the airfields could be opened. Yet the planners had had to take into consideration the possibility that Japanese air or naval forces would cut or interrupt the flow of supplies. One solution was to hold the LST's offshore and unload only the equipment and supplies that could be used immediately. But the LST's could not be tied up for long, because they were badly needed for resupply, or in other areas of the vast Pacific operations. About a hundred cargo ships, which could not be accommodated at the two-ship floating dock, had to remain unloaded in the harbor for several months. The value of offshore "floating warehouses," already under consideration, became more apparent.[62]

Aitape: the Persecution Task Force

The landing at Aitape was made on schedule on the morning of 22 April. Here as at Hollandia, the Japanese (chiefly service troops) fled after the air and naval bombardment, offering little or no opposition. The landing beach, designated Blue, was better than the beaches at Hollandia and behind it lay ample firm ground for the supply dumps. By the evening of D-day, seven LST's had been unloaded, roads were under construction, and the airfields that were the main object of the landing area were in Allied hands.[63]

To provide Ordnance support for the task force of about 12,000 men (mainly the 163d Regimental Combat Team of the 41st Division), the planners had allotted the entire 49th Ordnance Medium Maintenance Company; an 11-man detachment of the 629th Ordnance Ammuni-

[61] (1) *Engineers of SWPA IV*, pp. 299–302. (2) History 287th Medium Maint Co, 3 Apr–23 May 44. (3) Comments 741st Light Maint Co, in 41st Inf Div, LETTERPRESS (Humboldt) (LF) Hollandia Campaign (23 May 44), Lessons Learned in Hollandia Opn, p. 13. Both companies found the "composite" operation unsatisfactory. *Ibid.*

[62] (1) *Engineers of SWPA IV*, pp. 292–93, especially footnotes 288 and 292. (2) 41st Inf Div . . . Lessons Learned in Hollandia Opn. (3) Blackmore considered the failure to unload the cargo ships—of about 10,000 tons capacity—perhaps the worst feature of the Hollandia operation, even though it was questionable how much of their cargo was really needed at the moment. Blackmore Comments.

[63] *Engineers of SWPA IV*, pp. 313–21.

tion Company; the usual 4-man antiaircraft repair team from the 253d Company; and about one-third of the 41st Division's light maintenance company, the 741st. The advance 20-man detachment from the 49th landed on D-day, followed on D plus 1 by a small detachment with the ammunition and antiaircraft repairmen. The repairmen lacked tools, parts, trucks, and equipment; except for their hand kits, their supplies and equipment had been bulk-loaded on an AK, the *Etamin,* that was only about 5 percent offloaded on D-day. The Ordnance men who came ashore on D-day soon found some captured Japanese trucks, and by cannibalizing got three of them in running condition. They managed to get their welding equipment out of the *Etamin* and onto one of the captured trucks, but a shortage of landing craft slowed down the unloading of the rest of their gear. On D plus 6 the unlucky *Etamin* was hit by a Japanese bomb and all cargo was lost. The Ordnance men were badly hampered by lack of tools and parts until the rest of the 49th Ordnance Medium Maintenance arrived on D plus 8, 30 April.[64]

Less than a week later the 49th Medium Maintenance and other Ordnance units were preparing to leave Aitape to participate with the 163d Regimental Combat Team in the next operation up the New Guinea coast beyond Hollandia—the seizure of the Wakde-Sarmi area, scheduled for mid-May.

Relieving the 163d Regimental Combat Team, the 32d Division was brought up from Saidor as the main combat element of PERSECUTION Task Force. Before the end of June the Aitape airfields and the west flank were secure; but on the east flank in the region of the Driniumor River about eighteen miles east of Aitape, there had been increasingly heavy clashes with Japanese patrols. MacArthur's headquarters had reliable information from radio intercepts that the Japanese at Wewak were planning an attack early in July. Reinforcements consisting of two regimental combat teams and the 43d Division were ordered to Aitape, and because more than two divisions were now involved, General Krueger sent for XI Corps headquarters, placing the task force under the XI Corps commander. Until the arrival of the 43d Division the third week in July with its organic 743d Ordnance Light Maintenance Company and supporting medium maintenance company, the 288th, plus the 611th Ordnance Ammunition Company, all Ordnance support for the 32d Division and the two combat teams was furnished by the 32d's own 732d Ordnance Light Maintenance Company, its backup medium maintenance company, the 21st, and eleven men of the 611th Ammunition Company. The first job was to lay out a bigger ammunition dump (the old dump had exploded and burned on 16 May, the day after the departure of the 629th's detachment) and unload 4,000 tons of ammunition still in the holds of ships in the harbor. This was done by using a labor force of about 300 combat troops and 40 natives to clear out the kunai grass and cut dunnage. Native labor supplied by the Australia-New Guinea Administrative Unit

[64] (1) History Sixth Army Ord Sec, app. I, p. 3. (2) History PERSECUTION (Aitape) TF, 22 Apr–4 May 44. (3) History 49th Ord Medium Maint Co, 12 Apr–Jun 44. (4) *Engineers of SWPA IV,* p. 323.

force was also used by the 21st Medium Maintenance Company to build warehouses and sheds for the task force Ordnance depot, and here again the Australians helped by supplying prefabricated building material.[65]

Early in July, reports that a large concentration of the enemy was coming up from Wewak made it necessary to organize the Ordnance men into task force reserves; weapons were issued, and pillboxes were constructed. The counterattack never got as far as Aitape; but eastward on the Driniumor a full-scale battle developed that placed heavy demands on weapons and ammunition, especially ammunition for the 105-mm. howitzers. When the 43d Division, a South Pacific Area unit that had seen hard service in the Solomons, arrived from New Zealand, it was found that 76 percent of its weapons were unserviceable; parts had to be found and the weapons repaired. Throughout the Driniumor campaign Ordnance teams were sent to the front lines to keep the weapons operating. There was a tremendous expenditure of ammunition, estimated by XI Corps to be the largest expenditure of artillery ammunition in any campaign up to that time in the Southwest Pacific. Areas inaccessible by boat or truck were reached by an unprecedented airdrop of ammunition, estimated at 150 tons. The most important result of the battle of the Driniumor was that it destroyed several Japanese divisions that might have impeded the Allied forces in their march to the Philippines. Months before the battle ended on 25 August, other SWPA forces had made huge jumps in the advance; indeed even before Driniumor began a landing had been made at Arare, New Guinea, 275 miles north of Aitape and opposite the island of Wakde.[66]

The Geelvink Bay Operations: Wakde, Biak, Noemfoor

Long before the landings at Hollandia and Aitape, MacArthur had set his sights on the island of Biak, at the northern entrance of Geelvink Bay, some 325 miles northwest of Hollandia. A big coral island about 45 miles long and 20 miles wide, Biak had a flat coastal plain on which the Japanese had built three airstrips capable of development into heavy bomber bases. These were needed not only for the advance of Southwest Pacific forces to the Philippines but also for the Central Pacific's Mariana and Palau operations. The island seemed even more desirable after the discovery that weather and terrain made Hollandia's airfields unsuitable for the immediate employment of heavy bombers. The only really good bases for that purpose were still, by May 1944, far in the rear in the Admiralties and at Nadzab in eastern New Guinea.[67]

Wakde-Sarmi

As a preliminary to the attack on Biak, the seizure of the small island of Wakde,

[65] (1) Ord Activities Aitape Opn, XI Corps, 26 Jun–26 Aug 44. (2) History Det 629th Ord Ammunition Co, 9 Mar 43–12 Sep 44. (3) 32d Inf Div, 4 May–25 Aug 44, 332-ORD-0.3. (4) History 21st Medium Maint Co.

[66] (1) Ord Activities Aitape Opn. (2) 43d Div Opn Rpt Aitape Campaign, 29 Jun–25 Aug 44. (3) History 732d Ord Light Maint Co. (4) History 21st Medium Maint Co.

[67] (1) *AAF IV*, pp. 617–23. (2) For Ordnance support at Nadzab, see Ordnance in the Air Forces, prepared by Air Ordnance Office, AAF, May 1946, pp. 48–49, MS, OHF.

about two miles off the coast of New Guinea, some 120 miles west of Hollandia, seemed essential. Wakde had a good coral-based airstrip, from which fighters could protect the Biak landing; also there was thought to be in the region between Wakde and Sarmi (a settlement about twenty-five miles west) a fairly heavy concentration of Japanese that might menace the Allied advance. A report from air reconnaissance that the Sarmi area was "fuller of Nips and supplies than a mangy dog is with fleas" prompted a change in plans from a landing near Sarmi to one in the Arare-Toem area opposite Wakde. A landing there by TORNADO Task Force, composed mainly of the experienced 163d Regimental Combat Team of the 41st Division, went off on schedule at dawn on the morning of 17 May 1944. The next step, the capture of the small island of Insoemanai, less than a third of a mile off Wakde, and the emplacement there of heavy weapons to protect the Wakde operation, was accomplished by the 2d Battalion of the 163d Regimental Combat Team without opposition. Next day a landing was made on Wakde by the 1st Battalion of the 163d and one company of the 2d Battalion. They encountered stiffer opposition than had been expected; Japanese in some force were hidden in caves or deep coconut-log bunkers; but by 20 May Wakde was secure. The heaviest fighting was to come later on the mainland.[68]

An Ordnance maintenance detachment of three officers and 29 enlisted men of the 49th Ordnance Medium Maintenance Company went ashore near Arare on D-day about H plus 45. Mindful of the fiasco at Aitape, they took with them enough supplies and equipment to last five days. In addition to their wrecker they had two mobile-loaded trucks, one loaded with parts (in bins) and a number of rifles and machine guns, the other with complete welding equipment. The detachment was well rounded, consisting of one instrument repairman, two armorers, two spare parts clerks (who doubled as extra automotive mechanics and armorers), two welders, three antiaircraft and fire control mechanics, fourteen automotive mechanics, two men to assist the bomb disposal officer, and one cook. They immediately sent out teams to start vehicles that had flooded out during the landing; to tow waterlogged vehicles, using the wrecker; to assist at the antiaircraft command post; and to help unload the LST's. By noon they had also found a suitable spot about a mile west of Toem, between the artillery and infantry command posts and set up their shops under a big tarp. Next day, 18 May, during the assault on Wakde the men had a chance to display the ingenuity that was often called upon in Pacific landings. When a Sherman tank dropped into seven feet of water as it left the ramp of its LCM, they recovered it with their wrecker, hauled it to their shop, flushed all parts, and removed not only the engine but the entire wiring system, which had to be cleaned and dried. Some of the drying was done in the kitchen range; and when new parts were necessary (they had no spare parts for tanks) the mechanics made them out of tin cans, wire, and shell cases. The tank was back in operation in twenty-four hours.[69]

[68] (1) *AAF IV*, p. 620. (2) *Engineers of SWPA IV*, pp. 340–52.

[69] History 49th Medium Maint Co., 12 Apr–Jun 44.

Ammunition support of the TORNADO Task Force was supplied by a 93-man detachment of the 629th Ordnance Ammunition Company. The advance echelon of three officers (including a bomb disposal officer) and forty enlisted men got ashore in the Arare-Toem area on D-day, 17 May, and set up a dump to receive the ammunition coming off the LST's. They had instructions to sort the artillery ammunition by lot number as it was unloaded (mixed lots continued to be a constant problem in the Pacific as in Europe) but found this impossible. Here, as in many landings all over the world, the drivers of the dump trucks in their hurry to get rid of their cargo and get back to the ships simply dumped it on the ground without waiting for it to be unloaded. In this process, a good deal of the artillery ammunition was so badly damaged that it could not be used. The arrival on 21 May of the 158th Regimental Combat Team, of which two battalions were to be dispatched immediately to Sarmi and supplied from the task force dump, increased ammunition problems and caused concern over a possible shortage of small arms and mortar ammunition before supplies could be unloaded from ships in the bay.[70]

By the time the rest of the ammunition detachment and the remainder of the 49th Medium Maintenance Company arrived a few days later, the threat of a Japanese breakthrough in the Toem area and the shortage of combat troops had made it necessary for all the Ordnance men to set up rifle and machine gun defenses around their shops and dumps. The 49th had supplemented its five machine guns at one point with a captured Japanese machine gun. Toward the end of May the Japanese did attack in the area but were repulsed; and though the threat remained and for days the Ordnance men had to work all day and stand guard at night, the heaviest fighting on the mainland took place in the Maffin Bay area to the west, toward Sarmi. The battle was to continue until well into July, after the 6th Division had been brought in. Enemy strength in the area had been badly underestimated and resistance was stubborn; the Japanese were deeply entrenched in caves and bunkers and hard to root out. This was to be even more true on Biak.[71]

Biak

The Biak operation, begun by the HURRICANE Task Force (41st Division less 163d Regimental Combat Team) on 27 May, only ten days after Wakde, differed in many respects from anything undertaken by the Southwest Pacific forces up to that time. The landing place was selected by a process of elimination. The island is boot-shaped, and a large part of it is covered with rain forest growing out of high coral ridges; the Japanese had built their airfields on a flat inland terrace along the sole of the boot. In that area were reasonably good beaches near the villages of Mokmer and Bosnek. Mokmer, near the main Japanese airfield, was known to be heavily defended; therefore Bosnek (to the east) was selected. At Bosnek were two possibly usable jetties. The entire southern coast of Biak is surrounded by a coral reef, which made it necessary to use

[70] History Det 629th Ord Ammunition Co, 9 Mar 43–12 Sep 44.

[71] (1) History 49th Ord Medium Maint Co. (2) History Det 629th Ord Ammunition Co.

LVT's and DUKW's, carried to the reef in LST's, for the landing.

The Ordnance support for the force of nearly 21,000 men (twice as many as for Wakde) was fairly heavy: to the 41st Division's own light maintenance company, the 741st, was added the backup company, the 287th Ordnance Medium Maintenance; an entire ammunition company, the 649th; and detachments from the 253d Ordnance Maintenance Company (AA), 3608th Ordnance Heavy Maintenance Company (Tank) and 724th Ordnance Light Maintenance Company, totaling about 600 men.[72]

On D-day (for Biak called Z-day), the ammunition company was ashore early and by mid-morning had set up ten bays along the beach road. With the help of more than a hundred combat troops, the company managed during the afternoon to unload the LVT's and DUKW's from eight LST's. In late afternoon Japanese planes came over and bombed and strafed the beach, but the bombs were all duds and the strafing not much more effective. Another air attack early next morning caused no casualties among the ammunition men. They continued unloading until about 1030, when orders came through to rush as much 105-mm. ammunition to the combat units as possible. The 3d Battalion of the 162d Infantry, advancing along the beach road to Mokmer Drome against light opposition, had run into serious trouble west of Mokmer village. From caves in the cliffs that rose sharply up from the beach, the Japanese suddenly poured down on the men a withering fire.

As soon as the ammunition men got the order, they loaded twelve trucks and sent them forward, some of the men going along as guides and gunners on the armed vehicles. Attempts to unload on the beach road met with mortar and gunfire. The gun crews suffered heavy casualties. One driver returned with six wounded men on his truck. The next effort to get the ammunition to the beleaguered men was made by boats, which could move along the shore out of range of Japanese fire and then dart inshore at full speed. The 649th loaded nine LVT's with ammunition, using four of its own men as guides and gunners, and delivered it in this manner to the battalion, returning safely late in the evening. Next morning another attempt to deliver ammunition in LVT's and LCM's was called off when word came that the battalion was being evacuated.[73]

The action west of Mokmer resulted in the first tank-against-tank battle in the Southwest Pacific. On 28 May a platoon of Shermans sent forward on the coast road met some Japanese light tanks and drove them back. In this skirmish the Shermans had the aid of fire from destroyers offshore, and the damage to three of the Shermans was caused by Japanese artillery fire. The first real tank battle occurred next day, when the armor-piercing ammunition of the Shermans' 75-mm. guns destroyed the Japanese tanks, whose 37-mm. gunfire was wholly ineffective against the American tanks.[74] Rooting the Japanese out of the honeycomb of caves that dominated Mokmer Drome was a difficult and costly operation, requiring considerable reinforcements. In mid-June

[72] History Sixth Army Ord Sec, app. C, p. 4.

[73] History 649th Ord Ammunition Co, 21 May–23 Sep 44.

[74] Eichelberger, *Our Jungle Road to Tokyo*, p. 140.

I Corps was brought in, and General Eichelberger assumed command of HURRICANE Task Force vice Maj. Gen. Horace H. Fuller of the 41st Division, who left the theater, being succeeded as division commander by Brig. Gen. Jens A. Doe. It was late in June before organized resistance ended, and for weeks thereafter there were threats of suicide attacks by the 4,000 Japanese that remained on the island.[75]

The 287th Ordnance Medium Maintenance Company suffered several casualties. The advance party of one officer and fifty enlisted men, arriving on Z plus 6 (2 June) and acting as stevedores all day to unload needed supplies from the LST's, was attacked by enemy aircraft while on its way to a bivouac area that evening, and one man was wounded. After the arrival of the rear echelon on 5 June, the bivouac area became even more dangerous, for about 75 yards behind it, a battery of 155-mm. M1 guns began firing over it toward Mokmer Drome. As the men were preparing to move out on the morning of 7 June, a muzzle burst from one of the guns killed one of the men and wounded five others. The company was not able to get its shops set up until 9 June on the beach near Warwe and when it did, the work from nondivisional units and the overflow jobs from the 741st Ordnance Light Maintenance Company poured in: trucks damaged by rough roads and water holes; DUKW's damaged by coral reefs; weapons malfunctioning from constant firing; and all problems made worse by lack of preventive maintenance. But the men of the 287th, veterans of several difficult operations, knew the value of initiative and ingenuity. They improvised parts and used Japanese equipment, reconditioning some 200 Japanese trucks and putting two Japanese lathes to good use in their shops. Remaining at Biak as USASOS troops after Base H was established there, they were for a long time in danger from small bands of scattered Japanese. In September and October they captured three Japanese in their area.[76]

Noemfoor

The third Geelvink Bay operation, designated TABLETENNIS, was an invasion on 2 July 1944 of Noemfoor, a small circular island about halfway between Biak and the Vogelkop Peninsula of New Guinea. The Japanese were using the island as a staging area for troops moving to reinforce Biak; they had also constructed or partially completed three airdromes on it. The capture of Noemfoor would protect Biak as well as the sea lanes to the west of Biak; it would also provide airfields from which Allied fighters and bombers could cover the advance to the Vogelkop. Seizure of the airdrome sites was the principal mission of the assault force, which was the 158th Regimental Combat Team (brought up from Wakde-Sarmi), reinforced and designated CYCLONE Task Force. Of the 5,500 service troops assigned to the 8,000-man combat element some 3,000 were to be used for airdrome construction.

Like Biak, Noemfoor is almost surrounded by coral reefs; the landing plans

[75] For interesting firsthand descriptions of the caves see Harold Riegelman, *Caves of Biak*, pp. 145–55, and Col. Jack W. Rudolph, "Kuzume Makes the Team," *Military Review*, XXV, No. 2 (May 1945), pp. 17–23.

[76] History 287th Ord Medium Maint Co.

were therefore similar to those for Biak: to beach LCI's and LST's at the reef and unload their cargoes into LVT's and DUKW's for the assault run to the shore. The reef was narrowest at a point on the northwestern coast, which was selected as the landing place. It was near Kamiri Airdrome, which had the advantage of placing the assault troops immediately on their objective. Yet it also put them ashore at the point where Japanese defenses were expected to be strongest. For this reason the landing was preceded about an hour after sunrise on 2 July by the heaviest naval bombardment yet delivered in the Southwest Pacific. There was no opposition to the landing; the few Japanese, a far weaker force than had been expected, fled to the interior, where some of them were found wandering about stunned by the bombardment. Around 0900 Japanese mortar and 70-mm. artillery shells fell for a short time on the beachhead and reef, setting one DUKW afire and exploding a truckload of ammunition. Few casualties occurred among the assault troops; the highest casualty rate was suffered by ground accidents to paratroopers of the 503d Parachute Infantry who began arriving 3 July. With the help of the paratroopers, mopping-up operations continued until the little island was declared secure on 31 August.

On D-day at Noemfoor, thirty-nine men and four officers (including a bomb disposal officer) of the 629th Ammunition Company had gone in with the assault forces. Two days later the rest of the 90-man detachment of the company assigned to the operation (less a small rear echelon) was at Noemfoor. With some help from combat troops on unloading ships and DUKW's, by 10 July the men had succeeded in setting up a satisfactory dump on a coral ledge along Kamiri Drome. The bomb disposal officer, assisted by a 6-man squad, found that many of the roads and some of the beach and jungle area were mined with Japanese antipersonnel bombs, buried so that only the fuze was visible. But most of his work on Noemfoor was with duds dropped by Allied low-altitude bombers, and artillery shells and rockets fired in the heavy naval bombardment.[77]

Maintenance support for TABLETENNIS was provided by the 49th Ordnance Medium Maintenance Company. The advance 30-man echelon, plus the usual 4-man antiaircraft team, got ashore shortly after H-hour. The antiaircraft team stayed with the antiaircraft units, drying out and repairing equipment damaged by salt water. The other men, who brought with them a welding truck and two depot trucks, set up shop on the Kamiri airstrip. Their first job was repairing vehicles drowned out during the landing; then mechanics were sent out to all combat units to inspect and repair weapons. The welders were kept busy on Engineer and captured Japanese construction equipment, since construction work had begun at Kamiri Drome on D-day. By 25 July, Kamiri and neighboring Kornasoren (plans for the third airfield, Namber Drome, were discarded) were ready to support the impending invasion of the Vogelkop Peninsula.[78]

[77] History Hq Det 629th Ord Ammunition Co, 22 Jun–18 Jul 44.

[78] (1) History 49th Ord Medium Maint Co (Noemfoor Opn), 22 Jun–Aug 44. (2) History Sixth Army Ord Sec app. C, p. 4.

The Sansapor Area in the Vogelkop

The last operation in New Guinea, known as GLOBETROTTER, took place near Cape Sansapor on the northwest coast of the Vogelkop Peninsula. The date was 30 July 1944. In the thirteen months since the landings on Kiriwina and Woodlark, ALAMO Force had advanced 1,500 miles on the road to the Philippines. Time after time, landings had been selected by General MacArthur that would leap over and cut off Japanese centers of resistance; and the Vogelkop was one of them. Bypassing the Japanese base at Manokwari, which faced Noemfoor across Geelvink Bay, Southwest Pacific forces would go ashore 140 miles up the coast in an area that the Japanese had not thought worth defending. The Japanese had no airfields in the area —a clearing that looked to Allied reconnaissance planes like a partially cleared airstrip turned out to be a native garden area.[79]

The task force for the operation, called TYPHOON and consisting mainly of the 6th Division, less one regimental combat team, was staged in the Toem-Maffin Bay area. Ordnance support consisted in addition to the bulk of the division's own light maintenance company (the 706th) of a medium maintenance company, the 48th; an ammunition company, the 622d; tank and antiaircraft maintenance detachments; a bomb disposal squad; and a 63-man supply platoon of the 849th Ordnance Depot Company—the only depot men used in any New Guinea campaign other than Hollandia.[80]

On D-day, two battalions of the 1st Infantry landed without opposition on Cape Opmarai, and a reconnaissance troop landed on two small islands off the peninsula, Middleburg and Amsterdam, also without opposition. Next day a third battalion of the 1st Infantry moved by water from Cape Opmarai to Cape Sansapor and found no Japanese there or in the neighboring village of Sansapor. On D-day a detachment of two officers and forty-six enlisted men of the 622d Ordnance Ammunition Company landed from LST's and began setting up their dumps and by 11 August all of the company were in the Cape Opmarai area. Nearly a week later, on 17 August, the depot and medium maintenance men arrived. On that day a fighter airstrip on Middleburg Island became operational; and on 3 September an airstrip on the mainland near Mar was ready for bomber operations. Other than Japanese bombers coming over to drop bombs of the type used against parked aircraft, no enemy appeared. The Ordnance men spent their time building huts over their ammunition stacks and improving their shop areas. A big boost to morale in September was the long-awaited issue of beer to troops in the forward areas.[81]

Morotai

The final Southwest Pacific landing between New Guinea and the Philippines was appropriately named INTERLUDE. The time was 15 September 1944 and the

[79] Krueger, *From Down Under to Nippon*, pp. 116–21.

[80] History Sixth Army Ord Sec, app. C, pp. 1–4.

[81] (1) ALAMO Force, Rpt on the GLOBETROTTER (Sansapor) Opn, 30 Jul–31 Aug 44. (2) History 622d Ord Ammunition Co, 1943–1945. (3) History 48th Ord Medium Maint Co, Jul–Sep 44. (4) History 1st Supply Plat, 849th Ord Depot Co, Jul–Aug 44.

place was Morotai, an island off the north coast of Halmahera, selected in order to bypass strongly garrisoned Halmahera and yet stay within range of air support from Sansapor. The major combat elements selected by ALAMO Force for the operation were Headquarters, XI Corps, the 31st Infantry Division, and the 126th Regimental Combat Team of the 32d Infantry Division, constituting TRADEWIND Task Force, a force about twice the size of that selected for Sansapor. Ordnance support in addition to the 31st Division's organic light maintenance company (the 731st) and a detachment of the 32d's 732d, consisted of an ammunition company, the 623d; two medium maintenance companies, the 259th and 291st; the bulk of the 849th Ordnance Depot Company; a small detachment of the 3608th Ordnance Heavy Maintenance Company (Tank); two antiaircraft maintenance teams from the 3073d Ordnance Maintenance Company; and the 100th Bomb Disposal Squad. This was a total force of 932 Ordnance troops—the largest since Hollandia—and for the first time since Hollandia all nondivisional units were placed under a battalion headquarters, the 194th, the same battalion used at Hollandia.[82]

Like most of the islands the men of the Southwest Pacific had become familiar with, Morotai was mountainous and covered with rain forest. The only place suitable for airfields was a lowland area on the southwest end, from which slender Gila Peninsula extended toward Halmahera. General Krueger wanted to land simultaneously on the east and west sides of this peninsula, but his plan was vetoed by the Navy for several reasons, not the least important of which was that landings on both sides would interfere with the effective employment of naval gun fire. Consequently, two beaches were selected on the west, White Beach on the peninsula and Red Beach some 1,500 yards north on the mainland. At both beaches on 15 September the task force landed unopposed.[83] Unopposed, that is, by the enemy. It was definitely opposed by the terrain. General Krueger remembered later that the beach conditions "were the worst we had seen in our operations, and that was saying a lot." On the offshore reefs were coral heads and boulders that caught the landing craft, as well as deep holes and fissures that all but submerged the vehicles and men. Inshore, under a thin covering of sand, was sticky clay and mud in which trucks, artillery, tractors, and bulldozers bogged down. A better beach had to be found, and on the afternoon of D-day one was found on the east side of the peninsula, Blue Beach, where landing craft were unloaded beginning on D plus 1.[84]

The commander of the 194th Ordnance Battalion landed on Red Beach with the advance detachment of the 291st Ordnance Medium Maintenance Company and set up a service station on the beach to get the stalled vehicles operating. Two antiaircraft maintenance teams also got ashore on D-day and quickly managed to repair damage to the antiaircraft guns that had been submerged in salt water. Men of the 291st lent a hand with the heavy equipment and the welding of broken

[82] (1) ALAMO Force Rpt on the Morotai (INTERLUDE) Opn, 15 Sep–4 Oct 44. (2) History Sixth Army Ord Sec, app. C, p. 5.

[83] ALAMO Force Rpt on Morotai Opn.

[84] Krueger, *From Down Under to Nippon*, pp. 125, 129.



PULLING A TRUCK FROM A MUDHOLE, MOROTAI BEACH. *Other stranded vehicles await rescue.*

parts. The big 94-man ammunition detachment, accompanied by the bomb disposal squad, was split between Red Beach and White on D-day, receiving and segregating the ammunition coming off the LST's. The rest of the unit (less the rear echelon) landed next day by LST on the eastern side of the peninsula. The depot men and the 259th Ordnance Medium Maintenance Company arrived later, several days after General Krueger declared the Morotai operation at an end on 4 October. Soon after its arrival the depot company was alerted for early departure as part of the MIKE I (Luzon) operation, and for some time to come the efforts of the whole 194th Battalion were devoted to repairing or replacing the equipment of the combat units that were going to the Philippines.[85]

The time and place for the invasion of the Philippines was decided upon on the other side of the world on the night after D-day at Morotai. The Joint Chiefs of Staff, then attending the Quebec Conference, received a message from Admiral William F. Halsey, delivered by Admiral Chester W. Nimitz, recommending that plans for an assault on Mindanao on 15

[85] (1) History 194th Ord Bn, 3 Jan–4 Nov 44. (2) Histories 3d and 4th Maint AA Teams, Morotai Opn, in History 3073d Ord Maint Co, 15 Aug–9 Oct 44. (3) History 623d Ord Ammunition Co, 21 Aug–8 Oct 44.

November be canceled and that MacArthur and Nimitz make a joint assault on Leyte on 20 October. Halsey's advice was based on the success of his raids with the new *Essex* class aircraft carriers off the coast of the Philippines, which had revealed the weakness of the enemy's air defenses. His recommendations seemed sound to the Joint Chiefs. After MacArthur's consent was received on the evening of 15 September, the decision was made for the return to the Philippines.[86]

[86] (1) Samuel Eliot Morison, *American Contributions to the Strategy of World War II* (London: Oxford University Press, 1958), p. 63. (2) M. Hamlin Cannon, *Leyte: The Return to the Philippines*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1954), p. 9.

CHAPTER XX

The Philippines Leyte

By midsummer of 1944 "the clans were gathering at Hollandia," observed General Eichelberger, "A sure sign always that a major campaign is ahead." [1] Late in June Headquarters, Sixth Army (the designation ALAMO Force had been dropped in May), arrived from Cape Cretin and by August the Engineers' two sawmills were whirring to turn out lumber for buildings to house also the headquarters of the Southwest Pacific Area; United States Army Forces in the Far East; United States Army Services of Supply; Base G; Far East Air Force; and General Eichelberger's Eighth Army (activated on 7 September 1944). For a time the entire output of one mill was reserved for General MacArthur's headquarters, located inland on beautiful Lake Sentani against the backdrop of the towering Cyclops Mountains.[2] General MacArthur intended to lead in person the return to the Philippines. The primary objective was Luzon—the MIKE I operation. But first, airfields and bases for the ultimate assault had to be established. That was the purpose of the landing on the Leyte coastal plain—the KING II operation. Planning for MIKE I and KING II went on simultaneously at Hollandia.[3]

Close to the coast near Humboldt Bay the shelters for Base G depots were being built with prefabricated materials shipped from Australia. Base G, however, never became the major supply base in New Guinea. Base F at Finschhafen, which had a deeper harbor, continued to be first. But the Hollandia base was developed on a very large scale and is inseparably associated with the Philippines operations.[4] Among the earliest Ordnance efforts was the enlargement, chiefly by building huts in the native fashion, of the Hollandia Ordnance Service Center that had been set up by the maintenance and depot companies of the 194th Ordnance Battalion, which had participated in RECKLESS. An effort was also made to get the ammunition in Nichols Ammunition Depot off the ground and on coconut dunnage, and under shelter as much as possible. On Pie Beach a detachment of the 3608th Heavy Maintenance Company (Tank) put up a shop building to repair tracked vehicles and a vehicle assembly plant was being considered for the dock area.[5]

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[1] Eichelberger, *Our Jungle Road to Tokyo*, p. 163.

[2] (1) History Sixth Army Ord Sec, p. 16. (2) *Engineers of SWPA VI*, pp. 235–36.

[3] Cannon, *Leyte: The Return to the Philippines*, pp. 1–9. Unless otherwise indicated tactical details in this chapter are based on this source.

[4] (1) *Engineers of SWPA VI*, p. 236. (2) Alvin P. Stauffer, *The Quartermaster Corps: Operations in the War Against Japan*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1956), p. 89.

[5] Base G, History Hollandia, Jul–Aug 44.

Lt. Col. Frederick G. Waite helped plan for the support of the Leyte operation, first as Ordnance officer of Base G, and later as assistant executive officer at Base G headquarters. He was an old hand in the Southwest Pacific, having arrived in Australia in May 1942. His experiences in New Guinea, beginning at Milne Bay, had left him with few illusions about the effect of the tropics on Ordnance matériel and Ordnance men. He knew the damaging effect of heat and moisture on ammunition, optical equipment, weapons, and trucks, and the demoralizing effect of jungle warfare on men.[6]

Waite also knew well the supply problems involved in supporting assault landings on beaches where there were no roads, docks, hardstands, or buildings. It took time, sometimes several months, to construct the necessary facilities. He knew there was what he called a "dead" period of supply between the time the organic load was consumed and the time when base issues could be efficiently made, and a similar "dead" maintenance period before shops could be set up. In the Leyte operation he hoped that for the first time these dangerous gaps in maintenance and supply could be eliminated. Waite had for several months been working on the "floating shops" and "floating depot" that were going to be employed for the first time in the Philippines operations.[7]

The Ordnance Navy: The Shop and Depot Barges

In January 1944 a ship to carry spare parts was proposed by General Campbell in a memorandum for General Somervell, commanding general of Army Service Forces:

> I have an idea floating around in my head on which I would like to give you my thinking. When you and I were boys down South the huckster used to come around with all sorts of things in his wagon and the housewives would buy whatever they wanted. This was a very convenient way of replenishing the larder.
>
> Why should we not have an ASF spare parts ship stocked with miscellaneous assortments of fast moving spare parts of all the Services. Experts from each of the Services would man this floating depot, and parts would be those shipped to the various Theaters of call. . . .[8]

At the time, there was a definite shortage of shipping; no vessel of the size contemplated could be spared. In the Normandy invasion the use of commodity-loaded ships as floating depots or floating warehouses, although convenient and often necessary, was sharply criticized because it immobilized urgently needed ships. Such use was finally prohibited by the Joint Chiefs in December 1944. In the Pacific the floating depot or offshore LST was extremely vulnerable to enemy air attack, as had been demonstrated by the lone enemy bomber at Hollandia.[9]

Not until April 1945 did General Somervell act on General Campbell's suggestion. Three multiple-deck cargo vessels were selected for use by Ordnance. The *Nevadan* was to be stocked mainly with weapons parts; the *Susan Luckenbach* with

[6] (1) Base G, History Hollandia, Jul–Aug 44. (2) Waite Paper.

[7] *Ibid.*

[8] History Planning Division, ASF, vol. 2, p. 258; vol. 9, p. 215.

[9] (1) Bykofsky and Larson, *The Transportation Corps: Operations Overseas,* pp. 108, 311. (2) Blackmore Comments.

transport vehicle parts, and the *Marymar* with parts for tanks and other tracked vehicles. A similar type of vessel was selected for the Engineers; two C1–M–AVI vessels were designated for the Transportation Corps and one for the combined use of Signal, Chemical Warfare, and Medical services. To get the ships allocated, prepare plans for conversion, and do the job took many months. Significantly, the last delay was caused by the V–J Day celebrations in the shipyards. It was September 1945 before the three Ordnance ships, loaded with 420 carloads of spare parts, sailed. While they were on the way, it was decided that they would not be needed by the occupational forces in Japan, and they were returned to be discharged at U.S. ports.[10]

The inspiration for preparing in the United States floating maintenance shops for Pacific island bases came from a member of the ASF Maintenance Division in the spring of 1944. The ship contemplated was the small shallow-draft Baltic coaster; but as none was available the Transportation Corps suggested that concrete ships or barges be considered. The concrete barge was decided upon and by 3 May 1944 plans were well enough along to be presented in some detail, with a blueprint, to the commanders of the Southwest Pacific and Pacific Ocean Areas. The barge, approximately 265 feet long and 48 feet wide, was to house on its main deck technical repair shops to do maintenance up to fifth echelon for all types of army equipment, and in its lower holds and 'tween-deck holds storage for spare parts and assemblies. The boat deck was to carry a 50-ton landing barge plus a 30-ton crane to lift it into the water, and was to be equipped with 40-mm. antiaircraft guns and machine guns. The maintenance men would have comfortable quarters on the boat deck.[11]

Only two of these barges were planned, one for the Southwest Pacific and one for the Pacific Ocean Areas. Each was an ambitious, million-dollar project, completely equipped with machinery and tools, and possessing such features as air conditioning for the instrument shops and dehydrated compartments to provide rustproof storage. Planning went on for months, including consultations with theater commanders and conferences between members of the technical services. As Ordnance service was considered predominant, a TOE of 103 Ordnance men was agreed upon, with four Medical, one Engineer, nine Signal, and six Transportation men (as boat crew) attached, and essential equipment for all. The Ordnance men were given special training on Chesapeake Bay in boat drill and landing operations. Not until late 1944 did construction of the barges get under way and the first was not expected

[10] (1) History Planning Div, ASF, vol. 2, pp. 259–62, vol. 9, app. 20–A. (2) Ltr, Maj Gen Julian S. Hatcher to CG OCO–D, 12 May 45, sub: Floating Spare Parts Depots. (3) Memo, same to same, 25 May 45, and 1st Ind. (4) Memo, Brig Gen Henry C. Wolfe, Dir Planning Div ASF, for Deputy Dir Plans & Opns, ASF, 1 Sep 45, sub: Random Notes of Major Importance during Gen Scott's Absence, 18 Aug–31 Aug 45, ASF Theater Br Planning Div Files. (4) Lt Col C. R. Petticrew, "Ordnance Depots Afloat: A New Idea in Amphibious Warfare," *Army Ordnance*, vol. XXX, 154, (January–February 1946), pp. 56–58.

[11] (1) Memo, Brig Gen Frank A. Heileman for TAG, 3 May 44, sub: Floating Maintenance Barges for Various Island Bases in the Pacific Theaters, with Incls, and MFR, AG 560 (3 May 1944). (2) "Base Shops Afloat," *Firepower* (February–March 1945), pp. 2–3. (3) Maj Albert D. Lueders, "Maintenance Afloat," *The Ordnance Digest*, (April 1945), pp. 16–18.

to become available in the United States until February 1945.[12]

In the meantime, the USASOS Ordnance officers in the Southwest Pacific had taken matters into their own hands, as men in the theaters all over the world had learned to do, without waiting for the lengthy planning processes in the United States to bear fruit. Since the fall of 1942 they had been aware of the need for floating depots and shops to solve the serious problem of what Waite termed "supply strangulation" on assault beaches—the 60-day to 90-day period that elapsed between the time an advance base was first occupied and the time its subdepots were set up and operating. By the spring of 1943 Colonel Holman had in operation a fleet of small ships to deliver parts, replacement weapons, and cleaning and preserving materials to Ordnance maintenance companies in forward areas and to evacuate unserviceable equipment and captured enemy matériel. The ships carried small shops aboard to repair the small arms being evacuated.[13] During the leapfrogging operations up the New Guinea coast the value of this fleet became even more apparent and planning was directed toward somewhat larger ships and more emphasis on shop work. The main obstacle was finding the ships. The ideal vessel for the purpose was the LST, which could move under its own power, but LST's were too scarce to be even considered. The best available substitute was the 265-foot BCL (barge, concrete, large) constructed by the Maritime Commission for the Navy in National City, California, and towed across the Pacific behind Liberty ships.[14]

By June of 1944, the most pressing Ordnance need in this respect was for fifth echelon shop barges. ALAMO Force had made its way up the New Guinea coast as far as Biak, and distances were becoming too great to make it practicable to ship unserviceable unit assemblies back to base shops at Milne Bay. About the time the first concrete barges arrived at Milne Bay in September 1944, the tools and equipment to outfit them were also available, since a base shop at Milne was closing down and the entire plant of a shop at Sydney, Australia, was being shipped to Base F at Finschhafen. The Ordnance men at USASOS were planning four barges, each with a capacity of rebuilding ten engines a day plus five each of the other vehicle unit assemblies such as axles, and also with some facilities for repairing weapons and accessories. The job of outfitting and operating the barges was given to the 141st Ordnance Base Automotive Maintenance Battalion at Finschhafen.[15]

As soon as the barges arrived, Capt. Elroy C. Leoppard and 2d Lt. Dwight E. Wheeler of the 141st Battalion went down to Milne Bay, loaded fifth echelon equipment on BCL 3056 and started back to Finschhafen, arriving 27 September to begin the job of outfitting Ordnance's first floating shop. With the help of Waite and

[12] (1) MFR's, other Corresp, in AG 560 (3 May 44) Floating Maint Barges for Various Island Bases in Pacific Theaters; also in USAFFE AG Sec 560 Barges, Book 2, KCRC. (2) The barge destined for POA did not arrive at Hawaii until 6 July 1945, and was still in Hawaii on V–J Day. History 3121st Ord Floating Maint Barge, 12 Oct 45.

[13] (1) Rpt of Ord Activities, USASOS–SWPA, Nov 42, OHF. (2) Blackmore Comments.

[14] (1) Ltr, CG USASOS to CG USAFFE, 3 Dec 44, sub: Concrete Barges, USAFFE AG Sec, 560 Barges, Book 2, KCRC. (2) Waite Paper.

[15] (1) Rpt of Ord Activities, USASOS, Jun, Jul 44; (2) History Off Ord Officer, Base A, Sep 44 in History Milne Bay, USASOS.

Lt. Col. Walter A. Brown, Maintenance officer, USASOS, and under the direction of Captain Leoppard, who was to become the first Ordnance barge commander, a detail of a hundred men of the 141st worked three shifts a day on this pioneer operation. The barge was ready on 18 November. It had a wooden superstructure, with two hold levels below the main deck and eight hatches to each deck. The superstructure supported an electrically operated monorail hoisting system; at each of the four main deck doors a cargo boom could be lowered, which permitted use of the monorail lift over small craft or amphibians. On the top deck were quarters for the 3 officers and 121 men who were to operate the shop (Detachment A, 141st Ordnance Base Automotive Maintenance Battalion), but the quarters were to be occupied only during operation at a base. When the barge was being towed, the men had to be moved by some other means of transportation. The mission of the detachment, activated 1 January 1945, was to rebuild worn-out engines, assemblies, and power train units, and to operate a small but complete service section, in which almost any kind of tool and special equipment could be made. The barge, now designated USASOS Floating Shop 4, departed for Leyte in February 1945. She turned out to be an unlucky little vessel, for she suffered two explosions that cost lives; in the second, occurring late in August, an explosion in No. 4 Starboard Hold killed four men and seriously wounded seventeen. But she did fine work at Leyte.[16]

A second concrete barge, BCL 3058, arrived in Finschhafen in October, was similarly fitted out, and was functioning before the end of December as Floating Shop 6. Her mission was to clean up much of the New Guinea backlog before moving on to the Philippines. In March 1945 she was sent to Hollandia, where there was a tremendous backlog. The barge was anchored offshore at Pim Jetty (with her maintenance men located at the Hollandia Ordnance Service Center) and furnished with two 80-foot barges and an LCM to facilitate offshore operations. The Ordnance officers at Base G had estimated that there were enough reclaimable engines and assemblies on hand to keep the floating shop busy for three months; but the need in the Philippines was greater, and after only ten days of operation at Hollandia the barge departed in April for Manila.[17]

A third shop barge was designed for a very special use—as a floating tire repair shop. The tire problem was as hard to solve in the Pacific as it was in other theaters, and the arrival of one of the new and scarce tire repair companies, the 166th, at Finschhafen in April 1944 was welcomed in the Southwest Pacific as such companies had been welcomed in Europe. As in Europe, the company was broken down into detachments, one operating as part of the 141st Battalion in Finschhafen and the other running a tire shop at Milne Bay. The company's equipment was long delayed. When it was unloaded at Finsch-

[16] (1) History Off of Ord Officer, Base A, Sep 44. (2) Rpt of Ord Activities, USASOS, Sep, Oct 44. (3) History 141st Ord Base Automotive Maint Bn, May–Nov 44. (4) History Floating Shop 4 Prov-Det A, in History 141st BAM Bn, Jan–Nov 45. (5) History Base F, Feb 45, in History Finschhafen, Jan 44–May 45. (6) Waite Paper; for a photograph of the barge, Fig. 12. (7) "Ordnance Curb Service," *Army Ordnance,* XXVIII, 150 (May–June 1945), p. 332.

[17] Rpt of Ord Activities, USASOS, Nov 44, Jan 45. (2) History Off Ord Officer Base G, in History Hollandia Staff Sections, Mar–Apr 45.

hafen on 2 December 1944 plans were drawn up for installing it in a barge, and the work got under way under the direction of Colonel Brown as soon as BCL 3064 arrived on 20 December. This barge also had some bad luck when a harbor tug towing a steel crane rammed her side on 20 January 1945 and punched a hole in Starboard Hold No. 3; but repairs were quickly made and the shop installation was completed on 28 January. Floating Tire Repair Shop 11, as she was called, arrived at Manila on 10 June and a few days later was tied up in the Pasig River alongside Floating Shop 6.[18]

While the work on the shop barges was going forward at Finschhafen, another vessel in the Ordnance fleet was being readied at Milne Bay—a depot barge, made possible when BCL 3060 was turned over to Ordnance on 20 November 1944. With a dead-weight capacity of 2,500 tons, the depot barge was intended to supplement maintenance facilities and to effect prompt resupply of parts in forward areas where there were no USASOS depots. The work of installing bins for the storage and issue of parts was begun immediately by a detail from the 318th Ordnance Depot Company, supervised by Colonel Brown until Colonel Waite arrived to take over late in November. There was a very short deadline of 15 December, but it was met. For their contribution in hard work and initiative, Sgts. Edwin S. Coe, William R. Willson, and Orville L. Shields, and Pvt. George H. Bucholtz received handsome commendations from Waite. The barge, designated USASOS Floating Depot 9, and operated by a detachment of two officers and thirty-one enlisted men from the 172d Ordnance Depot Company (mostly transferred from the 318th), was supplied as much as possible from stocks in Milne Bay (thus helping in "rolling up the rear"), then moved up to Finschhafen and Hollandia to complete its stocks. Certain automotive parts were in short supply everywhere and stocking took longer than had been expected. The depot barge did not arrive at Leyte until April 1945.[19]

Planning for Leyte

Because D-day now meant to everybody the Normandy landing on 6 June 1944, General MacArthur designated the Leyte date of 20 October 1944 as A-day. This was by far the largest operation yet undertaken in the Pacific. For the first time, there would be two armies, Sixth Army to go in first, Eighth Army to follow up. And for the first time there would be an organization to provide logistical support in advance of USASOS, an organization comparable to the Advance Section, Communications Zone, which had been attached to First Army in the Normandy invasion.[20]

[18] (1) Rpt of Ord Activities, USASOS, Nov 44 and Jan 45. (2) History 166th Ord Tire Repair Co, Jun 43–May 49, Apr 44–Dec 45. (3) History Det 166th Ord Tire Repair Co, Sep–Nov 44 and Jan–Feb 45.

[19] (1) Rpt of Ord Activities, USASOS, Nov 44, Jan 45. (2) History Ord Officer Base A, Nov, Dec 44, Jan 45. (3) History Ord Officer Base G, Feb 45. (4) History Ord Office, Intermediate Sec, USASOS, Nov 44–Jan 45. (5) History 318th Ord Depot Co, 1944–45. (6) History 172d Ord Depot Co, 1944–45. (7) Waite Paper. (8) For use of Floating Depot 9 at Cebu in May 1945 see below, p. 435.

[20] Samuel Eliot Morison, "History of United States Naval Operations in World War II," vol. XII, *Leyte, June 1944–January 1945* (Boston, Little, Brown and Company, 1958), p. 114, n. 4.

ASCOM

The USASOS advance organization was designated Army Service Command (ASCOM). With the invasion of the Philippines in mind United States Army Services of Supply had established ASCOM in Brisbane on 23 July 1944 and given it two missions: first, to set up the new bases that would be needed in the Philippines (later to be turned over to USASOS); second, to provide logistical support for Sixth Army immediately after the landings. The base mission dictated that it be largely an Engineer outfit, and the commander was Maj. Gen. Hugh J. Casey, MacArthur's chief engineer. ASCOM arrived at Hollandia from Brisbane on 5 September. General Casey set up headquarters adjacent to Sixth Army headquarters and by 14 September his planning for KING I (the Mindanao landing) scheduled for 15 October and KING II (Leyte), scheduled for 20 December, was nearly complete. On 15 September, the day ASCOM was attached to Sixth Army, the KING I operation was canceled and the date of KING II was advanced to 20 October. Next day the ASCOM men who were going to run the base at Leyte were organized into Headquarters, Base K.[21]

The Ordnance officer of Base K was Col. Otto M. Low, the commanding officer of the 230th Ordnance Base Group. Lately arrived from the United States, this was the second Ordnance group headquarters in the Southwest Pacific. It was to act as headquarters of the Base K Ordnance Section and at Leyte was to control two Ordnance battalions with some nine companies, several of the "heavy" type. Colonel Low and two members of his staff were to go ashore at Leyte on A plus 2, the rest of the men on A plus 6. On 6 October group headquarters moved into the KING II staging area at Hollandia, which the men considered "a hole of the first water," with a mess run by an Australian mobile kitchen unit "that put out small quantities of almost inedible food when it felt like it."[22]

Theoretically, Army Service Command would relieve the Sixth Army Ordnance staff of considerable work and provide an immediate base of supply and evacuation in support of the Ordnance troops behind the combat units. It was also expected to provide an easy means of transition into USASOS operations. There were, however, some disturbing reflections. ASCOM headquarters had had little time to organize and train; and the delay in moving from Brisbane to Hollandia had made impossible the close co-ordination with the Sixth Army Ordnance Section that was so desirable during the planning period. Another handicap, which could not be foreseen, but which was to be a real drawback to smooth Ordnance operations, was a change in ASCOM Ordnance officers several times during the early stages of the Leyte campaign.[23]

[21] (1) History Army Service Command, 23 Jul–26 Dec 44. (2) History Base K, 16 Sep 44–31 Dec 45.

[22] (1) History Ord Sec Base K, Nov 44, in History Base K. (2) History 230th Ord Base Gp, Oct–Nov 44. (3) The first Ordnance group headquarters to arrive in SWPA was that of the 226th Ordnance Base Group, which came in May 1944, and after July acted as Ordnance Section of Base F. History Hq & Hq Det 226th Base Depot (formerly Hq Det, 226th Base Gp), May–Dec 44.

[23] History Sixth Army Ord Sec, p. 17.

Blackmore's Problems: Time and Distance

For D-day in Europe the First Army Ordnance planners had had months of preparation. For A-day in the Pacific, the planning of the Sixth Army Ordnance Section was measured in weeks rather than months. The Leyte planning was made even more difficult by major changes in the troop lists only five weeks before A-day. Conferences at Brisbane during the summer had contemplated landings by X Corps with the 1st Cavalry and 40th Infantry Divisions in the area of Tacloban, Leyte's capital, and the XIV Corps with the 24th and 37th Infantry Divisions about twenty miles south of Tacloban in the Dulag area. When on 15 September A-day was changed from 20 December to 20 October, the 40th and 37th Divisions had to be ruled out because they could not be brought forward in time from western New Britain and the Solomons. Instead of the 40th Division, X Corps took over the 24th Division, which had made a good record in RECKLESS at Tanahmerah Bay; and instead of XIV Corps, a corps from the Pacific Ocean Areas, the XXIV (7th and 96th Infantry Divisions) was substituted. The XXIV Corps could be diverted to the Southwest Pacific because its operation against Yap Island had just been canceled.[24]

During the planning period the assault units were widely scattered. The XXIV Corps was still loading out of Hawaii when the change in plan was announced on 15 September. The corps commander, Maj. Gen. John R. Hodge, flew to Hollandia with his G–4 to participate in the Leyte planning, but the big convoy itself, after reassembling at Eniwetok on 25 September, arrived at Manus in the Admiralties on 3 October and it was there that the final plans were made and orders issued. The troops had been aboard ship since 27 August. The 1st Cavalry Divison, which had been the main force in the capture of these islands earlier in the year, was still in the Admiralties. The only combat elements at Hollandia were the 24th Infantry Division and the Rangers of the 6th Ranger Infantry Battalion who had been given the job of securing the approaches to Leyte Gulf before A-day.[25]

In calculating the Ordnance units that would be needed to support the Leyte operation, the Sixth Army Ordnance Section planners once more (as in the earlier SWPA operations) fervently wished that MacArthur had had an Ordnance officer on his staff to give him some expert advice. They felt that the Ordnance units assigned by GHQ for Leyte were entirely inadequate, both in numbers and types. In this opinion they were not alone, for all of the Sixth Army special staff officers, as well as the commanding general of ASCOM, felt that they had themselves been short-changed by GHQ. The Engineers especially had put in a strong bid for more troops because they knew that a landing in the fall or winter—the rainy season on Leyte—would require a herculean effort in building airfields and a base to support future operations. The Engineers were turned down; GHQ had become accustomed to operating on a shoestring, and had become so confident that it was even holding back for the Luzon operation some of the scarce

[24] Krueger, *From Down Under to Nippon*, p. 143.

[25] (1) Opns Rpt, Leyte, XXIV Corps, 20 Oct–25 Dec 44. (2) CofS XXIV Corps Section Histories, 4 Apr 44–3 Jan 45. (3) Morison, *Leyte*, pp. 114–15.

service units that might have been used for Leyte—a bad decision, according to the Sixth Army G–4, who felt that the units might have been employed in KING II and picked up on Leyte for use in the Luzon operations. The shortage was further aggravated by the limited shipping space available for the invasion: units needed early in the operations were to arrive late because they had been assigned to movement on later echelons.[26]

At Leyte the job of the Sixth Army Ordnance officer, Brig. Gen. Philip G. Blackmore (recently promoted from colonel), was twofold: to exercise technical supervision and control over all Ordnance service; and to co-ordinate with USASOS to insure that the right supplies came forward at the right time. In the Tacloban landing in the north, all Ordnance companies, divisional and nondivisional, were to be attached to either the 24th Division or the 1st Cavalry until A plus 4, when X Corps' 246th Ordnance Battalion would take over the ammunition companies and the nondivisional maintenance companies. The maintenance and depot companies were to carry with them thirty days of supply and the ammunition companies, five units of fire. Supply planning for the XXIV Corps, which was to land at Dulag in the south, had already been done, for better or worse, when the corps loaded at Hawaii. Aboard ship were twenty days of Ordnance Class II supply and five units of fire. After the landing the XXIV Corps Ordnance battalion headquarters was to be attached to ASCOM, along with all Ordnance nondivisional companies except an ammunition company behind each division (along with a bomb disposal squad and an antiaircraft detachment each) and one heavy tank maintenance company, which would furnish all corps maintenance support.[27]

So much for planning. As it turned out, time and distance made intelligent supply planning all but impossible. Constantly alert to changes in the troop list, Blackmore's staff lost no time in placing requisitions with USASOS; but the truth was, there were not enough Ordnance supplies in the theater and not enough time for requisitions to be filled from San Francisco, which took a minimum of 120 days. The advance of two months in the invasion date was even worse than it first appeared, for Leyte is 1,250 miles from Hollandia, and the slow LST's carrying part of the troop list had to start on 4 October to get there on time. Moreover, it was impossible to make the best use of the supplies that were available in the Southwest Pacific because the USASOS bases were strung out from Brisbane to Biak, and supplies could not be transshipped in time since there were not enough ships. This lack of shipping affected not only resupply requisitions, but, more alarmingly, even the immediate am-

[26] (1) History Sixth Army Ord Sec, p. 18. (2) (2) Ltr, CG ASCOM to CG USASOS, 23 Sep 44 sub: Deficiencies in Service Units for K–2 Operations. (3) Memo, K. P. (Col Kenneth Pierce) DCofS Hq Sixth Army for CofS, 25 Sep 44, no sub. Last two in G–4 Jnl KING II Opn, 26 Aug–2 Oct 44.

[27] (1) Hq Sixth Army, Annex 2 to AdminO 14, Ord Plan, 30 Sep 44. (2) Hq X Corps, Annex 5 to AdminO 1, Ord Plan, 30 Sep 44. (3) Hq XXIV Corps, Ord Plan, Annex Item to AdminO 2, 2 Oct 44. All in G–4 Jnl, KING II Opn, Leyte, 26 Aug–12 Oct 44. (4) Sixth Army Rpt, Leyte Opn, 20 Oct–25 Dec 44, p. 24. (5) In General Blackmore's opinion, Brig. Gen. Francis A. Englehart, chief Ordnance officer of USAFICPA, had done a fine job in getting equipment and supplies in Hawaii for the troops of XXIV Corps. Blackmore Comments.

munition requirements and the basic loads of maintenance and depot companies.[28]

In the case of one maintenance company, there was an element of bad luck. This was the 207th Ordnance Medium Maintenance Company at Finschhafen, ordered to the Admiralties on 18 September to support the 1st Cavalry Division in the Leyte landing. Glad to leave New Guinea's mud and rain, the men loaded all their equipment aboard the Liberty ship *Don Marquis* and sailed for the Admiralties on the evening of 25 September. The next evening as the ship was approaching Manus she was rammed by a tanker, the *Missionary Ridge,* and began listing heavily. Fire broke out and spread and many were injured. Because the ship's crew pre-empted the lifeboats, the Army men and Navy gun crews had to lower the injured over the side on rafts improvised from hatch covers and then jump overboard. One Ordnance man was lost, Pvt. Harry K. Rhodes, who was last seen swimming near some burning oil; and twelve were injured. The company lost most of its equipment and after being rescued and carried to the naval base on Manus Island even had to be outfitted with Navy clothing. Thus the 1st Cavalry Division lost the company that had been counted on to back up its own organic Ordnance company in the assault on Leyte. The 292d Ordnance Medium Maintenance Company at Oro Bay was substituted for the 207th, but in the three days between the time it was alerted, 22 October, and the sailing date of 25 October sufficient supplies and equipment could not be made available and the unit did not arrive at Tacloban until 13 November.[29]

A-Day and After

On Friday afternoon, 13 October 1944, the convoy got under way at Hollandia, five hundred ships carrying X Corps headquarters and the 24th Infantry Division to Leyte. As they started out, Humboldt Bay was choppy, a bad sign of the coming typhoon season; also the fact that the day was Friday the thirteenth probably did not pass unnoticed. But it was to be an uneventful voyage in clear weather over calm seas. On the 15th they were joined by the convoy from the Admiralties with XXIV Corps and the 1st Cavalry Division. The plan was for XXIV Corps (the Southern Attack Force) to proceed to the anchorage at Dulag early on the morning of A-day and for X Corps (the Northern Attack Force) to steam toward the Tacloban area. Two beaches had been designated for the X Corps landing: White on the north, nearest Tacloban, was assigned to the 1st Cavalry; Red on the south near the village of Palo was assigned to the 24th Infantry Division.

Just before the huge fleet—the largest naval attack force ever to sail the Pacific—entered Leyte Gulf, there were two pieces of good news: the Rangers had secured the

[28] (1) History Sixth Army Ord Sec, pp. 18–19. (2) Rpt of Ord Activities, USASOS, Sep 44. (3) Morison, *Leyte,* p. 114.

[29] (1) History 207th Ord Medium Maint Co 1944 and Apr–Oct 44. (2) The accident cost not only equipment of the 207th, but also that of the 248th and 249th Port Companies, and the 98th Radar Maintenance Unit; also, 280 tons of ammunition, 8 liaison planes, six 105-mm. howitzers, and 27 TD–9 tractors were lost. Memo, F. L. M. Executive, 27 Sep 44, G–4 Jnl, KING II Opn Leyte, 26 Aug–2 Oct 44. (3) Ordnance Rpt in Sixth Army Leyte Rpt, p. 239; and History 292 Ord Medium Maint Co, 1944.

islands at the mouth of the gulf (an operation called by Samuel Eliot Morison "Clipping the Cat's Whiskers"); and a hurricane previously reported near Manila was said to be moving northward. By dawn of A-day, when the ships eased into the transport area, there had been no sign of the enemy except a lone plane that circled high overhead and disappeared into the mist; and the first rays of the sun that broke out of a bank of clouds over Samar fell on a glassy sea. The 24th Division historian reported, "So far the gods were with us." [30]

And in general the gods continued to favor KING II. The Leyte assault beginning at 1000 was less difficult than many other amphibious landings in the Pacific. The Japanese had withdrawn from the beachhead areas, a fortunate circumstance since the usual preliminary bombardment by U.S. Navy ships had accomplished little beyond cutting the tops from trees.[31] By the end of the day successful landings had been made along the east coast and on Panaon Island at a comparatively low cost in Sixth Army casualties—49 killed, 192 wounded, 6 missing. Landings at Red Beach met resistance. From well-camouflaged concrete pillboxes and coconut log bunkers behind the beach the Japanese directed machine gun, mortar, and 75-mm. artillery fire at the 24th Division's landing craft; and at Hill 522 near Palo, commanding not only the beaches but the entrance to Leyte Valley, they had a strongpoint interlaced with tunnels, trenches, and pillboxes. The division Ordnance officer when he went ashore shortly before noon was pinned down on the beach for forty-five minutes by mortar and machine gun fire. The beach itself aided the enemy, for it was too shallow to permit the LST's, which had no pontons for a causeway, to get close enough to unload. Standing offshore, the big craft presented easy targets to Japanese mortars: four were hit and one was set afire.[32]

At the southern end of Red Beach, two LST's carrying the 636th Ordnance Ammunition Company were more fortunate: they were not hit, although some of the men on board were injured by shell fragments. The two LST's were forced to withdraw to the transport area and were not able to unload until next day, when ponton units were brought up from Dulag.[33] When the men of the 636th did get ashore, so much Japanese fire was still directed on the beach that the ammunition had to be thrown down with no thought of dunnage and little effort at segregation. Construction of the Red Beach dump could not start until 22 October, when the division's own 724th Ordnance Light Maintenance Company reported in to help with men and equipment. By that time the division G–4 and ammunition officer had taken four truckloads of critical machine gun, rifle, and mortar ammunition forward. Up on White Beach, things were better. The 1st Cavalry Division met little

[30] (1) History 24th Infantry Division Landing Team, 20 Oct 44–25 Dec 44. (2) Morison, *Leyte,* p. 117.

[31] (1) Wesley Frank Craven and James Lea Cate, eds., "The Army Air Forces in World War II," V, *Pacific: Matterhorn to Nagasaki* (hereafter cited as Craven and Cate, *AAF V*) (Chicago: University of Chicago Press, 1953), p. 356. (2) Blackmore Comments.

[32] (1) Morison, *Leyte,* pp. 134–35. (2) Kenney, *General Kenney Reports,* p. 448.

[33] (1) History KING II Opn, 636th Ord Ammunition Co, Oct–25 Dec 44. (2) 11th Field Arty Bn–Leyte Campaign, 22 Oct–12 Nov 44.



UNLOADING SUPPLIES ON A LEYTE BEACH

enemy resistance, and the 595th Ordnance Ammunition Company was able to put down dunnage, most of it lumber salvaged from the landings, and to segregate its stocks by types.[34]

In XXIV Corps' landing at Dulag, where the 96th Division came ashore on Blue and Orange Beaches and the 7th Division landed on Violet and Yellow Beaches, the only ammunition men ashore on A-day were those supporting the 96th Division—the 632d Ammunition Company, divided into two detachments, one to establish an ammunition supply point, the other to establish the division water, ration, and miscellaneous dump. On the 7th Division's beaches, 11-man teams of the 707th Ordnance Light Maintenance Company, coming ashore with only their hand kits, their arms filled with spare parts and their pockets stuffed with all the wrenches and hardware they could carry, had the additional task of setting up the small beach ammunition dumps. They were immediately busy repairing shot-up LVT's, and the division acutely felt the need of an

[34] (1) "Leyte Landing," *Firepower* (June–July 1945), p. 12. (2) Ordnance Rpt, Annex 9 to Rpt of 24th Div Landing Team, 20 Oct–25 Dec 44, pp. 124–25.

ammunition company on A-day.[35]

Sixth Army Ordnance Section had helped to plan many SWPA landings, but had never participated in a landing until Leyte. An advance detachment landed on A plus 2, and by A plus 11 the whole section was ashore. The men soon discovered that their worst problem was getting the ammunition to the combat troops who had already begun to advance inland, X Corps headed northwest through the Leyte Valley toward Carigara on Leyte's northern coast, XXIV Corps southwest toward Baybay on the western coast at the narrow waist of the island.[36]

To begin with, the process of getting the ammunition from the ship to the beach was painfully slow because it had to be lightered ashore. The distance from ship to shore might be considerable, for the Navy did not want the dangerous ammunition ships too close to the beach. And when the time came for unloading, it was hard to get at the most wanted types of ammunition. The trouble was greatest in the X Corps area, for ships arriving from SWPA bases had not been loaded with this problem in mind. When the Ordnance men at White Beach, for example, looked into the holds of two Liberty ships offshore they were dismayed to find that they could not dig out the critical items without moving an immense tonnage of cargo. The only solution was to unload everything—thus increasing the congestion on the beach. Considerable confusion on the beach already existed because the Navy shore party, which called the ships in, was in radio communication with Navy transports only. Steel airfield matting was laid on the beach to get the ammunition trucks down to the water but it curled up and cut out hydraulic brake lining. At White Beach the soil was well drained, but in many places the ground was swampy or covered with rice paddies and could not be used without more help from the Engineers than was available. In short, there had not been time for careful planning for dump sites or for proper co-ordination.[37]

At Dulag in the XXIV Corps landing area, the terrain and the arrangements for unloading were better. In the 7th Division area on Beach Violet 1, for example, two LST's combat-loaded with bulk ammunition served as floating supply points for emergency requirements until A plus 3. But ironically enough, on this beach Ammunition Supply Point 2 had hardly been set up when Japanese air attacks during the battle for Leyte Gulf wiped out these advantages. On the night of 25 October, a Japanese bomb set fire to the ASP, blowing up the entire dump and destroying not only all of the division's ammunition but 80 percent of the Class II supplies and 20 percent of the vehicles of the 707th Ordnance Light Maintenance Company, located nearby. General Blackmore had to direct X Corps ammunition ships down to Dulag, for about one third of all the XXIV Corps ammunition was gone.[38]

[35] (1) Rpt 632d Ord Ammunition Co (Leyte Assault), 20 Oct–25 Dec 44. (2) 7th Inf Div, Opn Rpt KING II, G–4 Rpt, app. D. (3) "Leyte Landing," *Firepower* (June–July 1945), p. 10.

[36] History Sixth Army Ord Sec, p. 17.

[37] (1) History Sixth Army Ord Sec, pp. 19–20. (2) Sixth Army Rpt of the Leyte Opn, p. 210. (3) Ltr, Brig Gen W. J. Heavey to CO Sixth Army, 13 Dec 44, sub: Preliminary Report on 2 ESB Activities in Leyte Landing, in Jnl and Jnl File, K–II Opn, 2d Engr Special Brigade, 16 Sep–25 Dec 44. (4) Blackmore Comments.

[38] (1) 7th Inf Div, Opn Rpt KING II. (2) Memos, Blackmore and G. W. P., Asst G–4, to X

This catastrophe, occurring on the evening when the transfer of responsibility from division to corps was to take place, added to the burdens of the corps Ordnance officer, Lt. Col. William Menoher, which were already heavy enough. Instead of a battalion for normal corps support, he had been allotted in corps shipping one company only. He had selected the 284th Ordnance Heavy Maintenance Company (Tank) as the best tooled and equipped company available, and had ordered it to bring all the supplies it could carry. The 284th, especially trained on amphibious vehicles such as the LVT's (with which XXIV Corps was liberally supplied), was awarded the Meritorious Service Unit Plaque for its service at Leyte. But there was a limit to what one company could do. Not until almost two months after A-day did Menoher receive his other corps Ordnance units and when they did arrive, they were promptly assigned to ASCOM. In the meantime, Menoher's ammunition section had to maintain and supply ASP's and, pending the arrival of a depot company, his supply section had to function as a depot company when the first XXIV Corps resupply ship arrived. These resupply ships, long ago requisitioned by POA (before the corps' departure from Oahu) for direct shipment from the United States to Leyte, arrived early and saved the day on Ordnance Class II supply. They were to be a godsend not only to XXIV Corps but to X Corps as well.[39]

The Ordnance Officer of X Corps, Col. Duncan G. McGregor, had a battalion headquarters, the 246th. When corps took over from the divisions on 25 October, the battalion was built up with the two ammunition companies on Red and White Beaches, the 636th and 595th, and a medium maintenance company, the 3498th. The maintenance men, landing on 24 October in support of the 24th Division's own light maintenance company, had had their hands full, issuing small arms and working on antiaircraft guns during their first three days ashore. They worked out of their shop trucks until 29 October, when they found a suitable dump area near Marasbaras on the Palo-Tacloban road. One of the biggest jobs of the 3498th was to keep the artillery firing. The X Corps had two battalions of 155-mm. guns and a battalion each of 8-in. and 155-mm. howitzers and all were undergoing hard service in the attack on the town of Carigara, on the northern coast of Leyte. Lacking parts for these guns, mechanics worked around the clock to manufacture them. Many of the men were constantly on the road doing contact work at the firing batteries. Things improved when the company was moved up to Tunga (five miles south of Carigara) in mid-November, but the men were always overworked. For most of the campaign, the 3498th was the only maintenance company in the corps Ordnance battalion.[40]

Whatever the troubles of the maintenance men in both X and XXIV Corps,

Corps Transportation Officer, 26 Oct 44, in Sixth Army G–4 Jnl, KING II Opn.

[39] (1) XXIV Corps Section Histories, G–4 and Ord Rpts. (2) History Sixth Army Ord Sec, p. 19. (3) History 284th Ord Heavy Maint Co (Tank) 1945.

[40] (1) History Hq and Hq Det 246th Ord Bn, KING II Opn, 9 Oct 44–4 Jan 45. (2) History 3498th Ord Medium Maint Co, 15 Oct–25 Dec 44. (3) History Sixth Army Ord Sec, p. 39.

the big Ordnance problem at Leyte throughout the campaign was ammunition supply. Before the end of October it was apparent that the Japanese were making a strong fight for Leyte. Japanese reinforcements poured into Ormoc on the west coast; bombing and strafing attacks began to increase by 25 October. In defense of U.S. ships in the harbors and supply installations on the beaches, the 40-mm. and 90-mm. antiaircraft batteries fired enormous quantities of ammunition; and as the combat troops raced across the island to the west coast they met stiffening resistance that required heavy concentrations of fire from the artillery battalions.[41]

At times certain types of artillery ammunition were so low at the gun positions that they had to be rushed from the ship to the waiting gunner. Sometimes the types needed were not available and restrictions on expenditures had to be imposed. The Sixth Army Ordnance historian attributed the serious ammunition situation to lack of the required types in the theater, delay in unloading ships, and the dearth of suitable storage areas.[42] The dumps on the crowded beaches were dangerously vulnerable to enemy action. On 1 November a bomb explosion at X Corps' White Beach ammunition dump, operated by the 595th Ordnance Ammunition Company, killed one man of the company and wounded six so badly that they had to be evacuated.[43]

These troubles were compounded by bad weather beginning in early November. When the 636th Ordnance Ammunition Company established on 4 November the X Corps forward ASP 6 near Tunga, the men were able to stack the ammunition without dunnage on well-drained slopes camouflaged by the shadows cast by groves of palm trees. Three days later a typhoon struck Leyte with howling winds that bent the palms low and blew heavy rain into almost horizontal sheets. The rainy season had begun. Torrents of rain fell throughout November and December. The ammunition bogged down and it took strenuous efforts by the men, aided by Filipino laborers, to provide dunnage of palm logs, ammunition containers, and stones. Ammunition trucks coming in from the 30-mile trip back to White Beach (the round trip took six to eight hours) had to be worked around the area by bulldozer and tractor-crane.[44]

The crisis in ammunition supply occurred the second week in November in the X Corps sector during the attack on the mountains barring the entrance to the Ormoc Valley. The important 15-mile-wide corridor ran south from Carigara Bay on the northern coast to Ormoc on the northwestern coast, where the Japanese had landed. A detachment of the 595th Ordnance Ammunition Company had established Ammunition Supply Point 7 at Pinamopoan, a village on Carigara Bay at the head of the corridor, within sound of the big guns supporting the battle of

[41] (1) History Sixth Army Ord Sec, pp. 19–20. (2) History, 246th Ord Bn, KING II Opn, 9 Oct 44–4 Jan 45.

[42] (1) 24th Inf Div, Leyte, Annex 9, Ord Rpt, p. 125. (2) History Sixth Army Ord Sec, p. 19.

[43] (1) History 595th Ord Ammunition Co, 10 Sep 42–Aug, Nov–Dec 44. (2) History 246th Ord Bn–KING II Opn.

[44] (1) History KING II Opn, 636th Ord Ammunition Co, Oct–25 Dec 44. (2) History 246th Ord Bn, KING II Opn, 9 Oct 44–4 Jan 45. (3) "Leyte Landing," *Firepower* (Jun–Jul 45), p. 12. (4) For a description of the typhoon see Jan Valtin, *Children of Yesterday* (New York: The Reader's Press, 1946), pp. 187–88.

Breakneck Ridge. For weeks the men were harassed by enemy sniping, artillery fire, and bombing. This ASP was supplied by amphibious operations like those of an initial landing. All ammunition came in by LVT—either direct from White Beach up the water route around the northeastern tip of the island and into Carigara Bay, or from the town of Carigara on the bay where it had been brought up by truck from Tunga. After the middle of December the ammunition supply problem eased considerably.[45]

By that time the fighting was almost over. The two XXIV Corps divisions had crossed to the west coast by the Abuyog-Baybay road, and the 7th Division had pushed north through mountain ridges in a difficult and expensive advance that resembled the campaign in Sicily in 1943. On 7 December the 77th Division made an amphibious landing south of Ormoc and four days later captured Ormoc, the enemy's main supply base on Leyte. On the X Corps front, the 32d Division (which had relieved the 24th) and the 1st Cavalry Division had advanced south as far as Valencia by 16 December. A desperate effort by the Japanese to reinforce their troops on 11 December had been defeated by the Fifth Air Force. On 25 December the 77th Division captured Palompon—the only harbor of any importance that remained in Japanese hands—and General MacArthur declared organized Japanese resistance on the island at an end. Only mopping-up operations remained.

The Costly Base at Leyte

In the attempt to build a base at Leyte, the Engineers' gloomy predictions about bad weather were more than fulfilled; and in the all-important task of airfield construction were other unhappy circumstances that stemmed directly from the decision to advance the date of the Leyte landing and to eliminate the steppingstone operation on Mindanao. At Leyte the SWPA forces were 800 miles from the nearest fighter base and 1,000 miles from the nearest bomber base. Therefore it was vital to improve the best Japanese airfield, located on the Tacloban peninsula, but it was impossible to do so immediately. Lack of adequate maps of the beaches during the planning phase, mainly because Leyte had been beyond range of land-based photographic aircraft, had led to the LST debacle at Red Beach, resulting in the diversion of LST's to the Tacloban airfield site. There thousands of tons of ammunition, supplies, and equipment had been unloaded and had to be hauled out over one narrow access road before construction could even begin.[46]

By 27 October the Tacloban strip could receive some of Morotai's P–38 fighters, but the field was still a long way from being fully operational when the Japanese stepped up their air attacks on the beaches and shipping in Leyte Gulf at the beginning of November, and by that time some of the scarce P–38's had to be sent to Ormoc. The Navy's aircraft carriers, which were to serve until such time as the airfields were ready, were beginning to feel the effects of hard fighting in the battle of Leyte Gulf, as well as kamikaze and submarine attacks, and for days at a time in November were pulled off to strike at Luzon. The Japanese had begun effective night air opera-

[45] History 246th Ord Bn, KING II Opn, 9 Oct 44–4 Jan 45.

[46] *Engineers of SWPA VI*, pp. 283, 286, 290.

tions and for a good part of November they had air supremacy over Leyte Gulf after sundown.[47]

This air warfare had tragic consequences for two Ordnance ASCOM companies aboard the troopship *Jeremiah M. Daily,* the 3483d Ordnance Medium Automotive Maintenance Company and the 168th Ordnance Depot Company. On the afternoon of 12 November, anchored off Leyte awaiting debarkation,[48] the *Daily* was strafed and bombed by Japanese aircraft. An enemy plane crashed into the bridge, burst into flames, and fell into a forward hatch, spewing burning gasoline on ten drums of range fuel on the deck that exploded and burned furiously. The deck became an inferno of blazing gasoline and scalding steam from shattered pipes; and in the forward hold a bomb explosion killed or severely wounded many of the men. Twenty-eight men of the Ordnance maintenance company were killed, the total casualties of the company amounting to 75 percent of its strength. The depot company had 6 men killed, 5 wounded, and 22 missing. Some of the Ordnance equipment and supplies were saved, but a good deal of the maintenance company's equipment was damaged by water or the salt used to put out the fires.[49]



COLONEL BECKER

Eighth Army Ordnance Arrives

A month after the landing at Leyte, General Eichelberger and members of his Eighth Army staff, including his Ordnance officer, Col. Ward E. Becker, arrived at the Tacloban airstrip. Eichelberger's mission was to take control at Leyte as soon as the first phase of the campaign was over in order to free Sixth Army for the final planning for Luzon. For the past month, since 22 September, Eighth Army headquarters had had a similar job in New Guinea and had been training, staging, and mounting Sixth Army units for both Leyte and Luzon.[50]

[47] (1) Craven and Cate, *AAF V,* 369–85. (2) Morison, *Leyte,* pp. 348–50. (3) Kenney, *General Kenney Reports,* p. 475. (4) An airstrip located on the flat flood-plain of the Marabang River could be used for emergency landings, but because of rain and mud could not be made operational for fighter planes until 19 November. *Engineers of SWPA, VI,* p. 298, and Craven and Cate, *AAF V,* 373–74.

[48] There was said to be a standing order that troops must be taken off ships within twenty-four hours of arrival; but this was not done. Blackmore Comments.

[49] (1) History Ord Branch Base Sec [3] Jun 44–Jan 45. (2) History 168th Ord Depot Co, Oct–Dec 44. (3) History Sixth Army Ord Sec, app. C, p. 5. (4) History 3483d Ord Medium Auto Maint Co, 8 Apr 42–Nov 46.

[50] (1) Eichelberger, *Our Jungle Road to Tokyo,* pp. 172–73. (2) History Eighth United States Army Ordnance Section (hereafter cited as History Eighth Army Ord Sec), p. 23, OHF.

Colonel Becker was new to the theater, having arrived from the United States in midsummer, but he was not new to overseas operations, for he had had long service as Ordnance officer of Eastern Base Section in North Africa. His first action in New Guinea was to send the members of his Ordnance Section out to get first-hand information on the equipment of the combat troops and Ordnance units at staging areas along the coast from Morotai to Oro Bay and over to Gloucester in New Britain. They reported that one of the most serious problems was the scarcity of waterproofing kits. As there would not be enough time before the Luzon landing to receive the needed amounts from San Francisco, the only answer was improvisation in the theater. Another cause for worry, an old story everywhere by now, was the bad condition of trucks and other equipment, caused by poor driving, overloading, and neglect of first and second echelon maintenance. For help on this problem, Becker authorized Maj. John Foreman of his Maintenance Division to organize and supervise an inspection team, using men of the 207th Ordnance Medium Maintenance Company who had little to do otherwise, since they had lost all their equipment in the sinking of the *Don Marquis* off Manus Island in the Admiralties. The team, to be transported around New Guinea in two C–47's, was being organized in the Admiralties at the time Becker left for Leyte.[51]

Eighth Army's new headquarters was twenty miles down the coast from Taclo-ban at Telegrafo, a place characterized by General Eichelberger as "a swamp and a mudhole and nothing more." [52] Rain, mud, and the rough fighting X Corps had encountered in the west around Breakneck Ridge made it necessary for GHQ to postpone the Eighth Army takeover from 5 to 26 December. In the interval, Becker sent some members of his office to work closely with their opposite numbers at Sixth Army, and others, unofficially, to visit the Ordnance units on Leyte. After 26 December all Ordnance units on the island hitherto assigned or attached to Sixth Army went either to Base K, USASOS, established on the same date, or to Eighth Army, which assumed control of X and XXIV Corps.[53]

The Ordnance units who were going to take part in the invasion of Luzon were coming up from the south, from other Southwest or South Pacific bases. And at the time Eighth Army took over on the island, 299 of the Sixth Army Ordnance men—the 292d Ordnance Medium Maintenance Company, half of the 643d Ordnance Ammunition Company, small detachments of the 267th Ordnance Antiaircraft Maintenance and 724th Ordnance Light Maintenance Companies, and the 100th Bomb Disposal Squad—were not on Leyte, but far to the north, supporting the beachhead at Mindoro.

Success on Mindoro

Nothing demonstrates more clearly the dizzying stop-and-start of operations in the

[51] (1) History Eighth Army Ord Sec, pp. 7–10, and app. D, OHF. (2) Minutes, Conference Eighth Army Hq, 6 Nov 44, in G–4 Jnl File, Hollandia Opn Eighth Army 12 Jul 44–15 Jan 45. (3) History 207th Ord Medium Maint Co, 1944.

[52] Eichelberger, *Our Jungle Road to Tokyo*, p. 173.

[53] Rpt, CG Eighth Army, Leyte-Samar Operation (Including Clearance of the Visayan Passages), 26 Dec 44–8 May 45, pp. 72–78 (Ord Rpt).

Philippines than the story of the 292d Ordnance Medium Maintenance Company. Landing at Tacloban from Oro Bay on the night of 13 November 1944, the company was rushed by truck up to Tunga and worked there a little less than two weeks, when it was attached to the Western Visayan Task Force, destined to invade Mindoro, the large island lying on the southern flank of Luzon and separated from it by the 8-mile-wide Verde Island passage. MacArthur had decided that air bases on Mindoro were essential to the protection of convoys moving toward Lingayen Gulf as well as to assist with air strikes at Luzon and elsewhere. Since the island was known to be lightly held, a small force composed mainly of two regimental combat teams (one a "clipped-wings" parachute outfit) was all that was needed. The invasion date for the Mindoro operation (called LOVE III) was set for 1 December, and on 28 November the advance 119-man echelon of the 292d began boarding its LST in San Pedro Bay. The men remained aboard in the bay for almost two weeks. Bad weather slowed the development of the Leyte airfields counted on to provide air coverage for the operation and the invasion date was postponed to 15 December.[54]

Moving out into the dangerous northern waters on the afternoon of 12 December, the convoy was attacked the following afternoon by Japanese aircraft. The flagship *Nashville* was severely damaged by a kamikaze crash-dive; but the LST's were not hurt and landed safely on the morning of 15 December, designated as U-day. In many respects, U-day at Mindoro was unique in the history of Pacific island-hopping. The weather was good; the beaches, located in the southwestern corner of the island, were hard sand that could carry the heaviest vehicles; the invaders were met not by Japanese but by friendly Filipinos, some waving American flags; and the unloading, under the thoroughly experienced 532d Engineer Boat and Shore Regiment, proceeded in record time, because the Engineers had brought with them a 1,200-man labor detail taken from X and XXIV Corps units on Leyte. All the Ordnance men were ashore early on U-day and soon had their dumps and shops in operation near the town of San Jose. On Christmas Day the ammunition men invited twenty-five Filipino guests to share their turkey dinner.[55]

At the same time, there were many evidences that in approaching so close to Luzon the invaders were entering an extremely sensitive area. Bombing by Japanese aircraft was a daily occurrence, and on the day after Christmas the beachhead had the very unusual experience of being attacked by the Japanese Navy. Shortly before midnight an enemy task force approached so close to the breaches that the men on the shore could see the white glare of its antiaircraft fire as it attempted to repel Allied aircraft. Proceeding slowly down the coast, the ships kept up a run-

[54] (1) History 292d Ord Medium Maint Co, 1944. (2) Robert Ross Smith, *Triumph in the Philippines*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1963), p. 25. (3) History Sixth Army Ord Sec, app. C., p. 7. (4) *Engineers of SWPA IV*, p. 509.

[55] (1) *Engineers of SWPA IV*, pp. 510–14. (2) History 292d Ord Medium Maint Co, 1944. (3) History Det 643d Ord Ammunition Co, Nov–Dec 44. (4) More ammunition in terms of units of fire went in with this attack force than went in with any other; no resupply was needed. Blackmore Comments.

ning bombardment. Shells fell on airfields four miles inland, and on the Ordnance installations. But no great damage was done, and after about forty-five minutes the ships retired under constant attack by Allied bombers and PT boats.[56]

The air raids continued on land and sea. The resupply convoy arrived on 30 December crippled by Japanese attacks. On the whole, the small LOVE III operation cost more in sunk and damaged transport shipping than any other operation in SWPA.[57] But by 1 January 1945 Mindoro was firmly in Allied hands. On that date control passed to Eighth Army. By then Sixth Army's assault forces for Luzon were steaming north from New Guinea, New Britain, the Admiralties, and bases as far away as the Solomons and New Caledonia, heading for the greatest operation yet attempted in the Pacific—the massive landing on Lingayen Gulf scheduled for 9 January 1945.

[56] (1) *Engineers of SWPA IV*, p. 516. (2) History 292d Medium Maint Co, 1944. (3) History 643d Ord Ammunition Co, Nov–Dec 44.

[57] Armed Forces Staff College, 0–39: Conf-Historical Presentation, Leyte-Luzon, I, p. 8, Armed Forces Staff College Library.

CHAPTER XXI

The Philippines: Luzon

To most Americans Leyte was only a name on a map. Luzon was far more: it was Manila and Corregidor and Bataan and the Spanish-American War. To the Army, especially the older men in Sixth and Eighth Armies who had served in the Philippines in peacetime, Luzon and the southern islands had long and deep associations: legends of the Moro Insurrection; Zamboanga in Mindanao, immortalized by the barracks-room song about the tail-less monkeys; cool Baguio, the summer capital in the mountains of Luzon; lovely tropical evenings in Manila, one of the beautiful cities of the world.[1]

To the men in the huge task force convoys that began passing through Leyte Gulf 4 January 1945, Luzon meant a return to civilization. Many of them had not seen a city in two years or more; all were weary of thatched huts, the steaming jungle, the lonely beaches. Of the four divisions selected for the assault on Luzon the 43d was picked up at Aitape, the 6th at Sansapor. Both were under I Corps, the earliest corps headquarters to arrive in the Southwest Pacific Area. The other two divisions, under XIV Corps, came from the Solomons and New Britain—the 37th embarked at Bougainville and the 40th at Cape Gloucester. The plan was for both corps to land on the southern beaches of Lingayen Gulf, the I Corps on the left near San Fabian, ultimately to contain and attack the Japanese concentrations in northern Luzon. The XIV Corps, landing on the right near Lingayen, was to head for Manila. Offshore in ready reserve Krueger had the 25th Division from Nouméa as well as an airborne division, a regimental combat team, an armored group, and a Ranger battalion.[2]

Ordnance units down at Hollandia, Finschhafen, Milne Bay, and other bases from Sansapor to Bougainville had more time to prepare for this landing than for any other in memory. Back in October they had begun cleaning and overhauling weapons and vehicles, issuing new ones when they could; binning parts, stocking vans, and crating ammunition. Maintenance units destined to operate close to the front lines, like the 6th Division's 48th Ordnance Medium Maintenance Company at Sansapor, mounted their shop equipment on trucks and trailers and built kitchen trucks. The last job for all, usually done on the loading beaches, was supervising the waterproofing of all vehicles.

[1] (1) Eichelberger, *Our Jungle Road to Tokyo,* pp. 200–201. (2) Krueger, *From Down Under to Nippon,* p. 241.

[2] (1) Stanley A. Frankel, *The 37th Infantry Division in World War II* (Washington, 1948), p. 204. (2) Smith, *Triumph in the Philippines,* pp. 29–32. Unless otherwise indicated the tactical story of the Luzon campaign is based on this source.

By early December at the more remote bases like Bougainville, long lines of vehicles, their drivers dozing in the hot sun, were waiting their turn to be loaded in the LST's, Liberty ships, and Navy transports that crowded the harbors; and huge stacks of supplies on the shores were being reduced to the tune of screaming winches.[3]

Well before Christmas the Ordnance troops at Bougainville were aboard ship and sailing out of the harbor toward Luzon. There was a stop at Huon Gulf off Lae, where the 37th Division rendezvoused with the 40th Division and the Navy conducted a landing rehearsal; another stop at Manus in the Admiralties where the men had a chance to go ashore and spend Christmas, enjoying the Navy's ample supply of beer. For many of them it was the third Christmas away from home. Two days after Christmas the slow LST's got under way and by the night of New Year's Eve the whole XIV Corps convoy was swinging north of the equator, headed for the control point southwest of the Palaus where it was to rendezvous on 3 January with the I Corps convoy coming up from New Guinea.[4]

Like other Ordnance companies in this S-day armada, the 37th Division's 737th Ordnance Light Maintenance Company was dispersed—part traveling on a transport, part on an LST, and part on a Liberty ship. Dispersal was the general policy, to insure against the loss of any entire unit in a ship sinking; it was also, in the case of the Ordnance men, to provide detachments on each ship for dewaterproofing on arrival. During the long monotonous voyage, each detachment naturally thought it had the worst of it. The men aboard the Australian transports complained of the eternal mutton served at every meal and the eternal tea which, according to the 37th Division historian, almost brought on another Boston Tea Party. The Navy transports were abominably crowded. The LST's bobbed like corks and the bunks in their bottom decks were almost unbearably hot. The Liberty ships had no bunks at all, for they were not equipped to carry troops. The men of the 737th's detachment brought cots aboard the Liberty *Kathryn L. Bates* and proceeded to astonish the merchant crewmen by their ability to make themselves at home. On the deck crowded with vehicles and cargo, they put down their cots and built a kitchen, showers, and latrines, tying shelter halves and canvases to anything available. Some of the men, reported their historian, "built their homes between ration boxes"; and toward the end of the voyage as the kitchen took away the rations, complained of being eaten out of house and home.[5]

Ordnance Plans for Luzon

At Leyte General Blackmore, preparing for his own departure for Luzon, was easier in his mind about MIKE I than he had been about any operation in the Southwest

[3] (1) History 1st Ord Bn, M–1 Opn, Oct 44–13 Jul, Dec 45. (2) History 48th Ord Medium Maint Co 1944–46. (3) Frankel, *The 37th Infantry Division in World War II*, p. 205.

[4] (1) Frankel, *The 37th Infantry Division in World War II*, pp. 208–16. (2) Samuel Eliot Morison, *The Liberation of the Philippines* (Boston: Little, Brown and Company, 1959), p. 115.

[5] (1) History 737th Ord Light Maint Co, 1 May 44–Aug 45. (2) History 48th Ord Medium Maint Co, 1944–46. (3) Frankel, *The 37th Infantry Division in World War II*, pp. 208–11.

Pacific up to then. He was especially happy because he had been able to talk General MacArthur's G–4 into allowing Sixth Army three more ammunition ships than GHQ had proposed. On the question of manpower, he thought he was going to have enough men, for the first time, to take care of maintenance and supply. He would have liked to have more ammunition companies, but he knew he could depend to some extent on civilian labor. Also, there were some comforting reflections on terrain and the nature of the campaign. For the first time in his two years of island-hopping, he was going to be able to furnish Ordnance service to Sixth Army with some degree of orthodoxy. There would be extensive overland operations that would enable him to use an army Ordnance service center and the army ammunition supply points procedures outlined in Ordnance field manuals.[6]

To operate the service center the 189th Ordnance Battalion was attached to army, with two medium maintenance companies, an antiaircraft maintenance company, and a heavy field army maintenance company. For ammunition supply army had the 259th Ordnance Battalion with seven companies to operate the ammunition supply points. Blackmore was also able to augment his staff section with the headquarters of the 12th Ordnance Battalion. These troops, together with three bomb disposal squads, totaled more than two thousand men, a striking contrast to the 7-man bomb disposal squad that was all that the Sixth Army Ordnance officer had attached at Leyte.[7] Another striking contrast to Leyte was the amount of time for planning. A representative of Sixth Army Ordnance Section had been at Hollandia working with the Luzon planning group since August and during the fall Blackmore was able to call to Leyte for consultation the commanders of his army battalions as well as the Ordnance officers of I and XIV Corps.[8]

Each division in addition to its own organic light maintenance company would land with a backup medium maintenance company attached, plus an ammunition company (to revert to army later) and a bomb disposal squad. In I Corps, the 6th and 43d Divisions were each taking along also a detachment of the 3608th Ordnance Heavy Maintenance Company (Tank) (which had been doing excellent work at Pie Beach, Hollandia) to provide immediate Ordnance service on the beaches to tanks and other tracked vehicles. When I and XIV Corps took over on S plus 2, the maintenance battalion of each corps was to assume control of the medium maintenance companies from divisions and bring in heavy maintenance support—tank and field army, and a depot company.[9]

As far as Army Service Command was concerned, Blackmore's co-ordination was easy because the Ordnance Section of Base M—ASCOM's operating group for Luzon—had been at Tacloban since 12 November, working with Sixth Army Ordnance Section and Base K. Base M's Ordnance

[6] (1) Blackmore Comments. (2) History Sixth Army Ord Sec, pp. 21–22.

[7] *Ibid.*, p. 23, and app. C, pp. 5, 7.

[8] *Ibid.*, pp. 22–23.

[9] (1) I Corps History of Luzon Campaign 1945, pp. 229–30. (2) XIV Corps, Report of Ord Officer 9 Jan–15 Jun 45, Sec I, General Supply & Maintenance, AGF 319.1. (3) Hq 6th Inf Div, Annex 2 to AdminO 1, Ordnance Plan, 28 Nov 44. (4) Hq 43d Inf Div, Annex 4 to AdminO 1, Ordnance Plan, 28 Nov 44. Both in G–4 Jnls, M–1 Opns, Sixth Army.

Section, like that of Base K, was operated by one of the Ordnance group headquarters that began arriving in the Southwest Pacific in the summer of 1944—the 229th Base Group, whose commander, Lt. Col. John H. Henderson, became the Ordnance officer of Base M. On 10 December the group was reorganized under TOE 9–312 of 13 September 1944 and redesignated the 226th Ordnance Base Depot. In keeping with ASCOM's mission of relieving army from logistic responsibility in the base area (target date, S plus 20), Henderson's staff planned base service centers, to be operated by the 9th Ordnance Battalion with two depot companies, four automotive maintenance companies (two of them of the heavy type), a heavy field army maintenance company, and an antiaircraft maintenance company. ASCOM ammunition dumps were to be operated by ammunition companies independent of the battalion.[10]

The supply planning was easier than for Leyte. All units were directed to bring to the far shore in the assault period (S-day to S plus 12) 30 days of supply and 5 units of fire for the combat troops. This had also been the requirement for the Leyte invasion, but the advance in date for the KING II operation had made it impossible to meet. For Luzon, the 30-day supply requirement was generally met in I and XIV Corps, but because of theater shortages and the scarcity of interisland shipping all combat units did not have their 5 units of fire for all weapons before embarkation. For most weapons, however, the ammunition requirement was met by both corps, an achievement attributed by XIV Corps to its earlier alert for KING II and by I Corps to the "magnificent cooperation" of Col. John H. Woodberry, Chief Ordnance Officer, USASOS, who arranged to have a considerable amount of ammunition brought up from other bases by FS (fast supply) boats and by C–47, C–46, and B–17 aircraft. With regard to all types of supply, the scales in favor of success were considerably weighted by the postponement of the MIKE I operation for twenty days, from 20 December 1944 to 9 January 1945.[11]

Not the least advantage of the delay was the further opportunity to study maps and books on Luzon that provided valuable advance information on suitable sites for ammunition dumps and bivouacs for Ordnance units. Corps planners had time to make their selections and to co-ordinate them with shore party commanders, divisions, and army. At Sixth Army headquarters, planners made tentative assignments to the various services of areas where their installations would be located; they had seen with their own eyes the confusion after the Leyte landing, when representatives of the services rushed around selecting sites "like men staking out claims in a gold rush." At Luzon the area assigned for the

[10] (1) History 226th Ord Base Depot, 15 Oct 44–1 Oct 45. (2) Hq Army Service Command, Base M Ordnance Supply and Service Plan, 30 Nov 44, G–4 Jnl, M–1 Opn, Luzon, 16–19 Dec 44, Sixth Army. (3) History Sixth Army Ord Sec, app. C, p. 9. (4) Memo, P. G. B. [Blackmore] to ACofS, G–4, 2 Dec 44, sub: Date of Assumption of Responsibility by Base M for Unloading of Ships and for Logistic Responsibility. (5) Memo, W. N. L. [Leaf] to Ordnance Officer, 3 Dec 44. (6) Memo, P.G.B. to ACofS, G–4, 4 Dec 44. Last three in G–4 Jnls, M–1 Opns, Sixth Army.

[11] (1) History Sixth Army Ord Sec, p. 27. (2) XIV Corps, Rpt of Ord Officer, 9 Jan–15 Jun 1945, Sec II, Ammunition, p. 20, AGF 319.1. (2) I Corps History Luzon Campaign 1945, pp. 228–29.

army Ordnance service center was near Lingayen Gulf, at Calasiao, and the Sixth Army Ordnance planners had the further advantage of enlarged aerial photographs of the area to assist them in laying out the center.[12]

By New Year's Day 1945, the long and arduous staff work was over. The Luzon Attack Force began steaming out of Leyte Gulf on 2 January, headed by a group of mine sweepers and a gallant old fleet of battleships and cruisers (some of them survivors of Pearl Harbor) to bombard the invasion beaches. A few days later, General MacArthur went aboard the light cruiser *Boise* and General Krueger and key members of his staff boarded the command ship *Wasatch*. On the afternoon of 4 January the convoys coming up from below the equator began to pass through Leyte Gulf, to head south down Surigao Strait, then west through the Mindanao Sea, then north through the Sulu Sea and then north up the west coast of Luzon toward the last major landing in the Southwest Pacific.

Supporting the Lingayen Landings

Before sunrise on S-day the invasion convoys were safely in their transport areas in Lingayen Gulf. In the dim light of early morning the men on the decks could see all around them hundreds of ships riding a gentle ground swell. Beyond on either side were mountain ranges covered by low-lying clouds. Ahead, the 20-mile stretch of flat landing beaches was hidden in a haze thickened by a pall of smoke pierced here and there by bursts of orange. The old battleships and cruisers were shelling the beaches. They had been battered by kamikaze attacks in the gulf on 6 January and were still being sporadically attacked, but their guns were still firing, the shriek and distant rumble of the bombardment echoing over the water.[13]

As the first rays of the sun broke over the Caraballo mountains, the ships in the transport area began discharging their landing craft. The assault troops scrambled down the cargo nets of their transports and into the waiting LVT's, which then headed for the beaches, preceded by LCI gunboats and amphibious tanks. All of this followed a pattern that was by now familiar. The men who had planned the landings were veterans of many amphibious operations with the benefit of the large-scale experience at Leyte. As at Leyte, the LST's were grounded some distance from shore, but this time they had their ponton causeways, which splashed down around 1100. Also, at Lingayen Gulf there was a more liberal use of LVT's, invaluable in the terrain behind the beaches—a region of rice paddies, fish ponds, and swamps, through which meandered many streams and several good-sized rivers.[14]

This region had one thing in its favor. It was such poor defensive terrain that the Japanese had concluded that it would be

[12] (1) I Corps History of Luzon Campaign 1945, p. 230. (2) History Sixth Army Ord Sec, pp. 20, 23.

[13] (1) Morison, *The Liberation of the Philippines*, p. 125. (2) Col. Robert Armory, Jr., and Capt. Reuben M. Waterman, eds., *Surf and Sand: The Saga of the 533d Engineer Boat and Shore Regiment and 1461st Engineer Maintenance Company 1942–1945* (hereafter cited as *Surf and Sand*) (Andover, Mass: Andover Press Limited, 1947), pp. 134–36.

[14] Morison, *The Liberation of the Philippines*, p. 127.

futile to attempt to hold it; instead, they had concentrated their forces in the mountainous area east and northeast of Lingayen Gulf. In the first week after the invasion enemy artillery shelled the extreme left of the landing forces in the I Corps area, but elsewhere little or no opposition was encountered. At the XIV Corps beachhead on the right flank, the landings were virtually unopposed except for a few air raids.

The XIV Corps Beachhead

From right to left, the 40th Division landing was made on the extreme right over Orange and Green Beaches near the town of Lingayen and, next left, the 37th Division on Yellow and Crimson Beaches near Binmaley.

A few Ordnance officers attached to combat units got ashore in the early waves on the 40th Division beaches and three sergeants with a wrecker came in on an LSM around noon. Later in the afternoon a sizable detachment of the Division's own 740th Ordnance Light Maintenance Company (accompanied by nine men of the backup 263d Ordnance Medium Maintenance Company) landed from a Navy transport. By evening it had set up its bivouac area in the town of Lingayen, which boasted a much-battered but still recognizable capitol building in the Grecian style. These men were joined by a bomb disposal squad, which had been given the job of clearing the bombs and duds from the quickly captured Lingayen airstrip. Next day Japanese air raids occurred at sunrise and after sunset, but no damage was done. The division's regimental combat teams were moving south at such a fast clip, ferried over the rivers in the indispensable LVT's, that the maintenance company's first effort had to be devoted to sending out contact parties to perform maintenance on the run.[15]

On the 37th Division's beaches, only a small detachment of the 737th Ordnance Light Maintenance Company landed on S-day. Moving to their assembly area about two miles inland between the towns of Binmaley and Dagupan, the men saw their first signs of civilization—billboards advertising Texaco gas and Pepsodent toothpaste, and, according to the 37th Division's historian, "real houses, roads, people dressed in Western clothes, and pretty girls who spoke English. After three years of virgin jungle and unattractive headhunters, this was something!" [16]

On S-day forward elements of the 37th pushed inland ten miles to San Carlos but it was several days before the 737th could catch up with them because a delay in unloading its equipment had deprived the company of the men and trucks it needed to make the move. It was 16 January when the men pulled their shop trucks into a coconut grove near the town, hung out their sign, and were ready for business. It was here that they made a significant contribution to the drive on Manila. At a railroad siding in San Carlos the infantrymen had discovered six flatcars but no locomotive. The Ordnance men converted two jeeps to locomotives by flanging

[15] (1) 740th Ord Light Maint Co, Daily Journal, Jan–Dec 45, Folder, Historical Rpts 740th Ord Co (LM), 29 Mar–Jun 45. (2) Morison, *The Liberation of the Philippines,* p. 136. (3) XIV Corps, Rpt of Ord Officer, 9 Jan–15 Jun 45, Sec I, General Supply & Maintenance, pp. 5–8. (4) G–3 Operations Rpt, 594th Engr Boat & Shore Regt, 25 Nov 44–13 Feb 45.

[16] Frankel, *The 37th Infantry Division in World War II,* p. 25.

the rims on their wheels, and by 19 January the jeep-hauled Manila Railroad from San Carlos to Bayambang, twelve miles to the south, was in operation. Later extended to Tarlac, the railroad helped to make up for the shortage of trucks, a shortage created by the lack of ship space to bring them to Luzon.[17]

Corps took over command on S plus 2. By then advance echelons of the 90th Ordnance Heavy Maintenance (Tank), the 120th Ordnance Medium Maintenance, the 3149th Ordnance Medium Automotive Maintenance, and the 3007th Ordnance Depot Companies were landing, but they could not get into operation for some time because they did not have high enough priority to get their equipment unloaded from the ships. For example, the men of the 3149th (who called themselves the "Forty-Niners") expected their equipment on S plus 12 but were not able to get fully into operation until almost a month after S-day. All of these companies (plus the 263d Ordnance Medium Maintenance) came under the XIV Corps Ordnance Battalion, the 1st, when it landed on 15 January. The battalion had to wait five days before it could get enough vehicles unloaded to move inland to San Carlos. There it set up a salvage yard in order to obtain parts from wrecked vehicles.[18]

Ammunition presented no particular problem in XIV Corps in the assault phase. The 55th and 614th Ordnance Ammunition Companies landed on S-day, attached to the 40th and 37th Divisions, respectively, and remained attached to the divisions until taken over by army. Unloading was slowed somewhat by the high surf in Lingayen Gulf, and the usual confusion existed at the initial dumps, where all types of ammunition were thrown down without adequate segregation; but ASP's operated by small detachments of the ammunition companies were quickly leapfrogged forward in close support of the combat troops. At the beginning, firing was light in the XIV Corps area and remained so for some time. When Sixth Army assumed control of ammunition supply ashore on 24 January, army's main concern was meeting the demands of I Corps.[19]

The I Corps Landings

The I Corps' two Blue Beaches, to the left of XIV Corps' Crimson and separated from it by the Dagupan River, were much like the XIV Corps beaches—flat and subject to "wet landings," especially after the six- to ten-foot surf that began to break on 10 January. Here too there was no ground opposition: the 6th Infantry Division's landings went off on schedule. The assault troops continued in LVT's for 2,000 yards before debarking, and then advanced across sand dunes, muddy rice paddies, and fish ponds until by nightfall they had taken all objectives and made

[17] (1) History of 737th Ord Light Maint Co. (2) Frankel, *The 37th Infantry Division in World War II*, p. 229. (3) Krueger, *From Down Under to Nippon*, p. 229.

[18] (1) XIV Corps, Rpt of Ord Officer, 9 Jan–15 Jun 45, Sec I, General Supply & Maintenance, pp. 8–10. (2) History 90th Ord Tank Maint Co, 1945. (3) History, 1st Ord Bn, M–1 Opn, Oct 44–13 Jul, Dec 45. (4) Col. O. E. Hurlbut, "Manila," *Logistics*, II, 2 (October 1946), p. 20. The Forty-Niners were destined to be the first Ordnance company to enter Manila. *Ibid.*

[19] (1) XIV Corps, Rpt of Ord Officer, 9 Jan–15 Jun 45, Sec II, Ammunition, pp. 23, 25. (2) History Sixth Army Ord Sec, pp. 27–28.



LINED UP TO PASS AMMUNITION ASHORE, LINGAYEN GULF, LUZON

contact with XIV Corps.[20]

In addition to its own 706th Ordnance Light Maintenance Company, the 622d Ordnance Ammunition Company, most of the 48th Ordnance Medium Maintenance Company, and the 108th Bomb Disposal Squad, 6th Division had for Ordnance support in the landing phase a 14-man detachment of the 3608th Ordnance Maintenance Company (Tank), which was fortunate because a good part of the maintenance work in the first few days was caused by LVT track trouble, as well as by the rough surf that broke the transfer cases in trucks. As the division was short of transportation, maintenance men moving inland on the heels of the combat units, first to Santa Barbara, then to Villasis, and on 29 January to Guimba, continued to give first priority to truck maintenance. They were better off for supplies than the Ordnance men in XIV Corps, for their equipment was landed earlier, but they still had to resort to cannibalization to get needed parts. On 5 February the 48th Ordnance Medium Maintenance Company, with the tank maintenance men, was relieved of attachment to the 6th Division and came under corps' 243d Ordnance Service Battalion.[21]

[20] (1) Opns Rpt, 3d Engr Special Brigade, Jan 45. (2) I Corps History Luzon Campaign 1945, pp. 25–26.

[21] (1) History 706th Ord Light Maint Co, M-1

On the left of all the landing beaches were the three White Beaches allotted to the 43d Infantry Division. White Beach 3—separated from the Blue Beaches by the mouth of the Bued River—was worse than any other and was soon abandoned, for the LST's grounded so far out that they could be unloaded only with the greatest difficulty, and the smaller craft were stopped by an offshore sandbar. To the extreme left, White Beaches 1 and 2 (soon consolidated and called White Beach) were better than any other beach as far as terrain was concerned, for they were higher and therefore suitable for "dry landings." This turned out to be a mixed blessing because when the high surf arose on 10 January, skippers began diverting their ships to this beach, with or without orders, and the congestion mounted. White Beach was closer to the Japanese concentrations than any other beach, and the landing parties were soon made uncomfortably aware of this fact. Mortar and artillery fire began during the landings on S-day, was intensified next day, and then dwindled.[22]

The beach was under artillery fire when the 743d Ordnance Light Maintenance Company started coming ashore on the morning of S-day. The commanding officer, Lt. Col. Leon P. Sutton, and two men of the company, Sgt. Stanley V. Fisher and Pfc. Robert W. Walter, were wounded by shell fragments, as was the 43d Division's Ordnance officer. During the barrage, Technician 4 Percy H. Kief saw some vehicles that had bogged down in deep water in the line of fire. Grabbing a tractor that belonged to some other unit, he hauled the vehicles to safety under fire, a gallant action for which he received the Silver Star. The company's automotive and armament contact teams early got to work on dewaterproofing and maintenance. By early afternoon all the men were ashore and most had reported to the bivouac area in San Fabian.[23]

Luckily the division ammunition dumps set up by the 578th Ordnance Ammunition Company escaped the Japanese shelling, as did the backup medium maintenance company, the 288th, which spent the first two days at the beach helping to unload gas and ammunition. But the 288th had a bad scare after it moved down to San Fabian on 13 January. Late that evening, just as it had set up its command post in an abandoned storeroom near a battery of field artillery, it found itself on the receiving end of a barrage of 970-pound shells.[24]

They came from "Pistol Pete," a Japanese 305-mm. howitzer hidden in a ravine

Luzon Campaign 9 Jan–30 Jun 45. (2) History 622d Ammunition Co 1943–45. (3) History 48th Ord Medium Maint Co, 1944–46. (4) History 3608th Ord Tank Maint Co, 9 Jan–June 45. (5) *Engineers of SWPA IV*, p. 533. (6) Sixth Army Ordnance Section estimated that LVT's, and DUKW's as well, required at least two hours of maintenance for every hour of operation, but, as General Blackmore observed, "of course they almost never get it, so their life was short." Blackmore Comments.

[22] (1) *Engineers of SWPA IV*, pp. 536–39. (2) Opns Rpt, 3d Engr Special Brigade Jan 45. (3) I Corps History Luzon Campaign 1945, p. 25. (4) *Surf and Sand*, p. 144. (5) The congestion on 10 January was soon remedied; when General Blackmore arrived at White Beach on an LST on S plus 4 (13 January) he found "little confusion." By then the only action from the Japanese was a large mortar shell every hour or so. Blackmore Comments.

[23] History 743d Ord Light Maint Co, 6/42–9/45.

[24] (1) I Corps History Luzon Campaign, p. 230. (2) History 288th Ord Medium Maint Co, Jan–Jun 45.

about eight miles inland between the towns of Damortis and Rosario. Pistol Pete had "introduced himself with appropriate gusto," according to an Engineer historian, at San Fabian shortly after midnight on S-day. After the first "awe-inspiring" burst, "the society for the improvement of foxholes sprang full-blown into life." The men of the 288th dived into their foxholes and, though several casualties were reported in the area during the 5-hour barrage, escaped damage except to their nerves. They had their revenge on 4 February when a detail consisting of Technician 3 Primo Degli-Uomini and Technician 3 Earl V. Larsen was sent forward to strip one of the howitzers which had just been captured. For doing so under enemy sniper fire, both men received Bronze Stars. Pistol Pete had been hard to locate, for the Japanese were adept at hiding the few big howitzers they had. During the Luzon campaign one was found cleverly camouflaged by a house on rails that could be rolled back when the howitzer was fired, and to add to the effect a small grove of banana trees had been planted around the emplacement.[25]

Heavy artillery fire on the evening of S-day slightly damaged some of the vehicles of the 12-man 3608th tank maintenance detachment, which had landed early on the White beaches attached to a company of the 716th Tank Battalion and had moved that evening to Palapad. On 12 January the detachment made a night march with the tank battalion to San Jacinto, where it found an advance party of its parent organization preparing to set up shop. The main body of the company, landing on the White beaches on S plus 2, had its hands full in the first few days repairing LVT's. After the 43d Division began probing toward the Japanese concentrations in the Damortis-Rosario area, the mechanics had to repair crippled tanks, though this was relatively a minor problem. In their counterattacks the Japanese were using their medium tank 97. Armed with a high-velocity 47-mm. gun, it did some damage to American Shermans, but was nothing like as formidable as the German tanks encountered in Europe. Examining Japanese tanks destroyed by the Shermans, General Blackmore could not believe they had been very effective.[26]

On S plus 2, reinforcements arrived that were to help I Corps in its tough sector. The 158th Regimental Combat Team was landed on the extreme left on Red Beach —actually an extension of White Beach 1 —with the mission of advancing north up the coast and protecting the corps' left flank; in a few days it was attached to the 43d Division. With the regimental combat team came the 49th Ordnance Medium Maintenance Company, whose advance detachment on the first night ashore received a visit from Pistol Pete—eight of the twenty rounds that fell that night landed within a 100-yard radius of the Ordnance men's bivouac area. Next day they moved to a new area protected

[25] (1) *Surf and Sand,* p. 141. (2) History 288th Ord Medium Maint Co, Jan–Jun 45. (3) Office, Chief of Ordnance, Catalogue of Enemy Ordnance Materiel, vol. II, Japanese, p. 116.3. (4) Maj. Edward M. Flanagan, Jr., *The Angels: A History of the 11th Airborne Division 1943–1946* (Washington: Infantry Journal Press, 1948), p. 106.

[26] (1) History, Luzon Campaign, 3608th Ord Tank Maint Co, 9 Jan–Jun 45. (2) I Corps History Luzon Campaign, pp. 231–32. (3) Office, Chief of Ordnance, Catalogue of Enemy Ordnance Materiel, vol. II, Japanese, p. 8.1. (4) Blackmore Comments.

by a range of hills, and when the rest of the company (who had been employed in unloading ships in the harbor) arrived, the men were sent out on contact parties to support the rapidly advancing combat team. One party of mechanics came under mortar and small arms fire when it had to go up to the front lines to repair an M7 gun motor carriage. On 20 January the company was attached to the Corps' 243d Ordnance Service Battalion at San Jacinto.[27]

When opposition developed near the White Beaches on S plus 2 Krueger decided to land his reserve, the 25th Division (less one regimental combat team still in reserve), the 13th Armored Group, and the 6th Ranger Battalion. The Rangers landed in the Dagupan area, while the tankers and the division, which brought with it the 725th Ordnance Light Maintenance Company, went in on White Beach 3. The division indeed had the distinction of landing on the narrowest beachhead the Engineers had ever seen —a strip of land that was not over fifty yards wide at the mouth of the Bued River; but the landing was accomplished most efficiently, especially considering the amount of impedimenta involved. The 25th Division was rich. It had brought from the South Pacific a generous supply of stores, supplies, and equipment—including sixty days' supply of post exchange items, beer and cigarettes. Headquarters I Corps saw to it that the wealth was shared.[28]

[27] (1) *Engineers of SWPA IV*, p. 542. (2) History 49th Ord Medium Maint Co, 25 Feb 42–Jun 45.

[28] (1) *Surf and Sand*, p. 145. (2) History 725th Ord Light Maint Co, 11 Jan–Jun 45, RED VAULT 25th Inf Div. (3) I Corps History Luzon Campaign, p. 168.

The Advance Inland

In view of the enemy resistance in the I Corps area, General Krueger wanted to postpone the big XIV Corps push down the Central Plains toward Manila until the end of January, when the arrival of reinforcements—the 32d Infantry and 1st Cavalry Divisions and the 112th Cavalry Regimental Combat Team would enable I Corps to aid actively in the drive, at the same time staving off the threat of counterattacks in the northeast. But MacArthur was anxious to capture Clark Field as quickly as possible. The airstrips in the Lingayen area were inadequate for the heavy bomber facilities needed immediately; moreover, they would very likely be washed out when Luzon's rainy season began in April. Intelligence reports indicated that there would not be too much opposition in the Central Plains. If there was strong resistance in the Clark Field area, MacArthur pointed out, the planned landing in February by XI Corps just north of Bataan would overcome it. At the outset, I Corps could be echeloned to protect XIV Corps' left rear, while at the same time containing the main concentrations of Japanese in its own sector. Krueger was only half persuaded but he had to comply. He ordered XIV Corps to begin its advance south on the Central Plains on 19 January.

At that date the two corps still had logistical responsibility—four days beyond the S plus 6 date on which Col. William N. Leaf, the Sixth Army G–4, had planned for ASCOM to take over responsibility for unloading at the beaches and delivery to corps dumps. Colonel Leaf had planned for ASCOM to take over full responsibility

on 29 January—a safe date, he felt, since the two corps, bringing with them 30 days of Class I to IV supplies and 5 units of fire, would theoretically not require resupply from ASCOM dumps until well into February. In the planning phase General Blackmore had been disturbed about these assumptions as applied to ammunition. He regarded the setting of a fixed date for Army Service Command to take over as "not too close to the realities." He knew all too well the risks involved in an amphibious landing—the uncertainty of weather, the possibility of being unable to get the ammunition ashore in time. At Manus Island, for example, the Ordnance men had been obliged to arrange for air-drops of ammunition because the ships in the harbor could not be unloaded. Ships had to be unloaded from the top down, to keep them from turning over, and artillery ammunition was usually at the bottom; also, ships with ammunition aboard had to stay at some distance from other ships and from the shore for reasons of safety. Unloading nearly always took longer than expected; and after the stocks were deposited at the beach, there might not be enough trucks to carry them forward. Blackmore had reminded Leaf that at Leyte the corps had to control the issue of ammunition for several days beyond the date set for ASCOM to take over. The same thing might happen at Luzon.[29]

In the case of Luzon, the high surf, the lack of bridges inland, and the extreme shortage of trucks were largely to blame for delays. The ASCOM Ordnance units got ashore very early. Base M's operating battalion, the 9th, landed on 10 January with the 212th Ordnance Medium Automotive Maintenance Company. An advance party hiked six miles inland the same day. Mangaldan (near San Jacinto), twelve miles inland, was the site for the Base M Ordnance Service Center, and in a few days the mechanics were busy with the help of Filipino laborers constructing warehouses, offices, and bivouac areas, using bamboo poles with tarps for covering. On 12 January the ammunition officer arrived in the area with the 629th Ordnance Ammunition Company, which had just spent a night under artillery fire on White Beach where one of its sergeants was killed in his foxhole. Badly shaken by this experience, the men nevertheless began setting up that day the first of the three bays of the Mangaldan Ordnance Ammunition Depot. The 615th and 577th Ammunition Companies arrived on 21–22 January. But no ammunition was received until 26 January.[30]

Getting the Ammunition Forward

By the time Sixth Army assumed control of ammunition ashore on 24 January, it had become apparent—to Colonel Leaf as well as General Blackmore—that centralized unloading of ammunition ought to have taken place much earlier, so that army, which was, in Colonel Leaf's words, "the best judge of overall requirements," could have put the weight of effort where it was most needed. At that time, XIV

[29] (1) Memo, W. N. L., G–4, to Ord Officer, 3 Dec 44. (2) Memo, P. G. B., O.O., to ACofS, G–4, 4 Dec 44. Both in G–4 Jnls, M–1 Opns, Sixth Army. (3) Blackmore Comments.

[30] History Base M Ordnance, 20 Nov 44–15 Feb 45, and Incl, History 629th Ammunition Company, 314.7, AFWESPAC/Base M, Military History of Base Ordnance & Depot Organizations.

Corps was meeting little resistance in its drive on Clark Field and Manila and therefore its expenditures were light. I Corps, on the other hand, was heavily engaged on the left flank and its expenditures were so great that by 19 January the total 155-mm. howitzer and 81-mm. mortar ammunition ashore amounted to only 2.6 units of fire. The first task was to supply I Corps, and the quickest way to do it was to divert to it some of XIV Corps' initial supply. The next task was to get the ammunition unloaded from the Liberty ships that were still waiting out in the gulf because the light expenditures by XIV Corps had created the unfortunate impression that early unloading of resupply ships was not necessary. By 24 January unloading had begun on one of them at Port Sual, on the extreme right flank, where Base M had planned Sual Ordnance Ammunition Depot. But Port Sual was too far away to do I Corps much good; indeed, it was so difficult to get transportation to move the ammunition forward to XIV Corps that the depot was soon closed out. It was 27 January before the first resupply ship in reach of I Corps could be unloaded.[31]

It was now plain that the truck shortage was limiting the usefulness of Base M's Mangaldan Ordnance Depot, which was too far from the beach and too far from I Corps. Therefore the 577th Ordnance Ammunition Company was sent to Rabon, up the coast behind I Corps, to set up the Rabon Ordnance Ammunition Depot and receive ammunition from the waiting Liberty ships. The terrain was bad. Also, few Filipinos were available to help operate the depot. Most of the natives were hungry, however, so by rounding up supplies of rice and fish and providing sleeping quarters, the company managed to attract more than two hundred laborers. The 615th Ordnance Ammunition Company was moved up to Damortis, but this spot turned out to be dangerously close to enemy artillery fire. On 3 February the company was moved to an area south of Rabon to set up the Davis Ordnance Ammunition Depot, which became the main Base M ammunition depot. With the help of 850 Filipino laborers it was in operation by 11 February. In April when Mangaldan was closed out, Davis received the 629th Ordnance Ammunition Company, which had been split between Mangaldan and Sual.[32]

The three Base M ammunition companies made a remarkable record. Between 17 and 26 February, they came close to meeting Sixth Army's quota of 2,000 tons to be unloaded daily from ships in the harbor and 1,200 tons to be sent forward daily to the combat troops. In order to do this they had to work around the clock and take the risks incurred in night operations. These risks were painfully demonstrated at Davis near midnight on 22 March when, as usual, lights were on in the depot office and the company area, and the headlights of trucks and amphibians receiving and discharging ammunition were being used to illuminate the

[31] (1) Sixth Army Rpt on Luzon Campaign, vol. III, p. 58. (2) History Sixth Army Ord Sec, pp. 27–28. (3) History Base M Ordnance, 20 Nov 44–15 Feb 45, p. 9. (4) For getting ammunition forward where it was most needed, General Blackmore gave his ammunition officer, Lt. Col. Clinton A. Waggoner, credit for "a wonderful job." Blackmore Comments.

[32] (1) History Base M Ordnance, 20 Nov 44–15 Feb 45, pp. 9–11. (2) History 577th Ord Ammunition Co, 10 Sep 42–31 Oct 45.

storage bays. A Japanese plane came over and bombed and strafed the depot, destroying about 3,200 tons of ammunition. The bombs killed two men, Pfc. Marvin H. Helms, who was working in the small arms bay, and Pfc. Agapito Castillo of the Philippine Guerrilla Force, who was doing guard duty, and seriously injured Pfc. John F. Hamilton. Flying fragments wounded many others and destroyed most of the property and equipment in the bivouac area. There were many acts of simple heroism: 2d Lt. James R. Lewis saved all the ammunition in one bay by picking up a burning 155-mm. round and carrying it to a safe distance; and 1st Lt. Walter J. Miners, Pfc. John Anderson, and Pfc. Leo Sullivan risked their lives by going to the aid of the wounded.[33]

Beginning early in February, the strenuous and even heroic efforts of the ASCOM units were devoted to supplying the drive on Manila. By the end of January expenditures were mounting in XIV Corps. West of Clark Field in the 40th Division's sector, the Japanese, entrenched in hills and caves, were putting up a hard fight. Quantities of artillery ammunition were needed to blast them out of their positions. The 37th Division was racing toward Manila. On the extreme left flank, I Corps' 1st Cavalry Division and 6th Infantry Division had encountered considerable resistance in the San Jose region in their attempt to break the Japanese line of communications from the north. In the battle of Manila, beginning 3 February and lasting a month, tremendous quantities of artillery ammunition were expended. General MacArthur had vetoed the use of bombing; therefore the conquest of the city depended on the use of artillery to blast the Japanese out of buildings, culminating in the furious barrages, including those of a battalion of big 240-mm. howitzers, against the thick-walled buildings in the Intramuros sector—the old Walled City.[34]

By 31 January, Sixth Army had established an ammunition supply point at San Miguel (near Tarlac) which, though some forty miles from the operations at Manila, was in reasonable distance of the operations west of Clark Field. But it was something else again to stock it adequately. Rail shipments had been disappointingly small; combined rail and truck shipments from Port Sual and Base M amounted to only about 400 tons a day. The ASP's supporting I Corps were even worse off—remaining base trucks could supply only about 150 tons a day. This was not too serious in the case of I Corps, because its units could more readily get back to the Lingayen Gulf depots. But XIV Corps had to send ammunition trains from 90 to 150 miles back to the beaches.[35]

The XIV Corps, hardest hit, charged that army had not moved the ASP's close enough behind the combat troops. Both XIV and I Corps blamed army for not adequately stocking the ASP's, for not providing a margin of safety; indeed XIV Corps made the accusation that a deliberate policy existed of withholding ship-

[33] (1) History Base M Ordnance, 20 Nov 44–15 Feb 45, pp. 10–11. (2) History 615th Ord Ammunition Co, 25 Jan–Oct 45.

[34] XIV Corps Rpt, Japanese Defense of Cities as Exemplified by the Battle for Manila, 1 Jul 45, Armed Forces Staff College Library.

[35] (1) History Sixth Army Ord Sec, p. 27. (2) USAFFE Bd Rpt 281, AGF Questionnaire, Ord Sec, 30 Apr 45, p. 5. (3) Memo, P. D. H., Asst G–3, for CofS, 11 Feb 45, sub: Capacity for Forward Movement of Supplies, Sixth Army G–4 Jnl M–1 Opns, 6–14 Feb 45.

ment of ammunition to forward ASP's until a combat shortage occurred.[36] The Sixth Army Ordnance Section acknowledged the fact of the artillery ammunition shortage, but placed the blame not only on a shortage of trucks but, going further back, on the fact that it took the experience at Leyte to convince GHQ that more artillery ammunition would be needed than had been planned. Therefore, requisitions were submitted too late to allow prompt resupply; the loading of the ships in the United States was dangerously delayed. Also, of the few resupply ships that did arrive in the theater from the United States, two had had to be diverted to Leyte for the initial supply of the XI Corps, which landed on the west coast of Bataan 29 January in the MIKE VII operation, and the 11th Airborne Division, which landed south of Manila two days later in the MIKE VI operation.[37]

In mid-February when USASOS took over logistic responsibility from Sixth Army, including the reassignment of ammunition companies and the reorganization of Army Service Command headquarters as Luzon Base Section, USASOS, the artillery ammunition situation was so serious that Blackmore suggested limiting the rate of expenditure in XIV Corps—always a measure dreaded by commanders. Maj. Gen. George H. Decker, Sixth Army chief of staff, refused to go along with the recommendation, relying on the accelerated unloading of the resupply ships. But the shortage was never really eased. Manila's port facilities could not be used to any great extent until well into April because the once beautiful city had become such a shambles that extensive clearing and repair work had to be done. In the meantime, ammunition already ashore in Luzon had to be diverted to Eighth Army's operations in the Southern Islands. In the last phase of the campaign, when the main effort was directed toward blasting the Japanese out of the mountains of northern Luzon, rigid restrictions on artillery and 81-mm. mortar ammunition had to be imposed, limiting artillery to one-tenth of a unit of fire per day and mortars to one-eighth.[38]

Problems of Maintenance and Supply

The expectation that the Luzon Campaign would be adequately supplied with maintenance companies was soon dispelled. In the far-flung operations the medium maintenance companies were spread thin. Fortunately, with the exception of 105-mm. M2A1 howitzers, on whose tubes there was a consistent stripping of lands (the surface of the bore between the grooves), there were no unexpected maintenance problems on weapons. On supply, I Corps was handicapped in the early stages of the campaign by its inability to supply weapons to

[36] (1) XIV Corps, Rpt of Ord Officer, 9 Jan–15 Jun 45, Sec II, Ammunition, pp. 25–26. (2) I Corps History Luzon Campaign, p. 148.

[37] History Sixth Army Ord Sec, pp. 27–28.

[38] (1) Telephone conversation, Col Kiefer, Arty Officer Sixth Army, and Gen Blackmore, 1420, 14 Feb. (2) Memo, P. D. H., Ass't G–3, to G–3, 12 Feb 45. Both in Sixth Army G–4 Jnl M–1 Opns, 6–14 Feb 45. (2) History Sixth Army Ord Sec, p. 29. (3) I Corps History Luzon Campaign, p. 231. I Corps continued to criticize army, charging that slowness in processing ammunition reports, on which allocations were made, sometimes resulted in ammunition dropping to precariously low levels, specifically citing one morning in the Balete Pass area when the battery of extremely valuable 240-mm. howitzers found itself with only three rounds to start its day's firing mission. *Ibid.*, p. 148.

guerrillas. Before the invasion, Sixth Army had set up an operational project to bring 15,000 hand and shoulder automatic weapons for reissue to guerrillas, with I Corps delegated to bring in 25 percent of these weapons with an Ordnance maintenance company by S plus 4. At the last moment, USASOS informed Sixth Army that it could not supply the project. In the later stages of the campaign, when the system for collecting Japanese weapons improved, several hundred Japanese small arms, automatic weapons, and even some artillery pieces were processed through Ordnance shops in I Corps for reissue to guerrillas.[39]

Vehicles accounted for most of the maintenance troubles—tanks as well as trucks. The Japanese tanks on Luzon with their 47-mm. high-velocity gun were capable of inflicting far more damage than the Japanese tanks on Leyte with the 37-mm. Operation of the Shermans over steep mountain trails caused propeller shafts to fail; and the synthetic rubber of the tracks would not stand up during long-distance driving over hard-surface roads. Tank parts were often unavailable because Sixth Army Ordnance had had no experience on which to base requisitions. Parts lists in Ordnance catalogues were unrealistic. Perhaps because of the limited experience with tanks on Leyte, only two tank maintenance companies were sent to Luzon—the 3608th, attached to I Corps, and the 90th, attached to XIV Corps. Neither company was experienced in field repair. There were no tank repair men at Base M, the army service center, or the USASOS base at Manila. The two tank maintenance companies served seven divisions, three tank battalions, three tank destroyer battalions, and two amphibious tractor battalions. One very serious problem was that of bringing the tanks back from the battlefield to the shops. Luzon had no tank transporters until 14 February, when two M25's were received by the 3608th. One of these was sent down to XIV Corps to do recovery work on 6 March. By that time disabled tanks were scattered all over the area.[40]

Above all, trucks were the big problem. Constant operation over long distances took its toll; the neglect of preventive maintenance seriously affected operations, a lesson that the truck drivers never seemed to learn. Replacement vehicles went out of the Ordnance shops as fast as they came in. Certain parts, as well as tires and tubes, soon became critically short. By the end of the first month of the Luzon operation, the number of trucks on deadline was mounting.[41]

At a time when Sixth Army was already short of trucks, the arrival of the 32d Division on 27 January was the last straw. Brought up from Leyte, it landed minus 164 of its table of equipment vehicles, and of the few cargo trucks left to it, 70 were in such bad condition that they had to be towed off the LST's. Unlike the 6th, 25th, 37th, and 43d Divisions, which had

[39] (1) History Sixth Army Ord Sec, pp. 24, 31. (2) I Corps History Luzon Campaign, pp. 229, 231. (3) For important guerrilla operations in the conquest of Northern Luzon, see Smith, *Triumph in the Philippines,* pp. 464–67.

[40] (1) History Sixth Army Ord Sec, p. 31. (2) History, Luzon Campaign, 3608th Ord Tank Maint Co. (3) XIV Corps, Rpt of Ord Officer 9 Jan–15 Jun 45, Sec I, General Supply and Maintenance, p. 10. (4) Blackmore Comments.

[41] (1) History Sixth Army Ord Sec, p. 30. (2) XIV Corps, Rpt of Ord Officer, 9 Jan–15 Jun 45, Sec I, General Supply and Maintenance, p. 12.



SHERMAN TANK PASSING A BURNING JAPANESE MEDIUM TANK, LUZON

received many new vehicles before arriving in Luzon and besides had had a long training period before departure to get their old ones into shape, the 32d had received few new ones (only 25 cargo trucks), and had been actively engaged until Christmas 1944 on the west coast of Leyte under conditions that were a maintenance man's nightmare —mountain roads, rain every day, mud so bad that one of the men swore at the time, "it flows uphill." It had been virtually impossible for the division's own 732d Ordnance Light Maintenance Company, knee-deep in mud, and often under enemy fire, to set up adequate second or third echelon facilities or even to get up to the front in time to bring back damaged vehicles—before they could reach them, the wrecks were stripped of their parts by passing troops until they were beyond repair. Leyte had been the hardest operation in the 32d Division's history in SWPA, going back to the Papua Campaign.[42]

As soon as Maj. John E. Harbert, commanding officer of the 732d Ordnance Light Maintenance Company, got ashore near San Fabian, he went to General Blackmore with the story on the vehicles, describing the wretched conditions at Leyte,

[42] (1) I Corps History Luzon Campaign, p. 231. (2) Sixth Army Rpt on Luzon Campaign, vol. III, p. 58. (3) History 732d Ord Light Maint Co, 27 Jan–30 Jun 45. (4) History Eighth Army Ord Sec, pp. 170–89.

pointing out that the 32d had participated in five successive operations within the past ten months—Saidor, Aitape, Morotai, Leyte, and Luzon—and warning that if maintenance and parts were not soon forthcoming, 40 percent of the remaining vehicles would be on deadline. Harbert (soon to be promoted to lieutenant colonel) was a man whose words carried weight, for he had a long and highly creditable record in the Southwest Pacific, having been with the division since Buna, and (as a lieutenant) having received the Distinguished Service Cross for his service at Cape Sudest in November 1942.[43]

Blackmore had a high opinion of Harbert, but undoubtedly he had heard hard-luck stories before. While acknowledging the bad effects of the mud on Leyte, he was inclined to blame primarily the 32d Division's poorly instructed or careless drivers for the condition of the trucks. He also blamed the division for not providing good second echelon maintenance, particularly for not following Sixth Army instructions on brake maintenance. He inclined to the theory that the table of equipment provided too many trucks per division, and felt that truck companies should be given priority on trucks. Pressure on army by the division G–4, artillery officer, and Ordnance officer was necessary in order to obtain the release of eighteen cargo trucks to the 32d Division from ASCOM. For maintenance and parts supply the 32d had to depend solely, for the time being, on the I Corps 243d Ordnance Battalion, located at Balungao, whose two medium maintenance companies and one depot company were unable to keep up with the heavy work load.[44]

By 13 February Maj. Gen. Innis P. Swift, commanding general of I Corps, was so thoroughly alarmed by the condition of the cargo trucks in the 32d Division (111 were then on deadline) that he appealed to the Sixth Army G–4 for help. Colonel Leaf could only promise that priority would be given to unloading a resupply ship then in the harbor, that air shipment of critical parts would be arranged for; and that thirty-five replacement trucks would be furnished by army's 318th Ordnance Depot Company—when the trucks became available.[45] In the meantime, the 32d Division, advancing slowly and painfully up the Villa Verde Trail in northern Luzon against strong Japanese opposition, continued to suffer from a severe shortage of trucks. And it had more bad luck on 24 April when its 732d Ordnance Light Maintenance Company was bombed. The company's supply platoon, established in a building on the town square in Tayug, suffered a direct hit from a Japanese bomb that killed eight men—Technician 3 William F. Tyree, Jr., Technician 4 George E. Seekell, Technician 5 Clarence H. Carlson, Technician 5 Oliver T. Romine, Pfc. Charles P. Sternburgh, Pfc. Donald A. Gabriel, Pfc. L'Phillip Lightner, and Pvt. James G. Vorhauer. Thirteen men were wounded, some of them in attempting to rescue their comrades from the furiously burning building. All of the platoon's

[43] (1) History 732d Ord Light Maint Co, 27 Jan–30 Jun 45. (2) On Harbert, see above, p. 73.

[44] (1) Memo, P. B. G., O.O., to ACofS G–4, 16 Feb 45, G–4 Jnl Sixth Army, 14–18 Feb 45. (2) Blackmore Comments. (3) History 732d Ord Light Maint Co, 27 Jan–30 Jun 45.

[45] (1) Ltr, Swift to Leaf, 13 Feb 45. (2) Ltr, Leaf to Swift, 19 Feb 45. Both in G–4 Jnl Sixth Army, 14–18 Feb 45.

maintenance stocks, including quantities of machine guns, rifles, and carbines were destroyed.[46]

Though not as badly off as the 32d, the other I Corps divisions participating in the conquest of northern Luzon also felt the pinch on replacement vehicles and automotive parts. One Ordnance unit felt that the terrain features had been "sadly neglected" in computing the automotive supply logistics for this operation in difficult mountainous country, and the Sixth Army Ordnance officer agreed.[47] For all types of maintenance, in the early stages of the operation, I Corps had to depend on its own 243d Ordnance Battalion, located down at Balungao—a 95-mile round trip from Damortis.[48] And in the rapid advance north after 19 April, when I Corps broke through the Balete Pass, almost all Ordnance maintenance had to be evacuated to Base M because there were not enough maintenance companies in I Corps or army to provide the close support needed. Early in April Base M had moved most of its shops up the west coast to San Fernando, La Union, leaving two companies at Mangaldan to provide support for units in the area.[49]

Little or no evacuation from I, XIV, or XI Corps to Sixth Army was possible because army for most of the Luzon Campaign had no heavier Ordnance facilities than corps. Two heavy maintenance companies had been planned for the Sixth Army Ordnance Service Center, the 511th Ordnance Heavy Maintenance Company (Field Army) to arrive on 13 January and the 959th Ordnance Heavy Automotive Maintenance Company to arrive on 18 February, both to be attached to the center's operating battalion, the 189th; but the 511th did not land until 10 February, and by the time the 959th arrived on 1 March, it was sent first to help out at Base M and later sent to the Luzon Base Section in Manila.[50] During the time the Sixth Army center operated at Calasiao near the Lingayen Gulf, its maintenance work was mainly contact party work and refitting the 43d Division, with the help of the I Corps' own 243d Ordnance Battalion. On 10 March the center was moved down to San Fernando, Pampanga (about forty miles north of Manila) and remained there until the close of the campaign. After 1 April, when the 189th Battalion went to Philippine Base Section, the center was operated by the 12th Ordnance Battalion. By that time, XI and XIV Corps were evacuating unserviceable material to the USASOS base in Manila.[51]

The XI Corps, employed for most of the spring in a campaign designed to protect Manila from Japanese forces dug in in the mountains north and northeast of the city, and to increase Manila's water supply by capturing the dams in the region, had received on 15 March XIV Corps' Ordnance battalion, the 1st. This battalion, set up in the Kim Bee Foundry Building in Grace

[46] (1) History, 732d Ord Light Maint Co, 27 Jan–30 Jun 45. (2) *The Ordnance Digest,* vol. 27, No. 12 (December 1945), p. 3.

[47] (1) History 733d Ord Light Maint Co, 15 Feb–30 Jun 45. (2) Blackmore Comments.

[48] (1) History 732d Ord Light Maint Co, 27 Jan–30 Jun 45. (2) History 733d Ord Light Maint Co, 15 Feb–30 Jun 45.

[49] (1) I Corps History Luzon Campaign, p. 150. (2) History Sixth Army Ord Sec, p. 31. (3) History Base M Ordnance, pp. 6–8.

[50] (1) History Sixth Army Ord Sec, p. 31. (2) History 189th Ord Bn, Jan–Dec 45.

[51] (1) Hist 189th Ord Bn. (2) History 12th Ord Service Bn, Nov 44–3 Aug 45. (3) History Sixth Army Ord Sec, p. 31.

Park on the outskirts of Manila, had a field army heavy maintenance company, the 99th, which sent out contact parties to the men fighting in the mountains, and did an immense amount of rebuild work in its shops.[52]

After mid-March, XIV Corps had no Ordnance battalion. During the rest of the Luzon Campaign, it was to operate over a wide area south of Manila, with the object of securing the southern coast of Luzon, thus helping to clear the Visayan Passages—the shipping route through the central Philippines.

Clearing the Visayan Passages

Early in February General MacArthur had decided that a shorter, safer shipping route from the United States through the San Bernardino Strait (between Luzon and Samar) and then through the Sibuyan Sea and the Verde Island Passage (between Mindoro and Luzon) to Manila, was essential. This route would save some 500 nautical miles over the route taken by the Lingayen Gulf convoys and would be much less hazardous for small ships. He therefore gave General Krueger the job of clearing the southern coast of Luzon, including the far-flung southeastern Bicol Peninsula, delegating to Eighth Army the task of making safe the islands to the south of the route. Another valuable objective in Krueger's task was the early opening of Batangas Bay on the south-central coast of Luzon, for there MacArthur wanted to develop an extensive base and staging area for the invasion of Japan. For the operation, Krueger took the 11th Airborne Division (plus the 158th Regimental Combat Team), which was already in southern Luzon, having landed at Nasugbu in the MIKE VI operation; and the 1st Cavalry Division, sent down from the operations northeast of Manila. The 11th Airborne was ready to move on 7 March; the 1st Cavalry Division a week later.

It was to be a shoestring operation. Few Ordnance units were available to support it. Corps troops had only the 90th Ordnance Heavy Maintenance Company (Tank) sent from Grace Park fifty miles south to Cablubany, Laguna, where it remained throughout the campaign, performing maintenance for all service troops as well as the tankers. Supply requisitions were submitted to the 3007th Ordnance Base Depot Company, which had been detached from XIV Corps and attached to Base X at Manila. The 11th Airborne Division already had a 10-man detachment of the 643d Ordnance Ammunition Company, attached to its own 711th Ordnance Light Maintenance Company; it was now given the 3498th Ordnance Medium Maintenance Company. The 1st Cavalry Division had the 120th Ordnance Medium Maintenance Company to back up its organic 27th Ordnance Medium Maintenance Company. The 27th, already the proud possessor of a Gold Star awarded by the commanding general of the 1st Cavalry Division for its contribution to the Leyte Campaign, had just covered itself with glory in the street fighting in Manila when a contact party from the company, cut off by the enemy in a flame-lit street, had armed itself with rifles and machine guns and accounted for

[52] (1) For the reduction of the *Shimbu* Group north of Manila, see Smith, *Triumph in the Philippines,* pp. 367–418. (2) History 1st Ord Bn, M–1 Opn, Oct 44–13 Jul, Dec 45. (3) History 99th Ord Heavy Maint Co. (Field Army), Jan–Jun, Oct 45.

four truckloads of Japanese. For individual heroism in this action the leader of the contact party, Staff Sgt. Charles Stearns, was awarded the Silver Star and a battlefield promotion to second lieutenant.[53]

The southern Luzon campaign was characterized by hard fighting in the mountains and hills to which the defenders had withdrawn, notably at Mt. Macolod, where the Japanese had emplaced the one 305-mm. howitzer they had in the region. The stiffest opposition was found at the Mt. Malepunyo concentration. Tanks, bulldozers and flame throwers were used to blast the Japanese out of their caves, together with heavy air and artillery bombardments. The last phase of the campaign was a shore-to-shore operation by the 158th Regimental Combat Team to secure the Bicol Peninsula. The 158th embarked at Lemery and landed at Legaspi on 1 April. To support it, a hand-picked detachment of seventy men from the 11th Airborne Division's backup 3498th Ordnance Medium Maintenance Company was attached to the 158th Regimental Combat Team. The detachment was landed from LST's during the first week, accompanied the regimental combat team on its march inland, and during May also supported the 5th Cavalry Regiment of the 1st Cavalry Division which was engaged in the neighborhood. At first, weapons required considerable repair, an effort to which the welders and machinists of the service section—"the unsung heroes of an Ordnance maintenance unit," according to the company historian—made an invaluable contribution by manufacturing parts. Later occurred the old problem of truck maintenance after the long hauls over rough roads. The meeting of the 158th Regimental Combat Team with the 5th Cavalry on 2 May signaled the end of Sixth Army's task of clearing the northern shores of the Visayan Passages.[54]

Sometime before the end of the southern Luzon campaign, the port of Batangas, captured 11–12 March by the 158th Regimental Combat Team and under development before the end of March by engineers of the 592d Engineer Boat and Shore Regiment, was receiving Ordnance supplies. These went to a 36-man detachment of the versatile 90th Ordnance Heavy Maintenance Company (Tank), which set up a provisional XIV Corps Ordnance Depot, receiving 383,350 pounds of Ordnance matériel, consisting of vehicles, cleaning and preserving materials, and automotive parts, which were issued to the maintenance companies. It operated for about thirty days, at which time USASOS Base R took over.[55]

On the southern side of the San Bernardino Strait—across the strait from the Bicol Peninsula—lay the northern coast of the island of Samar. The task of clearing this coast and adjacent islands was given by Eichelberger to the Americal Division. Samar and offshore islands were secured in

[53] (1) XIV Corps, Rpt of Ord Officer, 9 Jan–15 Jun 45, Sec I, General Supply and Maintenance, p. 10. (2) History 90th Ord Tank Maint Co, 1945. (3) Rpt CG Eighth Army on the Nasugbu and Bataan Operations, MIKE Six and MIKE Seven, pp. 62–63. (4) History 27th Ord Medium Maint Co, 1st Cav Div (Luzon Campaign), Jan–Jun 45.

[54] (1) For the Legaspi landings see *Engineers of SWPA IV*, pp. 582–86. (2) XIV Corps, Rpt Ord Officer, 9 Jan–15 Jun 45, Sec I, General Supply and Maintenance, p. 11. (3) History, Det 3498th Ord Medium Maint Co, 17 Mar–Jun 45.

[55] (1) *Engineers of SWPA IV*, pp. 580–81. (2) XIV Corps, Rpt of Ord Officer, 9 Jan–15 Jun 45, Sec I, General Supply and Maintenance, p. 11.

about two weeks, beginning 19 February, by a reinforced battalion of the 182d Infantry and on 3 March elements of a reinforced battalion of the 132d Infantry landed with little or no opposition on larger islands to the west, Ticao and Burias. In both cases Ordnance support was provided by small contact teams of the division's organic 721st Ordnance Light Maintenance Company. Matériel damaged beyond the capability of the teams was evacuated to Leyte and resupply came from Base K on Leyte.[56]

Clearance of the rest of the islands athwart the shipping lanes in the Visayan Passages was the responsibility of the 24th Division, based on Mindoro. Northeastern Mindoro and Marinduque (except for one small pocket) had been secured by the Western Visayan Task Force's diversionary operations in January. The first job for the 24th Division was to invade the islands to the extreme west in order to control the Verde Island Passage; the second, to clear the central islands in the Sibuyan Sea east of Mindoro. Both tasks were accomplished between 23 February and 5 April, mainly by reinforced companies or battalions of the 19th and 20th Infantry, aided by guerrillas who later took on garrison duties. As was the case in the Americal Division's sector, the 24th Division elements drew ammunition from their division dumps and were supported by contact parties from their organic light maintenance company, the 724th. Damaged matériel was evacuated to Mindoro.[57]

Soon after the completion of their tasks in clearing the Visayan Passages, the Americal and 24th Divisions were to be involved in a much more ambitious operation—Eighth Army's campaign to clear the southern Philippines.

[56] (1) A detailed account of the Americal Divisions' straits operation is in Capt. Francis D. Cronin, *Under the Southern Cross: The Saga of the Americal Division* (Washington: Combat Forces Press, 1951), ch. 12. (2) Rpt CG Eighth Army, Leyte-Samar Operation (including Clearance of the Visayan Passages), p. 77.

[57] Rpt of Eighth Army, Leyte-Samar, p. 77.

CHAPTER XXII

The Philippines: The Southern Islands

On the morning of 28 February 1945 with an assault on the long, narrow, westernmost Philippine island of Palawan, Eighth Army began a campaign to capture the bypassed islands south of Luzon and Leyte. MacArthur wanted air bases on Palawan, on the Zamboanga Peninsula of Mindanao, and on the Sulu Archipelago to support a reoccupation of North Borneo. The rest of the islands—the central group of Panay, Negros, Cebu and Bohol, and southernmost Mindanao—he wanted for political considerations, to complete his return to the Philippines.

This series of successive operations was to be known as the VICTOR operations. The first four—VICTOR III and IV (the earliest) against Palawan and Zamboanga and VICTOR I and II against the central islands—were to be on a fairly small scale, reminiscent of the New Guinea landings. They were to be accomplished by a reinforced division or less, VICTOR III and IV by the 41st Division, sent up from Biak via Mindoro; VICTOR I by the 40th, brought down from Luzon; VICTOR II by the Americal, coming from Leyte. VICTOR V against Mindanao, the second largest island in the Philippines and reported to be strongly held by the Japanese, was to be a much larger operation. Here the principal combat units were to be the 24th Division from Mindoro and the 31st Division, brought up from Sansapor and Morotai, both under X Corps.[1]

The major landings on these southern islands were to be made at the rate of one a week—a speed that would have seemed fantastic to the planners on New Guinea in early 1944. The VICTOR operations were evidence of how far the art of amphibious warfare had advanced in the short space of a year. The Eighth Army Ordnance planners could now estimate with a degree of certainty the amount and kind of Ordnance troops, equipment, and supplies that would be needed and when they would be needed. They had learned a great deal about such matters as loading and unloading, waterproofing and dewaterproofing, bomb disposal, and other techniques. Early in the VICTOR program, the Eighth Army Ordnance officer, Col. Ward E. Becker, issued a folder of general instructions along these lines, prepared by his operations officer, Col. Thurman W. Morris, based on the combined experience of various Ordnance officers who had participated in the New Guinea, Leyte, and Luzon operations, and distributed it to all corps and division Ordnance officers under Eighth Army control, and also to all Eighth Army Ordnance unit commanders.[2]

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[1] (1) Smith, *Triumph in the Philippines*, pp. 583–86. Unless otherwise indicated the tactical details in this chapter are from this source. (2) History Eighth Army Ord Sec, pp. 32–34.

[2] (1) History Eighth Army Ord Sec, p. 32. (2) Hq Eighth Army, Office of the Ord Officer, Ord-

One subject treated at some length in Becker's instructions was the old problem of truck drivers' neglect of their vehicles. In the Luzon Campaign, failure to perform first and second echelon maintenance had not only increased the requirement for third and fourth echelon work, but had resulted in a seriously high deadline of badly needed trucks. Many commanders had insisted that first and second echelon maintenance was impossible during the early stages of an operation when the trucks had to be operated practically around the clock. Becker argued that experience had shown that this was not the case; that a few trucks at a time could be pulled out for weekly second echelon and that daily first echelon was imperative. What was needed was stricter maintenance discipline; and to prove this point he cited experience in the MIKE VII operation. There the XI Corps Ordnance officer, Col. Robert K. Haskell, had achieved excellent results by persuading his commanding general to station two inspection teams, each composed of an officer (not an Ordnance officer), two Ordnance mechanics, and an MP, along the main supply route to make spot checks two days after the landing. The inspection took only five minutes and no commander objected to having his vehicles stopped. When the teams found evidence of maintenance neglect, command letters went out signed by the XI Corps commanding general. Becker strongly recommended that inspection teams be used in all future Eighth Army operations.[3]

An inspection team was to be provided the VICTOR operations, not by corps and division commanders, but by the Eighth Army Ordnance Section. This was the team (composed of men taken from the 207th Ordnance Medium Maintenance Company) organized in the Admiralties the preceding fall. Using a system worked out by the Eighth Army Ordnance Section, the team inspected a sample of each unit's Ordnance matériel. If the rating on the sample was less than "excellent" a complete inspection of the unit's matériel was undertaken. After this was done, the rating for the division as a whole was sent to the division's commanding general in a personal letter from General Eichelberger along with information on the relative standing of the division among all the divisions under Eighth Army. The same method was applied to corps. Eichelberger's personal interest and his personal letters to the commanding generals "worked wonders."[4]

In regard to supply, the VICTOR invasion forces were different from previous SWPA forces. They were going to travel light. Realizing that resupply would be easier than it had been in past operations because seas around the Philippines were now free of large Japanese warships, the submarine danger had lessened, and the Allies had control of the skies (although there was still the threat of kamikazes), Eichelberger's G–4, Col. Henry C. Burgess, decided that the VICTOR operations would be conducted on a basis of only 15 days of Class II and IV supply instead of the customary 30 or

nance Procedures, 18 Mar 45, OHF. (3) Personal Ltr, Col Becker to Gen Campbell, 1 Apr 45, OHF.

[3] (1) Ordnance Procedures, p. 26. (2) Ordnance Rpt, Rpt of the Commanding General Eighth Army on the Nasugbu and Bataan Operations, p. 119.

[4] (1) Ltr, Col Ward E. Becker (USA Ret) to Lida Mayo, 21 Sep 63, OCMH. (2) For the organization of the team, see above, p. 404.

60. This seemed to General Eichelberger a common-sense approach to the problem of supply. In preceding campaigns the difficulty in unloading ships had demonstrated that there was such a thing as oversupply. If an emergency arose in the coming operations, supplies could be quickly dispatched from Base K on Leyte or the Eighth Army supply point on Mindoro by FS boats.[5]

Palawan and Zamboanga

The main element of the Palawan Task Force in the VICTOR III operation was the 186th Regimental Combat Team of the 41st Division. Since the rest of the division was to conduct the VICTOR IV operation against Zamboanga, the 41st's supporting Ordnance companies—the 741st Ordnance Light Maintenance Company, the backup 119th Ordnance Medium Maintenance Company, the 623d Ordnance Ammunition Company, and a detachment of the 267th Maintenance (AA) —were divided fairly evenly between VICTOR III and VICTOR IV. The VICTOR III force also had a bomb disposal squad, which was not necessary for VICTOR IV because the 623d Ammunition Company had an organic bomb disposal squad—the only ammunition company in the Southwest Pacific so organized. All staged from San Jose, Mindoro, for it was at Mindoro that the 41st had been stopped on its way to Luzon and diverted to Eighth Army and VICTOR. These two earliest VICTOR operations were of considerable interest to Becker and his staff. Maj. Ray D. Vane of the Eighth Army Ordnance Operations Division was sent on VICTOR III as task force Ordnance officer; and to VICTOR IV Becker sent an observer, Maj. H. V. Flett of the Canadian Army.[6]

Splitting the Ordnance companies between the two operations posed problems. Because it was impractical to split the third echelon tool sets of the 119th Ordnance Medium Maintenance Company, nearly all the tools of the automotive third echelon sets and about 75 percent of the automotive men went to VICTOR III, leaving only a small percentage for VICTOR IV. As it turned out, most of the repair work on Palawan was on vehicles. Weapons were no problem, for there was little or no resistance: the few Japanese on the island fled to the hills.[7] The landing at Puerto Princesa was accomplished without opposition. Here the men of the 41st Division (who called themselves the "Jungleers") saw the first town they had seen in three years, with macadam streets, churches, schools, and "real houses" in a setting of brilliant bougainvillea; and, enjoying the luxury of once again sleeping under a roof, got "great delight" (according to their historian) from "such simple, everyday operations as turning on and off water faucets and opening and closing doors and windows."[8]

The VICTOR IV landing on Zamboanga on 10 March 1945 (here called J-day) was

[5] (1) Eighth Army AdminO 6, 17 Feb 45, in Eighth Army G–4 Jnl, VICTOR III. (2) Eichelberger, *Our Jungle Road to Tokyo*, p. 233. (3) History Eighth Army Ord Sec, pp. 215–16.

[6] History Eighth Army Ord Sec, pp. 32–33, 215–16, 219.

[7] History 119th Ord Medium Maint Co, Opns Rpt, VICTOR III and IV Operation, 20 Feb–20 Jun 45.

[8] William F. McCartney, *The Jungleers: A History of The 41st Infantry Division* (Washington: Infantry Journal Press, 1948), p. 142.

not so easy. From the hills behind the coastal plain the Japanese directed mortar and artillery fire on the beaches and might have done a great deal of damage if they had had better aim and better ammunition. All the Ordnance troops except for part of the light maintenance company and the bulk of the 119th's detachment, which came in a week later, got ashore on J-day, including a small detachment of the 3608th Ordnance Heavy Maintenance Company (Tank) obtained from Sixth Army. By nightfall the men were unloading ammunition in their dump area, which was on the reverse slope of a small hill, screened from enemy observation. However, the top of the hill had a POL dump, easily observable by the Japanese, who next morning hit the dump and started a fire. Under the direction of the division Ordnance officer, Lt. Col. Ward C. Howard, the Ordnance men quickly moved their trucks to a safer area and then returned with flame throwers to burn off a firebreak and tractors to build revetments. For his "quick thinking and heroic action" during the emergency, Colonel Howard was awarded the Oak Leaf Cluster to the Bronze Star.[9]

Naval and air bombardment soon silenced the enemy guns. The combat troops moved inland and after a few days of heavy fighting in the hills, by the end of March had cleared the peninsula and were moving down into the Sulu Archipelago. During the operations on the Archipelago, a 17-man contact party of the 741st Ordnance Light Maintenance Company, accompanying the 163d Regimental Combat Team, set up a shop near the old Moro City of Jolo, once beautiful but now in ruins.[10]

The Central Visayan Islands

The islands south of Mindoro and west of Leyte—Panay, Negros, Cebu, and Bohol—were the richest part of the Philippines except for the area around Manila. Cebu City was the second largest city in the Philippines and Iloilo (capital of Panay) the third. Along the coastal plains were sugar plantations and sugar centrals; in the interior were jungle-covered mountains to which the Japanese, if they followed their usual policy, might be expected to retire. As it turned out, Panay and Negros were already largely in the hands of the guerrillas. When the 40th Division landed on the southern coast of Panay in the VICTOR I operation on 18 March, the amphibious forces were greeted by guerrillas on the beach; and two days later when the spearheading tankers reached Iloilo, they found themselves surrounded by laughing, cheering Filipinos throwing flowers. The Japanese had departed, after setting fires that, along with American bombing, left the city gutted; the ruins were still blazing.[11]

The 40th Division was staged by Sixth Army (in a reversal of the usual procedure in which Eighth staged for Sixth). It brought down from Luzon in addition to its own organic Ordnance company (the 740th) the 259th Ordnance Medium

[9] (1) 41st Inf Division, Office of the Ord Officer, 16 Jan–27 Jun 45, Opns Rpt VICTOR IV Opn. (2) History 741st Ord Co (Light Maint), 21 Jan–20 Jun 45. (3) History 623d Ord Ammunition Co, 10 Mar–20 Jun 45.

[10] History 741st Ord Co (Light Maint), 21 Jan–20 Jun 45.

[11] Eichelberger, *Our Jungle Road to Tokyo*, p. 209.

Maintenance, detachments from the 558th Ordnance Heavy Maintenance (Tank), the 611th Ordnance Ammunition, and the 3073d Ordnance Composite (AA) Companies, and a bomb disposal squad, the 184th. They encountered no special Ordnance problems. Arriving in Iloilo on 22 March, the maintenance men set up an Ordnance service center and were able to find competent civilian mechanics to assist them. The 259th also operated a civilian garage, using Filipino mechanics, to repair civilian vehicles that were found on the island and that could be leased by Eighth Army to relieve its transportation shortage. For once, there was no shortage of automotive spare parts. The Panay operation was highly successful; within eleven days one battalion of the division was able to handle the remaining Japanese forces. The rest of the division was then free to undertake the second part of VICTOR I, the liberation of the westernmost part of the neighboring island of Negros (Negros Occidental), making the short crossing on 29 March. In this operation the division took only Ordnance contact teams to perform emergency repairs. Disabled equipment was evacuated by LCM's and other small craft to the Iloilo Ordnance Service Center.[12]

The Ordnance support for VICTOR II against Cebu and neighboring eastern Negros (Negros Oriental) and Bohol was similar to that for VICTOR I. Here the principal combat unit was the Americal Division, coming from Leyte and depending on Base K for its supplies. It was supported by its organic maintenance company (the 721st), the 106th Ordnance Medium Maintenance, the bulk of the 578th Ordnance Ammunition Company, and a bomb disposal squad, the 183d. In addition it had half of the antiaircraft maintenance team that had gone in on VICTOR I and a detachment of the same tank maintenance company, the 558th, that had a detachment on Panay.[13]

Within five minutes after the landing on the east coast of Cebu at Talisay on 26 March (E-day), it was plain that the bomb disposal and tank maintenance men were going to have their work cut out for them. The first assault wave had hardly hit the beach when eight LVT's were knocked out by land mines. These were not conventional land mines, but shells and bombs, varying in size from 60-mm. mortar shells to 250-pound aerial bombs, buried upright at 10- to 15-foot intervals with the fuzes protruding through the loamy, vine-covered surface. The mine field, about thirty yards from the water's edge, stalled the advance for about an hour and a half on the narrow beach, the assault troops crowded shoulder to shoulder, two and three deep, until the Engineers could clear a path through it.[14]

Nowhere in the Philippines had such beach defenses been encountered. Nor was this all. Roads leading inland and into Cebu City were heavily mined, and mines were found scattered throughout the

[12] (1) History Eighth Army Ord Sec, p. 33. (2) Ordnance Rpt in Rpt of the Commanding General Eighth Army on the Panay-Negros and Cebu Operations, VICTOR I and II, pp. 152–53. (3) Memo, Lt Col Deobald, Hq Eighth Army, for Colonel Burgess, ACofS G–4 26 Mar 45, sub: VICTOR-One Operation, Eighth Army G–4 Jnl and Jnl File, Victor I. (4) History 740th Ord Co (Light Maint), 29 Mar–30 June 45.

[13] History Eighth Army Ord Sec, p. 33.

[14] Rpt of the Commanding General Eighth Army on the Panay-Negros and Cebu Operations, VICTOR I and II, pp. 61–64.

hills to which the Japanese had retreated.[15] And when on 1 April a small force crossed Cebu Harbor and landed on Mactan Island, four LVT's were lost to mines. It was at Mactan that the great navigator Ferdinand Magellan had met his death in an amphibious operation on 28 April 1521.[16]

The bomb disposal squad, split into two teams, was faced with a big task, but with the help of disposal officers of the 57th Engineer Combat Battalion it performed a real service in disarming the buried shells and bombs and in removing American parafrag and antipersonnel bombs, especially those that hung on trees and buildings and endangered artillery going into position. The tank recovery teams were exceedingly busy evacuating the LVT's from the beaches at Talisay and Mactan Island and bringing back damaged tanks. The men had no tank transporters and had discovered that the 10-ton wrecker was inadequate for handling armored vehicles, but they managed by combining the wrecker with a tank or tractor.[17] It was dangerous work. On 13 April a recovery crew composed of men from the 106th Medium Maintenance Company and the 558th's tank maintenance detachment came under heavy enemy mortar, machine gun and sniper fire when they went after a tank hit by a mine on top of a hill near Go Chan Hill. After retiring and taking cover, they saw that two infantrymen were lying on the hill seriously wounded. Sgt. Thorban H. Murray, Technician 5 James E. Newland, and Technician 5 John E. Noud returned to the hilltop and rescued the infantrymen under continuous enemy fire. All received the Silver Star.[18]

Cebu City, sometimes called "Little Manila," was almost as battered as its namesake. Heavy billows of smoke could be seen for miles. An Eighth Army G–4 officer looking for warehouse space found the city a wreck, its roofs pitted with holes, so that it was a problem to get supplies and equipment out of the weather.[19] The 578th Ordnance Ammunition Company found an ingenious solution to this problem. Having landed early on E-day and set up dumps, first on Talisay Beach and then at Mabolo north of the city (until infiltrating Japanese caused uneasiness about the possibility of fires being started), the company moved the ammunition to the railroad depot in Cebu City and put the ammunition in boxcars. This not only protected it from rain but contributed to safety, because the cars could be dispersed throughout the railroad yards.[20]

As no depot company was included in the operation, the 106th Ordnance Medium Maintenance Company had to set up the army supply point. The company's advance supply platoon (reinforced) was in Cebu City on E plus 2, but before the rest of the company got there two resupply

[15] *Ibid.*

[16] (1) History 106th Ord Medium Maint Co, Apr 45. (2) Charles McKew Parr, *So Noble a Captain* (New York, 1953), pp. 358–62. (3) War Diary–Journal, 1–3 April 1945, in 57th Engr Combat Bn Historical Record, Eighth Army VICTOR II Operation, 26 Mar 45–20 Jun 45, OCE.

[17] History Eighth Army Ord Sec, VICTOR II Operations Rpt, pp. 238, 242.

[18] History 106th Ord Medium Maint Co, Apr 45.

[19] Ltr, Bill Underhill to Lt Col Corrigan, no date, no sub, Eighth Army G–4 Jnl and Jnl Files, VICTOR II. Underhill also reported regretfully that the distillery had been destroyed by the Japanese and there was no "bonafide liquor" in the area.

[20] (1) History Eighth Army Ord Sec, p. 244. (2) Ord Rpt in Rpt of CG Eighth Army on the Panay-Negros and Cebu Opns, p. 152.

ships came in, one from Leyte, the other from the United States, and the Ordnance men were swamped at the outset. In order to get the supply point operating, the platoon had to borrow men from the company's advance automotive and armament platoons to bring the ships' cargoes to the supply point from the docks, where they had been unloaded by men from the 721st Ordnance Light Maintenance Company. When the bulk of the 106th arrived on 3 April, it built shelters for its stocks and shops with the help of fifty Filipino laborers.[21]

On 10 May USASOS Floating Depot 9 arrived in the harbor from Leyte, but it turned out to be not much help on the supply problem. The 106th's supply platoon, having been notified by Eighth Army that all requisitions submitted to Base K at Leyte after 10 April would be processed by the barge, had canceled all unfilled requisitions then on hand. The barge, however, could not fill any of these requisitions and did not have enough stock to bring the army supply point to the established level. Then began the weary process of re-requisitioning from Base K. On 15 June, Base S was established at Cebu.[22]

Between 11 April and 20 June Eighth Army completed its central Visayan campaign by sending out combat teams to clear Bohol and southeastern Negros (Negros Oriental). They were supplied from Cebu and were accompanied by ammunition detachments and maintenance contact teams. The teams, the Americal Division Ordnance officer reported, had benefited from lessons learned at Leyte and Samar and were more effective in this operation than any in the past.[23]

Mindanao

The last landings in the Philippines took place on Mindanao, where MacArthur had originally intended to begin his Philippines campaign before optimism in September 1944 had brought about the decision to make the long jump to Leyte.[24] Mindanao was huge, mountainous, primitive, and thinly populated, with a large percentage of its population the Moros that had given the U.S. Army so much trouble a generation before. It had only one city worthy of the name—Davao, at the head of Davao Gulf, which indents the southern coast. Eichelberger had wanted to make a direct amphibious landing in Davao Gulf as the quickest way of ending the campaign, for here were located large concentrations of Japanese. But by early spring of 1945 when the assault was planned, the Okinawa campaign was in progress and the Navy did not feel it could provide adequate protection for such an ambitious expedition. Therefore Army planners decided to land on the western coast at Illana Bay and march overland to Davao, putting the 24th Division ashore at Malabang on 17 April (R-day), and the 31st in the same area on 22 April.[25]

[21] (1) History Eighth Army Ord Sec, pp. 240–41. (2) History 106th Ord Medium Maint Co, Apr 45.

[22] (1) For the history of USASOS Floating Depot 9, see above, ch XVIII, p. 11. (2) History Eighth Army Ord Sec, pp. 244–45.

[23] History Eighth Army Ord Sec, pp. 244–46.

[24] Cannon, *Leyte: The Return to the Philippines*, p. 9.

[25] Eichelberger, *Our Jungle Road to Tokyo*, p. 218.

The Landing on Illana Bay

The Mindanao landing differed in two respects from any other amphibious operation in the Philippines. One was the greater use of small landing craft: no large Navy transports were involved. The beach at Malabang was suitable only for small craft. A shore-to-shore operation from Zamboanga, on the other side of Moro Gulf, was planned. Though Zamboanga was a peninsula of Mindanao, for purposes of military planning it was not considered a part of Mindanao but rather an island, for the mountains between the peninsula and the mainland were so steep that the principal contact had always been by boat.[26]

The 533d Engineer Boat and Shore Regiment, in charge of the landing, swung its LCVP's from the davits of LST's and made the daring (and as it developed later, very fortunate) decision to bring down from Lingayen and Mindoro to Zamboanga a huge fleet of little LCM's, under their own power. Ninety-nine of them, some carrying a DUKW or a truck, made the 338-mile voyage nonstop, each boat carrying enough fuel drums to keep it going. Luckily the trip was blessed with good weather and glassy seas, and all the boats arrived at "Zambo" in time for the men aboard to spend several days preparing for the invasion, resting up and getting acquainted with the Moros. While they were at Zamboanga they received a message from the flagship of the naval convoy that the landing would not be made at Malabang but at Parang, twenty miles down the west coast of Mindanao.[27]

The last-minute change in the assault plan was the second circumstance that distinguished VICTOR V. Planners had always considered that an amphibious operation, once launched, could no more be redirected than an arrow once the bowstring was released. For the decision to do so there were compelling reasons. While at sea, the task force commanders received word from Col. Wendell W. Fertig, head of the guerrilla forces on Mindanao, that Malabang was already in the hands of the guerrillas. The task force therefore decided to send only a battalion to Malabang and to make the main landing at Parang. Recognizing that the risk in the change in plans would affect the Engineer boat and shore regiment most of all, the commander of the 24th Division preceded the announcement of the decision with the words, "We will now have one minute of silent prayer for the 533d."[28] Miraculously, all of the assault waves landed on schedule on the right beach on the morning of R-day, 17 April, and met no opposition except for a small sniper party.[29]

A 68-man detachment of the 578th Ordnance Ammunition Company was aboard an LST in the bay on R-day, watching the bombing and naval bombardment. The men got ashore next day, but had hardly started to build bays for the Parang dump and to segregate ammunition on a round-the-clock basis (setting up a generator to provide light, so they could work at night), when they were sent forward. First a small detachment went to Cotabato to set up a dump in support of fast-moving X Corps troops and a few days later the rest

[26] *Ibid.*, pp. 216–17.
[27] *Surf and Sand*, pp. 163–67.
[28] *Surf and Sand*, p. 168.
[29] (1) *Ibid.*, p. 171. (2) Eichelberger, *Our Jungle Road to Tokyo*, p. 219.

of the men went up the Mindanao River in LCM's on an 11-hour trip to Fort Pikit in the interior.[30]

Inland Support by Water and Air

The river expedition into the interior was one of the most interesting features of the Mindanao campaign—an operation suggesting to many the Federal gunboats operating on the Mississippi in the Civil War. Immediately on landing at Parang, a regimental combat team of the 24th Division had started overland on Highway 1 for Fort Pikit, and soon discovered that the highway was little more than an overgrown trail and that the Japanese had blown nearly all the bridges. There was also a water route into the interior. Parallel to the highway as far as Fort Pikit (thirty-five miles by land, about eighty-six by water) meandered the muddy Mindanao River. Little was known about it, but the Engineers believed they could navigate it with their shallow-draft landing craft. Some of their LCM's already had rockets, others were now converted to gunboats with light and medium artillery and designated LCMG's. The little flotilla, which included a number of LCM's and LCVP's carrying troops of the 21st Infantry, started upriver on R plus 1, attacking river towns, from most of which the Japanese appeared to have recently fled, and being met along the way by canoes filled with cheering guerrillas or curious Moros.[31]

At first the voyage seemed to the Engineers "a pleasant novelty—fascinating scenery, cheery greetings from each barrio, and dead calm, but a little went a long way. The heat was the most oppressive the men had experienced overseas, night runs were a terrific strain on the helmsmen, and snags and flotsam caused much damage." [32] By 21 April when the river force was at Peidu Pulangi, where the Mindanao River becomes the Pulangi, it was some twenty miles in advance of the overland force moving up Highway 1 and had been reinforced by two battalions of the 34th Infantry and three Navy PGM's (patrol gunboats, medium), which were converted submarine chasers. The unit commanders of the river force sent part of the infantry overland to Fort Pikit and proceeded with the rest by water around a wide bend in the river. The landing craft got there first. The gunboats had to fall back because they could not get past the wreckage of a bridge (formerly carrying Highway 1 over the river); therefore the glory of taking Fort Pikit belonged to the crews of the LCMG's. They overran the fort that gave the place its name—an old Filipino constabulary fort—and when the infantrymen arrived they saw atop its square stone tower the American flag flying from a boathook. Between 20 and 28 April the amphibian engineers managed to ferry three regimental combat teams to Pikit. Later the river became the main supply route into the interior.[33]

[30] History 578th Ord Ammunition Co (VICTOR V, Opn), 12 Apr–30 Jun 45.

[31] (1) Eichelberger, *Our Jungle Road to Tokyo,* pp. 220–21. (2) Morison, *The Liberation of the Philippines,* pp. 244–46. (3) *Engineers of SWPA IV,* pp. 642–43. (4) Hq X Corps, G–4 Historical Report of the VICTOR V Operation, 17 Apr 45 to 30 Jun 45, pp. 7–9.

[32] *Surf and Sand,* p. 187.

[33] (1) *Engineers of SWPA IV,* p. 647. (2) *Surf and Sand,* p. 185. (3) Hq X Corps, G–4 Historical Rpt, p. 8. (4) History Eighth Army Ord Sec, p. 252. (5) Ltr, Col Charles E. Brokaw to Col Burgess, 10 May 45, no sub, Eighth Army G–4 Jnl and File VICTOR V, Book II.

The substitution of water transportation for motor transport was a blessing to the Ordnance maintenance men because it relieved them for the first two or three weeks of the usual heavy burden of truck repair. At Parang, on the coast, X Corps' 194th Ordnance Battalion, landing on 22 April with the 310th Ordnance Depot Company, the 642d Ordnance Ammunition Company, and detachments of the 291st Ordnance Medium Maintenance and 3608th Heavy Maintenance (Tank) Companies, could devote its attention to setting up the Parang Ordnance Service Center on a hillside near the remains of Fort Mago, which was built in 1900. The service center was on the site of old Camp Luna, whose concrete sidewalks and barracks floors, found in cornfields and potato fields, were useful to the maintenance and depot men. The 642d took over the dump left by the 578th and soon had its hands full dealing with the ammunition that came in with the 31st Division, which also landed on 22 April.[34]

By the end of the first week in May the Ordnance battalion at Parang had been bolstered by the arrival of the 509th Ordnance Heavy Maintenance Company (FA), the 108th Ordnance Medium Maintenance Company, and the rest of the 291st. By then it had become necessary to send medium maintenance men forward to support the 24th and 31st Divisions.[35] The 24th Division, having seized the important road junction at Kabacan about nine miles north of Pikit where Highway 1 joins Sayre Highway (which runs northward almost 150 miles to Macajalar Bay on Mindanao's north coast), then turned south on Highway 1, captured Digos on Davao Gulf, pushed north via Talomo and, entering Davao on 3 May, attacked the concentration of Japanese in the hills north of the city. The 31st Division, sent forward to Kabacan, was advancing up Sayre Highway—a highway in name only, the men discovered, for at times it disappeared in quagmires and toward the north became hardly more than a mountain trail. The trail here was cut by gorges that were not only deep but bridgeless, for the Japanese had destroyed the ramshackle wooden bridges that formerly spanned them.

In the 24th Division's sector the 108th Ordnance Medium Maintenance Company was sent to the Davao area to back up the 724th Ordnance Light Maintenance Company. The 108th made the trip by water on LST's around the southern coast of Mindanao, landing at Talomo on 7 May, and remaining in the Davao area until the end of the campaign. Trucks were sent back to Parang for parts and supplies until the rainy season set in and the overland route became impassable; thereafter the supplies came by water or by air.

Ordnance bomb disposal men, urgently needed after the 24th Division reached Digos, arrived by air. At the beginning of the Mindanao campaign plans based on previous experience in the Pacific with unexploded bombs and shells had allotted one squad to each division—the 181st to the 24th Division and the 182d to the 31st. But as the 24th Division approached Davao, it found that (as at Cebu) the Japanese were using buried bombs and artillery shells as mines. Mine clearance was an Engineer function, but the removal

[34] (1) History Eighth Army Ord Sec, p. 255. (2) History 194th Ord Bn. (3) History 310th Ord Depot Co, Mar–Jun 45.
[35] History 194th Ord Bn.



LCM Carrying Troops Up Mindanao River to Fort Pikit

and disposal of bombs and shells belonged to Ordnance. The 181st, an excellent squad, did what it could, but had to have help. Three additional squads were brought in by air—one of them the unique squad belonging to the 623d Ordnance Ammunition Company.[36]

The 31st Division depended for Ordnance support in its arduous advance mainly on its 731st Ordnance Light Maintenance Company, which did not arrive at Parang until 3 May, though small contact teams had accompanied the division's regimental combat teams. When the light maintenance company did arrive, it was dispatched to a point twelve miles north of Kabacan, and stayed there two weeks, until the road beyond was made passable for trucks as well as jeeps. When the company moved on, division ordered to Kabacan, to help with the very heavy automotive repair job, a 33-man detachment from the 108th Ordnance Medium Maintenance Company on Davao Gulf. In the

[36] (1) Opn Rpt 108th Ord Medium Maint Co (Mindanao Campaign), 11 Mar 43–30 Jun 45. (2) History Eighth Army Ord Sec, 255–57, 259. (3) Location of Service Units, 22 May 45, Eighth Army G–4 Jnl, and File Victor V, Book II.

meantime, a 20-man maintenance team from the 291st Ordnance Medium Maintenance Company had been sent from Parang to serve corps troops at the small inland base set up at the end of the river supply route at Pikit, from which supplies were trucked nine miles forward to Kabacan.[37]

Because the condition of Sayre Highway did not permit truck haulage, the 31st Division had to be supplied by air. Ammunition was carried from Parang across Illana Bay by boat to Malabang, then trucked to Malabang airfield for airlift to the front. At first, until the capture of Maramag airstrip near Sayre Highway the second week in May, supplies had to be airdropped. For ammunition, parachutes were used whenever possible, but the parachute supply was soon exhausted and much of the ammunition was free-dropped—an extremely wasteful measure, for only about 30 percent was recoverable, and about half of that recovered was so damaged that it was unusable.[38]

The Move to Macajalar Bay

The problem of supplying the 31st Division as it advanced slowly and painfully up Sayre Highway was compounded by the heavy seasonal rains. The roads on the 150-mile overland route from Parang to the upper valley were washed out by torrential downpours; Sayre Highway broke down under the weight of army vehicles; at times supplies had to be carried forward by plodding carabao. General Eichelberger decided that the time had come to establish a new supply base on the north coast of Mindanao at Bugo on Macajalar Bay. From there supplies could be moved by a fairly good road sixteen miles inland to Del Monte airfield and flown to the various airfields along the highway.[39]

On the morning of 10 May 1945 (called Q-day), a task force composed mainly of the 40th Division's 108th Regimental Combat Team (to be reinforced 14 May by a battalion from the Americal Division) landed against light opposition near Bugo and five days later had secured Del Monte airfield.

Del Monte, really a complex of several fields, had haunting associations with the fall of the Philippines. Here, early in December 1941, a hasty attempt had been made to expand a landing strip into a heavy bomber base for some of the B–17's at Clark Field, on Luzon, a heroic effort to which two Ordnance aviation companies had made valiant contributions—the 701st Air Base and the 440th Bombardment, sent to Mindanao from Clark Field ahead of the bombers. One detachment, preparing to sail at the time of Pearl Harbor, was aboard ship in Manila Bay when Nichols Field was bombed, and had a hair-raising journey from Luzon through dangerous waters; another lost three men in the sinking of the *Corregidor,* which was struck by a floating mine. The men who did arrive safely at Del Monte found them-

[37] (1) History 731st Ord Light Maint Co, V–5 Opn (Central Mindanao), 19 Apr–30 Jun 1945. (2) History 291st Ord Medium Maint Co, 10 Mar–Jul 45. (3) History Eighth Army Ord Sec, pp. 253, 256–57. (4) Ltr, Brokaw to Burgess, 10 May 45, no sub, Eighth Army G–4 Jnl and File VICTOR V, Book II.

[38] (1) Hq X Corps G–4 Historical Rpt, Incl 6, Ord Rpt, pp. 6–7. (2) Peifer, *Supply by Sky,* pp. 52–54.

[39] (1) Eichelberger, *Our Jungle Road to Tokyo,* p. 230. (2) Eighth Army Operational Monograph on the Mindanao Operation, 11 Apr–Jun 45, p. 46.

selves living under conditions of extreme hardship and in danger from Japanese bombing attacks. Since there were no antiaircraft weapons on Mindanao, they built mounts for .50-caliber machine guns salvaged from wrecked aircraft, and ended by manning about half of them. In late December the B–17's took off for a safer base in Australia and thereafter Del Monte was used only as a base for an occasional bombing raid (and for General MacArthur's last stop on his way to Australia). With the arrival of Brig. Gen. William F. Sharp's Visayan-Mindanao Force, which was poorly equipped and had no Ordnance support, the aviation Ordnance men took on the task of repairing ground weapons and made antitank mines by filling pineapple juice cans with dynamite and improvising a firing mechanism. In May 1942 the Japanese came.[40]

Not far from the American landings on Macajalar Bay in May 1945 was the great Del Monte pineapple plantation—where millions of pineapples had lain rotting after the arrival of the Japanese. In the beach area the old canning plant was still partly usable for storing rations, and a concrete unloading dock built by the Del Monte Company was helpful in beach operations. Inland at Del Monte airfield the detachment of the 623d Ordnance Ammunition Company that had accompanied the task force began setting up a dump; and when detachments of the 106th Ordnance Medium Maintenance and 558th Ordnance Heavy Maintenance (Tank) Companies came in on Q plus 5, they established their shops in the same area. All had their troubles. The maintenance men were immediately busy with repair work caused by accidents on the narrow, winding, slippery roads and with maintaining engineer equipment for which no maintenance provision had been made. The ammunition men suffered from lack of dunnage and the scarcity of civilian labor. The operation had been hastily mounted. Supply figures had not been entirely accurate and airdrops had to be resorted to not only for ammunition but for automotive parts.[41]

In late May the base at Parang began its movement to the Bugo–Del Monte area on Macajalar Bay. Following the pattern of most Mindanao supply operations, the move was accomplished mainly by water. Part of the 291st Ordnance Medium Maintenance Company, which had been carrying the maintenance load at Parang, made the two-day voyage around Zamboanga on three LSM's loaded with about half the company, 7 trucks, 21 trailers, and 90 tons of supplies. The rest of the men in the company with 21 vehicles made the trip by LST to Malabang and then traveled overland by wretched roads to the northern coast at Illigan, where LCM's ferried them to Bugo. The whole journey took about as long as the trip around Zamboanga. The greatest problem for Ordnance was moving the 310th Depot Company with its 1,500 tons of stock. The "Ordnance Navy" came to the rescue. Floating Depot 9, which had been brought from Cebu, was loaded with about 750

[40] (1) Craven and Cate, *AAF I*, pp. 187–88, 220–22, 406–07, 418. (2) Ltr, Maj Victor C. Huffsmith to Brig Gen Earl McFarland, 20 Nov 42, no sub, Folder, Troop Units Reports, Miscellaneous Reports, OHF.

[41] (1) Edward Haggerty, *Guerrilla Padre in Mindanao* (New York: Longmans, 1946), p. 65. The guerrillas had run their automobiles on alcohol distilled from the pineapples. *Ibid.* (2) Ltr, Gardner to Burgess, 20 May 45, no sub, Eighth Army G–4 Jnl and File VICTOR V, Book II. (3) History Eighth Army Ord Sec, pp. 261–62.

tons of parts and on its deck carried the depot's knocked-down prefabricated buildings. The rest of the stock was sandwiched in on Libertys, LST's, LSM's, and any other available shipping. Most of the men went overland in company and replacement vehicles, following the same route taken by the maintenance company. In mid-June the new Ordnance service center was being set up on a grassy plateau about two miles from the beach near Bugo.[42]

By that time the campaign in Mindanao was virtually over. The 108th Infantry, in a rapid advance down Sayre Highway slowed only by supply problems, made contact with the 31st Division on the afternoon of 23 May. After a period of mop-up and pursuit, including a landing on the northeastern coast at the Agusan River, General Eichelberger declared the Mindanao operation closed on 30 June 1945. Some encounters with the enemy continued in minor operations such as a landing to clear the Sarangani Bay area on 4 July; but except in remote parts of Mindanao and in northern Luzon, organized resistance by the Japanese in the Philippines was at an end.

On 1 July 1945 in preparation for the invasion of Japan a drastic regrouping of forces took place, which affected Ordnance as well as combat units. Except on Mindanao, almost all of the Ordnance units on the southern islands and all on Luzon, except the minimum required to operate USASOS (now redesignated AFWESPAC) bases, went to Sixth Army, which was to spearhead the coming invasion in Operation OLYMPIC. In order to allow Sixth Army time to get ready for OLYMPIC, Eighth Army was to take over in northern Luzon. After OLYMPIC, Eighth was to combine with Tenth Army in a massive assault on Japan called CORONET.[43] These ambitious plans were made possible by the success of a bloody campaign waged by Tenth Army throughout the spring of 1945 to conquer Okinawa, the big island in the Ryukyu chain that lay far to the north of Luzon, at the threshold of Japan.

[42] (1) History 291st Ord Medium Maint Co, 10 Mar–Jul 45. (2) History 310th Ord Depot Co, Mar–Jun 45. (3) History 194th Ord Bn. (4) History Eighth Army Ord Sec, p. 257. (3) Hq X Corps, G–4 Historical Rpt, Incl 6, Ord Rpt, p. 2.

[43] History Eighth Army Ord Sec, pp. 35–36.

CHAPTER XXIII

Boldly Aiming at Okinawa

Farewell, dear Isle!—on thee may ne'er
The breath of civil discord blow!
Far from your shores be every fear,
And far—oh! far—the invading foe!

So wrote Mr. Gillard, an officer of His Britannic Majesty's Ship *Alceste,* when his ship set sail on 27 October 1816 from Okinawa. During a sojourn of more than a month on the island, officers and men of the *Alceste* and her sister ship the *Lyra* had been enchanted by the landscape, the low, pine-crowned hills, the valleys of cultivated fields and meandering rivers with pretty villages and villas on their banks surrounded by brilliant foliage, the picturesque houses of the capital city of Shuri rising row on row to the summit of a hill crowned by the king's palace embowered in lofty trees.

Most of all, they had been charmed by the people of Okinawa, so gentle and hospitable, who had come out in canoes to welcome them, bringing jars of fresh water and baskets of boiled sweet potatoes and fish. The Englishmen, who had recently been subjected to what they considered the "cold repulsive manners" of the Koreans and the "boorishness" of the Chinese mandarins, responded gratefully and during their stay established friendships most unusual in the annals of nineteenth century voyages. When the time came to say good-bye, the bearded noblemen of Okinawa in their long girdled robes and flat turbans were so choked with tears that they could not speak as they presented farewell gifts of pipes, fans, and knives to the "Engelees." Weighing anchor, the British sailors saw vast crowds assembled on the heights above the harbor. Their last glimpse of the island was of people standing on the sea wall beating gongs and waving umbrellas, handkerchiefs, and fans.[1]

Notwithstanding Mr. Gillard's fervent wish, the invading foe was never very far from the shores of his "dear Isle" after Commodore Matthew Calbraith Perry by his visit to Okinawa in 1853 alerted Japan to the possibility of foreign aggression at her doorstep. Okinawa, the central island in the Ryukyu chain extending from Japan to Formosa, is only about 350 miles south of the southernmost Japanese province of Kyushu. The most likely aggressor was China, to which for centuries the government of the Ryukyu (known to the Chinese as Liu Ch'iu) Islands had paid tribute and to which its people had close ties, being by blood a mixture of Chinese, Malay, and Ainu strains. Alarmed by the claims of the Chinese to the islands in the 1870's, the Japanese announced their annexation of the Ryukyus and in 1879 deposed the king, sent in troops to occupy

[1] George H. Kerr, *Okinawa: The History of an Island People* (Rutland, Vt.: C. E. Tuttle Co., 1958), pp. 252–58. For a picture of the scene at the sea wall see Plate 15, p. 262.

Shuri castle, meeting only passive resistance, and made the Ryukyus a prefecture of Japan. The islands contributed little to the Japanese economy; the people were poor, looked down upon by the Japanese as backward rustics; the prime value of Okinawa (the great island or "Great Loochoo") was as a bastion to the defenses of the Japanese homeland.[2]

A Strongly Fortified Island

In the spring of 1944 the Japanese strongly fortified the island, pouring in troops, building airfields, and conscripting all able-bodied Okinawans for the army proper or a 20,000-man *Okinawa Home Guards* force. The preparations were accelerated in midsummer 1944 after the capture of the Marianas in the Central Pacific by the American forces. Concluding that the Americans were now "boldly aiming" at Okinawa, the Japanese constructed extensive fortifications in the caves on the southern part of the island, arming them with more and better artillery than they had ever before employed in the Pacific.[3]

The Americans were indeed aiming at Okinawa. The Joint Chiefs of Staff, in the directive dated 3 October 1944 ordering General MacArthur to seize and occupy Luzon, ordered Admiral Nimitz, Commander in Chief, Pacific Ocean Areas, to invade the Ryukyus. For this operation, called ICEBERG, Nimitz had ample resources. For the assault on Okinawa, an island only 60 miles long and from 2 to 18 miles wide, and the seizure of small offshore islands, he had more combat troops than MacArthur had for the Lingayen landings on Luzon. With supporting elements drawn from the Southwest Pacific, the South Pacific, and even from the European theater (made possible by the late landing date, finally fixed at 1 April 1945), ICEBERG was to bring together the greatest concentration of land, sea, and air forces ever used in the Pacific. Supply was plentiful, assured by the decision at the Washington Conference in May 1943, TRIDENT, that the Central Pacific would have priority over the Southwest Pacific in the advance on Japan.[4]

The Advance in the Central Pacific

Until Okinawa, the Central Pacific had been mainly a Navy theater, with the Marine Corps carrying most of the burden of the amphibious and ground fighting. In the first large-scale campaign, that against the Gilberts and Marshalls beginning 20 November 1943 and ending 2 February 1944, a regimental combat team of the 27th Infantry Division (which had been doing garrison duty in Hawaii since March 1942) was employed on Makin, Kwajalein, and Eniwetok; and the 7th Division (which had arrived in Hawaii from the Aleutians in mid-September 1943) was used at Kwajalein; but all Army units were attached to the Marine V

[2] Kerr, *Okinawa: The History of an Island People*, pp. 354, 381–82, 459, 463–66.

[3] Roy E. Appleman, James M. Burns, Russell A. Gugeler, and John Stevens, *Okinawa: The Last Battle*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1948), pp. 85–92. Unless otherwise indicated, this chapter is based on this source.

[4] (1) Smith, *Triumph in the Philippines*, p. 29. (2) Philip A. Crowl and Edmund G. Love, *Seizure of the Gilberts and Marshalls*, UNITED STATES ARMY IN WORLD WAR II (Washington, 1955), pp. 12–14.

Amphibious Corps commanded by Lt. Gen. Holland M. Smith; and at Tarawa, the hardest battle of the campaign, there were no Army combat troops. The second campaign, fought in the Marianas between 15 June and 10 August 1944, was also largely a Marine Corps show, under V and III Amphibious Corps, with Marine generals commanding the landing forces on Saipan, Tinian, and Guam, and Lt. Gen. Holland M. Smith in over-all command. Here the Army combat elements were the 27th Division and the 77th Division—the first operation for the 77th, which had arrived in Hawaii from the United States during April and May 1944. Also used in the Marianas were artillery battalions of XXIV Corps, the only Army corps in the Central Pacific, organized in Hawaii in 1944. The corps was originally intended for the campaign in the Western Carolines (the Palaus and Ulithi Atoll), 15 September to 24 November 1944, but the plans were changed; the first operation for XXIV Corps was to be Leyte. An Army division, the 81st, participated in the Western Carolines, but it was under the Marine III Amphibious Corps.[5]

These campaigns to capture small islands (brief actions except in the Palaus) differed greatly, as may be imagined, from the long haul up the New Guinea coast in the Southwest Pacific. For such operations, the Ordnance support that could be provided by the divisions' own light maintenance companies was generally sufficient, with the assistance of small detachments of tank mechanics and ammunition men sent forward from Hawaii.[6] After the Gilberts and Marshalls campaign, the 7th and 27th Divisions were returned to Hawaii for rest and for rehabilitation of their equipment. In the Marianas, heavy matériel such as guns, tanks, and LVT's was sent back for overhaul in the Ordnance shops on Oahu. Ammunition left over from these island operations and excess to the needs of the garrison forces was either moved forward to new operations or returned to Oahu for renovation.[7]

The Hawaiian Base

There had been an Ordnance organization in Hawaii since 1913, when a depot was sent out from Benicia Arsenal in California to Fort Kamehameha on the southern coast of Oahu. During World War I, the Hawaiian Ordnance Depot was moved to Fort Shafter, near Honolulu, and a few years later it also had a maintenance company and a depot detachment at Schofield Barracks in the interior. After Pearl Harbor, all types of Ordnance service at both locations were considerably expanded. By the time the big push in the Central Pacific got under way in late 1943, two Ordnance centers were in operation, one at Schofield to serve the North Sector of Oahu, the other at Shafter to serve the South Sector. There was also, because of the changeover of motor transport from Quartermaster to

[5] Army participation in the Central Pacific campaigns is described in the following volumes of UNITED STATES ARMY IN WORLD WAR II: Philip A. Crowl, *Campaign in the Marianas* (Washington, 1960); Crowl and Love, *Seizure of the Gilberts and Marshalls;* and Smith, *The Approach to the Philippines.*

[6] (1) History 81st Ord Co (Heavy Maint) (Tank), APO 957, 1 Jan 44–31 Mar 44. (2) History 68th Ord Ammunition Co, Okinawa Opn, Apr–Jun 45.

[7] Report of Visit to Pacific Ocean Area by Brig Gen Julian S. Hatcher, 9 September–12 October 1944: Hawaiian Islands, Saipan, Tinian and Guam (hereafter cited as Hatcher Rpt).

Ordnance in mid-1942, a sizable Ordnance Automotive Depot, divided between the two locations. The main ammunition storage area was at Aliamanu Crater (where maximum use was made of tunnels dug into the mountains), with subdepots at Diamond Head and Ulupau and another planned for Ewa.[8]

Not until July 1944 was there a communications zone organization in the Central Pacific. When Lt. Gen. Robert C. Richardson, Jr., assumed the top Army job in the area—that of Commanding General, United States Army Forces, Central Pacific Area (USAFICPA)—in June 1943, he appointed a board to study the communications zone problem and on its recommendation decided to stick to the conventional general and special staff, with a limited number of support functions assigned to an Army Port and Service Command. As his chief Ordnance officer he selected Col. Francis A. Englehart, chief of the Military Plans and Organization Branch, Field Service, Office of the Chief of Ordnance, who had been recommended by the Chief of Ordnance as "a very sincere, earnest and hard-working officer." A few months after Englehart's arrival in mid-January 1944, General Richardson reported that he was "taking hold of the Ordnance in his accustomed efficient manner with excellent results."[9]

At the time Richardson assumed command, the Hawaiian Islands had a defensive mission. Feeling that this role would have to be changed immediately to one of preparations for offensive operations, he instituted a vigorous training program, establishing a Unit Jungle Training Center in two Oahu valleys, and even (in anticipation of amphibious operations) a school to teach swimming. As the pace of the war in the Pacific accelerated beginning in 1944, the job of training increased, and also the task of seeing that the new divisions staging in Hawaii on their way to action were properly equipped. On 1 July 1944 General Richardson, whose command on 1 August was to be redesignated U.S. Army Forces Pacific Ocean Areas (USAFPOA), established the Central Pacific Base Command (CPBC), giving it responsibility not only for the defense of Hawaiian and adjacent islands but also for logistical support and planning for Army units stationed or staging in Hawaii and for the maintenance of supply levels at advance bases as directed. The Central Pacific Base Command did not include units and installations assigned to the forward areas, and in this respect differed sharply from United States Army Services of Supply in the Southwest Pacific. Also, because of the growing practice of direct shipment from the United States to forward areas without a stop in Hawaii, the most important front-line supply function of Central Pacific Base Com-

[8] (1) Ordnance History: Extracts, History of the Hawaiian Department and Historical Records 74th Ordnance Company (Depot), June 1, 1913–June 30, 1939. (2) Historical Rpts Hawaiian Ordnance Depot, 1941–43. (3) Organization and History of Ordnance Automotive Depot, August 1, 1942 to June 30, 1943. (4) History Hq 17th Ord Bn, 21 Apr 44. (5) Ltr, Maj Harold A. Strohman, Hq Ord Depot, to Ord Officer, HUSAFICPA, 12 Apr 44, sub: Historical Report Quarter Ended 31 March 1944, Folder, Headquarters Ordnance Depot, USAFICPA, OHF. (6) Memo, Col William C. Crosby for Director of Supply, ASF, 12 Dec 44, sub: Report on Trip to Pacific Ocean Areas, apps. to Storage Operations December 1941–December 1945, ASF Historical Monograph, app. I.

[9] (1) Rpt of Lt. Gen. Brehon Somervell on Central Pacific Area, 13 Sep 43, OCMH. (2) Ltrs, Campbell to Richardson, 22 Jan 44. no sub; Richardson to Campbell, 13 May 44, no sub. Campbell Overseas File, OHF.

mand in the later campaigns was to act as an emergency supply point. After the Marianas campaign, plans were made for a Western Pacific Base Command at Saipan (about 3,500 miles west of Oahu) to provide faster emergency service, but it was not activated until 25 April 1945—almost a month after the Okinawa landings. On Okinawa, base development was to be the responsibility of Tenth Army.[10]

Tenth Army Plans and Preparations

Tenth Army, activated in the United States in June 1944, the only field army employed in Central Pacific operations, was in several respects different from armies in other theaters. Organized not only for combat but also for base operation and development, it was a joint force composed of Navy and Marine units as well as Army, and was employed under the operational direction of Admiral Nimitz. Its commanding general was commonly referred to as COMGENTEN, according to Navy usage. At the same time, Tenth Army was under the administrative direction of General Richardson for all Army units assigned to it.[11] The command relationships (never satisfactory to General Richardson) were intricate and delicate. The success of this large joint undertaking depended in no small measure on the diplomacy of COMGENTEN—Lt. Gen. Simon Bolivar Buckner, Jr., a ruddy-faced, white-haired gentleman (son of the Confederate general of the same name) fresh from Alaska, where for four years he had commanded the Alaskan Department. In the Aleutians he was involved in a campaign that was a brief example of interservice co-operation.[12]

Buckner brought some of his Tenth Army staff with him from Alaska; others came from the European Theater of Operations and from important jobs in Washington. As his Ordnance officer he was able to secure Col. Robert W. Daniels, chief Ordnance officer of Army Ground Forces, who, since the beginning of his duty in Washington in July 1941 as General McNair's Ordnance officer, had had a big share in plans for reorganizing and modernizing Ordnance service in the field army.[13] In this culminating planning effort in the Pacific, Daniels was faced with hard problems when he arrived on Oahu in September 1944, not the least of which concerned interservice co-ordination. The "Expeditionary Troops" for which Tenth Army was responsible consisted of Army units under XXIV Corps; Marine units under III Amphibious Corps; Army and Marine air units under the commanding general of Tenth Army's tactical air force;

[10] (1) Ltr, Richardson to CofS, U.S. Army, 15 Mar 46, sub: Final Report of Commanding General, Army Forces, Middle Pacific (hereafter cited as Final Rpt COMGENAFMIDPAC), ASF Planning Div, Theater Br. (2) History of Central Pacific Base Command During World War II, vols. 1 and 6, 8-5.7 AA, OCMH. (3) Hatcher Rpt. (4) History Western Pacific Base Command, vol. 1, 8-5.7 CA, OCMH.

[11] Tenth Army Action Report Ryukyus, 26 March to 30 June 1945, p. 1-0-1.

[12] (1) Final Rpt of COMGENAFMIDPAC. (2) Conn, Engelman, and Fairchild, *Guarding the United States and Its Outposts*, pp. 266-68. (3) Robert Sherrod, *On To Westward* (New York: Duell, Sloan and Pearce, Inc., 1945), p. 259. (4) Samuel Eliot Morison, "History of United States Naval Operations in World War II," *Aleutians, Gilberts and Marshalls: June 1942-April 1944* (Boston: Little, Brown and Company), pp. 3-66.

[13] Brig. Gen. R. W. Daniels, "Field Ordnance Service," *Ordnance*, XXXVIII, No. 203 (March-April 1954), 750-52.

certain naval construction and service units; and a composite of Army, Navy, and Marine units (mostly service units) under the Commanding General, Army Garrison Force. Because of the mixture of forces, Buckner's staff sections were augmented with Navy and Marine officers. Ordnance received a marine, Lt. Col. David S. McDougal. Daniels considered him "a grand chap," and characterized co-operation between Marine Corps and Army as "outstandingly fine." [14]

The initial preparation, movement, and supply of the various units of the Expeditionary Troops were the duty of various commanders: Commanding Generals, Pacific Ocean Areas and Central Pacific Base Command for Army troops; Fleet Marine Force Pacific and Fleet Marine Service Command for the Marine Corps; Commanding General, POA, through Commanding General, AAF POA, and the Central Pacific Base Command for Army air units; and ComAirPac through ComServPac for Navy and Marine Air units. It was Daniels' job to insure that the troops were ready for combat, that the equipment coming from these various sources made for a balanced force, and that all activities were properly co-ordinated.[15]

All Army Ordnance units in ICEBERG, except organic units of divisions and certain attached Ordnance units, were assigned to a new organization somewhat different from that used for logistical support in any other operation. This was the Island Command (ISCOM), established at Oahu on 13 December 1944 under the command of Maj. Gen. Fred C. Wallace of Army Garrison Force. In the early stages of the Okinawa operation, its responsibilities were to be similar to those of Army Service Command in the Southwest Pacific, but unlike ASCOM, which was attached to Sixth Army in the early phases and later reverted to USASOS, Island Command was assigned to Tenth Army and remained so, becoming the agent for executing Tenth Army's base development mission. As such it would command garrison forces on Okinawa, including Marine and Navy as well as Army, and would be responsible for defense of the island after it was secured. In this later period, in keeping with the heavy base responsibilities, Island Command was to receive several Ordnance group headquarters: one to administer general supply and ammunition depots; another to administer maintenance shops; and a third (a new type, a base depot group) to control base armament and base automotive battalions. The Ordnance officer for Island Command was Col. Ray O. Welch, who had had long experience on Hawaii, first at the Ordnance Automotive Depot and later as General Supply Officer of Central Pacific Base Command's Ordnance Service.[16]

[14] (1) Tenth Army Action Report Ryukyus, ch. 11, sec. XIV, Ordnance (hereafter cited as Tenth Army Ord Action Rpt), pp. 1–3. (2) Report of the Ordnance Officer Tenth Army, ICEBERG Operation (hereafter cited as Rpt Ord Officer Tenth Army), p. 1, and Annex D, OHF. (3) Daniels Interv.

[15] Rpt Ord Officer Tenth Army, pp. 1–2.

[16] (1) Rpt Ord Officer Tenth Army, Annex D, p. 3. (2) Island Command Okinawa (ISCOM), Island Command Operation Plan No. 1 LEGUMINOUS, Feb–Apr 45, pp. 11–12, 15; app. B, Annex XII, Ordnance Plan, pp. 1–2. (3) Island Command (ISCOM) G–4 Daily Jnl 15 Dec 44–30 Jun 45, p. 14. (4) Central Pacific Base Command—History of Ord Service, 10 Aug–31 Dec 44. (5) Interv, Col Ray O. Welch (USA, Ret), 23 Jun 61.

Neither Colonel Welch nor any member of his section had ever taken part in an amphibious operation; therefore, in planning Ordnance support in the battle for Okinawa, they relied mainly on XXIV Corps experience at Leyte. An ammunition company was to go in with each of the three U.S. Army divisions, the 7th, 77th, and 96th; and in a few days the supply sections of the divisions' own light maintenance companies were to be bolstered by a detachment of the 196th Ordnance Depot Company, sent to Leyte from Oahu. For the period when corps took over, after the beachhead was secured, Welch attached to XXIV Corps the same heavy tank maintenance company that had served in the Leyte landings, the 284th (experienced on LVT's), plus a medium maintenance company, a depot company, and a detachment of an antiaircraft maintenance company. No battalion headquarters was included in the initial troop list. Later the 209th Ordnance Battalion headquarters was added at the request of the commander of the 1st Engineer Special Brigade. The headquarters of this brigade, a veteran unit that had participated in landings from Oran to Normandy, had been obtained from the European theater to handle the shore party work in the Army phase when Island Command took over, for ISCOM was inexperienced in shore operations. Attached to the brigade, the 209th Battalion headquarters was to take over the ammunition and depot companies from divisions and corps and use them to operate the shore dumps. Later, in the base operations period the 209th and battalions yet to arrive would be assigned to the 61st Ordnance Group.[17]

[17] (1) Island Command (ISCOM) Action Report, 13 Dec 44–30 Jun 45, pp. 3–0–1, and ch. 8, sec. XIII, Ordnance, pp. 1–2, 11–12. (2) 1st Engr Special Brigade Action Report, Okinawa Campaign, 9 Apr–31 May 45, ch. III, p. 4. (3) History 209th Ord Bn, Okinawa Opn, Apr–Jun 45. (4) For the story of the 1st Engineer Special Brigade at Okinawa see Heavey, *Down Ramp!*, pp. 176–84.



COLONEL DANIELS

Re-equipping and Supplying the Combat Troops

Central Pacific Base Command went all out to re-equip the five infantry divisions planned for Okinawa, backed up by greater resources in the United States than were available for any other operation in the Pacific. When the cargo vessels laden with supplies for the three XXIV Corps divisions that had been fighting in the Philippines—the 7th, 77th, and 96th—were unloaded at Leyte, the veterans of the Southwest Pacific who did the unloading could hardly believe their eyes. Every-

thing was new—jeeps, trailers, machine guns, mortars, howitzers, tanks. As General Eichelberger observed, "We had never seen such wonderful gear!" And the same was true of the two divisions being staged in the South Pacific, the 27th at Espíritu Santo and the 81st at New Caledonia.[18]

The copious supply of Army vehicles on Okinawa was to be a source of constant astonishment to the marines, accustomed as they were to move by foot, to fight for quick decisions in small areas. In this operation they seldom had to walk, "Being as how we are working with the Army on this invasion," one Marine officer explained to a war correspondent, "and have the loan of some of their vehicles, of which they got more than there are in the city of Detroit." [19]

Plans for keeping these vehicles operating occupied a good deal of the time of the Ordnance Sections of AFPOA, CPBC, and Tenth Army. A 30-day supply of spare parts was provided in blocks (for immediate use before the depots were set up) and sets (to facilitate requisitioning from depot stocks). Vehicle spare parts were relatively plentiful. The crying need for better first and second echelon maintenance on trucks was met by setting up Tenth Army spot check teams to enforce maintenance discipline. Perhaps the greatest problem on vehicles in the planning stage was that of tire repair, increased by the responsibility for repairing Engineer earth-moving equipment. Experience had shown, especially at Saipan, that an enormous number of tire injuries would be inflicted on engineer equipment working around airfields by bomb fragments and shell fragments.[20]

Experience in previous Pacific campaigns was carefully studied in planning ammunition supply for Okinawa. As a result, extra artillery ammunition was provided. Twenty-two resupply AK's (auxiliary cargo ships) were requested, also six LST's to carry a cushion of artillery ammunition for quick discharge on the beach. The Navy could furnish only 19 AK's and 5 LST's for the invasion phase, but established an emergency operational reserve in the Marianas. Though tremendous quantities of ammunition were expended on Okinawa, the only really serious shortages were shell for the 81-mm. mortar, white phosphorous (WP) shell for all calibers, and illuminants.[21]

Taking into account known Japanese tactics, Tenth Army Ordnance Section planned minor modifications on some of the equipment issued to combat troops. These modifications mainly concerned tanks. The "backscratcher" was an arrangement of five M2A1 antipersonnel mines, mounted around the base of the tank turret, that could be fired electrically from within to protect the tank from suicide attacks by Japanese foot soldiers armed with "satchel charges" (crude wooden boxes filled with explosives), molo-

[18] (1) Rpt Ord Officer Tenth Army, Annex A, p. 1. (2) Eichelberger, *Our Jungle Road to Tokyo*, pp. 183–84.

[19] John Lardner, "A Reporter on Okinawa: I—Suicides and Bushwhackers," *The New Yorker*, (May 19, 1945), p. 35; "A Reporter on Okinawa: II—The Tomb Life," *The New Yorker*, (May 26, 1945), p. 46.

[20] (1) Rpt Ord Officer Tenth Army, Annex A, pp. 2–3; Annex B, p. 1. (2) Hatcher Rpt. (3) Ltr, Col Frazer W. Rodman, Asst Ord Officer Tenth Army, to Lt Col Raymond F. Ranges, ASF, 27 Aug 45, no sub, ASF Planning Div, Theater Br.

[21] Rpt Ord Officer Tenth Army, Annex C, pp. 1–2.

tov cocktails, grenades, or other devices. Thirty backscratcher kits were manufactured by the 393d Heavy Maintenance Company (Tank) on Oahu and flown to Leyte and Espíritu Santo. For protection against Japanese antitank magnetic mines, the Ordnance Section recommended that all tanks be painted on their vertical surfaces with enamel mixed with beach sand and this was done for one very important battalion being readied on Oahu, the 713th Armored Flame Thrower Battalion. Also, a flotation device similar to that used on the "swimming tanks" in the Normandy landings was installed on the Shermans of one Army tank company and half a Marine company.[22]

The Okinawa landings, however, were to be coral reef landings. The armored LVT—the LVT(A)—was a lightly armored amphibian tractor usually called the amphibian (and sometimes, confusingly, the "swimming") tank, or "amtank." It was not designed to operate as a tank but as a personnel carrier, and was mainly counted on to provide close fire support for the assault troops and to act as a land tank until tanks could be brought ashore. The LVT(A) was first used in this manner at Saipan, though not very successfully; for one reason, the amtanks were too thin-skinned to withstand enemy artillery attacks. In getting ready for the Okinawa invasion, machine shops on Oahu were busy adding more armor protection. Also, an ambitious program for modifying DUKW's was under way, of which a major part was devoted to installing guards to protect propellers from damage by coral heads.[23]

What of New Weapons?

For this last battle of the war no important new Ordnance matériel, in the sense of newly developed items such as the M26 (Pershing) tank, was available. At the time of the plans and preparations for ICEBERG, late 1944 and early 1945, the sights in the United States were set on Europe; and until the experience on Okinawa the Pacific was satisfied with the Sherman tank. But there had for some time been an awareness of the need for heavier artillery, specifically heavier howitzers than the 155-mm. A mission sent out by the War Department to study the effectiveness of U.S. and Japanese weapons in the Marshalls spent five months, from 31 January 1944 to 30 June 1944, in the Central and Southwest Pacific. The head of the mission, Col. Claudius H. M. Roberts of the Ordnance Department, reported on 31 July 1944 that both theaters had urgently requested 8-inch and 240-mm. howitzer

[22] (1) Tenth Army Action Rpt Ryukyus, 20 Mar–30 Jun 45, p. 11–XIV–15. (2) Rpt Ord Officer Tenth Army, Annex E, pp. 1–7. (3) German Panther tanks captured in Italy in the late spring of 1944 were found to be covered with an antimagnetic-mine paste that looked like rough plaster. The rough surface kept the mine magnets from functioning. Jarrett, Achtung Panzer, pp. 30, 73, MS, Jarrett Collection. (4) For a good picture of a swimming M4 going in at Okinawa, see George McMillan, *The Old Breed: A History of the First Marine Division in World War II* (Washington: Infantry Journal Press, 1949), p. 361.

[23] (1) Samuel Eliot Morison, "History of United States Naval Operations in World War II," *Victory in the Pacific* (Boston: Little, Brown and Company, 1960), p. 149. (2) Crowl, *Campaign in the Marianas*, pp. 44–45; 85–86. (3) Monograph, Maj. Howard C. Hooker, Amphibian Tank Battalion on Saipan, 1 May 48, Armored School Library, Ft. Knox. (4) Lt William H. Funk, Report on the Activities of Ordnance Overseas Maintenance and Modification Amphibian Team, 25 May 45.

battalions, anticipating "larger land masses where much of the operations will be conducted beyond range of covering naval gunfire or in terrain defiladed against flat trajectory fire." The request came at a time when heavy artillery and heavy artillery ammunition were in short supply, and when Europe had the highest priority. Only one battalion of 8-inch howitzers was shipped to Oahu to go in with XXIV Corps artillery in the Okinawa operation, because there was not enough ammunition to support more than one battalion. The only 240-mm. howitzer battalion sent to the Pacific went to Luzon; furthermore, here also ammunition was scarce. On another recommendation pertinent to the Okinawa operation—the need for illuminating shell for all mortars and artillery from 75-mm. through 155-mm. because of Japanese tactics in night raiding and infiltration—the response was equally discouraging. The only illuminating shell reportedly available in any quantity was that for the 60-mm. mortar.[24]

Colonel Daniels thought good use could be made of Canal Defense Light tanks. The Japanese in their campaign in Malaya had successfully made end runs at night along the coast, landing tanks from boats, and could be expected to do the same thing along the coast of Okinawa. Against such attacks, the CDL's with their blinding searchlights might be used to very good effect. General Buckner had never heard of the CDL's but after having been furnished a description he gave Daniels permission for a flight to Washington to round up a company. When Daniels got to Washington, he found that all of these special tanks had gone to England for shipment to France, but that he might expect some in several months. Accordingly, he put in a request for about 18 or 20 CDL's, and an officer and men trained in operating them. They did not arrive until late June 1945, after the Okinawa campaign was over.[25]

Not only on tanks and artillery but on new items such as the 57-mm. and 75-mm. recoilless rifles and VT fuzes, Europe had priority. In March 1945 the Ordnance Department sent fifty of each caliber recoilless rifle to Europe, with ammunition and instructors, for special operational use. The best Tenth Army Ordnance could do was to obtain a promise that a demonstration team would be sent to Okinawa after the invasion. The team arrived with two recoilless rifles of each type on 19 May 1945. In late April a team arrived to demonstrate the use of VT fuzes in ground combat (first used in this manner in the Ardennes), one of several teams sent to the Pacific that spring. Neither the recoilless rifle nor the VT fuze had any real effect on the outcome of the Okinawa

[24] (1) Report of Mission to Pacific Theaters, 31 January to 30 June 1944, prepared by WD Mission for the Chief of Staff, 31 July 1944 (hereafter cited as Roberts Rpt), pp. 34–35, 38. (2) Ltr, COrd to CG ASF, 3 Oct 44, sub: Report of Mission to Pacific Areas, 31 January to 30 June 44, p. 5. Both in OHF. (3) Thomson and Mayo, *Procurement and Supply*, pp. 100–103. (4) Hq XXIV Corps Artillery, Action Report, Ryukyus Campaign, 31 March to 30 June 1945, pp. 1, 27. (4) Conf, 0–28 Historical Presentation—Okinawa, 1948–49, pp. 8–9, Armed Forces Staff College Library.

[25] Ltr, Brig Gen Robert W. Daniels to Lida Mayo, 23 Nov 63, OCMH. When the CDL's arrived Daniels got one ashore and showed it to Gen. Joseph W. Stilwell, who had succeeded Buckner as Commanding General of Tenth Army. Stilwell was impressed. *Ibid.*

campaign.[26]

The only significant new ground matériel on Okinawa was contributed by the Chemical Warfare Service. The effectiveness of flame against Japanese bunkers and other strong fortifications had been demonstrated in January 1943 at Guadalcanal, where the first portable flame thrower was employed. Army Ground Forces soon thereafter wanted to mount a flame gun in a tank but tanks were scarce; it was spring of 1945 before four obsolete light tanks rigged with flame guns were shipped to the Pacific from the United States and they went to Luzon—the only "main armament" flame throwers produced in the United States to see combat. In the meantime, Chemical Warfare Service officers in Hawaii went ahead on their own without waiting for action from the United States, just as Ordnance officers in various theaters had learned to do in similar situations. With the assistance of the marines, Chemical Warfare Service installed a Canadian flame thrower in an obsolescent M3A1 tank, the only tank that could be obtained from Ordnance. Called the Satan, it was so successful at Saipan and Tinian in assaulting dugouts, canefields, buildings, and caves that Tenth Army requested that large capacity flame throwers, with the flame gun enclosed in a 75-mm. tube, be installed on 54 Sherman tanks. With a strong assist from the Seabees, this was done, and the 713th Provisional Flame Thrower Tank Battalion landed with Shermans early in the Okinawa operation. According to General Richardson, the flame throwing Shermans were "of incalculable value. In fact, the Infantry and the Marines came to rely on this weapon of warfare as their greatest support." [27]

The Landings on Kerama Retto

No landing in the Pacific involved such important—and daring—preliminaries as the landing on the western coast of Okinawa on 1 April 1945, a day called L-day. Sacrificing the element of surprise to the need for an advance base for ship refueling and repair, the Navy decided to seize on 26 March, nearly a week before L-day, a small group of rocky islands fifteen or so miles west of southern Okinawa known as the Kerama Retto. For this purpose a Western Islands Attack Force was formed. As the 77th Infantry Division was to be the Army element, men of the division's own 777th Ordnance Light Maintenance Company plus the attached 693d Ammunition Company and 193d Ordnance Depot Company detachment had the interesting prospect of being the first Ordnance men ashore in ICEBERG.[28]

[26] (1) Col. René R. Studler, "Recoilless Rifles," *Army Ordnance*, XXIX, no. 152 (September–October 1941), p. 233. (2) Rpt Ord Officer Tenth Army, Annex E, pp. 7–8; Annex C, p. 14. (3) Combat Analysis Sec, Opns Div, WDGS, Extracts from Operations Reports on Reduction of Japanese Cave-type Fortifications, Part II, 1 Jun 45, p. 2. (4) Memo, Col René R. Studler for Chief Research and Development Service, OCO, 16 Jun 45. Last two in Folder, Cave Warfare, Barnes File, OHF. (5) For difficulties with the VT fuze see Ordnance Periodic Summaries, Tenth Army, 29 Apr–10 Jun 45, Folder, G-765-S, POA, 29 Apr 45, OHF.

[27] (1) Brophy, Miles, and Cochrane, *From Laboratory to Field*, pp. 153–56. (2) Final Rpt COMGEN AFMIDPAC, p. 5. (3) Pacific Warfare Board Report 76, 6 Nov 45, sub: Future Organization and Employment of Main Armament Flame Thrower Tanks.

[28] (1) Morison, *Victory in the Pacific*, pp. 88, 117–20. (2) History ICEBERG Phase (Kerama Retto–Keise Shima) Opns, 77th Inf Div, 26–31 Mar 45.

As the ships of the Western Islands Attack Force approached the Kerama islands in the early hours of 26 March 1945, the setting moon made a golden path on the East China Sea. Soon the sky lightened; streaks of light from the coming dawn appeared in the east and revealed the invasion fleet—the Navy carriers and destroyers and the ships carrying the 77th Infantry Division. In the slow tractor flotilla that had left Leyte on 20 March were 22 LST's, 14 LSM's and 40 LCI's. In the faster convoy leaving two days later, were 20 transport and cargo vessels. Briefings on shipboard had indicated that few if any Ordnance men, after all, would be landed in this invasion. The plan was for three regimental combat teams of the 77th to make successive landings on the eight small islands, clear them of Japanese, and return to their ships. On only one island, Zamami, would a small garrison force remain to protect radio intelligence, air warning, air weather, and small boat installations planned for the island. If all went well, very likely the Ordnance maintenance, depot, and ammunition men would simply remain aboard their transports in readiness for the next 77th Division operation. But an invasion is a tricky thing, and the Ordnance men were to be involved in the one serious mishap of this one.[29]

Plowing through the waves of the East China Sea, rolling with the swells and kicking up white foam as she moved toward Kerama Retto at dawn on 26 March, the cargo vessel carrying the 777th Ordnance Light Maintenance Company was suddenly attacked by a Japanese bomber. With a shrill whistle followed by an explosion, a bomb crashed through the forward deck into the cargo compartment, flooding the hold and submerging the Ordnance vehicles and equipment. The deck shook violently, the ship lurched, and only a quick shift of ballast kept her from sinking. She lay helpless for days waiting for a tug, while the combat troops were successfully securing all the Kerama islands. Her cargo was unloaded into landing craft, with the help of ninety men from the 693d Ordnance Ammunition Company put ashore on Aka Shima; most of it went to Zamami for reconditioning and salvage. There remained the problem of the 23 trucks and 17 trailers still lying under water in the hold. The dripping vehicles were hoisted over the side into landing craft and taken to the tiny little island of Aegenesluku nearby, where they were beached and towed inland by a bulldozer landed from another ship. Also put ashore was a 31-man detachment from the 777th Ordnance Light Maintenance Company, along with truckdrivers and tools and spare parts. On the barren little island inhabited only by five inquisitive goats, the men spent eight days, provided daily with food, water, and other supplies by boat, completely reworking the vehicles and thus saving them to play their part later on Ie Shima and Okinawa.[30]

Nor was this the end of bad luck for the Ordnance men with the Western Islands Attack Force. After the successful inva-

[29] (1) Morison, *Victory in the Pacific*, pp. 131. (2) History 77th Inf Div, 26–31 Mar 45, pp. 10, 34.

[30] (1) Capt. S. K. Cecil, "Okinawa," *Firepower* (August–September 1945), p. 6. (2) History 693d Ord Ammunition Co, Okinawa Opn, and Yearly Rpt, Apr–Jun 45. (3) History 777th Ord Light Maint Co, 26 Mar–30 Jun 45. (4) History 77th Inf Div, 26–31 Mar 45, p. 34.

sion of the Kerama Retto, the transports carrying the re-embarked 77th Division retired southward to wait for orders for the next operation, the capture of the island of Ie Shima far to the north off the Okinawan coast. At evening on 2 April this group came under severe attack by kamikazes. One of them crashed the attack transport *Goodhue,* carrying most of the 693d Ordnance Ammunition Company. The Ordnance men escaped injury, but 24 soldiers and sailors were killed and 119 were wounded.[31]

In the meantime, there had taken place the surprising landings on Okinawa.

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[31] (1) Morison, *Victory in the Pacific,* pp. 176–77. (2) History 693d Ord Ammunition Co, Okinawa Opn, Apr–Jun 45.

CHAPTER XXIV

Crescendo on Okinawa

The men aboard the invasion fleet off the coast of Okinawa on Easter Sunday morning, 1 April 1945, had been told in shipboard briefings as they steamed north and west from Leyte, Guadalcanal, Hawaii, and other Pacific bases, that Okinawa was likely to be a bigger and tougher operation than Iwo Jima. The casualty reports from Iwo made this a gloomy reflection indeed. Aboard the *Montauk*, the command ship from Hawaii, Easter services were held at 0400, and Colonel Welch, Ordnance officer of Island Command (ISCOM), observed that about 75 percent of those who attended would not have gone to church back home.[1]

The beaches selected for the L-day landing were known as the Hagushi beaches, after a village at the mouth of the Bishi River about halfway down the five-mile-long landing area. North of the river two Marine divisions, the 1st and 6th under III Amphibious Corps, landing abreast, were ordered to capture Yontan airfield behind their sector and then advance north to the narrow neck of the island and east to the coast. South of the river, the 7th and 96th Infantry Divisions under XXIV Corps were to capture Kadena airfield and advance east and south. In addition to the 77th Division, which was to be available for special operations after Kerama Retto, Tenth Army also had the 2d Marine Division to make a feint against the east coast of Okinawa and the 27th Infantry Division to serve as floating reserve. As area reserve, the 81st Infantry Division, under the control of CINCPOA, was to stand by in New Caledonia. The plans for this big invasion force were based on the belief that the Japanese would put up a hard fight for the two airfields behind the Hagushi beaches.

The Landings on Hagushi

At sunrise, anxious faces at the rails of the transports were straining for the first look at Okinawa through gaps in the smoke of the heaviest concentration of naval gunfire ever to support a landing. It was a beautiful morning, just enough offshore breeze to blow the smoke back. The rising sun, in the words of Samuel Eliot Morison (who stood at the rail of the battleship *Tennessee*), cast "a peach-like glow" over the calm sea. But the air was not calm, filled as it was with the deep booming of the naval cannon, the rumble of exploding bombs, and the crack of rockets.[2]

[1] (1) Morison, *Victory in the Pacific*, p. 146. (2) Welch Interv.

[2] (1) Appleman *et al.*, *Okinawa: The Last Battle*, p. 69. (2) Morison, *Victory in the Pacific*, has a vivid eye-witness account of the landings, pp. 146–55.

To this familiar overture to an amphibious operation was added one rather novel contribution, the roar of 155-mm. guns based on an offshore island. Using a technique successfully employed at Kwajalein, Tenth Army had emplaced two battalions of Long Tom guns on Keise Shima, a group of coral islets that had been secured by the 77th Division on 31 March following the Kerama Retto operation. From Keise, about eight miles southwest of Hagushi and about eight miles west of the Okinawan coastal town of Naha, the artillerymen had the job of prohibiting enemy reinforcements from moving toward the landing beaches from the south.[3]

Before the sea, air, and land bombardment had lifted, the LVT's were issuing from the LST's and forming waves that followed the pattern set at Saipan (like Okinawa, a coral reef landing)—first, the LVT(A)'s (the amtanks), next the troop-carrying LVT's, all guided to their assigned beaches by control craft flying colored pennants to match the beach designations: from left to right, green or red for the 6th Marine Division; blue or yellow for the 1st Marine Division; purple or orange for the 7th Infantry Division; and white or brown for the 96th Infantry Division. Lined up behind the first assault waves were the landing craft—LCVP's, LCM's, LSM's, LST's. Of particular interest to the Ordnance Island Command men on the *Montauk* were the LSM's carrying the "swimming" Sherman tanks.[4]

The bombardment increased as the first waves approached the shore at 0830, and then suddenly stopped until nothing could be heard except the rumble of shells that were falling inland. In those first nervous waves, the tense men stumbling ashore had "steeled themselves to meet almost anything—except the Sabbath calm which greeted them."[5] Crossing the narrow strip of sand and climbing the 10-foot sea wall, the infantrymen and marines to their utter surprise were able to go in standing up[6]—no crouching, no foxholes, for there was no enemy resistance beyond some sporadic and ineffective sniper fire. They found themselves on farmlands peaceful and still in the brisk spring sunshine. Maj. Gen. Lemuel C. Shepherd, Jr., of the 1st Marine Division expressed the general feeling when he said with a smile, "There was a lot of glory on Iwo, but I'll take it this way."[7]

Through gaps in the sea wall blasted by naval gunfire rolled amtanks and DUKW's carrying 4.2-inch mortars. The swimming Sherman tanks did not go in with the leading waves, and when they did take to the water, it was discovered that reef conditions made their flotation equipment worse than useless. Standard Shermans, landed directly from LCM's at the reef edge, got ashore more easily. In any case, the firepower of the swimming tanks (greater than that of the amtanks) was not needed.[8]

Since there was no opposition, the supply

[3] History (Ryukyus) 420th Field Arty Group, 31 Mar–Jun 45, p. 25.

[4] (1) Morison, *Victory in the Pacific*, pp. 141, 152. (2) Welch Interv.

[5] From *The Deadeyes: The Story of the 96th Infantry Division*, by Orlando R. Davidson, J. Carl Willems, and Joseph A. Kahl, copyright 1947 by Infantry Journal Press (now Association of the U.S. Army), p. 85.

[6] McMillan, *The Old Breed: A History of the First Marine Division in World War II*, p. 359.

[7] Sherrod, *On to Westward*, p. 280.

[8] (1) Rpt Ord Officer Tenth Army, Annex E, p. 7. (2) Welch Interv. (3) 7th Infantry Division Operation Report, Ryukyus Campaign, pp. 35, 101.



PREPARING LONG TOMS TO FIRE ON OKINAWA FROM KEISE SHIMA

DUKW's followed quickly in the wake of the assault troops. On the 96th Division beaches an advance party of officers and supply men of the 796th Ordnance Light Maintenance Company was ashore by 1030 in three DUKW's that it had combat-loaded at Leyte with emergency parts, cleaning and preserving materials, and weapons. The destination of these men was Sunabe, a little coastal town behind White Beach 2, but when they reached it they found that it had been leveled by the air and naval bombardment and that their designated site was a heap of smoldering rubble and debris. That afternoon they started out to find a better place for their supply dump and found it about a mile and a half east, across the road from a small deserted village.[9]

Rolling inland, past checkerboard fields of barley, sugarcane, sweet potatoes, and cabbages, and houses roofed with red tiles, they could hardly help thinking that Okinawa was a pleasanter place than the Philippines. The most striking feature of the inland scene was the circular coral tomb built into almost every hillside, said by some to represent a turtle's back, because of the low domed roof, and by others to represent a womb. For centuries the Okinawans had thus interred their dead,

[9] History 796th Light Maint Co, Ryukyus Campaign, 1 Apr–30 Jun 45.

first coffining the body in a seated position (some said in a fetuslike position), later removing the bones and placing them on shelves in ceramic pots. The Army had issued strict instructions against entering these tombs, but after sundown on L-day the air became chill and "more than one shivering doughboy," reported the 96th Division historian, "sought sanctuary among the 'ancestors' in their snug homes that first cold night." The top of a tomb was to serve Colonel Daniels, Tenth Army Ordnance officer, as the foundation of his tent when Tenth Army command post was set up next day near Yontan airfield.[10]

By nightfall of L-day most of the rest of the 796th Ordnance Light Maintenance Company was ashore, bivouacked at Sunabe, and the 632d Ordnance Ammunition Company was ashore also, setting up its first dump about 150 yards inland from the beach with ammunition brought in by DUKW and LVT. But here men of the 632d worked with heavy hearts for the company had suffered sadly in the landings. A lieutenant and eighteen enlisted men of the company had been drowned when their LCVP capsized at the coral reef.[11]

A few miles up the coast on the 7th Infantry Division's beaches, the main group of the 707th Ordnance Light Maintenance Company, consisting of sixty-seven men and the commanding officer, were ashore on Purple Beach 1 at 1400 on L-day. Moving to a point south of Kadena airfield to set up the bivouac, they were immediately busy with shore party work, returning to the beaches where the 644th Ordnance Ammunition Company was establishing its first ASP, and the army (196th) depot detachment was laying out a supply dump. The 707th had some trouble getting the division Ordnance supplies ashore, but this was less serious than it might have been because the XXIV Corps Ordnance companies, which began landing on L-day, were also located in the Kadena area. The division Ordnance company acknowledged that it received "splendid service" throughout the campaign from the corps 183d Ordnance Depot Company.[12]

The rest of the 707th Ordnance Light Maintenance Company was split up into 11-man detachments, one behind each of 7th Division's regiments. Landing on the day after L-day, the detachments moved immediately down to Koza and set up a third echelon shop in support of the division's rapid advance. In the first few days after the invasion, spectacular gains were made in all sectors. By 4 April, in the north the 6th Marine Division had cut Okinawa in two at the line Nakodamari to Ishikawa (the L plus 15 line) and the 1st Marine Division had reached the eastern shore. In the south the 7th Infantry Division, having also reached the east coast on

[10] (1) Davidson *et al.*, *The Deadeyes*, pp. 87–88. (2) Kerr, *Okinawa: The History of an Island People*, pp. 218–19. (3) Brigadier General William A. Borden's Observations in the Pacific, 7 July 1945–20 August 1945, p. 12, MS in Borden Personal File, OHF. (4) Daniels Interv.

[11] (1) History 796th Ord Light Maint Co, Ryukyus Campaign. (2) History 632d Ord Ammunition Co, Okinawa, 12 Mar–13 Aug 45.

[12] (1) History 707th Ord Light Maint Co, Ryukyus Campaign, Opns on Okinawa, 1 Apr–30 Jun 45. (2) History Okinawa Opn, 644th Ord Ammunition Co, Apr–Jun 45. (3) XXIV Corps, Ordnance Operations Rpt, Okinawa Campaign, 24 Mar–21 Jun 45. (4) Walking along Purple and Orange Beaches on 9 April, Samuel Eliot Morison was impressed with the "order and cleanliness" of the XXIV Corps sector. Morison, *Victory in the Pacific*, p. 175.

the heights commanding Nakagusuku Bay, was ready to drive south to join the 96th Division, which had turned south and arrived at the narrow waist of southern Okinawa. The 96th had now reached the outposts of the Shuri defenses.[13]

Supporting the Assault on the Shuri Defenses

Following closely behind the combat troops, an advance party of the 796th Ordnance Light Maintenance Company made a long jump forward on 5 April to a point less than a mile west of Futema and about a mile from the 96th Division's front lines. Next day, after the rest of the company had arrived, enemy shellfire began to fall in the company's area. This was but a taste of what was happening in the combat zone. The Japanese were reacting strongly with machine gun, mortar, antitank, and artillery fire of great volume and intensity. At noon on 8 April three 674-pound projectiles—the biggest the men had ever seen—came screaming into the 96th Division lines. They came from a 320-mm. spigot mortar emplaced on one of the ridges. The "boxcars," as the shells were nicknamed, traveled so slowly and were so large that the men swore they could see them coming. Unless a direct hit was scored the boxcars buried themselves in the earth, digging craters as big as swimming pools, and did little damage (beyond that caused by the rocks thrown into the air) except to the nerves of the soldiers already under strain from shelling by the more effective 150-mm. pieces.[14]

As a result of the intensity of the enemy resistance, which stopped the 96th Division cold at Kakazu Ridge the second week in April and was also being felt strongly on the 7th Division front, the 27th Infantry Division was landed on the southern Hagushi beaches and sent down the west coast. But as serious as the need for more combat troops was the need for more artillery ammunition before the attack could be resumed.[15]

At the same time the Japanese began to resist on land at the outposts of the Shuri defenses, they began to resist by kamikaze attacks. On 6–7 April they inflicted heavy damage on the shipping off Okinawa. In Kerama roadstead kamikazes crashed into two Victory ships converted to ammunition carriers, the *Logan* and the *Hobbs*. Abandoned by their merchant marine crews, the vessels drifted, burning and exploding, for over a day, until the U.S. Navy sank them.[16] The loss of these two ships contributed to the ammunition crisis but by no means caused it. The main cause was inability to unload the ships off the XXIV Corps beaches. Getting the ammunition ashore was in the opinion of the ISCOM Ordnance officer the biggest Ordnance problem on the beachhead.[17] There were not enough men to do it, nor enough equipment of the right kind. Until the 61st

[13] (1) History 707th Ord Light Maint Co, Ryukyus Campaign. (2) Davidson *et al., The Deadeyes,* pp. 95–100.

[14] (1) Davidson *et al., The Deadeyes,* pp. 97–98. (2) For the 320-mm. and 150-mm. Japanese mortars see OCO, Catalogue of Enemy Ordnance Materiel, vol. II: Japanese, pp. 126–27.

[15] Opn Rpt, Ryukyus Campaign, XXIV Corps, Apr–Jun 45, p. 26.

[16] Morison, *Victory in the Pacific,* pp. 195–96.

[17] (1) Opn Rpt, Ryukyus Campaign, XXIV Corps, Apr–Jun 45, p. 80. (2) Welch Interv.

Ordnance Ammunition Company came in with the 27th Division, the XXIV Corps beachhead area had only two ammunition companies, the 644th with the 7th Division and the 632d with the 96th Division. The 632d arrived crippled from the accident at the reef. The 644th for the first two days was operating most of the time on the beach at less than half its strength. It had been obliged to leave two platoons aboard three LST's to act as ship's platoons, and on L plus 1 had to send one platoon inland to set up an advance dump. At first the 644th had to do all unloading by hand, for it had no cranes. All the ammunition companies keenly felt the need for heavy equipment such as dump trucks and bulldozers, which were lacking either because they were not provided in the tables of equipment or because they had been left behind as a result of limitations on assault shipping.[18]

Native labor, depended upon for ammunition operations in other campaigns, did not exist on Okinawa. The Okinawans who emerged from the caves and tombs to which they had fled during the preliminary bombardment were mostly children or old people—"under six or over sixty," one officer noted; there were no young men and very few young women. All looked miserable and undernourished. The most wretched were the bearded old men in their black kimonos or filthy blue smocks. One 70-year-old man seemed to a *Time* correspondent "one of the most pitiable of God's creatures"; while being treated by a medical corpsman for a bayonet wound inflicted by the Japanese before they evacuated his village, "he tried repeatedly to rise from the stretcher, in an unknowing, fearful manner."[19]

Lacking native labor, the 1st Engineer Special Brigade had used tactical units when it took over shore party operations on 9 April. Three antiaircraft battalions and an armored group furnished more than 700 men for labor in the ammunition dumps for periods from four days to two weeks. A Quartermaster company was also pressed into service. And when three ammunition companies designated to set up army ammunition depots began to arrive on 16 April—the 61st, the 68th, and the 693d (diverted, except for a detachment, from the 77th Division's Ie Shima operation)—they were used as handlers on the beaches for varying periods until 6 May.[20]

Siege Warfare With a Difference: The Cave Positions

By such efforts, enough artillery ammunition was rushed to the front to enable XXIV Corps to launch a full-scale attack on the first Shuri defenses on 19 April. In planning the attack, Pacific Ocean Areas placed great confidence on massed artillery fire, assisted by naval bombardment and air bombing, to blast the Japanese from their hill positions. These were the tactics—fairly standard for mountain warfare—that had been employed in Italy. It is significant that when they failed on Okinawa,

[18] (1) Pacific Warfare Board Report No. 66, sub: Report on Okinawa Operation-Ordnance, Incl #1 (Action Rpt, 209th Ord Bn), pp. 1–2. (2) History 644th Ord Ammunition Co, Okinawa Opn, Apr–Jun 45. (3) Rpt Ord Officer Tenth Army, Annex C, p. 4.

[19] Sherrod, *On to Westward,* pp. 281–82.

[20] 1st Engineer Special Brigade, Action Report, Okinawa Campaign, 9 Apr–31 May 45, ch. IX, pp. 27–28.

as fail they did, General Buckner referred to a proposed second landing as "another Anzio." [21]

The reason for the failure was the enemy's intelligent and effective use of the deep caves that honeycombed the limestone hills of southern Okinawa. This became clear only after the hard fighting and heavy casualties of the assault on the first Shuri defenses, 19–24 April. During the action a newspaper correspondent explored a typical cave position:

> In the face of a rocky hill was a narrow horizontal slit five feet long and eighteen inches high, with pine log for header and low growing bushes for camouflage. At a distance of a hundred feet it could not be seen.
>
> We had to wriggle through on our bellies to reach the interior of the cave. There in a room about 15 feet square was a Japanese antitank gun mounted on pneumatic-tired wheels. Piled high around three walls were cases of ammunition, some high explosive, some of armor-piercing variety.
>
> From that room a drift or tunnel ran 125 feet through the hill, opening on another side. At intervals along its length were other rooms in each of which large quantities of ammunition were stored.
>
> From the slit through which we entered the gun crew commanded the field of fire covering the broad, level plain across which American tanks had to advance to reach Kakazu Ridge.

The cave was finally spotted and artillery was trained on it, but "Our gunners might just as well have tried to level the Rock of Gibraltar. Their high trajectory fire from howitzers landed on the round top and steep sides of the hill but accomplished nothing more useful than showering the cave mouth with dust. Aerial strikes were equally ineffective." [22]

Against positions like these a great deal of the artillery ammunition put ashore with such strenuous efforts was undoubtedly wasted. The Tenth Army Ordnance officer estimated that between 1 April and 2 May it took 1.65 tons of ground ammunition (not counting air and Navy) to kill one Japanese. Direct fire by self-propelled 155-mm. guns or 8-inch howitzers might have been effective if Tenth Army had had any such weapons (the only self-propelled artillery consisted of three battalions of 105-mm. tank destroyers); on the other hand, self-propelled guns were too vulnerable to be brought up very close to their targets.[23]

Heavy Tank Losses

The tanks were having a hard enough time against the withering Japanese fire, especially fire from the 47-mm. antitank gun, which was accurate and deadly. The gun was small and easily concealed and its high muzzle velocity would send a projectile through any part of a medium tank except the glacis plate. At Kakazu on the morning of 19 April in the 27th Division's sector, Company A of the 193d Tank Battalion lost four tanks from a single 47-mm. piece firing only sixteen shots and later in the day had many more cut down by artillery fire, some of them the scarce and

[21] Appleman *et al., Okinawa: The Last Battle,* p. 259.

[22] Dispatch by Gordon Cobbledick in *Cleveland Plain Dealer,* dateline Okinawa, April 21, quoted in Davidson *et al., The Deadeyes,* p. 302.

[23] (1) Borden Observations in the Pacific Jul–Aug 45, pp. 14, 18, OHF. (2) Ordnance Periodic Summary, 3 Jun 45, p. 2, File, Tenth Army ORD Summaries, G–765–S POA, OHF. (3) Tenth Army Action Rpt Ryukyus, p. 11–VI–8.

valued flame throwers. The company returned with only eight out of thirty tanks—the greatest loss suffered by American armor in any single engagement on Okinawa.[24]

Six of the tanks lost in this action at Kakazu were destroyed by satchel charges placed by Japanese suicide squads that seemed to spring out of the grass beside the tank, sometimes forcing turret lids open and throwing in grenades that killed the tankers. These squads of three to nine men did not cause as many tank casualties as the 47-mm. gun, but they continued to be a constant source of danger. Each man of the squad had his own job: one would blind the tank with smoke grenades, another would force it to button up by hurling fragmentation grenades, another would immobilize it with a mine under the track. The final act was destruction of the tank and crew by a satchel charge.[25]

Against such tactics, Tenth Army Ordnance in Hawaii had devised the backscratcher but just what it accomplished was hard to determine. Only a few were actually mounted on Army tanks, none on Marine tanks. In one case the device wounded rather than killed the attacker; in another, rain shorted the circuit so that the mine did not detonate. The few times the backscratcher appeared to be effective, friendly fire took equal credit for destroying the enemy.[26]

The test of the sanded paint applied to the tanks of the 713th Armored Flame Thrower Battalion for protection against magnetic mines was also inconclusive, for the battalion encountered no mines of this type.[27] Antitank mines did, however, account for about 31 percent of all tank losses on Okinawa. Luckily there were few antipersonnel mines among them to interfere with tank recovery. The problem in bringing back the tanks was the lack of enough tank recovery vehicles to do an adequate job. Often after a tank was immobilized by a mine, satchel charge, or antitank projectile, or because it had simply thrown a track or bogged down in bad terrain, it was abandoned by its crew, and if not recovered by nightfall it would be demolished at leisure by the returning Japanese.[28]

By the end of May, the four Army tank battalions and the one armored flame thrower battalion had suffered 221 tank casualties, not counting Marine losses. Among the 221 tanks put out of action, 94 (including at least 12 of the irreplaceable flame throwers), or 43 percent, had been completely destroyed. The effort by Tenth Army Ordnance to make up these losses was painfully unproductive. To begin with, losses on such a scale had not been anticipated. In the planning, a small reserve stock of 13 medium tanks was to be placed on Saipan for fast emergency shipment to Okinawa. These were sent for on 25 April. But even this small reserve had not been established on Saipan. The tanks had to be ordered from Oahu and did not arrive at Okinawa until 10 June—

[24] Appleman *et al., Okinawa: The Last Battle,* pp. 203–04. (1) Armor on Okinawa, A Research Report Prepared by Committee 1, Officers Advanced Course, The Armored School, 1948–49 (Fort Knox, May 1949), p. 72, MST–S 1–ARM.2 1949.1, OCMH. (2) For the effectiveness of the 47-mm. gun see Daniels Interv.

[25] Armor on Okinawa, p. 72.

[26] (1) Ordnance Summary, 4 May 45. (2) Rpt Ord Officer Tenth Army, Annex E, p. 6.

[27] Rpt Ord Officer Tenth Army, Annex E, p. 6.

[28] (1) Armor on Okinawa, pp. 74, 144. (2) Ordnance Summaries, 22, 23 May 45.

some ten days before the campaign was virtually over. An additional shipment of 65 Shermans and 25 tank recovery vehicles was requested from Oahu on 28 April. They were shipped on 20 May and did not arrive until 15 July—almost two weeks after the campaign had been declared officially at an end.[29]

Because of the delay, all serviceable medium tanks were stripped from the 193d Tank Battalion (the unit crippled at Kakazu) and distributed to other tank battalions. By early May the tankers were asking for a tank heavier than the Sherman, with a weapon of higher muzzle velocity and thicker armor plate. The M26 Pershings seemed to be the answer. In mid-May (after V–E Day) twelve were requested from the United States, but they were not received until August. In the meantime, to provide better protection against the 47-mm. gun, the Ordnance tank maintenance companies welded steel track sections to the side sponsors, turret sides, and glacis plate of the Shermans, and also used armor plate from wrecked tanks to reinforce the sponson and shield the suspension system.[30]

In the end, however, the best defense for the Sherman turned out to be the infantrymen who accompanied it as part of the tank-infantry team, a truth forcibly brought home to commanders in the catastrophe at Kakazu where the tanks had been operating alone. In the early assault on the Shuri defenses, the Japanese, who knew the value of the infantryman, attempted to pin down the infantry with artillery and mortar fire, often successfully. But as the long bloody battle for Shuri dragged on through April and May, the Tenth Army commanders learned about cave warfare and how to win it. They directed artillery fire on cave entrances, forcing the Japanese gunners back into their tunnels; then infantry and tanks closed in, the infantry protecting the tanks from the suicide squads. Having gained a foothold, the troops could move down on cave openings from above, sealing them with flame or explosives, a method that General Buckner called "blowtorch and corkscrew." [31]

Shortages in Mortars and Mortar Ammunition

This type of warfare demonstrated again the usefulness of mortars, which could drop projectiles into Japanese positions on top of the hills and on the reverse slopes, and, moreover, could be hand-carried. The Chemical Warfare Service's 4.2-inch rifled mortar was extensively used and was a great favorite with the marines. Observers believed that the 155-mm. mortar developed by Ordnance in its jungle warfare program would have been most effective; however, this remained speculation, for none was available. Since the 155 was lacking, the cry arose for more 81-mm. and 60-mm. mortars. This demand was more easily met by Tenth Army Ordnance than that for medium tanks because these light

[29] (1) Rpt Ord Officer Tenth Army, Annex A, pp. 4–5. (2) Tenth Army Action Rpt Ryukyus, p. 11–XIV–8. (3) Personal Ltr, Col Frazer W. Rodman, Asst Ord Officer, Tenth Army, to Lt Col Raymond F. Ranges, Hqs ASF, 27 Aug 45, no sub, ASF Planning Div, Theater Br.

[30] (1) Rpt Ord Officer Tenth Army, Annex A, p. 5; Annex E, pp. 10–11, with pictures of reinforced tanks. (2) Ordnance Summaries, 4, 13, 15, 17, 24 May, 10 Aug 45. (3) Capt. S. K. Cecil, "Okinawa," *Firepower*, (August–September 1945), p. 6.

[31] Appleman *et al.*, *Okinawa: The Last Battle*, p. 256.

weapons could be supplied by air. On 9 May a hundred 81-mm. and thirty 60-mm. mortars were requested from Oahu and the entire reserve stock of twenty-seven 81-mm. mortars on Saipan was called forward, all shipments to be made by air. All of the Saipan mortars were on Okinawa four days later, those from Oahu in about ten days. For this quick reaction two infantry commanders expressed "great satisfaction and thanks." [32]

Tremendous quantities of mortar as well as artillery ammunition were expended in the assault on Shuri. By mid-May, XXIV Corps had fired 268,904 rounds of 81-mm. mortar ammunition—six times as much as it had expended during the first six weeks of the Leyte Campaign—and stocks were running alarmingly low. On 21 May Tenth Army requested Oahu to ship 100,000 rounds by air. Nothing like that amount was available in Hawaii, but the Central Pacific Base Command responded so promptly with what it had, aided by the 962d Ordnance Ammunition Renovation Company, that it received a radio of appreciation from General Buckner. A total of 36,000 rounds came in by Air Transport Command and Naval Air Transport Service planes in two shipments, the first arriving 28 May, the second on 9 June. It was reported that combat troops cheered loudly when told of their arrival.[33]

Certain types of mortar shells continued to be the most critically short ammunition items of the campaign, not only the 81-mm. light round with the superquick M52 fuze, but the 60-mm. mortar illuminating shell. Illuminants of all kinds, including trip flares, became crucially important because the Japanese on Okinawa made skillful use of their customary tactics of night counterattacks and infiltration. These tactics had been stressed in the Roberts report of July 1944. But the hope that the 60-mm. mortar illuminating shell would be available in sufficient quantity was not fulfilled. The first large shipment of 20,480 rounds did not arrive at Okinawa until 24 June. In this dilemma the Navy came to the rescue, providing XXIV Corps with about 75 percent of its illumination. Most effective was the Navy's 5-inch star shell, usually fired by destroyers.[34]

The Ordnance Build-up in the Mud

By the end of the third week in May, Tenth Army had reached the inner ring of the Shuri defenses at the narrow waist of the island, the line known as Naha-Shuri-Yonabaru. This had been accomplished by bringing the entire Marine III Amphibious Corps (the 1st and 6th Marine Divisions) down from the north early in May (sending the 27th Division up to take over the marines' garrison duties in the north-

[32] (1) Maj. Charles S. Nichols, Jr., USMC and Henry I. Shaw, Jr., *Okinawa: Victory in the Pacific* (Historical Br, Hq U.S. Marine Corps, 1955), p. 272. (2) Observations of XXIV Corps by Lt Col Walter J. Preston, Jr., 1 May 45, in Extracts from Operations Reports on Reduction of Japanese Cave-type Fortifications, pt. II, 1 Jun 45, Folder Cave Warfare, Barnes File, OHF. (3) Rpt Tenth Army Ord Officer, Annex A, p. 4. (4) Ordnance Summaries, 9, 12, 13, 23, 25 May 45.

[33] (1) Ordnance Summary, 20 May. (2) Tenth Army Action Rpt Ryukyus, pp. 11–XIV–24, 11–XIV–51. (3) Rpt Ord Officer Tenth Army, Annex C, p. 7, and Incl H. (4) Quarterly Historical Report, 962d Ordnance Ammunition Renovation Company, 10 Jul 45.

[34] (1) XXIV Corps Ordnance Operations Rpt, Okinawa Campaign, 26 Mar–21 Jun 45, p. 4. (2) On the Roberts Rpt, see above, p. 452. (3) Rpt Ord Officer Tenth Army, Annex C, p. 8. (4) Ordnance Summaries, 19 May, 24 Jun 45. (5) Morison, *Victory in the Pacific*, p. 245.



SIGNAL CORPS MEN IN A WEASEL, OKINAWA

ern area); by committing the 77th Infantry Division after its capture of Ie Shima at the end of April; and by the hard, costly tactics of digging the Japanese out of their caves. To support the two Marine and three Army divisions now in the line, Ordnance companies had been landing almost every day. In addition to the 209th Ordnance Battalion, which now controlled three Marine ammunition companies as well as six Army, the 1st Engineer Special Brigade had a second battalion headquarters, the 192d, to control depot operations, and had established a second Army depot on the east coast. Island Command, which was to release the 1st Engineer Special Brigade on 31 May, had received an Ordnance battalion headquarters, the 214th, and its first Ordnance group headquarters, the 61st, and was in the process of establishing two Ordnance service centers, the northern and the southern, under the group.[35]

Then the rains came. Until 21 May the weather had been good, but that day

[35] (1) Ordnance Summaries, 29 Apr, 4, 10, 12, 24 May. (2) History 192d Ord Bn, 27 Apr–21 Jun 45. (3) Rpt Ord Officer Tenth Army, Annex D, pp. 3–5. (4) Rpt Tenth Army Ryukyus Campaign, p. 11–XIV–5. (5) For rearrangement of Marine ordnance service to some extent along the lines of Army ordnance, see Rpt Ord Officer Tenth Army, p. 2.

strong gusts of wind and an overcast sky heralded the beginning of the season that the Okinawans call the "plum rains." The downpour began during the night and continued until 5 June, bringing a total of twelve inches of rainfall. Rivers flooded, fields became lakes, and roads were washed out. At one ammunition supply point ammunition stacks located near a small stream were caught in swift-flowing torrents and carried several yards downstream; when the flood subsided, some of the crates were found in the branches of trees five feet from the ground. Tanks were mired, and trucks could not get through to bring up ammunition and food. The little tracked Weasel (cargo carrier M29C), which up to that time had been of little use, assumed new importance, though there were places where the mud was so heavy that neither the Weasel nor the LVT could get through. The M5 tractor performed better, and was used by the contact parties of the divisional light maintenance companies and also to bring up ammunition. But at many front positions supplies had to be carried in, and casualties carried out, by men up to their knees in water or mud. During the last week in May, Tenth Army was virtually bogged down.[36]

This seemed "awfully tough luck" to General Buckner,[37] because just at this time intelligence reports indicated that the Japanese, severely crippled by the American attacks during May, were withdrawing south from Shuri. Despite the mud, which was still so deep that supply trucks had to be dragged through quagmires by winches or bulldozers, Buckner ordered his two corps to drive rapidly forward. On the morning of 29 May, a Marine company had already penetrated to Shuri Castle. Two days later the III Amphibious Corps and the XXIV Corps joined lines south of Shuri and at dawn on 1 June began the pursuit.

Three weeks of hard fighting were ahead. On the left of the advance, the 7th Division, having captured the little port of Yonabaru on the east coast on 22 May, cleared Chinen Peninsula. Wading over green, rain-soaked hills and meeting slight resistance, by 4 June the division had reached the soggy banks of the Minatoga River at the southern base of the peninsula. On the right of the advance, III Amphibious Corps attacked the Oroku Peninsula, which was across the bay from Naha (captured 27 May) and contained Naha airfield. Here it had much harder going than the left flank, for the *Okinawa Base Force* composed of naval units and home guards put up a stubborn fight with mines, machine guns, and 40-mm. antiaircraft fire, aided by the mud that prevented the marines from using their tanks. But clearing weather and an amphibious landing enabled the marines to clear the peninsula by 12 June. In the center of the general advance that began 1 June, XXIV Corps by 5 June had come up against the last Japanese defense line, dug into the deep caves of the formidable Yaeju-Dake–Yuza-Dake escarpment. There XXIV Corps faced an enemy that was determined to fight to the last man.

Supply by Water

When the roads were washed out in late May and early June, Tenth Army got its supplies to the front by the same means

[36] (1) Cecil, "Okinawa," *Firepower* (August–September 1945), p. 7. (2) Rpt Ord Officer Tenth Army, Annex A, p. 10.

[37] Appleman *et al., Okinawa: The Last Battle,* p. 423.

employed by Eighth Army during the rainy season on Mindanao—air and water. Most of the airdrops were to the 1st Marine Division (561 out of a total of 830 plane loads), which between 30 May and 9 June was supplied almost entirely by air. On 6 June, when XXIV Corps was getting ready to jump off in its large-scale attack on the southern escarpment, 76 plane loads of supplies were dropped to XXIV Corps and III Amphibious Corps, chiefly water, rations, small arms and mortar ammunition, and grenades. But the bulk of the ammunition for both corps came by water, along the east coast for XXIV Corps and the west coast for III Amphibious Corps.[38]

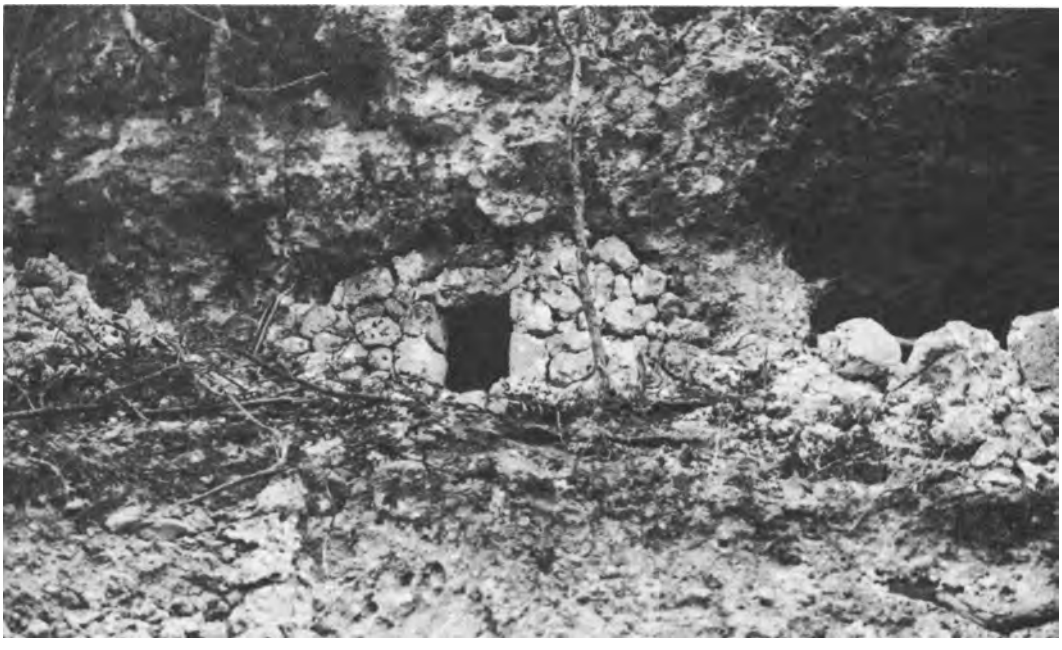
The west coast had the advantage of the Hagushi beaches. The III Amphibious Corps had early established a supply route using DUKW's from Hagushi to the mouth of the Asa Kawa River, where the main advance dump was located. On 1 June after the roads went out, efforts were made to survey and buoy channels at that point so that LCT's and LSM's could be used and also to clear away the hulks in the harbor of Naha to permit LCM landings. These were not entirely successful. The main dependence at Naha continued to be an offshore LST and an AK (the *Wesleyan Victory*) loaded with ammunition, plus a fleet of about seventy DUKW's operating out of Hagushi. South of Naha the troops were supplied by thirty-four LVT's making a daily run from Hagushi.[39]

On the east coast, by the end of May two discharge beaches were in operation on Nakagusuku Bay—Awashi and Kuba. From these beaches water, fuel, and ammunition to support XXIV Corps were carried by LCM's and LCT's to Yonabaru, where two platoons of the capable and experienced 644th Ordnance Ammunition Company were on hand to set up an advance dump. When the roads from the rear became impassable, Island Command brought up a Victory ship, the *Berea Victory,* loaded with 7,200 tons of ammunition, and anchored it off Yonabaru to serve as a floating ASP. Thereupon, the XXIV Corps Ordnance officer then instituted an effective "amphibian" adaptation of the normal ammunition control system. A crew from the 644th was sent aboard the *Berea* to select and place aboard the lighters the required types of ammunition, on shore-to-ship radio orders from the XXIV Corps ammunition officer. When the ammunition arrived on the beach, troops were waiting there to receive their loads directly from the lighters, thus cutting down the handling to such an extent that in several instances the ammunition reached the gun positions within six hours after the request had been made. Later an LST was also brought to Yonabaru as a floating ASP. After the Chinen Peninsula was cleared, two LST's served the same purpose at the little port of Minatoga, which was close behind the XXIV Corps front. By these means, XXIV Corps was assured enough ammunition to mount its final attack.[40]

[38] (1) Conf, 0-28 Historical Presentation-Okinawa, p. 31, Armed Forces Staff College Library. (2) Tenth Army G-4 Periodic Reports, 5, 8 Jun 45, in Hq Tenth Army G-4 Periodic Reports Ryukyus Campaign, 27 Mar-5 Jul. 45. (3) Rpt Ord Officer Tenth Army, Annex C, pp. 4, 8.

[39] (1) Tenth Army G-4 Periodic Reports, 1, 2, 3 Jun 45. (2) ISCOM Action Rpt, pp. 7-XI-2 and 8-XIII-9. (3) Rpt Ord Officer Tenth Army, Annex C, p. 8.

[40] (1) Tenth Army G-4 Periodic Rpts, 1-14 Jun 45. (2) XXIV Corps Ordnance Operations Report, Okinawa Campaign, p. 4. (3) ISCOM Action Rpt, pp. 8-XIII-8, 9, 13. (4) Journal XXIV Corps Ordnance Section 11 Jun 45. (5) History 209th Ord Bn, Annex 2. (6) History 644th Ord Ammunition Co, Okinawa Opn. A third platoon



THE PROBLEM AND THE SOLUTION. *Above, entrance to a cave held by the Japanese; below, a flame-throwing tank fires into an enemy-held cave.*



Ordnance Class II supplies were also sent on the east coast water route from Kuba to Yonabaru, mainly in LCT's. The first attempt to use DUKW's very nearly ended in disaster, for it was made on the morning of 4 June when a typhoon east of Okinawa kicked up heavy seas. A convoy of six DUKW's loaded with Ordnance, Medical, Signal, and Quartermaster supplies and commanded by Capt. W. A. Gore, the assistant Ordnance officer of 7th Infantry Division, ran into rough water and after several hours of fighting wind and waves lost one of the DUKW's and had to return to shore. Luckily no men were lost.[41]

When the last major overland supply route for XXIV Corps disintegrated in the mud, the Engineers concentrated on keeping the roads running south from Yonabaru to Minatoga in operation. From dumps at these two east coast ports the corps was mainly supplied for the rest of the campaign. The 7th Infantry Division's 707th Ordnance Light Maintenance Company was moved to Yonabaru the second week in June. The 96th Division's Ordnance company, the 796th, was not sent there because of a lack of shipping space to make the voyage around from the west coast. Later, clearing weather enabled the company to move overland to Kamizato, south of Yonabaru, where it was close behind the XXIV Corps lines.[42]

of the 644th was sent to Naha early in June, and in mid-June the fourth and last platoon was sent to Yonabaru.

[41] (1) S–4 Jnl & Msg File 7th Inf Div, Ryukyus Campaign Apr–Jun 45. (2) Cecil, "Okinawa," *Firepower* (August–September 1945), p. 7.

[42] (1) S–4 Jnl & Msg File 7th Inf Div, Ryukyus Campaign 9 Jun 45. (2) History 796th Ord Light Maint Co, Ryukyus Campaign. (3) Journal XXIV Corps Ordnance Section, 6 Jun 45.

Bloody Finale

From the last great escarpment to the cliffs that mark the southern shore of Okinawa, the Japanese disputed every rod of territory with machine gun fire, extensive mine fields, and effective use of their dwindling supply of 47-mm. and other artillery pieces. They no longer had any hope of winning the battle, only of prolonging it, and prolong it they did until 22 June, killing more than 1,500 Tenth Army men and wounding more than 6,600. Among those killed was the Tenth Army commander, General Buckner—the only army commander to die in action in World War II.

It was the terrain that enabled the enemy to hold out as long as he did—the deep caves and rocky cliffs that had to be burnt out and stormed—but he could not indefinitely withstand the full weight of armament that Tenth Army brought to bear in this small area. After the rains stopped on 5 June the southern tip of the island lay open under the spring sunshine to the bombers, to the Navy guns offshore, and to the Long Toms emplaced on the heights of Shuri, so that targets could be hit at will. By 10 June the roads had dried from mud to dust, therefore the tanks and direct fire artillery could be brought up.[43]

Relatively free from the antitank artillery fire that had done so much damage before Shuri, the American tanks could operate more freely and aggressively. The "blowtorch and corkscrew" method of attacking cave openings was materially improved when the men of the 713th Armored Flame Thrower Battalion attached to the flame thrower a 200-foot hose to spray

[43] History (Ryukyus), 420th Field Arty Group, 31 Mar–Jun 45, p. 41.

napalm on places inaccessible to the tank. Also (in a reversal of their former roles) flame throwers and other tanks were used to protect infantrymen from the bands of machine gun fire that were causing heavy casualties. The tanks carried combat reinforcements to the front lines in their hulls, as well as supplies of blood plasma, water, and ammunition, and brought back the wounded.[44]

The Japanese resisted to the water's edge. Many chose to commit suicide rather than surrender. The last act of the bloody drama took place on the seaward side of a rocky cliff on the southern shore. There before dawn on the morning of 22 June the commander of the Japanese forces on Okinawa and his chief of staff emerged from the entrance of their last cave headquarters and committed hara kiri.[45] This marked the end of organized resistance on Okinawa. The mop-up phase took ten days longer. Reaching the southern end of the island, XXIV Corps and III Amphibious Corps turned north to the Naha-Yonabaru valley, cleaning up pockets of resistance and destroying enemy soldiers who might escape to engage in guerrilla warfare in the north, as the Japanese had been ordered to do by their general in his last written order, dated 18 June. In the final days of the campaign and in the mop-up phase, infiltration by Japanese—many disguised in Okinawan kimonos—who were being driven north by the combat troops was a real danger to men in rear installations, some of whom, reported the 96th Infantry Division historian, "got a chance to put notches in their seldom-used firearms." A few Japanese were killed in the sector of the division's light maintenance company, but by setting up outposts on surrounding hills the Ordnance men kept the infiltrators out of their company area.[46]

During the last two weeks in June, 80,000 Okinawan civilians crawled out of the caves on the southern tip of the island. A third or more were wounded. There were few able-bodied men among them; they were mostly women, old men, and children. As they plodded north in long columns they saw that the Okinawa they had known was gone. Villages had been leveled, the city of Naha laid waste, the ancient capital of Shuri reduced to coralstone and red-tile rubble, a "crater-of-the-moon landscape"[47] of utter desolation. Around the ruins of Shuri Castle remained only remnants of its massive ramparts and only blackened skeletons of its great trees. Nothing was left of the great gates, the temples, the gardens.[48]

In the "typhoon of steel" (as the Okinawans called it)[49] that had swept over the island, about 110,000 Japanese had lost

[44] During the 5-day battle for Kunishi Ridge, 12–17 June, 47-mm. and other artillery shells destroyed or damaged 21 tanks when they were road-bound in a rice paddy region; but this appears to have been the only serious tank loss. Appleman, *et al., Okinawa: The Last Battle,* p. 452. By 12 June, the sound of Japanese artillery "had faded from its April rumble to a faint whisper." *Ibid,* p. 462.

[45] For a Japanese account of the scene see Edmund G. Love, *Hour Glass: The 7th Infantry Division in World War II* (Washington: Infantry Journal Press, 1950), pp. 481–82.

[46] (1) Davidson, *et al., The Deadeyes,* p. 190. (2) History 796th Ord Light Maint Co, Ryukyus Campaign.

[47] Appleman, *et al., Okinawa: The Last Battle,* p. 402.

[48] Kerr, *Okinawa: The History of an Island People,* p. 470. It was estimated that more than 62,000 Okinawans had perished, of which some 47,000 were civilians who had been unable to find refuge in caves or tombs. *Ibid.,* p. 472.

[49] Kerr, *Okinawa: The History of an Island People,* p. 472.

their lives and 7,400 had been taken prisoner. The American casualties—Army, Marine, and Navy—were 11,689 killed and missing and 34,559 wounded. The ratio of American to enemy losses was not so high as it had been at Tarawa or Saipan or Iwo Jima, but those were smaller, shorter campaigns. On Okinawa more American lives had been lost than in any other campaign against the Japanese.[50]

Preparing for Japan

Even before Okinawa was officially declared secure on 22 June, the Ordnance men were preparing to support the invasion of the Japanese homeland. The first task was to re-equip the infantry divisions, giving priority to the 77th, which was already loading out for Luzon to go to Japan with Sixth Army. Colonel Welch of Island Command had set up at the Ordnance service centers a policy of straight exchange —a serviceable item in exchange for an unserviceable one, whether watch or gun. Most of the vehicles turned in had been damaged by the deep mud, which was particularly hard on brake linings. Otherwise—in striking contrast to almost every other campaign of the war—the mortality on trucks and other vehicles at Okinawa had not been great. There had not been long distances to travel in this siege warfare operation; maintenance discipline had been effectively enforced in Tenth Army by spot inspections; and, for once, spare parts had been relatively plentiful. On weapons, the only serious cause for concern was a shortage of 105-mm. howitzer tubes. These had been requisitioned by Tenth Army, but were short because shipment had been slow.[51]

While the work of re-equipping the divisions was going on, Ordnance base troops had been landing to do their part in the development of Okinawa as the last great base of World War II. A visitor from the United States, landing on the hot and humid afternoon of 19 July, found the island "a beehive of activity—air and ground," and was "immediately impressed with the extent of roads well paved and the mass of busy traffic," noting in his diary that "tented groups are all over the place and the usual air of American business and ingenuity. What people we are to come out here and be so well established so quickly." [52]

This observer was the ubiquitous Brig. Gen. William A. Borden, director of the New Developments Division, War Department General Staff, making his fifth visit to overseas theaters—his first was to Tunisia in the spring of 1943. His mission on Okinawa was to let the commanders know

[50] (1) Appleman, *et al., Okinawa: The Last Battle,* pp. 473–74. This account gives Marine casualties as 2,938 killed and missing, 13,708 wounded; Navy as 4,907 killed and missing and 4,824 wounded. The official Army casualty figures are 3,844 killed in action and missing and 16,027 wounded (of which 995 died of wounds). D/A Final Rpt, Army Battle Casualties and Nonbattle Deaths in World War II . . . 7 December 1941–31 December 1946, p. 95. (2) Col. George A. Harvey, "Okinawa," *Military Review,* XXVI, 5 (August 1946), p. 72. (3) In the campaign for Luzon and the Southern Philippines, the combined casualties of Sixth and Eighth Armies were 10,300 killed and 36,550 wounded. Smith, *Triumph in the Philippines,* p. 652.

[51] (1) Jnl, Hq and Hq Det, 61st Ord Group, 17–30 Jun 45, in History Hq and Hq Det, 61st Ord Gp, 44, 24 Mar–Jun 45–46. (2) Welch Interv. (3) Personal Ltr, Rodman, Asst Ord Officer Tenth Army, to Ranges, ASF, 27 Aug 45, Folder, X-O Opns, ASF Planning Div, Theater Br. (4) Jnl XXIV Corps Ord Sec, 11 Jun 45.

[52] Borden Observations in the Pacific, Jul–Aug 45, pp. 1, 12, OHF.

what was being done in the United States to provide them with new equipment and techniques for the assault on Japan. With regard to the Ordnance Department, he could tell the commanders that a cave warfare program had been started on 25 May, sparked by a memorandum from General Stilwell, then commanding general of Army Ground Forces, to General Marshall, stating that the terrain in Japan lent itself to dug-in positions in depth.[53]

In initiating the program, Maj. Gen. Gladeon M. Barnes, chief of the Ordnance Research and Development Division, made the point that Ordnance already had powerful weapons applicable to cave warfare. Foremost among them were self-propelled artillery—the 90-mm. gun on the M36 carriage and the 155-mm. on the M40 carriage—and the M26 Pershing tank. To supplement these weapons for particular situations were the 57-mm. and 75-mm. recoilless rifles, which could be manhandled into position, and a series of mortars for indirect fire. The catch was that except for twelve Pershings that were on their way to the Pacific, most of these weapons were still in Europe or the United States. The first step in the cave warfare program was to get them out to the Pacific; and Barnes warned the Ordnance division chiefs that "we do not have a couple of years in which to do it." The second step was to get out an ASF booklet on cave warfare. In its final form, dated 24 June 1945, to which not only Ordnance but Engineers and Chemical Warfare Service contributed, other Ordnance items listed were the M24 light tank (highly maneuverable in rough terrain) and several experimental weapons such as the self-propelled 8-inch howitzer, the 4.5-inch multiple rocket launcher, and a ground-launched, rocket-propelled, 250-pound bomb.[54]

A booklet on how to fight cave warfare could only seem ironical to veterans of the Okinawa campaign; however, the commanders were generally receptive to the Ordnance recommendations on desirable weapons. At Tenth Army headquarters, General Borden encountered General Stilwell himself, who had arrived on 23 June to replace General Buckner. Stilwell, wearing his old campaign hat, said that he was in favor of heavy self-propelled artillery and the Pershing tanks. General Hodge, the XXIV Corps commander, whom Borden interviewed at his headquarters near the ruins of Shuri Castle, had more specific ideas, based on his experience throughout the campaign. He wanted self-propelled artillery for precision fire against point targets because he had discovered that mass artillery fire against cave positions only drove the Japanese into their holes and wasted ammunition. He wanted the Pershing tank, the main armament flame thrower tank, and the recoilless rifle. He also stressed the importance of flares and star shells, the latter in calibers up to 155-mm., for night operations. Hodge's recommendations on weapons were given point by a tour Borden afterward made of the island—from the north, where combat teams of the 27th Division were still killing Japanese, to the south, where the 7th Divi-

[53] (1) *Ibid.*, p. 1. (2) Minutes, Meeting with General Borden 14 May 1945, 15 May 45, sub: Equipment for Use Against Japan, and Incl. (2) OCO, Special Division Chiefs Meeting, 25 May 45, sub: Cave Warfare in the Pacific Theater. Both in Folder, Cave Warfare, Barnes File, OHF.

[54] ASF, Special Technical Intelligence Bulletin No. 10, Cave War, 24 Jun 45, Folder, Cave Warfare, Barnes File, OHF.

sion was also still flushing them out of caves. The tour convinced the visitor that the terrain of Okinawa was "far more rugged than anyone who had not seen it can imagine." [55]

On 24 July General Borden departed for Manila and spent the following three weeks in the Philippines, visiting Leyte, the southern islands, and the mountains of northern Luzon, where fighting was still going on, and interviewing commanders of Sixth and Eighth Armies on the weapons they wanted for the assault on Japan. On 15 August as he was leaving his hotel for the airport to return to the United States, he was told that a radio had been received from President Truman stating that the Japanese had accepted the U.S. surrender terms. The war was over.[56]

[55] Borden Observations in the Pacific, Jul–Aug 45, pp. 12–19.

[56] *Ibid.*, pp. 20–57.

CHAPTER XXV

The Guns Fall Silent

On the pleasant summer evening of 15 August 1945 Americans were still fighting in the mountains of northern Luzon. In the 32d Division sector, a walkie-talkie said "The war's over," and a grimy sergeant replied, "Yeah, all over these damned mountains." Japanese sniping and banzai attacks continued until General Yamashita surrendered to the 32d Division on the morning of 2 September. But for most of the men the war was really over. In the area where the 37th Division was mopping up, a combat team at Cabagan got the news from the loud triumphant ringing of the village church bells. A platoon out on patrol came marching back to its company perimeter in formation at right shoulder arms, to the cheers of the entire company. Rifle volleys were fired into the evening sky. Far up on the banks of the Cagayan River in the tents of the 737th Ordnance Light Maintenance Company, the men were writing letters home and preparing to go to bed when they heard the news over the radio. Luckily for the celebration that followed, Sergeant Nussbaum had just broken out a beer ration.[1]

On Zamboanga, where the 41st Division was training for the invasion of Japan, the men got the first news of peace from the firing of guns and flares aboard ships in the harbor. As the news spread there was more firing of weapons and "a feeling of relief and thankfulness that the whole bloody mess had come to an end."[2] On Okinawa, where the fighting had been most bloody, there was a glorious celebration. Guns boomed, tracer bullets streaked through the night in every direction, sirens screeched, and searchlights fingered the sky. One group of the 96th Division had a ringside seat in Buckner Bay aboard ships that were about to take them to the Philippines for rest and rehabilitation before they went on to Japan. The men of another group of the same division who had just arrived off Luzon were deeply moved as they gazed at Corregidor and Bataan.[3]

The guns fell silent. The task of assessment became foremost—assessment, in the case of the Ordnance Department, of the weapons and vehicles, and the Ordnance doctrine and organization that had been employed in the two-ocean war. In Europe such discussions had been going on for several months. Indeed, by V–E Day little on the subject of weapons could be

[1] (1) Maj. Gen. H. W. Blakeley, *The 32d Infantry Division in World War II* (Madison, Wis., n.d.), p. 265. (2) Frankel, *The 37th Infantry Division in World War II*, p. 359. (3) History 737th Ord Light Maint Co, 1 May–31 Oct 44; Nov 44–3 Feb 45; Apr–Aug 45.

[2] McCartney, *The Jungleers*, p. 157.

[3] Davidson, *et al.*, *The Deadeyes*, p. 235.

added to the findings of General Barnes's ZEBRA Mission of February 1945.[4] The Ordnance item that came under the sharpest fire from combat commanders was the Sherman tank with the 75-mm. gun. Most commanders liked the design of the new Pershing tank with the 90-mm. gun, but few had received it in time to determine how well it performed in combat. The only really revolutionary new American weapon that got overseas in time for widespread combat use was the 2.36-inch rocket and launcher known as the bazooka and first used in the Tunisia Campaign in the spring of 1943. Experience had proved that it was valuable in many ways but that it was not powerful enough to disable a German Panther or Tiger tank at practicable ranges. The German hand-carried weapon of this type, the *Panzerfaust,* was considerably more powerful.

Comparing American with German weapons in the spring of 1945, General Eisenhower reported to General Marshall that, with the exception of German tanks, "only the German bazooka may be considered superior to an item of ours."[5] American pistols, rifles, and machine guns were well liked. American artillery came off well in the assessment. Even so dedicated a tanker as General Patton admitted that the war "was largely won by the artillery."[6] Star performers were the 155-mm. gun and the 105-mm., 8-inch, and 240-mm. howitzers. The 90-mm. antiaircraft gun did well in its antitank role, though many experts placed it second to its German counterpart, the famous 88-mm. Effective artillery techniques and the good quality of American ammunition compensated in many cases for the more advanced design of some of the German guns. Rockets used as artillery had little chance to prove themselves. Artillerymen disliked the fin-stabilized 4.5-inch rocket mainly because it was inaccurate. The more accurate spin-stabilized model with a suitable mount did not arrive in the European theater in time to make a significant contribution to victory. Artillerymen of World War II concluded that "the surface has only been scratched in the development of rockets."[7]

Experience had shown that mobility was almost as greatly to be desired as firepower. Commanders had been converted to self-propelled artillery by the success of the M12 155-mm. gun on its gun motor carriage and wanted all artillery ultimately to be self-propelled. In the motor transport field, 2½-ton trucks and jeeps had been plentiful and durable; the trucks withstood an unbelievable amount of punishment from careless or unskilled drivers. One real innovation on the American side was the DUKW, which made an invaluable contribution to amphibious warfare both in Europe and in the Pacific.

In the Pacific, commanders had been satisfied with the Sherman tank, which was better than anything the Japanese could bring against it; indeed they considered standard American Ordnance matériel of all types generally superior to Japanese counterparts. No new items such as the

[4] For findings of the ZEBRA Mission, see above, pp. 333–34.

[5] Msg, Eisenhower to Marshall, 26 Mar 45, Eisenhower Personal File.

[6] AGF Rpt 1032, Artillery Conference, Third U.S. Army, 12th Army Gp 319.1.

[7] Conclusions and Recommendations Based on Committee Studies at the Field Artillery Conference, Field Artillery School, Fort Sill, Oklahoma, 18–29 March 1946.

Pershing tank and self-propelled artillery were in great demand in the Pacific until the large-scale cave warfare on Okinawa. This was fortunate, because none were available until after V–E Day; until then, Europe had come first. Lacking such weapons, the flame thrower Sherman tank —a field improvisation by the Chemical Warfare Service—carried the main burden of cave warfare. There was only limited use of the bazooka in the Pacific. Nor were the commanders impressed by tests of the few experimental 4.5-inch artillery rockets sent to the theater. The main role of the artillery rocket in the Pacific was to serve as armament for landing craft, and for this purpose the Navy's 4.5-inch rocket was preferred. American ammunition in most calibers was dependable and effective in the Pacific as in Europe. The only type seriously lacking was the illuminating shell, useful because of Japanese night infiltration tactics.[8]

Twenty years after V–J Day, arguments on the relative effectiveness of the weapons of World War II seem almost as bootless as the heated controversy raging in England during the first decade of the twentieth century on whether the lance should replace the sword as the cavalryman's principal weapon. More instructive is a study of the reasons offered for the ineffectiveness of some of the American weapons when compared with their German counterparts. The report of the Army Ground Forces Equipment Review Board in June of 1945 was critical of the Ordnance Department; on the other hand, General Barnes, chief of Ordnance's research and development organization, blamed the using services for acting as a brake on the efforts of the Ordnance Department to arm the U.S. troops adequately. Between these two points of view was the position of the Ordnance Section of Army Ground Forces, of which the executive officer, Lt. Col. George T. Petersen, had had long service overseas in Tunisia and Italy. Colonel Petersen and Col. Edwin P. Mechling, Ordnance officer of Army Ground Forces, pointed out, "The policy of our development has too often been a mere copying of revolutionary enemy equipment," and asked, "Why can't we be first with the revolutionary development?" They concluded that the using arms by being too specific and too rigid in the characteristics they required in new weapons had not encouraged revolutionary improvements. Army Ground Forces had lacked foresight. On the other hand, the Ordnance Department had not sufficiently consulted Army Ground Forces during the design stages of new equipment. Better understanding between the technician and the combat officer was essential; one way of achieving it would be the assignment of Ordnance officers experienced in development and design to duty with troops, another would be to detail combat officers to Ordnance.[9]

Along with evaluating weapons development, the Ordnance officers who had served in the field with the combat forces evaluated the Ordnance doctrine that had

[8] (1) Roberts Rpt, 31 Jul 44. (2) Borden Observations, Jul–Aug 45.

[9] (1) Maj Gen Gladeon M. Barnes, USA Ret, Comments on manuscript of Green, Thompson, and Roots, *Planning Munitions for War,* Incl to Ltr, Gen Barnes to Maj Gen Orlando Ward, 25 Jan 52. Copy in OHF. (2) Memo, Mechling and Petersen for Ground Plans Section, 20 Aug 45, sub: Comments of Ground Ordnance Section on Equipment Review Board AGF Study, Files Ord Officer, 400, Supplies and Equipment.

been published and taught in the schools between World War I and World War II. Most considered it antiquated. Conceived largely in terms of the fixed position warfare of World War I, it had provided a system too rigid and too formal, with complex administrative arrangements that would have made it impossible for Ordnance support to keep up with fast-moving tactical troops—if the system had been followed. Of necessity, Ordnance officers at army level had simply discarded it and evolved their own individual systems. No two were exactly alike, and this had complicated the training problem and introduced other problems, but success in devising workable systems in the field produced in most theaters, in the opinion of postwar Army Ground Forces Ordnance officers, "at least an approximation of good effective Ordnance service." [10]

The initiative of Ordnance officers overseas had brought about better organization in the field at an early date in the war. The Provisional Ordnance Group established in Oran in November 1942 antedated considerably the first Ordnance group authorized in the United States in April 1944, and was the pattern for the Ordnance support system in all the armies in the European theater. Ordnance officers overseas also had to devote considerable thought and effort to making the best use of certain types of Ordnance companies. Several companies were overspecialized; for example, the tank maintenance company that supported tank and tank destroyer battalions only, wherever located, and the antiaircraft maintenance company that supported all antiaircraft combat units no matter how widely scattered. The use of such companies caused much confusion, unnecessary travel, and congestion of the road net. Some companies—such as the evacuation company for moving armor from collecting points to the rear—had no place in the army area. On the other hand, certain Ordnance missions developed in every army area for which no suitable company existed.[11] One such mission was that of bringing back all types of Ordnance material from the battlefield This problem the Ordnance officer of First Army solved in England by converting the evacuation company into a collecting company and using the men left over to man his radio net. Setting up a radio net to control Ordnance operations was one of the most valuable of all field expedients.

The need for better communications with Ordnance officers at corps, group, and battalion level, who were usually widely dispersed, was only one of many problems arising from the size and complexity of the Ordnance organization that was essential if the modern field army was to be adequately supported. Many Ordnance officers at army level, faced with the task of directing their large organization, felt that they had not been adequately prepared for the job. Usually well trained in technical subjects, they learned that they would have benefited from training in business administration or management. Furthermore, the field army Ordnance officer was obliged not only to administer

[10] Brig Gen H. A. Nisley, Ordnance Service with the Army Ground Forces, an address delivered to the graduating class, Associate Basic Ordnance Officers' Course, The Ordnance School, 31 October 1947, p. 4, app. 4 of Minutes of Army Ground Forces Ordnance Conference, Ft. Monroe, Va., 1–5 March 1948.

[11] Nisley Address, 31 Oct 47.

his own organization but also in nearly all the armies had to engage in manufacturing, using indigenous labor, materials, and facilities on a scale unheard of in the past.[12]

Because of the ever-present need for field improvisation to meet unpredictable situations, many participants in World War II, looking back, felt that the prime Ordnance lesson was that good Ordnance service to the combat troops depended largely on the intelligence, resourcefulness, and good judgment of the Ordnance officer sent overseas. Of him might be demanded the one characteristic Field Marshal von Runstedt demanded in an infantryman: "To learn quickly." [13] General Campbell, wartime Chief of Ordnance, regarded the selection of capable officers for the field as one of his primary duties, having been profoundly influenced by a remark made to him just after World War I by Brig. Gen. John H. Rice, chief Ordnance officer of the American Expeditionary Force, "that if he had to go through the war again he would spend 95% of his time selecting men for particular jobs, and the other 5% he would spend in reading the newspapers!" [14]

In World Wars I and II there had been a considerable number of capable men to choose from. The Ordnance Department had attracted them. A man's desire to belong to a respected organization, one to be proud of, seemed to officers with wide experience in World War II to be very strong—perhaps the strongest of all motivations.[15] The importance of *esprit de corps* increased rather than lessened as warfare became more and more mechanized. In the words of a British military critic, "the mechanical impersonality of war requires to be counteracted by the greatest moral stimulus." [16] Whether large impersonal logistical organizations such as those established in the early 1960's at the time of the abolition of the Office, Chief of Ordnance, would be able to recruit the best men remained to be seen.

Planning the future organization of Ordnance service to field forces in the immediate postwar years, the seasoned veterans of overseas service in World War II were determined not to fall into the common error of "fighting the last war." Believing that push-button warfare was at least ten years away, they planned for an interim period in which they envisioned increased requirements for dispersion, as compared with World War II, and a very high requirement for mobility. Beyond the ten-year period the planners refused to go, because at that time "we might have to fight a wholly new type of war, the general shape of which is only dimly seen at present." [17]

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[12] (1) Niblo, Ordnance Lessons Learned During World War II. (2) Ind by Brig Gen Philip G. Blackmore, USA Ret, to Ltr, Lida Mayo to Blackmore, 6 Jan 64, OCMH.

[13] *Danger Forward*, p. 398.

[14] (1) Ltr, Lt Gen Levin H. Campbell, Jr., USA Ret, to Harry C. Thomson, 29 Apr 49. OHF. (2) Campbell Comments.

[15] Intervs with Maj Gen Nelson M. Lynde, USA Ret, 10 Nov 64 and Gen Bruce C. Clarke, USA Ret, 16 Nov 62.

[16] J. A. Terraine, "A Soldier's Soldier," *The Spectator*, June 7, 1957, p. 742.

[17] Nisley Address, 31 Oct 47.

Bibliographical Note

To explore with any hope of success the tons of records that arrived in U.S. ports in shipload after shipload at the close of World War II, the historian must quickly decide where to begin. In research for the present volume, the most obvious place to look first was the Ordnance Section of the European, Mediterranean, and Southwest Pacific theaters. The records of the European and Mediterranean theater Ordnance Sections were found to be abundant and good. In the Southwest Pacific Area, because of differences in organization and situation, the files of the Ordnance officer of the United States Army Services of Supply were the most fruitful sources.

Of particular interest because of the scheme of this volume were the records of the Ordnance officers of the various armies. All were different. By far the most voluminous were those of the Ordnance officer of Fifth Army, who issued a daily mimeographed Ordnance Operations Bulletin with many annexes—reports on specific operations, inspections, tests of new weapons, and so on. Next in bulk were the very full typewritten monthly after action reports of the Ordnance officer of First Army, appended as annexes to the First Army after action reports. The Ninth Army Ordnance officer's somewhat briefer monthly reports were included in Ninth's monthly G–4 reports. The best sources for Third Army in Europe as well as Seventh Army in Sicily (the Ordnance officer was the same) are the Ordnance annexes to the final reports of those armies. For Seventh Army Ordnance in southern France the best sources are 6th Army Group weekly G–4 reports for Seventh Army and the monthly reports of two Ordnance groups. In the Southwest Pacific, the Ordnance officers of Sixth and Eighth Armies produced book-length histories of their operations, reproduced for wide distribution. The Tenth Army Ordnance officer prepared a very full typewritten report, with copious annexes, of operations on Okinawa.

Other valuable manuscript sources were the files of the 12th Army Group, particularly the daily Ordnance Section Journal; the G–4 journals of armies, task forces (especially in the Southwest Pacific), and corps; and the after action reports of tactical units.

The periodic reports of Ordnance groups, battalions, and companies yielded rich returns. Many of the company histories are perfunctory and most are hard on the eyes, being written usually either with a worn typewriter ribbon or in longhand; but a surprising number tell very vividly what the men did, saw, and felt.

Preoccupation with records generated in the theaters should not lead the historian to overlook records accumulated throughout the war by headquarters in the United States concerned with overseas operations. The Army Service Forces files were rich in Ordnance material, particularly those of the Maintenance and Distribution Divisions and the Planning Division's Theater Branch. The files of the Army Ground Forces Ordnance officer contributed much, as did the AGF Board Reports on Ordnance subjects.

The best single collection of Ordnance primary sources was close at hand in the Historical Branch, Office, Chief of Ordnance: long, informative personal letters to the Chief of Ordnance from Ordnance officers serving overseas at many levels; mission reports, notably those of the early Middle East missions; travel reports and key personnel final reports. In addition to this type of material, the Historical Branch files included lengthy manuscript histories, in several volumes, of the ETO and MTO Ordnance Sections; two file cabinets of data on weapons turned over to the branch by Maj. Gen. Gladeon M. Barnes (cited as Barnes File); a set of the Ordnance studies prepared by the U.S. Forces, European Theater (USFET) Board; and miscellaneous papers of considerable importance. These holdings of the Ordnance Historical Branch, cited in the footnotes as OHF (Ordnance Historical Files), were deposited in the Federal Records Center, General Services Administration, Alexandria, Virginia, when the Office, Chief of Ordnance, was abolished. They were later transferred to the National Archives.

The National Archives, the principal repository for U.S. Army records of World War II, may be assumed to be the location of documents cited in this volume unless another repository is indicated. The second largest collection of pertinent official Army records of the period was at the time of writing located in the Army Records Center, Kansas City, Missouri (cited as KCRC), which in 1960 was absorbed by the Federal Records Center, General Services Administration, Kansas City, Missouri.

The information in the official records has been supplemented by the author's interviews and correspondence with participants. These are filed in OCMH. Other interviews, unless otherwise specified, are filed in OCMH.

Among the printed sources the most valuable were the volumes published by the Office, Chief of Military History, in the series UNITED STATES ARMY IN WORLD WAR II, almost every one of which has been used in the preparation of this volume. The author has also frequently consulted the multivolume "History of United States Naval Operations in World War II" by Samuel Eliot Morison; "The Army Air Forces in World War II" series, edited by Wesley Frank Craven and James Lea Cate; two Marine Corps monographs, *The Campaign in New Britain* by Lt. Col. Frank O. Hough and Maj. John A. Crown, and *Okinawa: Victory in the Pacific* by Maj. Charles S. Nichols, Jr., and Henry I. Shaw, Jr.; and several volumes in the official war histories of the United Kingdom and Australia. Published histories of U.S. armies, corps, divisions, and battalions have been cited throughout. Memoirs and biographies have been useful, and the numerous books by war correspondents have added color and interest. The most important magazine articles were those written by Ordnance men with firsthand knowledge of overseas operations and they appeared most often in *Ordnance* (formerly *Army Ordnance*), *Military Review,* and *Firepower.*

Glossary

AA	Antiaircraft
AAA	Antiaircraft artillery
AAF	Army Air Forces
AAR	After action report
ABC	American–British Conversations (January–March 1941)
ABDA	American-British-Dutch-Australian (Command)
ACofS	Assistant Chief of Staff
Actg	Acting
Admin	Administration; administrative
AdminO	Administrative order
ADSEC	Advance Section (on Continent)
AFB	Air Force Base
AFHQ	Allied Force Headquarters (Mediterranean)
AFWESPAC	U.S. Army Forces, Western Pacific
AG	Adjutant General
AGF	Army Ground Forces
AGWAR	Code letters for War Department messages
AMMISCA	American Military Mission to China
AP	Armor-piercing
APD	High-speed transports
Armd	Armored
ASCOM	Army Service Command (Southwest Pacific)
ASD	Ammunition supply dump (British)
ASF	Army Service Forces
ASP	Ammunition supply point
AW	Air warning
BAM	Base automotive maintenance
BAR	Browning automatic rifle
BCL	Barge, concrete, large
Bd	Board
Br	Branch
BS	Base Section
CBI	China-Burma-India
CBS	Continental Base Section
CDL	Canal Defense Light
CinC	Commander in Chief
Comdr	Commander

CMH	Chief of Military History
CofOrd	Chief of Ordnance
CofS	Chief of Staff
COMGENAFMIDPAC	Commanding General, Army Forces, Mid-Pacific
COMGENTEN	Commanding General, Tenth Army
COMZ	Communications Zone
CONAD	Continental Advance Section (Europe)
Conf	Conference
COrdO	Chief Ordnance Officer
CP	Command post
C&P	Cleaning and preserving
CPBC	Central Pacific Base Command
CTF	Center Task Force (North Africa)
DCofS	Deputy Chief of Staff
DD	Duplex drive
DDAR	Division of Defense Aid Reports
Det	Detachment
DUKW	2½-ton amphibious truck
EBS	Eastern Base Section (Mediterranean and England)
EEIB	Enemy Equipment Intelligence Branch
Engr	Engineer
ETF	Eastern Task Force (North Africa)
ETO	European Theater of Operations
ETOUSA	European Theater of Operations, U.S. Army
FA	Field army; field artillery
FECOMZ	Forward Echelon, Communications Zone (Europe)
Flak	*Flugabwehrkanone,* German antiaircraft gun
FS	Fast Supply (ships)
FUSA	First U.S. Army
FUSAG	1st U.S. Army Group
G–1	Personnel section of divisional or higher staff
G–2	Intelligence section of divisional or higher staff
G–3	Operations and training section of divisional or higher staff
G–4	Supply section of divisional or higher staff
GHQ	General Headquarters
Gp	Group
HAM	Heavy automotive maintenance
HB	Historical Branch
HE	High explosive

HM	Heavy maintenance
HVAP	High-velocity, armor-piercing
Incl	Inclosure
Ind	Indorsement
Insp	Inspection
Instr	Instructions
Interv	Interview
ISCOM	Island Command (Okinawa)
Jnl	Journal
KCRC	Kansas City Records Center
Kwk	*Kampfwagenkanone,* German tank gun
LCI	Landing craft, infantry
LCM	Landing craft, mechanized
LCT	Landing craft, tank
LCVP	Landing craft, vehicle and personnel
LM	Light maintenance
LSM	Landing ship, medium
LST	Landing ship, tank
LVT	Landing vehicle, tracked
LVT (1)	Landing vehicle, tracked, unarmored, Alligator
LVT(A)	Landing vehicle, tracked, armored (turret type)
Maint	Maintenance
MAM	Medium automotive maintenance
MBS	Mediterranean Base Section
MFR	Memo for record
MIM	Military Iranian Mission
Min	Minutes
MM	Medium maintenance
MNAM	Military North African Mission
M&S	Maintenance and supply
Msg	Message
MTO	Mediterranean Theater of Operations
MTOUSA	Mediterranean Theater of Operations, U.S. Army
MVA	Motor vehicle assembly (company)
MVD	Motor vehicle distributing (company)
N.A.	North Africa
NAMM	North African Military Mission
NATO	North African Theater of Operations
NATOUSA	North African Theater of Operations, U.S. Army
N.G.	New Guinea
NGF	New Guinea Force
NIBC	Northern Ireland Base Command

NUSA	Ninth U.S. Army
NYPE	New York Port of Embarkation
OCM	Ordnance Committee Minutes
OCO	Office of the Chief of Ordnance
OCT	Office of the Chief of Transportation
OHF	Ordnance Historical Files
OMET	Ordnance Middle East Tasks
O.O.	Ordnance Office
O.O.B.	Ordnance Office Bulletin
OPD	Operations Division
Opn	Operation
Ord	Ordnance
Orgn	Organization
Pak	*Panzerabwehrkanone,* German antitank gun
PBS	Peninsular Base Section (Italy)
Plng	Planning
POA	Pacific Ocean Areas
POE	Port of Embarkation
POG	Provisional Ordnance Group
POM	Preparation for Overseas Movement
POZIT fuze	European theater term for proximity fuze or VT
PROCO	Projects for continental operations
Prov	Provisional
Pzkw	*Panzerkampfwagen,* German tank
QM	Quartermaster
RAAF	Royal Australian Air Force
Rad	Radiogram
RAF	Royal Air Force
RAOC	Royal Army Ordnance Corps
RASC	Royal Army Service Corps
RCT	Regimental combat team
Recn	Reconnaissance
REME	Royal Electrical and Mechanical Engineers
RPH	Remember Pearl Harbor (Group)
Rpt	Report
SBS	Southern Base Section (England)
Sec	Section
Secy	Secretary
Serv	Service
SFPOE	San Francisco Port of Embarkation
SHAEF	Supreme Headquarters, Allied Expeditionary Force
SNL	Standard Nomenclature List

SOLOC	Southern Line of Communications
SOPAC	South Pacific Area; South Pacific Force
SOS	Services of Supply
SP	Self-propelled
SPA	South Pacific Area
Spec	Special
SPOBS	Special Observer Group
SS	Special Staff
SSUSA	Special Staff, U.S. Army
Sub	Subject
SUP	Single unit pack for vehicles
SWPA	Southwest Pacific Area
TAG	The Adjutant General
TAP	Truck assembly plants
T/BA	Table of basic allowances
TC	Transportation Corps
TD	Tank destroyer
T/E	Table of equipment
Tech	Technical
TICAF	The Industrial College of the Armed Forces
Tk	Tank
T/O	Table of organization
TOE	Table of organization and equipment
TUP	Twin unit pack for vehicles
TUSA	Third U.S. Army
U.K.	United Kingdom
USAAS	United States Army Air Services
USAFBI	United States Army Forces in the British Isles
USAFFE	United States Army Forces, Far East
USAFIA	United States Army Forces in Australia
USAFICPA	United States Army Forces in Central Pacific Area
USAFIME	United States Army Forces in the Middle East
USAFPOA	United States Army Forces, Pacific Ocean Areas
USANIBC	United States Army Northern Ireland Base Command
USANIF	United States Army Northern Ireland Force
USASOS	United States Army Services of Supply
USAT	U.S. Army transport
USFET	United States Forces in the European Theater
USFIA	United States Forces in Australia
USFIP	United States Forces in the Philippines

USMNAM	U.S. Military North African Mission
USSR	Union of Soviet Socialist Republics
UXB	Unexploded bomb
VT	Proximity fuze
WBS	Western Base Section (England)
WD	War Department
WDGS	War Department General Staff
WPD	War Plans Division

Code Names

ALAMO	Task force directly under GHQ SWPA (MacArthur).
AMOEBA	Advance Sub-Base C, Goodenough Island.
ANVIL	Early plan for the invasion of southern France.
ARCADIA	U.S.-British conference in Washington, December 1941–January 1942.
AVALANCHE	Invasion of Italy at Salerno.
BACKHANDER	Task force for Cape Gloucester.
BATTLEAXE	British Eighth Army operation at Halfaya Pass, June 1941.
BOLERO	Build-up of U.S. troops and supplies in United Kingdom for cross-Channel invasion.
BREWER	Task force for Admiralties.
BYPRODUCT	Task force for Kiriwina.
CENT	Scoglitti beaches, Sicily.
CHRONICLE	Invasion of Woodlark and Kiriwina Islands.
COBRA	First Army operations in the Cotentin, France, July 1944.
CONQUER	Code name for Ninth Army.
CORONET	Plan for invasion of Honshu at the Tokyo plain.
CYCLONE	Task force for Noemfoor.
DEXTERITY	Invasion of New Britain.
DIME	Gela beaches, Sicily.
DIRECTOR	Task force for Arawe area.
DRAGOON	Invasion of southern France.
ESCALATOR	Code name for ALAMO Force.
FABIUS	May 1944 dress rehearsal for invasion of Normandy.
FLASHPOINT	Ninth Army crossing of the Rhine.
GLOBETROTTER	Operations in northwest New Guinea near Cape Sansapor.
GRENADE	21 Army Group offensive from Roer to Rhine.
HURRICANE	Task force for Biak.
HUSKY	Invasion of Sicily.
ICEBERG	Invasion of the Ryukyus.
INDIGO	Plan for movement of U.S. troops to Iceland.
INTERLUDE	Operations on Morotai.
JOSS	Licata beaches, Sicily.

KING I	Plan for operations on Mindanao, canceled.
KING II	Invasion of Philippines at Leyte, October 1944.
KOOL	Reserve force for Sicily.
LAZARETTO	Task force for Gasmata, New Britain.
LEATHERBACK	Task force for Woodlark.
LETTERPRESS	Task force for Humboldt Bay, New Guinea.
LOVE III	Mindoro operation.
MAGNET	Movement of the first U.S. forces to Ireland.
MAPLE	U.S. advance base at Port Moresby.
MICHAELMAS	Task force for Saidor, northeast New Guinea.
MIKE	Series of plans for operations on Luzon.
NEPTUNE	Actual 1944 operations within OVERLORD. Used for security reasons after September 1943.
NOISELESS	Task force for Tanahmerah Bay, New Guinea.
OLYMPIC	Plan for March 1946 invasion of Kyushu, Japan.
OMAHA	U.S. V Corps beach in Normandy, June 1944.
OVERLORD	Allied cross-Channel invasion of northwest Europe, June 1944.
PEMMICAN	Advance Base A, Milne Bay, New Guinea.
PENUMBRA	Advance Sub-base B, Oro Bay, New Guinea.
PERSECUTION	Task force for Aitape, New Guinea.
POPPY	Name for force to be sent to New Caledonia in early 1942.
RAINBOW	Various plans prepared between 1939 and 1941 to meet Axis aggression involving more than one enemy.
RECKLESS	Task force for Hollandia, New Guinea.
ROUNDUP	Plan for major U.S.–British cross-Channel operation in 1943.
SATIN	U.S. II Corps operation against Sfax, Tunisia, January 1943, canceled.
SHAGGY	MICHAELMAS task force resupply point at Cape Cretin, New Guinea.
SHINGLE	Invasion of Italy at Anzio.
SLEDGEHAMMER	Allied plan for a limited cross-Channel attack in 1942.
SUMAC	Early code name for Australia.
TABLETENNIS	Operation at Noemfoor Island, New Guinea.
THE WHIP	Early code name for the bazooka.
TIGER	U.S. VII Corps full-dress rehearsal for UTAH assault, Slapton Sands, England, April 1944.

TILEFER	Code name for assembly of boxed and cased American vehicles in British Isles under the British Ministry of Supply.
TORCH	Allied operations in French north and northwest Africa, November 1942.
TORNADO	Task force Arawe-Toem area, New Britain.
TRADEWIND	Task force for Morotai, New Guinea
TRIDENT	U.S.–British conference held in Washington, May 1943.
TYPHOON	Task force for Cape Sansapor, New Guinea.
UTAH	U.S. VII Corps beach in Normandy, June 1944.
VICTOR	Series of operations in central and southern Philippines.
ZEBRA	Barnes mission to Europe, February 1945.

Basic Military Map Symbols

Symbols within a rectangle indicate a military unit, within a triangle an observation post, and within a circle a supply point.

Military Units—Identification

Antiaircraft Artillery ..... 

Armored Command ..... 

Army Air Forces ..... 

Artillery, except Antiaircraft and Coast Artillery ..... 

Cavalry, Horse ..... 

Cavalry, Mechanized ..... 

Chemical Warfare Service ..... 

Coast Artillery ..... 

Engineers ..... 

Infantry ..... 

Medical Corps ..... 

Ordnance Department ..... 

Quartermaster Corps ..... 

Signal Corps ..... 

Tank Destroyer ..... 

Transportation Corps ..... 

Veterinary Corps ..... 

Airborne units are designated by combining a gull wing symbol with the arm or service symbol:

Airborne Artillery ..... 

Airborne Infantry ..... 

Size Symbols

The following symbols placed either in boundary lines or above the rectangle, triangle, or circle inclosing the identifying arm or service symbol indicate the size of military organization:

Squad ..... •

Section ..... ••

Platoon ..... •••

Company, troop, battery, Air Force flight I

Battalion, cavalry squadron, or Air Force squadron II

Regiment or group; combat team (with abbreviation CT following identifying numeral) III

Brigade, Combat Command of Armored Division, or Air Force Wing X

Division or Command of an Air Force XX

Corps or Air Force XXX

Army XXXX

Group of Armies XXXXX

EXAMPLES

The letter or number to the left of the symbol indicates the unit designation; that to the right, the designation of the parent unit to which it belongs. Letters or numbers above or below boundary lines designate the units separated by the lines:

Company A, 137th Infantry .....



8th Field Artillery Battalion .....



Combat Command A, 1st Armored Division .....



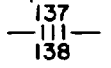
Observation Post, 23d Infantry .....



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Boundary between 137th and 138th Infantry .....



Weapons

Machine gun .....

Gun .....



Gun battery .....



Howitzer or Mortar .....



Tank .....



Self-propelled gun .....



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