

SLIM CHANCE:
THE PIVOTAL ROLE OF AIR MOBILITY IN THE BURMA CAMPAIGN

BY
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DISCLAIMER

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.

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ABSTRACT

This study applies lessons learned from air mobility's pivotal role in Field Marshal Sir William Slim's World War II Burma campaign to contemporary air mobility operations. The author begins by tracing the evolution of air mobility from its pre-World War I roots to the Second World War, noting how its development proceeded despite the lack of coherent, codified doctrine. Next the author assesses Slim's Burma campaign and how the key elements of organization, training and leadership, apart from air mobility, proved critical to Allied victory. Building upon this, the discussion turns to air mobility's contributions to Slim's joint campaign. From this analysis, the author identifies the tenets of air superiority, organization and air mobility normalization as being critical and enduring airpower lessons from the Burma theater. The closing chapters offer a primer on contemporary mobility operations before arguing that modern air mobility practitioners must account for five key essentials: superiority across the air and space domains; proper organization that promotes relationship building at the operational level of war; normalization of the complete air mobility supply chain and its accompanying idea of "air mobility mindedness"; training focused on increased interoperability; and the vital role of leadership.

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Introduction

In the opening months of 1942, forward elements of the Imperial Japanese Army's 33rd Division advanced through the jungles of lower Burma toward the Sittang River, specifically the 1,650-foot iron railway bridge spanning its otherwise impassable waters. With the bridge's capture, Japanese forces would secure a direct march route to the capital city of Rangoon and its well-developed ports on the Gulf of Martaban. Opposing their advance was the 17th Indian Infantry Division which, despite a continual retreat since opening defeats at Kawkareik Pass and Moulmein, now took up entrenched defensive positions on both river banks.

Here, in the early dawn hours of 23 February, 1942, the 17th Indian's British commander, Major General J.G. Smyth, faced a dilemma. With his brigade commanders unable to guarantee further resistance against the likely Japanese onslaught, Smyth weighed dynamiting the bridge, which would frustrate Japanese tactical plans but simultaneously strand more than two-thirds of his division on the far bank. After several minutes of agonizing deliberation, Smyth ordered the Malerkotla Field Company to drop the bridge, in turn sealing the fate of thousands of British, Indian and Gurkha troops caught on the Sittang's eastern bank.¹

Although only one episode in the Allies' long and painful retreat from Burma to India, the Sittang disaster (as it would come to be known) continues to resonate precisely for its ability to encapsulate the larger Allied difficulties in the Burmese theater during the Second World War. At Sittang, and throughout the conflict, a disparate number of races, nationalities, and motivations were involved: British, Japanese,

¹ Louis Allen, *Burma: The Longest War (1941-1945)* (New York: St. Martin's Press, 1984), 3.

American, Chinese, Indian, Gurkhan, Burmese, East and West African, native Karen, Kachin, and others.² Indeed, from these basic cultural differences emerged larger strategic differences concerning the ultimate goals of the campaign.

For the Americans, Burma remained largely a means to an end. American attention focused sharply on the campaign in North Burma and attempts to open the Ledo Road from India to Kunming, Yunnan, China. This overland supply route, designed as an alternate to the famed Burma Road cut by the Japanese invasion, served in the United States' larger strategic purpose of sustaining Generalissimo Chiang Kai-Shek's Nationalist Army as a check on Japanese divisions in China.³ American planners also prized Chinese airfields for launching strategic bombing missions against the Japanese homeland.

For the British, however, the engagement in Burma took a much different form. Although national independence movements were gaining momentum across many British colonies, to include Gandhi's in India and Ba Maw's in Burma, Great Britain still viewed the Burma campaign as one of reconquering a lost portion of the British Empire.⁴ The desperate action at the Sittang Bridge graphically highlighted this conviction. In sharp contrast, official American sentiment, fueled by President Franklin D. Roosevelt, was tilting decidedly anti-colonialist. Such differing perceptions induced both friction and suspicion over motivations into the upper echelon decision-making circles.

This divergent strategic focus translated to constant challenges in both manpower and resources for the forces fighting in Burma. As David Hogan notes, "The [Burma] theater lay at the end of long lines of communications extending halfway around the world from Britain and the United States. That, and strategic priorities, resulted in shortages of

² Allen, *Burma: The Longest War*, xiv.

³ William Slim, *Defeat into Victory: Battling Japan in Burma and India, 1942-1945* (New York: Cooper Square Press, 1956), vii.

⁴ Allen, *Burma: The Longest War*, xv.

nearly every item of supply.”⁵ Furthermore, operations in the theater were continually hampered by inadequate railroads, poor and limited roads, a scarcity of navigable waterways, and an overall dearth of motorized transport. As the geographical link between the European and Pacific theaters of operation, the China-Burma-India (CBI) Theater equally served as the seam through which many resource requests simply disappeared.

Compounding these issues, the topography of Burma itself presented unique challenges. Japanese Colonel Fuwa Maseo noted that the war in Burma was a combination of jungle, mountain and desert war with its corresponding extremes of cold and heat.⁶ Historian Louis Allen asserts that “the place and its climate were as much an enemy as the man you were sent to kill.”⁷ Wartime diaries record soldiers on both sides enduring forced mountain marches under curtains of snow flakes, then similarly quick transitions to long slogs across acres of muddy paddy fields against the solid force of driving monsoon rains.

These elements—differing strategic ends, resource shortfalls, and a forbidding environment—are but a few of several factors influencing the campaign of Burma’s most famous commander, Field Marshal Viscount William Slim. Slim, who assumed command shortly after Sittang and husbanded the thoroughly defeated Allied forces to an Indian sanctuary in 1942, would hand Japan the greatest defeat her land army has ever known a scant three years later.⁸ Within those three years, fighting ranged from ground to air to sea; across Burma to India and China; and from savage hand-to-hand combat more closely resembling the Stone Age

⁵ Slim, *Defeat into Victory*, x.

⁶ Allen, *Burma: The Longest War*, xiv.

⁷ Allen, *Burma: The Longest War*, xiv.

⁸ Edward Drea, *Japan’s Imperial Army: Its Rise and Fall, 1853-1945* (Lawrence, Kansas: University of Kansas Press, 2009), 238.

to modern warfighting technologies considered novel even by mid-twentieth century standards.⁹

Yet despite the great amount of literature on World War II, the struggle in Burma remains in many respects a “forgotten war.”¹⁰ One of the longest, most remote and demanding campaigns of the war deserves special attention, however, for many of the warfighting innovations it inspired, particularly those involving airpower. It is arguable that Slim’s Burma campaign was the singular World War II operation that *required*, not just benefitted from, air mobility for its success. As such, this thesis aims to examine air mobility’s tenets, its impact on the campaign’s successful outcome, and the application of subsequent lessons learned to current air mobility operations and doctrine.

The first chapter focuses primarily on the evolution of air mobility from its inception in World War I through the Burma campaigns of World War II. Key issues of doctrine development, aircraft acquisition, and future planning are examined through historical analysis. The second chapter explores the history of Slim’s operations to better orient readers to the strategy and tactics of the Burma campaign. This chapter specifically assesses those factors, apart from air mobility, leading to the success of Slim’s campaign.

The third chapter builds upon the previous discussion by transitioning to analysis of the specific role of air mobility in the context of the joint campaign. Key “lessons learned” from mobility operations within Slim’s campaign are subsequently identified and analyzed. The next chapter then introduces readers to contemporary air mobility operations with an emphasis on doctrine and current tactics, techniques and procedures. Because historical analysis at its best is instructive, Chapter Five refracts lessons learned from Burma through present-day

⁹ Allen, *Burma: The Longest War*, xiv.

¹⁰ David Hogan, *India-Burma* (Washington D.C.: US Government Printing Office, 1992), 24.

air mobility operations to inform and enlighten current and future air mobility practitioners. The non-contiguous battlefield of Iraq and Afghanistan, to the extent that it mirrors World War II Burma, is given particular emphasis.

Carl von Clausewitz wrote, “In reviewing the whole array of factors a general must weigh before making his decision, we must remember that he can gauge the direction and value of the most important ones only by considering numerous other possibilities—some immediate, some remote.”¹¹ In explaining the difficulty of this task, Clausewitz further noted how many generals stop short of their objective from timidity, while others equally fail through energetically overshooting. He surmised, “Only the man who can achieve great results with limited means has really hit the mark.”¹² Slim embodies such an ideal, as this thesis will illustrate through his imaginative and innovative campaign design and the key role air mobility played within it.

¹¹ Carl Von Clausewitz, *On War*, ed. Michael and Paret Howard, Peter (Princeton: Princeton University Press, 1976), 572.

¹² Clausewitz, *On War*, 573.

Chapter 1

The Development of Air Mobility Before World War II

There was no justification for buying [air] transports due to their high cost....no use which warranted their purchase.

–Secretary of War Harry Woodring, 1937

We have learned and must not forget that from now on, air transport is an essential element of air power, in fact, of national power.

–General H.H. “Hap” Arnold, 1945

Air mobility, a force-multiplying capability now widely taken for granted, transformed the modern battlefield. But its many advantages were not always readily recognizable, masked at differing times by technical limitations and prevailing paradigms of strategic thought and operational practice. Correspondingly, the development of aerial transportation followed an evolutionary course marked by both periods of crisis and stretches of remarkable success. This chapter explores the beginnings of air transport from its earliest practices in the nascent days of aviation through the beginning of the Second World War.

WORLD WAR I

Like most airpower missions, American air mobility traces its operational roots to World War I. While disparate experiments in passenger transportation, resupply and aeromedical evacuation occurred almost out of necessity in the decade before the Great War, the atmosphere of World War I proved fertile grounds for the innovative application of the tenets of mass, maneuver, economy and surprise that would only later become codified air mobility practices. On 7 September 1918, several airplanes transported 18 enlisted men from Chanute Field, Illinois to nearby Champaign in the first recorded American display of

troop transportation by air.¹ Overseas American, as well as British and French, airmen frequently employed pursuit and observation aircraft to transport senior officers, move time-sensitive intelligence and perform limited casualty evacuation throughout the Western theater.² In general, these efforts may be characterized as improvisational mission outgrowths utilizing the only means readily available—in this case pursuit and observation aircraft.

On 3 October, 1918, the first attempt at aerial resupply of combat forces took place during the Argonne Forest offensive. In the midst of intense fighting, German forces surrounded nearly 550 members of the 77th Division, subsequently known to history as the famed “Lost Battalion.” In the following days, airmen from the 50th Aero Squadron attempted to locate and drop supplies to the missing ground forces despite adverse weather conditions and intense enemy fire.³ Although the airmen were ultimately successful in determining the battalion’s true position, the initial effects of the air drop were mixed at best. As Brigadier General Billy Mitchell later recorded, “Our pilots thought they had located it [the battalion] from the panel that it showed, and dropped off considerable supplies [chocolate, concentrated food, ammunition], but later I found out they had received none of the supplies we had dropped off. The Germans had made up a panel like theirs and our men had calmly dropped off the nice food to the Germans who undoubtedly ate it with great thanksgiving.”⁴

Despite its general ineffectiveness, many planners, including Mitchell, were not dissuaded from pursuing even bolder airlift operations.

¹ Smith, Jay. *Anything, Anywhere, Anytime: An Illustrated History of the Military Airlift Command, 1941-1991*, (Scott AFB, IL: Headquarters Military Airlift Command, 1991), 2.

² Smith, *Anything, Anywhere, Anytime*, 2.

³ J.J. Hudson, *Hostile Skies: A Combat History of the American Air Service in World War I* (New York: Syracuse University Press, 1968), 266.

⁴ Stephen Longstreet, *The Canvas Falcons: The Men and Planes of World War I* (New York: Trans-Atlantic Publishing, 1995), 243.

Two weeks later Mitchell presented an ambitious plan to General John J. Pershing, Commander of the American Expeditionary Forces, proposing to airdrop the entire American First Division behind German lines. To execute this plan, Mitchell envisioned using 60 squadrons of Handley-Page bombers, comprising 1,200 aircraft, to deliver the 12,000-member strong division.⁵ According to plan, the division would receive subsequent ammunition and food resupply by air and, combined with coordinated ground assaults and air cover, maneuver against German forces and decisively defeat them.

Although slated for the spring of 1919, the proposal would have been extremely difficult to accomplish. At the time only a few Handley-Page bombers were in active service, each capable of transporting ten or fifteen soldiers and equipment, with additional orders for aircraft backlogged in production.⁶ Additionally no training between ground and air components had been attempted on any scale, much less one with the attendant complexity of a division movement and subsequent resupply.⁷ Although Pershing approved the further development of the project, this signaled his confidence in Mitchell's broad strategic air vision more than it did his assessment of the feasibility of the operation.⁸ A month later, the November armistice precluded any continued development of Mitchell's far-reaching air mobile concept.

EARLY INTERWAR ERA

As with similar airpower lessons from World War I, the potential strategic effects of air mobility were not actively pursued by the post-war air service in the interwar era. Faced with austere defense budgets, air leaders focused instead on further developing the combat arm as a means to achieving the ultimate objective—a separate, independent air

⁵ I.D. Levine, *Mitchell: Pioneer of Air Power* (New York: Arno Press, 1972), 146-151.

⁶ Roger Burlingame, *General Billy Mitchell: Champion of Air Defense* (Westport, Connecticut: Greenwood Press Publishers, 1952), 101.

⁷ Burlingame, *General Billy Mitchell: Champion of Air Defense*, 102.

⁸ Burlingame, *General Billy Mitchell: Champion of Air Defense*, 101.

force. In his 1922 annual report, Chief of the Air Service Major General Mason Patrick stated, “The 80 percent [of the Air Service] devoted to ‘air force’ or ‘combat aviation’ has suffered. The need for increased strength in this vitally important arm is readily apparent and urgently recommended.”⁹

Patrick subsequently sought to recalibrate the air arm, and the nearly 40 percent of non-combat units comprising the total force structure, through the addition of extra combat organizations.¹⁰ While high-visibility events such as the *Ostfriestland* sinking captured both governmental and public attention, air mobility assets were largely left to evolve without continued consideration. Although the Army Air Service initially invested in a limited number of cargo planes for its supply depots, the great surplus of combat planes ensured bombers doubled as transports through most of the two interwar decades. While this preserved low maintenance and production costs, such benefits weighed against the overall uneconomical use of bombers as transports since reports indicated “unless the fuselage was completely redesigned, bombers developed for combat purposes [were] lacking the aerodynamic features necessary for an effective cargo plane or troop carrier.”¹¹ With air mobility still considered, and projected to remain, a peripheral air mission, however, the cost-benefit analysis of bombers-as-transports seemed justified.

Importantly, despite relative inattention from the service bureaucracy, air mobility continued to develop largely as a result of its symbiotic relationship with civil aviation. This relationship reflected Mitchell’s argument, in *Winged Defense*, that “transportation is the

⁹ Robert White, *Mason Patrick and the Fight For Air Service Independence* (Washington D.C.: Smithsonian Institution Press, 2001), 70.

¹⁰ Charles E. Miller, *Airlift Doctrine* (Maxwell Air Force Base, Alabama: Air University Press, 1988), 2.

¹¹ Air Material Command, *Development of Transport Airplanes and Air Transport Equipment*, Dr. Genevieve Brown, US Air Force Historical Research Agency (USAFHRA), 201-7, 245.

essence of civilization...in speed the airplane excels and will continue to excel, in increasing proportion, all other means of transportation. [Therefore] the substantial and continual development of air power should be based on a sound commercial aviation. America is in a better position to develop commercial aeronautics than any other nation in the world.”¹²

The military and commercial sectors spurred each other on in the continuing development of aviation as a national resource. In mid-1922 an organized military air transport service first emerged through scheduled flights along the Model Airways, a government-sponsored national airway system.¹³ The intent of the Model Airways program, according to a memorandum from the Office of the Chief of the Air Service, was to “show the American public what can be done with the airplane as a carrier and to advertise American aviation.”¹⁴ This initiative, in concert with Mitchell’s air-minded beliefs, promoted a substantial growth in aviation infrastructure that benefitted both national defense and emerging commercial interests. Along with surveying over 3,500 landing sites, airways pilots flew more than 1.2 million miles while carrying over 1,200 passengers and 62,000 pounds of high-priority cargo.¹⁵

Largely due to the success of the program, Air Service officials in 1925 appointed a board of officers to prepare regulations governing the continued air transport service. Those regulations, arguably the nearest attempt at a codified mobility doctrine, were never completed as Congress reorganized the Army Air Service into the Army Air Corps in 1926. This reorganization, along with additional legislation, removed government participation from aviation activities that private companies

¹² William Mitchell, *Winged Defense: The Development and Possibilities of Modern Air Power--Economic and Military* (Tuscaloosa, AL: University of Alabama Press, 1925), 96.

¹³ Smith, *Anything, Anywhere, Anytime*, 2.

¹⁴ Smith, *Anything, Anywhere, Anytime*, 2.

¹⁵ Smith, *Anything, Anywhere, Anytime*, 5.

could otherwise provide. As a result, Congress discontinued Model Airways funding and subsequent scheduled military air transport vanished.¹⁶ Despite the arresting effect the move had on further military transport development, however, the civilian transport industry suddenly flourished.

The strategic culture and economic environment at the end of the 1920s further restricted the evolution of America's military air transport system. Power projection beyond the national borders remained fundamentally untested, reflecting prevailing isolationist attitudes. Economic pressures equally prevented such projection through limited aircraft development and production. Ironically, however, these same austere economic factors helped build the initial foundation for air mobility operations. With popular sentiment compelling the Air Corps to focus on defense and the overall scarcity of aviation resources dictating the dispersal of combat assets nation-wide, Air Corps leadership needed a mechanism to rapidly concentrate these limited forces against impending threats. With railway or road support options deemed too constricting, planning staffs turned to air mobility to provide the much-needed speed and flexibility of supply.

The Air Corps maneuvers of 1927 validated this change in thinking. As the final report unequivocally stated:

Air transports are essential for the movement of an Air Force. The defense of our coast line by an air force depends to a large extent on the mobility of the forces engaged. This was indicated when the enemy fleet was reported as directing its approach against the area between Boston New York, and then changing its destination to the area between the Delaware Bay and the Chesapeake Bay. The change of base of the Air Brigade to meet this change in the enemy's could be accomplished only with the assistance of air transports.¹⁷

¹⁶ Keith Hutcheson, *Air Mobility: The Evolution of Global Reach* (Vienna, Virginia: Point One Publishing, 1999), 4.

¹⁷ Air Corps Tactical School, Critique of Air and Ground Maneuvers, May 1927, USAFHRA, 248.2122, 1.

Subsequent exercises built upon this concept by incorporating the recommendation of Lieutenant Colonel Clarence Culver, Commandant of the Air Corps Tactical School, who called for supplying deployed Air Corps troops by air means.¹⁸ In demonstrating the feasibility of this notion during the 1928 aerial operations exhibition, 14 bombers transported over 73,000 pounds of equipment and personnel to the proving grounds.¹⁹ In 1930, a young Major Henry H. “Hap” Arnold employed four aircraft to move nearly 37,000 pounds of cargo over 36 missions, an impressive achievement at the time.²⁰

LATER INTERWAR ERA

Critically, however, the Air Corps’ ideas on the use of air mobility assets still largely focused inward to meet service needs. In 1931, Major Hugh J. Knerr, Chief of the Field Service Section of the Material Division and an early advocate of transport aircraft, proposed the creation of a new air cargo system. In justifying the purchase of four additional cargo aircraft, one for each supply depot, Knerr argued “If an Air Force is tied to rail heads and its services of supply dependent upon motor transportation, its mobility is that of the flat car and truck. The ideal situation is one wherein the Air Force is maintained and accomplishes all of its transportation by air.”²¹ This justification was a logical, and prevalent, extension of the field exercise lessons.

Others, however, expressed frustration at the narrow focus of the Air Corps. Lieutenant Colonel Albert Sneed, commander of the Fairfield Air Depot, criticized the services’ preoccupation with combat forces while simultaneously advocating “the larger area of action in the field of

¹⁸ Miller, *Airlift Doctrine*, 9-11.

¹⁹ Miller, *Airlift Doctrine*, 9-11.

²⁰ Miller, *Airlift Doctrine*, 9-11.

²¹ Air Technical Service Command, *The Evolution of the Storage System of the Air Technical Service Command, Part 1, 1918-1940*, USAFHRA, 201-23 v.1, 128.

transportation.”²² Sneed looked to broaden his audiences’ minds with the notion that air transportation should not solely support the needs of the air force but “those of other services as well.”²³ Air transportation, he continued, “should move to its logical destiny” with a “position of equality with rail and motor transport” and, by consequence, equally benefit the ground and naval components.²⁴ The linchpin to this transition, according to Sneed, was better centralized command and control—at the time a distant conceptual goal.

Indeed, even when greater War Department emphasis on army mobility prompted a more formalized organization of transportation assets, critical resource shortfalls persisted. Knerr’s section estimated that a 9,000-member air force in support of a million-member field army would require an impossibly-large force structure of 210 cargo airplanes, each capable of transporting 1.5 tons.²⁵ Additionally, when Major General Benjamin D. Foulois, Chief of the Air Corps, ultimately approved the 1st Air Transport Group (Provisional) as a peacetime skeletal organization primed for wartime expansion, the group’s four transport squadrons still relied on “enlisted men as pilots and whatever planes were available...to move engines, parts and other equipment between the depots and area airfields...while also providing air transport support for exercises and maneuvers.”²⁶ In retrospect, while these moves were small steps in the right direction, the focus still remained squarely on supporting only air force elements and air force operations. The synergy of true joint operations had yet to be realized.

²² Air Material Command, *Development of Transport Airplanes and Air Transport Equipment*, 49.

²³ Air Material Command, *Development of Transport Airplanes and Air Transport Equipment*, 49.

²⁴ Air Material Command, *Development of Transport Airplanes and Air Transport Equipment*, 50.

²⁵ Air Technical Service Command, *The Evolution of the Storage System of the Air Technical Service Command*, 128.

²⁶ Air Material Command, *Development of Transport Airplanes and Air Transport Equipment*, 50.

Correspondingly, in 1934 the most innocuous of all daily items—the mail—highlighted the widespread neglect of air transport, in turn causing ripple effects throughout the Air Corps. In February, the Roosevelt Administration determined civil airmail contracts had been improperly awarded during the previous Hoover administration.²⁷ Consequently, Roosevelt canceled all existing contracts and ordered the Army Air Corps to assume the mail routes. The move forced Foulois, lacking either dedicated transport planes or a trained pilot force, to press into service every available pursuit, observation and bomber aircraft. The higher operations tempo, coupled with poor winter weather and a lack of training, contributed to several high-profile Army crashes along the mail routes. The ensuing public outcry and political pressure forced the Roosevelt Administration to issue new civil contracts and remove the Air Corps from mail service.²⁸

The public embarrassment resulting from the air mail disaster compelled the Army Air Corps to reorganize, with all offensive aviation forces consolidated under the General Headquarters (GHQ) Air Force while the Air Corps retained training and supply functions. Yet this restructuring also induced command-and-control issues that presaged larger World War II organizational concerns. Air Corps planners formed the 10th Transport Group, headquartered at Patterson Field, Ohio, in 1937 as an air transport organization to provide “training and development which can be rapidly expanded in an emergency, as well as augment the movement of personnel and supplies of tactical units in peace maneuvers.”²⁹ Planners later intended to expand the number of aircraft assigned to the 10th while also adding a five-squadron transportation group under GHQ Air Force.³⁰ Forming two separate air transport organizations, with differing objectives, drove this vision: the

²⁷ Smith, *Anything, Anywhere, Anytime*, 8.

²⁸ Smith, *Anything, Anywhere, Anytime*, 8.

²⁹ Smith, *Anything, Anywhere, Anytime*, 9.

³⁰ Smith, *Anything, Anywhere, Anytime*, 9.

10th Transport Group for widespread logistical support and GHQ Air Force squadrons for tactical support.

Fearing the dilution of mobility capability across too many bases, however, Brigadier General Augustine Robins, Chief of the Air Corps' Material Division, objected and suggested instead all transport planes consolidate under the 10th Transport Group.³¹ Under this construct of centralized control, Robins argued, planes could be directed to fulfill any Air Corps or GHQ Air Force tasking while more efficiently fulfilling other logistical missions in the non-tasked down time. The new Chief of the Air Corps, Major General Oscar Westover, rejected this proposal, however, and allowed GHQ Air Force to retain its organic mobility fleet. Additionally, when GHQ Air Force requirements exceeded capacity, the 10th Transportation Group was directed to execute any remaining shortfalls.³²

This organizational arrangement persisted until the eve of World War II. Of note, the Air Corps, as well as Britain's Royal Air Force, still eschewed any large-scale, coordinated airlift exercise with a sizable land component.³³ During the mid-1920s, the RAF had occasionally airlifted company-size units around Mesopotamia and the greater Middle East on imperial policing duties.³⁴ As previously noted, the Army Air Corps had also transported squadron support personnel around the country on maneuvers via air. Yet neither air force attempted to match the scale, intensity or duration of the Luftwaffe's airlift of Nationalist troops from Spanish Morocco into Spain in 1936.

From the end of July until mid-October, more than 20,000 Nationalist soldiers were moved into the theater of operations. Of this, the Luftwaffe airlifted more than two-thirds, or 13,000 troops, along with

³¹ Smith, *Anything, Anywhere, Anytime*, 10.

³² Maurer Maurer, *Aviation in the U.S. Army, 1919-1939*. (Washington, D.C.: Office of Air Force History, 1987), 369.

³³ Richard Townshend Bickers, *Military Airlift Transport: The Illustrated History* (London: Osprey Aerospace, 1998), 32.

³⁴ Bickers, *Military Airlift Transport: The Illustrated History*, 30.

270,000 kilos of equipment ranging from machine guns to ammunition to artillery pieces.³⁵ As historian James Corum notes, "The entire operation was carried out under extremely arduous conditions with the loss of only one aircraft" and Arnold himself deemed the airlift "one of the most important developments in military air power in recent years."³⁶

A critical contributing factor to the Allied inability to achieve, or even attempt, such an operation directly relates to its lack of advanced mobility technology. Specifically, neither British nor American air forces had invested substantially in an air mobility platform. On 30 June 1929, the Air Corps possessed 31 cargo planes with 10 more ordered but undelivered.³⁷ A five-year proposed acquisition plan called for purchasing a total of 3,530 Air Corps airplanes.³⁸ Of that total, 158 were designated cargo planes and assigned primarily to GHQ units.³⁹

In April 1934 the Baker Board, one of 11 military aviation commissions during the interwar years, was appointed to examine the relationship between Army and civilian aviation as well as contributing causes to the air mail disaster two months prior. Clearly enamored with advances in civilian aircraft, and favoring economy, the board recommended "the Army Air Corps should whenever possible use converted commercial air transport of acceptable performance for cargo and transport airplanes."⁴⁰ Additionally the board stated that "in general, it seems desirable that cargo and transport airplanes procured by the Air Corps be developed from types in use in commercial service and in production, instead of specially developed types that would not be

³⁵ James S. Corum, *The Luftwaffe: Creating the Operational Air War, 1918-1940* (Lawrence, Kansas: University Press of Kansas, 1997), 185.

³⁶ Corum, *The Luftwaffe: Creating the Operational Air War*, 185.

³⁷ Miller, *Airlift Doctrine*, 4.

³⁸ Miller, *Airlift Doctrine*, 4.

³⁹ Miller, *Airlift Doctrine*, 4.

⁴⁰ Air Corps Plans Division, "Final Report on War Department Special Committee in Army Air Corps [Baker Board]," USAFHRA, 145.93-94A, 2-3.

available in large quantities in the event of an emergency.”⁴¹

Foulois, as Air Chief at the time, took exception to the board’s results and offered a well-reasoned response. While noting the different military requirements for aircraft durability, flexibility, and speed, he further added, “Commercial airplane manufacturers are not specializing in the development of cargo-carrying airplanes, as such, so that if a cargo plane is desired by the Army Air Corps it must be developed under government supervision and with government funds, primarily as a cargo airplane, with the capability of conversion for passenger-carrying or air ambulance work as secondary considerations.”⁴²

In truth, the debate was largely moot. As Major Walter Frank, chief of the Air Corps Plans Division testified, the Air Corps remained ready to “show the advantage to the operation of the Air Corps of the establishment of aerial transport facilities for supplying Air Corps units in time of war in the theater of operations.”⁴³ Yet Congress capped the Air Corps authorized strength at 1,800 total aircraft and even that number, Frank argued, “will not give [us] an Air Force that meets the minimum requirements for the air defense of the United States.”⁴⁴ As such, no aircraft were to be diverted for mobility purposes.

Economic considerations continued to relegate cargo aircraft acquisition to lower-level status late into the interwar period. In December 1936, Brigadier General Arnold, now Assistant Chief of the Air Corps, tried to convince both the Army General Staff and the War Department to purchase additional transport aircraft. The successful Luftwaffe airlift, along with Italian airdrop operations in Ethiopia in 1935-1936, greatly influenced his position.⁴⁵ Secretary of War Harry

⁴¹ Air Corps Plans Division, “Final Report on War Department Special Committee in Army Air Corps [Baker Board],” 2-3.

⁴² Miller, *Airlift Doctrine*, 8.

⁴³ Miller, *Airlift Doctrine*, 7.

⁴⁴ Miller, *Airlift Doctrine*, 7.

⁴⁵ Air Material Command, *Development of Transport Airplanes and Air Transport Equipment*, 87.

Woodring, however, disapproved Arnold's request in 1937, noting he saw no reason "for buying any transports due to their high price."⁴⁶

Additionally Secretary Woodring allocated funds for the purchase of only 36 transports in 1938 and none in 1939.⁴⁷ He further directed the Army Air Corps to convert old bombers to transports in order to meet any pressing airlift requirements.

ROYAL AIR FORCE TRANSPORT DEVELOPMENT

Despite becoming an independent service during the First World War, the Royal Air Force (RAF) developed its transport forces in similar fashion to those of its American counterpart. Although the Great War witnessed the emergence of many doctrinal air mobility roles, most notably the attempted aerial re-supply of besieged Indian troops at Kut-Al-Amara in Mesopotamia, post-war budget challenges similarly forced British airmen to first tout the offensive, kinetic potential of the air service.⁴⁸ Yet one key difference, the decidedly anti-isolationist, colonial orientation of Britain, portended in favor of greater transport force development.

Indeed, in 1921 at the height of the challenges to the RAF, the first major air route from Cairo to Baghdad began as airplanes navigated along primitive vehicle tracks across the desert landscape.⁴⁹ Additional routes soon followed into Africa and the Far East in what would eventually form the foundation for civil airway routes. This tied into Chief of Air Staff Sir Hugh Trenchard's larger strategy of establishing the RAF's reputation for long-distance, high-altitude and high-speed flying and the close civil aviation relationship required to achieve them.⁵⁰ Critically, while American airmen mapped airways linking continental US

⁴⁶ Hutcheson, *Air Mobility: The Evolution of Global Reach*, 6.

⁴⁷ Hutcheson, *Air Mobility: The Evolution of Global Reach*, 6.

⁴⁸ CJ Finn, *A Brief History of the Royal Air Force* (Norwich: Crown Publishing, 2004), 30.

⁴⁹ Graham Pitchfork, *The Royal Air Force Day by Day* (Chalford: Sutton Publishing, 2008), 200.

⁵⁰ Finn, *A Brief History of the Royal Air Force*, 71.

cities, British airmen mapped routes for the Empire to such far-reaching destinations as Australia, Singapore and the southern tip of Africa.⁵¹

Yet importantly, British aviation lagged considerably behind American companies in the development of most passenger-carrying aircraft and subsequently could not sustain the industrial base necessary to support growth within the RAF.⁵² Similar to American forces, British mobility airmen piloted dual-purpose Victoria bombers as transports for most of the interwar years, including the first major civilian airlift in history when nearly 600 women and children were removed from a besieged Kabul in 1928 at the request of the British envoy.⁵³ The lack of suitable, dedicated transport planes also limited the number of troops the British could move between Iraq and India during its air policing phases. Only after Ferrying Command helped establish the North Atlantic transit routes in 1941 and the venerable DC-3 started arriving by the thousands, could the RAF further expand its transportation arm for global action in World War II and within Burma specifically.⁵⁴

ENTRY INTO WORLD WAR II

The outbreak of war in 1939 gave the United States much-needed time, and a sense of urgency, to form a rudimentary military transport service before its own direct involvement began in December 1941. Although no formal pre-war doctrine ever officially existed, mobility historian Charles Miller identifies five tenets as both embodying and influencing the force that would engage in World War II:

- The primary and overriding role of military transportation is to support the air forces. As such, it belongs to the air forces and will be controlled by them.

⁵¹ Finn, *A Brief History of the Royal Air Force*, 73.

⁵² Christopher Chant, *The History of the RAF: 1939-1989* (London: Chevprime Limited, 1990), 78.

⁵³ Pitchfork, *The Royal Air Force Day by Day*, 383.

⁵⁴ Chant, *The History of the RAF: 1939-1989*, 78.

- Military air transportation is vital to the flexibility and mobility of GHQ air forces. Some degree of air transportation should be organic to that force, and other air transportation assets will be called upon to augment that fighting force when required, at the expense of other missions.
- Military air transportation is also important as a logistics tool for the entire air force. It offers an economic and very reliable way to distribute supplies and to avoid certain stock level costs
- All of the advantages of military air transportation notwithstanding, it is less important than the development, acquisition, and operation of combat forces. As the infantry is called the queen of battle, so too combat aviation may be called the queen of the air forces
- Civil air transportation is relatively plentiful and becoming more so with time. Although civil air transportation airplanes are not perfectly designed for military purposes, they are sufficiently so that the air force will rely on mobilizing them in wartime, at the expense of building an organic capability in peacetime⁵⁵

This “loose” doctrine directly contributed to two key challenges facing American mobility forces at the beginning of World War II. The first challenge concerned resources or, more specifically, the lack of air mobility platforms. At the beginning of December 1941, the Army Air Forces possessed only 11 four-engine mobility planes.⁵⁶ Additionally, these transports were divided among modified B-24 bombers [called the C-87], two different types of seaplanes, and the Boeing C-75 Stratoliner. Earlier efforts to spark civilian aircraft investment, however, now paid dividends. On 13 December, 1941, President Roosevelt authorized the nationalization of the civil aviation industry by the War Department and immediately the air force gained 400 transports from airline service and, more critically, the long-term production capability of C-47 transports.⁵⁷

Pilot shortages persisted, however, and ultimately presented a dilemma to War Department planners. Although more than 2,500 airline pilots were Army reservists, recalling even a significant portion to active

⁵⁵ Miller, *Airlift Doctrine*, 19.

⁵⁶ W.F. Craven and J.L. Cate, ed., *The Army Air Forces in World War II, Volume One* (Chicago: University of Chicago Press, 1948), 352.

⁵⁷Smith, *Anything, Anywhere, Anytime*, 32.

duty too quickly would disrupt the fragile national transportation system. Consequently the airlines transported the bulk of the military's air logistic requirements during the war's opening stages, to include almost 90 percent in 1942.⁵⁸ Only by 1945 had the military training system peaked and military flight crews accounted for 81 percent of airlifted materials.⁵⁹

The resource scarcity also underpinned the second major challenge for mobility forces in World War II, how to best organize to maximize efficiency. In the summer of 1941, Army aviation underwent a major reorganization when the General Staff established the Army Air Forces (AAF) and named Arnold its first chief. Additionally, the General Staff created two subordinate units within the AAF: the Air Force Combat Command (AFCC) comprised of former GHQ Air Force units, and the Air Corps responsible for all other AAF functions.⁶⁰ The reorganization added impetus for Arnold to resolve overlapping responsibilities between the Air Service Command, an organization assigned responsibility for maintenance supply of Army aircraft, and the burgeoning Air Corps Ferry Command charged with delivering Lend-Lease aircraft to Great Britain and other allied nations.

In crafting a solution, Arnold returned to the framework of the GHQ Air Force and the Air Corps of the mid-1930s. In his decision, Arnold restricted the Air Service Command to the Western Hemisphere while also assigning to the organization the additional duty of creating transport squadrons capable of conducting airborne troop and glider assaults. In essence, Air Service Command mirrored the tactical focus of the GHQ Air Force. Ferry Command, on the other hand, retained the global mission of aircraft delivery and the corresponding development of necessary air routes and long-range procedures to sustain cargo

⁵⁸Smith, *Anything, Anywhere, Anytime*, 17.

⁵⁹ R.D. Hinds, "The Development of Strategic Airlift for the Armed Forces of the United States, 1941-1965," (Scott AFB, IL: Office of MAC History, July 1968), 3.

⁶⁰ Cate and Craven, *The Army Air Forces in World War II, Volume One*, 115.

worldwide channels. This command approached the strategic concept of global air mobility operations functioning under centralized control.

While tidy on paper, the delineation of forces in reality proved more convoluted. Due to its varying requirements and combat-specific focus, the tactical airlift mission was parceled out to air components of respective theater commands for use by the joint force commander within theater. Strategic airlift, however, remained under centralized control in the United States to ensure its efficient utilization across multiple theaters. Under the unrelenting strain of scarce mobility resources, however, theater commanders frequently redirected strategic airlifters transiting their area of responsibility to meet pressing theater-specific needs. This induced great friction throughout the entire warfighting supply chain.

In June 1942, the War Department issued formal direction to theater commanders to refrain from diverting transports within their theater. This order worked to great, but not complete, effect.⁶¹ Additionally, on June 20th General Arnold further codified the doctrinal split by issuing AAF General Order Number 8. Aimed to further reduce duplication of effort and elimination of dual responsibility, the order created the strategic-focused Air Transport Command and the tactical-focused Troop Carrier Command as the foundational organizations of air mobility.⁶² Two years later, AAF Regulation 20-44 specifically cemented the differing roles and responsibilities of global transport services and theater transport command.⁶³ The China-Burma-India Theater came to rely heavily on resources from both organizations in prosecuting the war against Japan.

CONCLUSIONS

⁶¹ *Administrative History of the Ferrying Command, 29 May 1941 – 30 June 1942* (Army Air Forces Historical Study No 33, 1945), 33.

⁶² Smith, *Anything, Anywhere, Anytime*, 21.

⁶³ Miller, *Airlift Doctrine*, 65.

More than any other component of the air arm, the air mobility forces truly encapsulated the global nature of the Second World War. Its evolutionary path from humble pre-World War I beginnings, however, proceeded in fits and starts, with great success and corresponding failure over the course of two decades between wars. In general air mobility lacked a solid theory of employment and, consequently, with only the sporadic development of associated mission capabilities, air force leaders were slow to realize its strategic importance in the warfighting realm.

This lack of awareness manifested itself in numerous ways. Throughout the 1920s and 1930s, mobility aircraft continued to suffer in resources and development in relation to combat aircraft, the vehicle through which air leaders sought to establish the independence of the air service. In August 1938, General Westover continued General Patrick's earlier argument by stating more four engine bombers were required to "balance" the air force.⁶⁴ This idea persisted despite the overwhelming ratio of combat to transport craft, peaking at a ratio of 5146 to 653 in January 1945.⁶⁵

Without a codified theory of employment, mobility aircraft also necessarily relied upon commercial industry for advances in aircraft design and technology as well as pilot manning. As such, "in the periods both prior to, and during World War II, the principal pattern involved commercial types which were employed by the military either in original form or in a version modified to fulfill certain requirement...the Army Air Forces was dependent upon commercial technological development to supply transports."⁶⁶ Subsequently, the US entered World War II with largely generic civilian aircraft or poorly modified bombers attempting to fulfill specific and demanding mission requirements. The same principle

⁶⁴ Major General Oscar Westover, Chief of the Air Corps, to Adjutant General, memorandum, 31 August 1938, USAFHR, 145.93-23.

⁶⁵ Air Material Command, *Development of Transport Airplanes and Air Transport Equipment*, 245.

⁶⁶ Air Material Command, *Development of Transport Airplanes and Air Transport Equipment*, 245.

held true for pilot development, ultimately inducing a widespread “catch up” program for mobility forces.

The greatest advance among air mobility assets, however, included the refinement of command and control processes. Driven by resource shortfalls and the integration of air mobility on par with ground and sea transportation elements, the shift away from primarily unit-level forces to a body comprised of both strategic and tactical aircraft signaled a greater recognition of the need for efficiency among limited air transport assets. Although this refinement process would continue throughout the Second World War, it helped usher the air mobility mission to one of increased prominence among air power contributions through the remainder of the century. Ultimately, then, trial-and-error attempts stemming from the early days of aviation, fused with focused determination against the backdrop of impending war, fomented the evolutionary development of air mobility as a revolutionary addition to the battlefield of World War II.

Chapter 2

Slim's Burma Campaign

*By the old Moulmein Pagoda, lookin' eastward to the sea,
There's a Burma girl a-settin', and I know she thinks of me;
For the wind is in the palm-trees, and the temple-bells they say:
'Come you back, you British soldier; come you back to Mandalay!'*
—Rudyard Kipling, 1890

In *The Longest War*, Louis Allen's definitive account of the Burma campaign, the famed military historian notes, "The Japanese say Java was their happiest station in Asia, Burma their worst; and the latter verdict might well be shared by British soldiers who fought there. Farthest away from home, at the end of a long and often rickety supply line, they remained largely unnoticed by a public in the United Kingdom for whom the war was, by its very nature, remote from everyday experience."¹ The US public shared this sentiment, fueled by the lack of large, committed American ground forces and a distinct unfamiliarity with the distant battlefields of Imphal and Meiktila that competed for attention, and lost, against those of Midway or Normandy.

Historical accounts, in many respects, reflect this larger trend, leaving the rich story of the Burma campaign and Field Marshal Viscount William Slim's armies confined to the smaller corners of general World War II knowledge. In an attempt to redress this imbalance, this chapter offers a brief overview of operations in the "forgotten theater" while simultaneously identifying and assessing the critical factors of organization, training, and leadership that proved critical, outside of air mobility, to the Allied victory in Burma.

CAMPAIGN OVERVIEW

Most discussions of WWII Burma begin with descriptions of the nation's forbidding geography, a natural starting point given its significant influence on campaign design. A nation with a total area of

¹ Allen, *Burma: The Longest War*, xvii.

416,000 square miles, Burma is 1.8 times larger than Japan and 2.3 times larger than Great Britain.² Malarial, impenetrable jungle dominates much of this landscape along with alluvial deltas and coastal swamps that, while providing abundant natural resources for the largely agricultural society, further impede the development of a robust national transportation network.³ To the west and north-northeast, hills and mountain ranges in excess of 10,000 feet form a natural border with Burma's strategic neighbors India and China, while simultaneously ringing the relatively open Shwebo plain of Central Burma.⁴

The Irrawaddy River bisects the country from the north to the south and serves, along with its main tributary the Chindwin, as a major transportation line before emptying into the Bay of Andaman.⁵ Burmese rivers, typical of others in Southeast Asia, replenish from rainfall precipitated by the Indian Ocean's dominating monsoon winds. The monsoon season usually begins in May and runs through October, when the winds change from south-west to north-east, with rainfall at its heaviest from June to August.⁶

Britain first imposed its rule on the 2,500-year-old Burmese civilization in 1824, administering it as a province of India until 1937 when, against the backdrop of burgeoning nationalist sentiment, Burma achieved colony status.⁷ With the outbreak of war, British officials based Burma's defensive scheme upon her unforgiving topography, coupled with the inherent difficulty imposed by monsoon rains and a belief that

² John Nunnally and Kazuo Tamayama, *Tales by Japanese Soldiers* (London: Cassell and Company, 2000), 13.

³ Gerald Astor, *The Jungle War: Mavericks, Marauders, and Madmen in the China-Burma-India Theater of World War II* (Hoboken, NJ: John Wiley and Sons, Inc., 2004), 6.

⁴ David Steinberg, *Burma/Myanmar: What Everyone Needs to Know* (Oxford: Oxford University Press, 2010), xxvi.

⁵ Astor, *The Jungle War: Mavericks, Marauders, and Madmen*, 7.

⁶ Nunnally and Tamayama, *Tales by Japanese Soldiers*, 6.

⁷ Michael W. Charney, *A History of Modern Burma* (Cambridge: Cambridge University Press, 2009), 5.

sufficient warning time would be available to organize the loosely arranged defense forces.⁸

The rapid advance of the Japanese army, however, cut short such time. Following successful campaigns in Malaya, the Dutch East Indies, and Singapore, two Japanese divisions launched attacks across the Thai border and captured the Tenasserim airfields in Burma's southern provinces in early February 1942.⁹ After establishing air superiority, Imperial Japanese forces swiftly advanced northward against two inexperienced British divisions, winning successive victories at Moulmein and the Sittang Bridge before capturing the capital at Rangoon.¹⁰ With the sea ports of lower Burma secured, and their military position further consolidated, the Japanese were free to effect their grander strategic goal of interdicting supplies transiting the Burma Road from Lashio to Chiang Kai-Shek's Nationalist forces near Kunming, China.¹¹

British elements, conversely, suffered through the longest retreat in Britain's storied military history.¹² Lieutenant General Sir William Slim first arrived to take command of the forces, now known as Burcorps, following their near annihilation at Taukkyan, where Japanese forces inexplicably and fortuitously removed a roadblock that would otherwise have trapped the withdrawing remnants of the Rangoon garrison and the 17th Division.¹³ A veteran of World War One, where he was wounded at Gallipoli as well as in Mesopotamia, Slim had transferred to the Indian Army during the inter-war years, where he earned a permanent commission, attended staff college, and commanded

⁸ Christopher Bayly and Tim Harper, *Forgotten Armies: The Fall of British Asia, 1941-1945* (Cambridge: Belknap Press, 2005), 97.

⁹ Bayly and Harper, *Forgotten Armies*, 157.

¹⁰ H.P. Willmott, *The Second World War in the East* (London: Casell, 1999), 63.

¹¹ Ian Lyall Grant and Kazuo Tamayama, *Burma 1942: The Japanese Invasion* (Chichester, West Sussex: The Zampi Press, 1999), 27.

¹² Richard Holmes, ed., *The Oxford Companion to Military History* (Oxford: Oxford University Press, 2001), 160.

¹³ Holmes, *The Oxford Companion to Military History*, 160.

a Gurkha battalion.¹⁴ Now, despite the addition of Chinese reinforcements under the direction of American Lieutenant General Joe Stillwell, the Allied retreat persisted; and Slim's forces crossed the Chindwin River into Indian sanctuary at the end of May, when monsoon rains also halted further Japanese advances.¹⁵ In sum, the retreat cost 13,000 Allied casualties to only 4,000 suffered by the Japanese, with nearly 50,000 corresponding civilian deaths and more than 500,000 Burmese having been displaced.¹⁶

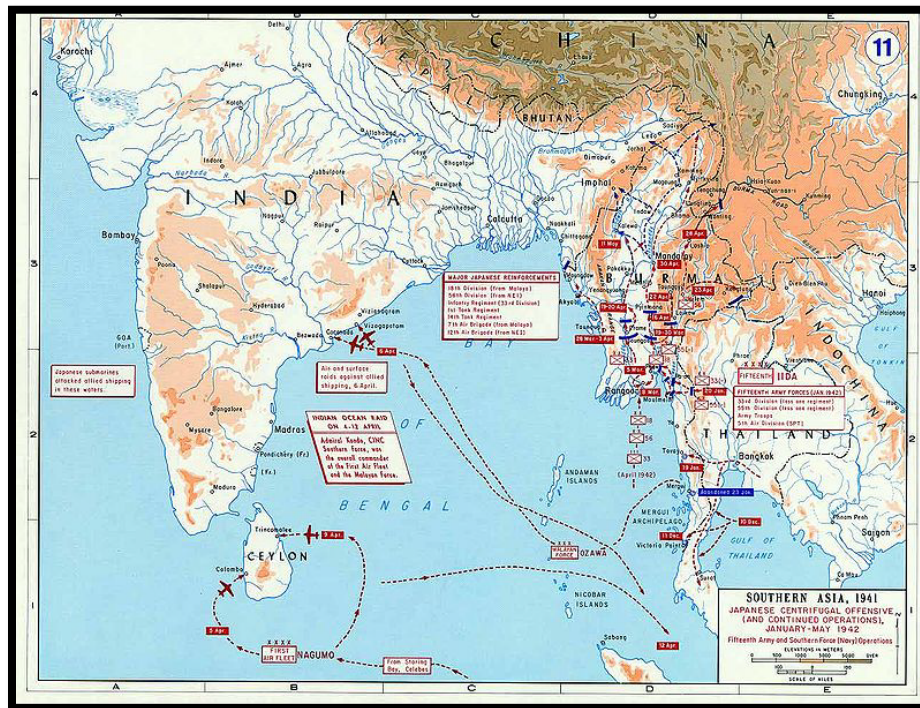


Figure 1: Japanese Offensive, January - May 1942

Source: United States Military Academy, Department of History, <http://www.dean.usma.edu>

The next eighteen months of the Burma Campaign witnessed little direct action as Allied leadership sought to redress significant force deficiencies and Japanese divisions improved their defensive posture. Spurred by the psychological loss of Burma, however, and seeking to

¹⁴ Holmes, *The Oxford Companion to Military History*, 843.

¹⁵ Joseph Stillwell, *The Stillwell Papers* (New York: William Sloane Publishers, 1948), 83.

¹⁶ Holmes, *The Oxford Companion to Military History*, 160.

regain the initiative, the British theater commander General Sir Archibald Wavell launched an offensive into the Arakan peninsula in early December 1942.¹⁷ Despite initial successes, however, the advance soon faltered against superior Japanese troops before ultimately ending in embarrassing failure. Two months later, Brigadier Orde Wingate launched the first of his Chindit expeditions, which while offering substantial returns in improved morale, otherwise resulted in insignificant material damage to the enemy.¹⁸

In January 1944, the Japanese military responded with its own Burma offensive. In the preceding months, Japanese senior leadership had invested heavily in forming the Indian National Army [INA], a group of captured Indian troops serving under ultra-nationalist Subhas Chandra Bose, a former Indian National Congress member.¹⁹ The Japanese commander in Northern Burma, Lieutenant General Renya Mutaguchi, hoped to employ the INA following a successful attack into India with the greater objective of knocking India—and by consequence Britain—out of the war in the Pacific altogether.²⁰

Slim, who after extensive Allied reorganizations now commanded the Fourteenth Army, anticipated a general Japanese offensive and opted to absorb and exhaust any blow before launching a subsequent counterattack. After fierce jungle fighting the Allied forces successfully defeated the first Japanese phase, an attack up the Arakan peninsula known as U-GO.²¹ In March 1943, Mutaguchi launched the second and main effort, named HA-GO, toward the north-east Indian town of

¹⁷ J. Lee Ready, *Forgotten Armies: The Military Contributions of the Colonies, Exiled Governments, and Lesser Powers to the Allied Victory in World War II* (London: McFarland & Company, Inc., Publishers, 1985), 63.

¹⁸ Ready, *Forgotten Armies*, 64.

¹⁹ Basil Collier, *The Second World War: A Military History* (New York: William Morrow & Company, Inc., 1967), 490.

²⁰ Collier, *The Second World War: A Military History*, 487.

²¹ Hogan, *India-Burma*, 15.

Imphal.²² After encircling Allied troops at a critical redoubt near Kohima, and surrounding the main body at Imphal, the invading Japanese divisions were ultimately checked at a cost of more than 60,000 casualties, marking Japan's largest land defeat of the entire Second World War.²³

Six months later, the Allied offensive commenced in December 1944 with flanking forces in northern Burma and the Arakan supporting Slim's main thrust southward across the central plain. After extensive maneuvering and intense fighting across the Irrawaddy River, the key strongholds of Mandalay and Meiktila fell, in turn clearing southern avenues to Rangoon for Slim's forces racing the onset of monsoon season.²⁴ Japanese forces quickly abandoned the capital city and Allied forces seized possession at the beginning of May. At that point large scale military operations within Burma ceased, with the war terminating a few short months later in August, 1945.

KEY FACTORS

Many factors, including the contributions of air mobility, contributed to the successful conclusion of the Burma campaign. Slim's army also benefitted from a high level of effectiveness in three factors: organization, training, and leadership.

ORGANIZATION

Many of the Allied reverses at the outset of the Burma campaign may be directly attributed to the lack of organization in the command relationships. "In Burma our unpreparedness when the blow fell was extreme, and we paid for it," noted Slim in *Defeat Into Victory* before further detailing its chief cause.²⁵ "In the space of about sixteen vital months there had been five separate superior headquarters in turn

²² Hogan, *India-Burma*, 15.

²³ E.W. Elliot, *Burma: The Forgotten War* (Bloomington, Indiana: AuthorHouse, 2005), 128.

²⁴ Holmes, *The Oxford Companion to Military History*, 162.

²⁵ William Slim, *Defeat into Victory: Battling Japan in Burma and India, 1942-1945* (New York: Cooper Square Press, 1956), 10.

responsible for the defense of Burma, and for practically the whole of that time administrative had been separated from operational control.”²⁶ These revolving headquarters were primarily a consequence of the evolving political and international dynamic.

Until 1937 the defense of Burma had largely fallen to the Indian government because the two nations were intimately linked in military affairs—Burma was, in fact, generally viewed as a defensive outwork of India. This relationship changed, however, when Burma became its own colony in 1936 and subsequently responsible for its armed forces.²⁷ With the outbreak of war in the fall of 1939, the British Chiefs of Staff assumed operational control of Burmese forces, while the Burmese government retained administrative responsibilities.²⁸ One year later, the Singapore-based Far Eastern Command took operational control, while administrative control was divided between the Burmese government and the War Office in London.²⁹ In December 1941, Indian authorities regained control of Burmese defenses—for three weeks—until the disintegration of the Java-based Southwest Pacific Command cemented its permanent return to Indian commanders in early 1942.³⁰

This lack of command continuity presented numerous, tangible disadvantages that persisted throughout the conflict. Slim charges that the repeated separation of operational and administrative control ensured that “little to no progress [was] made in linking up India and Burma by road, so that when war came there was no overland communication between them.”³¹ The unclear lines of responsibility also precluded development of the northeastern Indian state of Assam, a

²⁶ Slim, *Defeat into Victory*, 11.

²⁷ John Cady, *A History of Modern Burma* (Ithaca, New York: Cornell University Press, 1958), 387.

²⁸ Slim, *Defeat into Victory*, 11.

²⁹ Jeremy Black, *World War II: A Military History* (Routledge Press, 2003), 96.

³⁰ Slim, *Defeat into Victory*, 11.

³¹ Slim, *Defeat into Victory*, 11.

key military staging area for overland attacks into Burma.³² Finally, no clear process for identifying troop or supply requirements—or how to resource such requirements—was ever fully developed. As Slim correctly identified, “An army whose plan of campaign is founded on fundamental errors in organization cannot hope for success unless it has vast superiority over the enemy in numbers and material.”³³ The Allies in the Burma theater had the former, and only belatedly would welcome the latter.

Fortunately, after the dispiriting results of the first Arakan campaign highlighted the operational deficiencies of piecemeal command organization, the Allies introduced sweeping reforms. Following the 1943 Quebec Conference, the Combined Chiefs of Staff established the South East Asia Command (SEAC) in August under the command of British Admiral Lord Louis Mountbatten.³⁴ The headquarters was designated as being combined, with British and American representation, as well as joint between the army, air and naval services. In simplified terms, the reorganization allowed Mountbatten to direct the overall theater strategy while three service commanders-in-chief supervised near-term operations within their components.

Although clean on paper, and a marked improvement overall, political considerations among subordinate entities complicated command relationships and required effective expedients, specifically regarding Stillwell and Chiang Kai-Shek. With the advent of SEAC Mountbatten planned to organize all land forces under one command, British General George Giffard’s 11th Army Group. Stillwell, however, as SEAC’s Deputy Commander and the senior American theater commander, resolutely refused to serve under Giffard.³⁵ Stillwell

³² Astor, *The Jungle War: Mavericks, Marauders, and Madmen*, 103.

³³ Slim, *Defeat into Victory*, 115.

³⁴ Trevor Dupuy, *Strategic Direction of World War II* (New York: Franklin Watts, Inc., 1965), 37.

³⁵ Slim, *Defeat into Victory*, 206.

maintained additional authority as the only general Chiang Kai-Shek would permit to exercise operational control over Chinese forces in Northern Burma. Only through a complicated compromise, in which Stillwell placed his Northern Combat Area Command under Slim's Fourteenth Army, which itself still reported to Gifford, was a potentially debilitating organizational dispute finally defused.³⁶ As the next chapter indicates, similar issues arose within the air force chain of command, also driven by Stillwell's intransigence, which achieved resolution only after vigorous debate and Stillwell's departure from the theater in October, 1944.³⁷

In his postscript to *Defeat Into Victory*, Slim unequivocally addresses the connection between proper organization and success. "The organization of the command in a theater is, of itself, the utmost importance," he wrote. "The first step towards ultimate victory in South-East Asia was the setting up of a supreme command, controlling all Allied forces, land, sea and air, in the area. There will always be these frictions to a greater or lesser degree in any Supreme Headquarters, but where Allied forces are operating together, there is no effective solution other than a Supreme Headquarters."³⁸

On a scale smaller than theater level command, the role of organization proved equally vital. During the early phase retreat from Rangoon, Slim's entire Burcorps might have been trapped without the efforts of Sun Li-Jen's Chinese 38th Division.³⁹ Slim persuaded Sun, who was initially distrustful of British intentions, to engage in battle by placing all the Burcorps guns north of the Pin Chaung and that "most precious of assets, Brigadier Anstice's 7th Armoured Brigade" under his

³⁶ Slim, *Defeat into Victory*, 207.

³⁷ Charles Romanus and Riley Sunderland, *Stillwell's Command Problems* (Washington, D.C.: Office of the Chief of Military History: Department of the Army, 1956), 470.

³⁸ Slim, *Defeat into Victory*, 536.

³⁹ Allen, *Burma: The Longest War*, 64.

command.⁴⁰ This bold move, particularly given the Chinese command's poor reputation, saved Burcorps in the near term while also paying important long-term dividends.

Building upon the trust engendered by the unorthodox unity of command, Slim gained crucial insights into Japanese tactics from a Chinese general who participated at Changsha, China's one significant victory against the Japanese to that time. The general related "the Japanese, confident in their own prowess, frequently attacked on a small margin of safety...and estimated a force would usually not have more than nine days' supplies available. If [one] could hold the Japanese for that time, prevent them from capturing supplies, and then counter-attack, [one] would destroy them."⁴¹ Slim internalized the lesson and employed it to great effect in subsequent campaign plans.

Additionally, the Allied forces benefitted from a stroke of organizational luck. Slim knew his initial two divisional commanders extremely well. Major General Bruce Scott of the 1st Burma Division, Major General David "Punch" Cowan of the 17th Indian Division, and Slim had all been "officers together in the same battalion, 1/6 Gurkhas, and were old friends of more than twenty years' standing."⁴² Indeed Slim noted "I could not have found two men in whom I had more confidence or with whom I would have rather worked" and "the fact that we were on these terms was more than a help in the tough times ahead."⁴³ In sharp contrast, Mutaguchi's division commanders during the invasion of Imphal were not well suited for command together. Yanagida openly referred to Mutaguchi as a "moron," Sato loathed him as a result of deep-seated factional issues dating to the peacetime Imperial Army, and

⁴⁰ Allen, *Burma: The Longest War*, 67.

⁴¹ Slim, *Defeat into Victory*, 18.

⁴² Allen, *Burma: The Longest War*, 61.

⁴³ Slim, *Defeat into Victory*, 23.

Yamauchi's intellectualism did not mesh with the gritty requirements of battle command.⁴⁴

Allen indicts the Imperial Army bureaucracy for the failings, noting "That these three men should have become Mutaguchi's subordinate commanders in the first place was an illustration of the ineptitude of the Personnel Bureau of Imperial General Headquarters and its chief, the Vice War-Minister, Lieutenant-General Tominaga."⁴⁵ Taking a wider aperture, he further argues that the assault against Imphal, a desperate gambit for the Japanese forces, illustrated the faults of "deep-seated quarrels between various levels of command [and] disorganization" endemic to the entire campaign and a key contributing factor in the overall Japanese defeat.⁴⁶

TRAINING

At the beginning of the Burma campaign, many of the Allied setbacks may also be attributed to the lack of training across several key specialties—jungle warfare, intelligence, and medical services—and their resultant impact on troop morale. Slim argued that, despite other attendant disadvantages at the outset, the British forces "could have, if not defeated the Japanese, at least made a much better fight of it with even the small force of reliable troops we possessed, had they been properly trained."⁴⁷ Instead, while Japanese leadership had the foresight to employ formations specifically designed for jungle and riverine environments, the British suffered under forces equipped and trained for open desert warfare whose commanders were consequently too prone to regard most Burmese jungles as impenetrable.⁴⁸

John Hadley concurs, adding, "Far and away the most important point was that the Japanese were trained for jungle war and we were not,

⁴⁴ Allen, *Burma: The Longest War*, 164.

⁴⁵ Allen, *Burma: The Longest War*, 164.

⁴⁶ Allen, *Burma: The Longest War*, 206.

⁴⁷ Slim, *Defeat into Victory*, 117.

⁴⁸ Slim, *Defeat into Victory*, 118.

and nothing—air support, friendly inhabitants, or anything else, would have made any difference as long as that fact remained.”⁴⁹ Although this point remains arguable, for British troops unaccustomed either physically or psychologically to operating within the jungle environ, the Japanese soldier appeared almost superhuman, particularly given the preferred Imperial Army tactic of encircling the enemy army.⁵⁰ The linear, road-bound requirements of mechanized British forces only added to the general effectiveness of the Japanese, who mastered the jungle’s tenets of concealment and surprise in conducting coordinated attacks.

Following the disastrous retreat from Burma in 1942, Slim addressed this general deficiency. After assuming command of 15th Corps, he promptly established a jungle warfare training program at Ranchi, India to reinforce two key fundamentals—the jungle was not, in fact, impenetrable; and in Burma there were no front lines.⁵¹ These precepts embodied his larger intent of making every soldier, not just the infantry, effective at jungle maneuver in concert with his philosophy “there are no non-combatants in jungle warfare. Every unit, and sub-unit, including medical ones, is responsible for its own all-around protection, including patrolling, at all times.”⁵²

Though largely successful in turning army support personnel into valuable complements to the infantry branch, Slim’s school had limitations, chiefly in its span of influence. Although all British soldiers would eventually receive jungle training before facing combat in Burma, in early 1942 such training remained haphazard and unit-centric.⁵³ While valuable manuals derived from earlier Allied experiences in Malaya were available, each unit was responsible for its own training regime,

⁴⁹ T.R. Moreman, *The Jungle, the Japanese and the British Commonwealth Armies at War, 1941-1945: Fighting Methods, Doctrine and Training for Jungle Warfare* (London: Frank Cass, 2005), 208.

⁵⁰ Moreman, *The Jungle, Japanese and British Commonwealth Armies at War*, 205.

⁵¹ Slim, *Defeat into Victory*, 142.

⁵² Slim, *Defeat into Victory*, 143.

⁵³ Moreman, *The Jungle, Japanese and British Commonwealth Armies at War*, 211.

thus producing uneven results as commanders “interpreted official doctrine as they saw fit...cherry picked some elements and ignored others...or only paid lip service” to prescribed tactical methods.⁵⁴

The first Arakan campaign highlighted the deficiencies of this approach, particularly in relation to the well-disciplined Japanese forces, and further served as a catalyst for the widespread overhaul of India Command’s entire training program.⁵⁵ Led by the determined leadership of General Sir Claude Auchinleck, the India Command implemented a comprehensive approach that reoriented training policy towards jungle fighting from recruit stage to higher level formations.⁵⁶ This training, based on a clearly defined doctrine for jungle warfare, realistic and intensive combat scenarios, and senior staff support, immediately increased the combat effectiveness of the Allied forces.⁵⁷ As Raymond Callahan observed, “The revolution in training policy wrought by the reorganization of June 1943 and the hard work of [Major General Reginald] Savory and his subordinates were the foundation for Slim’s great victories.”⁵⁸

Coupled with jungle training, the Allies also sought to improve in the area of intelligence. In enumerating the many reasons for the initial defeat, Slim identified extremely poor intelligence as the chief culprit.⁵⁹ Several separate factors contributed to this: the Japanese warrior ethos regarding surrender, with no soldier over the rank of captain ever allowing himself to be captured; the lack of language capability within Allied forces, as Slim’s resident expertise included one Japanese speaker for the entire corps; and the absence of technical means—such as ULTRA—that were employed to such advantage in other combat

⁵⁴ Moreman, *The Jungle, Japanese and British Commonwealth Armies at War*, 211.

⁵⁵ Moreman, *The Jungle, Japanese and British Commonwealth Armies at War*, 211.

⁵⁶ Moreman, *The Jungle, Japanese and British Commonwealth Armies at War*, 211.

⁵⁷ Moreman, *The Jungle, Japanese and British Commonwealth Armies at War*, 211.

⁵⁸ Moreman, *The Jungle, Japanese and British Commonwealth Armies at War*, 212.

⁵⁹ Slim, *Defeat into Victory*, 28.

theaters.⁶⁰ Initially, British and Allied forces were confined to intelligence either gathered through air means or, more predominantly, from documents pilfered from abandoned positions or the bodies of dead Japanese soldiers. Even then, such intelligence could not be gainfully exploited due to the paucity of linguists.⁶¹

Although Slim admitted that his intelligence service was never truly satisfactory, a common refrain uniting commanders across history, increased training improved collection capabilities with resultant successes.⁶² Fighting patrols, instructed in what constituted valuable intelligence sources, returned with diaries, marked maps, and operations orders that headquarters refined into a picture of Japanese dispositions and intentions, in turn exploiting poor Japanese operational security. Additionally, British agents organized and equipped V Force, an effective network of Burmese nationals who moved throughout the country reporting on Japanese activities.⁶³ Even language resources, while still insufficient, steadily improved while a process for translating critical documents in Indian rear echelon headquarters achieved muted success.⁶⁴

While the British improved jungle and intelligence training to defeat the Japanese, they also improved medical training as a means to defeat the other Burmese foe—the hostile environment. In 1943, the sick rate among the forward troops averaged 12 per 1,000 per day, a rate which would incapacitate the entire army in nearly three months.⁶⁵ Slim conceded the futility in relying strictly upon medical supplies or other panaceas from abroad, noting “However, as we had long ago discovered, it was no use waiting for other people to come to our help. Prevention

⁶⁰ Allen, *Burma: The Longest War*, 394.

⁶¹ Allen, *Burma: The Longest War*, 396.

⁶² Slim, *Defeat into Victory*, 221.

⁶³ Slim, *Defeat into Victory*, 147.

⁶⁴ Allen, *Burma: The Longest War*, 396.

⁶⁵ William Slim, “Some Aspects of the Campaign in Burma Lecture,” Churchill Archives Centre Cambridge, Slim 3/2, 20.

was better than cure. We had to stop men going sick, or, if they went sick, from staying sick.”⁶⁶

The Allies subsequently tackled medical issues in a number of critical ways. With research into tropical diseases having advanced rapidly over the previous years, Mountbatten accelerated the fusion of field operator with researcher to produce breakthroughs in techniques, methods and treatment methods specific to Burma.⁶⁷ Penicillin and DDT, a powerful insecticide, appeared within the theater and, combined with disciplined use among the troops, made an immediate impact in lives saved.⁶⁸ Additionally, field hospitals established only a few miles behind the fighting helped stabilize serious casualties before further transport. One such field hospital admitted over 11,000 casualties during heavy fighting in 1944 and 1945 and sustained only 23 deaths.⁶⁹

More commonly, forward hospitals treated the persistent ailment of malaria so prevalent in the hot and humid jungle environment. At the beginning of the war, malaria frequently sidelined soldiers for five months or longer as they convalesced in far-removed Indian hospitals. The Malaria Forward Treatment Units, however, employed advanced techniques to reduce this time to three weeks, in turn increasing forward combat power and preventing malaria or typhus considerations from dictating operational plans or halting operations due to manpower constraints.⁷⁰ By 1945, at the height of the campaign, these combined measures lowered the sick rate to 1 per 1,000 troops, a metric Slim argued could not be equaled in the factories of London, much less the jungles of Burma.⁷¹

All together, the improvements in jungle, intelligence, and medical training merged to positively impact what Slim deemed the most decisive

⁶⁶ Slim, *Defeat into Victory*, 178.

⁶⁷ Slim, *Defeat into Victory*, 178.

⁶⁸ Slim, “Some Aspects of the Campaign in Burma Lecture,” 20.

⁶⁹ Slim, “Some Aspects of the Campaign in Burma Lecture,” 20.

⁷⁰ Slim, *Defeat into Victory*, 178.

⁷¹ Slim, “Some Aspects of the Campaign in Burma Lecture,” 20.

element of all—troop morale. Specifically, the jungle and intelligence training focused on debunking the myth of the Japanese as an invincible jungle “superman,” an idea that “was perhaps the most enduring and pernicious myth of the entire Second World War.”⁷² The broad training across the three elements ultimately proved the jungle was not impenetrable but rather tamable as a separate avenue of maneuver apart from otherwise restricting roads and rivers. These successes soon built upon one another as the British learned to move as effectively, or more so, than their counterparts through the jungles. “Morale,” Slim later wrote, “was a state of mind” and the well-organized and disciplined training programs helped shape the collective attitude of the Allied army from one of defeat to victory.⁷³

LEADERSHIP

A final, and arguably most significant, element in the Allied victory underpins all the others—leadership. Any discussion of leadership regarding Burma naturally begins with Slim. As Mark Parill notes, “If there is one common theme in the literature on the war in Southeast Asia, it is the universally high regard for the professional and personal qualities of Sir William Slim, who suffered through the dark days of the retreat out of Burma but returned to conquer it at the helm of the Fourteenth Army...a convincing case [may be made] for Slim as the person most responsible for the Allied victory in Burma.”⁷⁴

Slim’s leadership qualities manifested themselves in many important ways. His humble beginnings made him an unusual candidate for flag rank in the British Army, yet these same modest circumstances also shaped his ability to manage men, the “core skill which took him to the top.”⁷⁵ In sharp contrast to Field Marshal Bernard

⁷² Moreman, *The Jungle, Japanese and British Commonwealth Armies at War*, 205.

⁷³ Slim, *Defeat into Victory*, 182.

⁷⁴ Floyd Lee, ed., *World War II and the Pacific and the War's Aftermath, with General Themes* (London: Cassell Press, 2002), 96.

⁷⁵ Holmes, *The Oxford Companion to Military History*, 843.

Montgomery, Slim possessed the “common touch” of being able to relate equally to his soldiers, a skill he employed frequently since, by his own account, nearly a third of his time was spent engaged with the soldiers under his command.⁷⁶ George Fraser, one of his common soldiers, recalls how, with Slim, it was never “I” or even “we” but always “you” with regard to the accomplishments of the Fourteenth Army.⁷⁷ In a most revealing example, as Slim addressed a unit about to see action one member excitedly called out “We’ll follow you General!,” to which Slim replied with a smile, “Don’t you believe it. You’ll be a long way in front of me.”⁷⁸ His many years of service in the Indian Army Gurkha battalions further bolstered this common-touch ability because fluency in multiple dialects permitted him to converse in the native tongues of many under his command. These talks, coupled with his willingness to share the same privations as his soldiers, contributed enormously to improved morale.

Yet his tremendous people skills were not limited solely to subordinates. Slim remained the only commander “Vinegar” Joe Stillwell agreed to serve under, a critical concession that preserved Allied unity of command in otherwise tangled organizational charts. Slim’s ability to control Wingate, whose personality and access to Churchill similarly threatened to undermine coalition efforts, proved equally critical. Indeed, Slim engaged many of his commanders in broad, Moltke-like terms. He strongly believed in command as an individual matter and further wrote, “Commanders at all levels had to act more on their own; they were given latitude to work out their own plans to achieve what they knew was the Army Commander’s intent.”⁷⁹

⁷⁶ Holmes, *The Oxford Companion to Military History*, 844.

⁷⁷ George MacDonald Fraser, *Quartered Safe Out Here: A Recollection of the War in Burma* (London: Harvill Publishing, 1992), 37.

⁷⁸ Fraser, *Quartered Safe Out Here*, 37.

⁷⁹ Slim, *Defeat into Victory*, 541.

Slim's construct worked well within the Allied forces where leadership both up and down the chain proved critical. During heavy fighting near Imphal, Lieutenant Colonel G.A. Harvest related to his commanding officer, Brigadier General Sam Greeves, how he missed his more "experienced officers—casualties in the recent battles—as so much in this type of fighting depended on company and platoon commanders. Greeves agreed: it was 50% of the battle, jungle training and defense being 'only the other half.'"⁸⁰ The fluid nature of the battle placed a premium on adaptable, forward learning junior officers exhibiting the traits of initiative and determination. Up the command chain, Slim acknowledged the favorable qualities of his superior, General Gifford, who "having chosen his subordinates and given them their tasks, knew how to leave them without interference, but with the knowledge that, if they needed it, his support was behind them."⁸¹

Much to the contrary, the Japanese exercised a very rigid, hierarchical command structure that discouraged innovation, rapid-decision making and quick execution. In a 1946 speech on the Burma campaign, Slim asserted the Japanese Army was "really a second class army. Second class, or at least I thought so, in its leadership and systems of control. Altogether the Japanese Army would not have been very formidable but for one thing—the individual Japanese soldier."⁸² He further mused how the "Japanese, formidable as long as they are allowed to follow undisturbed their daring projects, are thrown into confusion by the unexpected."⁸³ This translated into an overarching willingness to uphold a plan and commit all reserve forces to achieve success, even when the plan's failings were clearly manifested. Such a single-minded approach bred fanatical determination down to the lowest tactical level that, in turn, marginalized the flexibility so key to operational execution.

⁸⁰ Allen, *Burma: The Longest War*, 226.

⁸¹ Slim, *Defeat into Victory*, 164.

⁸² Slim, "Some Aspects of the Campaign in Burma Lecture," 3.

⁸³ Slim, *Defeat into Victory*, 121.

This leads to his final leadership trait, Slim's willingness to embrace innovation. Despite spending a significant portion of his professional life in the Middle East, Slim was not blindly wed to desert doctrine as a template for all forms of warfare. He notes, "The hardest test of generalship is to hold this balance between determination and flexibility" and Slim pursued flexible, innovative approaches whenever possible.⁸⁴ He implemented tactics allowing his forces to be surrounded in order to engage the enemy more effectively. Resource strapped, he constructed novel stone kilns at 20 mile intervals in order to fire bricks needed for vital road improvements during monsoon season.⁸⁵ In contrast to army convention, he enthusiastically placed great command influence with the administrative, or logistics officers, within the Fourteenth Army.⁸⁶ This overarching willingness to innovate as the situation warranted, an approach that was calculated and not merely risky, imbued his army with both the means and the spirit to prosecute a war that, to the rest of the world, remained largely forgotten.

CONCLUSIONS

In summation, Williamson Murray notes that by 1945, the British forces in Burma were "among the most effective units deployed by Great Britain in the Second World War."⁸⁷ Such high praise seemed a near-impossible illusion during the early reverses of the campaign, when a superior enemy, unforgiving geography, and resource scarcity combined to conspire against the Allied effort. Yet the Allied forces weathered the early defeats and successfully addressed lingering, critical deficiencies across the force structure. A theater-wide reorganization clarified lines of responsibility and achieved unity of effort spanning all levels of command. Comprehensive training programs laid the foundation for

⁸⁴ Slim, *Defeat into Victory*, 537.

⁸⁵ Slim, "Some Aspects of the Campaign in Burma Lecture," 19.

⁸⁶ Ronald Lewin, *Slim: The Standardbearer* (London: Leo Cooper Ltd., 1976), 72.

⁸⁷ Murray Williamson, "British Military Effectiveness in the Second World War," in *Military Effectiveness Volume III*, ed. A.R. Millett, Murray, W. (London: Unwin Hyman, 1988), 120.

units and individual soldiers to prosecute the campaign throughout one of the world's harshest climates. Superior leadership, embodied by Field Marshal Slim but exhibited throughout the Allied chain of command, proved instrumental in further shaping the conditions for success. These elements, apart from air mobility, ultimately proved decisive in securing victory from defeat for the "Forgotten Army" of World War II. The next chapter transitions to a focused consideration of air mobility's particular contributions, in concert with these various elements, to Slim's ultimate successes in Burma.

Chapter 3

Analysis of The Air Mobility Elements Supporting Slim's Campaign

*You may talk of Flying Forts, And 'Pea-Shooters' deadly
sports, And of shooting down Jap Zeros by the score,
But when it comes to servin', The transports are deservin',
Of a little praise 'n credit in this war*

*'Cause when the fightin's thick and fast, and men doubt that
they can last, So far outnumbered they—our brave Allies,
It really is inspirin', To know they'll keep on firin'
'Cause we're dropping ammunition from the skies.*

—Ode to a C-47

In a 1946 article entitled “Some Aspects of the Campaign in Burma,” Field Marshal Viscount Slim expounded at length upon the tenets of air power and, specifically, the mission of air transport. Slim carefully noted how air mobility was not a completely new phenomenon born to Burma—indeed he himself was a veteran of air transport operations in Iraq and India in the 1920s and 1930s.¹ Other official histories noted that the successful maturation of Allied air mobility operations in the New Guinea campaign, and similar remote battlefields throughout the Pacific, significantly influenced Burma operations.²

Slim argued, however, the key difference between Burma and other theaters of war was “that we made air transport an absolutely *normal* [emphasis in original] method of supply.”³ As resources increased, he continued, “We planned the whole of our strategy of this campaign on air supply. There was no main operational plan made in the Fourteenth Army which was not based on air supply.”⁴ This chapter builds upon the aforementioned factors contributing to Allied success by examining, through a careful assessment of Burma's major battles, the critical

¹ William Slim, “Some Aspects of the Campaign in Burma Article,” Churchill Archives Centre Cambridge, Slim 3/2, 82.

² Leo J. III Daugherty, *The Allied Resupply Effort in the China-Burma-India Theater During World War II* (London: McFarland and Company, Inc., Publishers, 2008), 189.

³ Slim, “Some Aspects of the Campaign in Burma Lecture,” 5.

⁴ Slim, “Some Aspects of the Campaign in Burma Lecture” 5.

nature of air mobility's contribution to the overall joint campaign. It concludes by articulating several key "lessons learned" from air mobility's employment within Slim's overall scheme of operations.

CAMPAIGN OVERVIEW

EARLY YEARS: RETREAT AND FIRST ARAKAN CAMPAIGN

Throughout 1942, as Allied forces continued to reel from successive Japanese victories, air mobility played a small but critical stabilizing role. During the initial invasion, India-based Royal Air Force transports evacuated 4,117 casualties and refugees while simultaneously dropping more than 155,000 pounds of supplies in support of the defense of Rangoon and, subsequently, the retreating Allied ground forces.⁵ The American 7th Bombardment Group was pressed into impromptu service and safely transported 4,500 persons and nearly two million pounds of critical cargo to Indian strongholds.⁶ The British 31 Squadron, along with the American 2nd Troop Carrier Squadron, also resupplied critical warning posts and the isolated airfield at Fort Hertz, the only serviceable emergency landing field for "Hump" aircraft continuing strategic mobility operations to China.⁷ These efforts, while diminutive in scope, helped establish a vital measure of stability within an otherwise chaotic environment of defeat.

The first Arakan campaign, in December 1942, further highlighted the serious need for air mobility assets. Two Indian divisions marched overland with the twin goals of capturing a key airfield near the port city of Akyab and simultaneously wresting the initiative away from the Japanese.⁸ Forced across a narrow front by the confines of the Arakan peninsula, however, the Indian divisions were outflanked by the smaller

⁵ W.F. Craven and J.L. Cate, *The Army Air Forces in World War II, Volume Four: The Pacific: Guadalcanal to Saipan* (Chicago: University of Chicago Press, 1950), 501.

⁶ Craven and Cate, *The Army Air Forces in World War II, Volume Four*, 501.

⁷ Deryck Groocok, "The RAF and the Far East War 1941-1945," in *A Symposium on the Far East War* (Royal Air Force Historical Society, 1995), 49.

⁸ Trevor Dupuy, *Asiatic Land Battles: Allied Victories in China and Burma* (New York: Franklin Watts, Inc., 1963), 8.

Japanese force whose doctrine preached encirclement of enemy forces.⁹ With their lines of communication threatened, the larger Indian forces faced Hobson's choice of starvation or withdrawal and subsequently retreated to the sanctuary of India. The crippling defeat reinforced the strategic need to redefine troop supply practices in a jungle environment. Air mobility offered the greatest promise yet the first Arakan operation also highlighted the criticality of establishing air superiority as Japanese fighters, in firm control of the skies, denied access to outnumbered and outgunned Allied aircraft. By the end of 1943, Japan's air force numbered 740 aircraft in theater, with 420 based in Burma and Siam (now known as Thailand).¹⁰ Of this smaller number, 250 were fighters, 110 light and medium bombers for targeting enemy airfields, and 60 reconnaissance aircraft.¹¹ While Allied air strength steadily increased as the antiquated Brewster Buffalo units were gradually replaced by Spitfire and Hurricane squadrons, Japanese forces also benefitted greatly from shorter interior lines while Allied forces stretched to defend along the entire Indian border, to include the northern transport routes to China.¹²

SECOND ARAKAN CAMPAIGN

In January 1944, Allied forces launched the second campaign into Arakan. Slim, profiting from the painful experiences of the first expedition, anxiously sought to avoid advancing along the same tired front with only amphibious feints to keep the enemy slightly off balance. Instead he required an additional formation to advance along the left flank of the main body, down the Arakan's perennially-dangerous "soft spot" of the Kaladan River.¹³ Such a formation, independent of the main advance, would of necessity require supply entirely by air. For the task,

⁹ Dupuy, *Asiatic Land Battles*, 8.

¹⁰ Henry Probert, *The Forgotten Air Force: The Royal Air Force in the War against Japan: 1941-1945* (London: Brassey's Publishing, 1995), 159.

¹¹ Probert, *The Forgotten Air Force*, 159.

¹² Probert, *The Forgotten Air Force*, 127.

¹³ Slim, *Defeat into Victory*, 165.

Gifford supplied the 81st West African Division and the corresponding air transport to properly resource it.

“This was the first time a normal formation such as a division was to be committed to complete air maintenance,” commented Slim as he realized “if we were going to make the best of this great new weapon of air supply we must, with our limited resources in aircraft, provide a simple, flexible organization of control and operation that would suit any normal formation without elaborate preparation.”¹⁴ This approach embraced Slim’s larger vision of “airmindedness,” the idea that movement by air was no more extraordinary than movement by rail, road or boat and that, indeed, the single test of airmindedness “is not whether you can fly an aeroplane, but whether you regard it as a vehicle. If you do, you are airminded; if you regard it as anything else—a weapon, a sporting adjunct, or a bag of tricks—you can be an air marshal but you are not airminded.”¹⁵

In early February 1944, British forces created a small salient as they moved down the Arakan coast toward Akyab, a fact that passed tactical advantage to the Japanese forces. The 10,000-member-strong Japanese army outflanked the Allied forces on the left and established rear sector road blocks that effectively cut off the Indian 7th Division from other friendly units.¹⁶ With the British army surrounded, Japanese leadership anticipated a large-scale Allied retreat in order to preserve their threatened lines of communications.¹⁷ Japanese logic, however, failed to account adequately for the changing possibilities of air supply. In contrast, Slim employed this new potential to great effect.

Instead of retreating, the 7th Indian Division entrenched and formed the famed Administrative Box, the 1,000-yard square main semi-

¹⁴ Slim, *Defeat into Victory*, 165.

¹⁵ Slim, *Defeat into Victory*, 165.

¹⁶ Craven and Cate, *The Army Air Forces in World War II, Volume Four*, 500.

¹⁷ Craven and Cate, *The Army Air Forces in World War II, Volume Four*, 500

fortified position comprised primarily of headquarters personnel.¹⁸ With only two days' rations on hand when the Japanese attacked, the flat open ground proved ideal for aerial resupply; and C-47s of the combined Troop Carrier Command braved intense ground fire and lingering fighter threats to air drop critical relief supplies to the division.¹⁹ A British soldier named George Hufflett, a veteran of the two-week siege, remarked, "We only managed because the RAF and Yanks came with their transport planes and dropped ammo to us on parachutes. Barrels of rum, and grub too—same old bully and beans, but it was more than the Japs had."²⁰

Indeed the battle portended a larger strategic shift within the Burma theater by invalidating the preferred Japanese tactic of encirclement. Importantly, as one Japanese historian noted, the ability to resupply food and ammunition by air critically altered the geometry of the battlefield.²¹ The flat, encirclement tactics of the Japanese were effectively countered by British cubic, or box, tactics that promised a comprehensive, 360-degree multi-directional defense underpinned by secure air supply lines.²² This, in turn, produced an Allied firepower advantage the Japanese could not overcome.

Additionally Imperial Army forces, continually short of food and ammunition resources, relied on captured Allied stores to augment their austere supplies. As Slim had learned from the Chinese, Japanese leadership conducted offensives with no more than ten days' worth of rations—in Arakan, it was seven.²³ Resupply efforts extended the Allied ability to withstand such offensives, in effect fixing the Japanese forces in place for other Allied maneuver elements to engage. In the second

¹⁸ Roger Annett, *Drop Zone Burma: Adventures in Allied Air Supply 1942-1945* (Barnsley, South Yorkshire: Pen & Sword Aviation, 2008), 80.

¹⁹ Annett, *Drop Zone Burma*, 81.

²⁰ Annett, *Drop Zone Burma*, 81.

²¹ Allen, *Burma: The Longest War*, 187.

²² Allen, *Burma: The Longest War*, 187.

²³ Annett, *Drop Zone Burma*, 79.

Arakan operation, the air-supplied 81st West African Division's advance along the Kaladan River, while the Japanese pressed the Administrative Box attack, ultimately threatened the entire Japanese position in the Arakan.²⁴ Additional Allied ground forces, marching overland from India, helped to secure the victory in the end.

Although an operationally small-scale victory within the larger campaign, Slim nonetheless cited the Arakan battle as one of the "historic successes of British arms and the turning point of the Burma campaign."²⁵ In waging it, the British Army met and defeated a coordinated Japanese attack, then followed this accomplishment with a successful counteroffensive. Along with restoring morale and validating the intensive jungle training programs, the victory decisively affirmed air mobility's vital role. At various times in the fighting, all four divisions relied on air supply to some important extent, with the 7th Indian and the 81st West African relying upon it completely.²⁶

Critically, it is also important to recall the reorganization efforts brought about by the introduction of Southeast Asia Command. This presaged the widely recognized potential of air supply throughout Burma and resulted in the formation of Eastern Air Command (EAC) in mid-December 1943.²⁷ EAC established Troop Carrier Command (TCC) as one of its four subordinate commands under Brigadier General William D. Old. Troop Carrier Command was conceived as a combined Army Air Force-Royal Air Force headquarters charged with directing air transport operations, to include airborne forces and air supply, across the Burma front.²⁸ Initially comprised of 4 American and 4 British squadrons,

²⁴ Nigel Warwick, *Constant Vigilance: The RAF Regiment in the Burma Campaign* (Barnsley, South Yorkshire: Pen & Sword Aviation, 2007), 120.

²⁵ Slim, *Defeat into Victory*, 246.

²⁶ Slim, "Some Aspects of the Campaign in Burma Article," 82.

²⁷ W.F. Craven and J.L. Cate, ed., *The Army Forces in World War II, Volume Five: The Pacific: Matterhorn to Nagasaki* (Chicago: University of Chicago Press, 1953), 204.

²⁸ Joe Taylor, *Air Supply in the Burma Campaigns* (Maxwell AFB, AL: Air University, 1957), 52.

totaling nearly 100 aircraft, the ratio would grow to almost two to one in favor of Army Air Force squadrons as American resources steadily increased throughout the war.²⁹ Importantly, although TCC was still finding its footing with the air supply mission, the combined command adjusted to fly 9,000 sorties and deliver more than 60 tons daily to the Arakan ground elements.³⁰

In this instance, the dedicated mobility organization also ensured quicker resolution of potentially debilitating shortfalls. Old's TCC secured the services of 25 larger C-46s, assigned to Air Transport Command's (ATC) China resupply mission, to further support the Arakan effort, leading EAC Commander General George Stratemeyer to report to Hap Arnold, "All in authority here are convinced that General Old's Troop Carrier Command...was to a large extent responsible for the success of the battle."³¹ In a grander sense, the new organizational construct facilitated the more efficient use, and subsequent availability, of air supply as an enabling factor in Slim's campaign design.

THE CHINDITS AND IMPHAL

Major General Orde Wingate's Chindit expedition remains, perhaps, the most well known and well publicized aspect of the Burma air campaign. As such, this paper does not intend to delve deeply into its specific mechanics or its role as the foundation of modern air commando operations. But the overall importance of the Chindits' mission deserves special consideration. On a strictly material basis, the overall impact of the Chindits remained relatively small—Slim even considered the returns in disrupted enemy communications not necessarily commensurate with the large resource investment required.³² Additionally, the Chindits' relatively minor, rear-guard actions seemed unlikely to induce significant

²⁹ Taylor, *Air Supply in the Burma Campaigns*, 53.

³⁰ Annett, *Drop Zone Burma*, 81.

³¹ Craven and Cate, *The Army Air Forces in World War II, Volume Four*, 503.

³² Holmes, *The Oxford Companion to Military History*, 202.

results in isolation or spur widespread retreat from Imphal given the fanatical nature of the Japanese fighting forces.³³

Yet the greater strategic impact of the two Chindit expeditions remains undeniable in their influence on both the Allied and Imperial Armies. For British forces, Wingate's operations greatly restored flagging morale in the same vein as did American Lieutenant Colonel Jimmy Doolittle's Tokyo raid, particularly during the dark, stalemated times of 1943.³⁴ Additionally, as Allen notes, "Wingate demonstrated that the Japanese could be beaten at those things they were thought to be the best at: physical endurance, secret and swift movement, and inventive use of jungle tactics."³⁵ Even more so, Wingate validated the role of air supply to sustain maneuver troops. As Mountbatten explained at the conclusion of the war, Wingate shaped his own view of the conduct of operations so that, instead of increasing more long range penetration (LRP) brigades, he sought to train the larger army to function more on the tenets of the LRP.³⁶ The resultant successes within the Burma theater attest to the wisdom of this approach.

With respect to the Japanese, Wingate's operations also provoked the new Fifteenth Army commander, Lieutenant General Mutaguchi, to launch the ill-advised offensive against Imphal. Chafing under a dormant defensive posture while Chindits operated across his rear communication lines, Mutaguchi sought to invade India via Imphal, despite its position at the end of distant supply lines.³⁷ True to Japanese doctrine, Mutaguchi envisioned a quick, encircling victory resulting in the capture of critically sustaining Allied supplies. His plan, arguably

³³ Thomas E. Griffith, *MacArthur's Airman: General George C. Kenney and the War in the Southwest Pacific* (Lawrence, Kansas: University of Kansas Press, 1998), 235.

³⁴ Robert H. Farquharson, *For Your Tomorrow: Canadians and the Burma Campaign 1941-1945* (Toronto: Trafford Publishing, 2004), 139.

³⁵ Allen, *Burma: The Longest War*, 118.

³⁶ Nath Pratihvi, *Wingate--His Relevance to Contemporary Warfare* (New Delhi: Sterling Publishers Private Limited, 1990), 69.

³⁷ Farquharson, *For Your Tomorrow*, 44.

the product of goading by the Chindit operation, stood in contrast to the beliefs of his immediate superiors at Burma Area Army headquarters but quickly gained approval from Tokyo command authorities.³⁸ The Japanese subsequently launched the general offensive against Imphal on 10 March 1944 and, to the great surprise of Slim, quickly surrounded IV Corps personnel and positions near Imphal and Kohima to the north.³⁹

Similarly to its role in the second Arakan campaign, air mobility played a huge role in sustaining these garrisons. The Japanese completed the encirclement of Imphal on 29 March 1944, ensuring Lieutenant General Geoffrey Scoones' 150,000-member IV Corps required resupply entirely by air.⁴⁰ The securing of usable airfields, however, continually drove operational strategy within Burma and British planners wisely anchored their defensive fortifications around the six Imphal air strips.⁴¹ This provided a critical avenue for air transports to operate as they airlifted 14 million pound of rations, nearly 1 million pounds of gasoline, more than 1,000 pounds of mail and 40,000 cigarettes.⁴² The IV Corps ultimately required 540 tons of supplies a day, much of which was also airdropped to the surrounded fortification at Kohima.⁴³ Simultaneously, airlifters also transported out nearly 43,000 non-combatants and 13,000 casualties, in turn reducing the size and requirements of the resupply force.⁴⁴

The Allied ability to sustain forces through the air at Imphal facilitated recovery from the strategic surprise Mutaguchi's larger-than-expected force induced while also precluding a potentially disastrous retreat into India proper. Such a retreat would have threatened the

³⁸ Holmes, *The Oxford Companion to Military History*, 162.

³⁹ Basil Collier, *The Second World War: A Military History* (New York: William Morrow & Company, Inc., 1967), 490.

⁴⁰ Allen, *Burma: The Longest War*, 244.

⁴¹ Slim, *Defeat into Victory*, 293.

⁴² Allen, *Burma: The Longest War*, 244.

⁴³ Allen, *Burma: The Longest War*, 244.

⁴⁴ Allen, *Burma: The Longest War*, 244.

Hump airfields in Assam while at the same time disrupting the Indian civil populace with far-reaching consequences.⁴⁵ Additionally, the flexibility of air mobility assets allowed Troop Carrier Command to airlift vital troop reinforcements—the 5th and 7th Indian Divisions from the Arakan—that proved absolutely critical in both holding, then counterattacking, against the overextended and exhausted Japanese forces.⁴⁶

The Imphal operation exposed, however, lingering fissures in airlift organization. When the early air supply demands of Imphal became readily apparent, Mountbatten moved quickly to secure augmented air capability to help supply Wingate's ongoing mission, lingering action in the Arakan, and the now serious threat developing in Eastern India. In his role as theater commander, Mountbatten requested additional relief from ATC aircraft flying the strategic supply Hump missions into China.⁴⁷ The appeal, however, required approval from the American JCS. Fearing the previous request's seven-day-approval process was too long, Mountbatten wired British leadership his intention to divert 30 C-47s in three days unless he heard otherwise.⁴⁸ While ultimately approving the diversion of 20 C-46s, the JCS also chided Mountbatten for exceeding his authority with the planned diversion. A subsequent supplementary request in late March was also denied.⁴⁹ Fortunately, the Combined Chiefs of Staff interceded on Mountbatten's behalf and redirected five additional squadrons, originally bound for Europe, to cover Burma's transport shortfall.⁵⁰

With this organizational friction as background, Imphal constituted the critical turning point of the Burma campaign and the

⁴⁵ Dupuy, *Asiatic Land Battles*, 24.

⁴⁶ Miller, *Airlift Doctrine*, 148.

⁴⁷ Miller, *Airlift Doctrine*, 148.

⁴⁸ Miller, *Airlift Doctrine*, 148.

⁴⁹ Miller, *Airlift Doctrine*, 148.

⁵⁰ Miller, *Airlift Doctrine*, 148.

largest land defeat ever suffered by the Japanese Imperial Army.⁵¹ Its success was underwritten by air mobility's ability to rapidly resupply both material and personnel under dynamic combat conditions.

Commenting on the siege's conclusion in June 1944, Joe Taylor, the foremost expert on Burma air supply operations, notes "Imphal was the final testing ground for air supply. The experience gained in the NCAC area, in the Arakan, in 3 Indian Division operations, and at Imphal convinced air and ground commanders that air supply could sustain an offensive of great enough magnitude to drive the Japanese from Burma. The pursuit of the remnants of the Japanese Fifteenth Army began immediately, and with the end of the rains Fourteenth Army lunged forward to finish the war in Burma."⁵²

MEIKTILA AND THE MARCH TO RANGOON

At the outset of the final offensive in October 1944, Slim reiterated to Fourteenth Army that "the whole plan of battle" was based on Allied air support as it swept southward from north and central Burma. This pronouncement underscored the remarkable expansion of confidence in air mobility's potential to support not only static operations but the advances of large field armies.⁵³ Organizationally Slim refit brigades from both the 5th and 7th Indian division as "entirely air transportable" while operationally assigning to Indian XV Corps the capture of additional Arakan airfields from which to base supply aircraft.⁵⁴ Initially, Slim hoped to battle the retreating Japanese forces on the open Shwebo Plain where Allied armor could best be employed.⁵⁵ The Japanese, however, escaped beyond the Irrawaddy River to entrenched positions in and around the city of Mandalay. In a brilliant operational scheme, Slim changed his original intent and, after detaching a small deceptive force to

⁵¹ Allen, *Burma: The Longest War*, 193.

⁵² Taylor, *Air Supply in the Burma Campaigns*, 89.

⁵³ William Slim, "Some Aspects of the Campaign in Burma Lecture," 5.

⁵⁴ Slim, *Defeat into Victory*, 387.

⁵⁵ Craven and Cate, *The Army Forces in World War II, Volume Five*, 247.

fix the Japanese in place at Mandalay, subsequently maneuvered southward toward Meiktila as the gateway to southern Burma and Rangoon.⁵⁶

Initially Slim considered an airborne operation to seize Meiktila; but the unreliability of dedicated air mobility assets, chiefly American, warned against this course of action. Events soon proved the wisdom of Slim's caution as three squadrons of US C-47s, totaling 75 aircraft, were summarily dispatched without forewarning to assist the deteriorating situation in China.⁵⁷ The loss influenced plans far beyond the airborne operation alone. As the RAF official history notes, by the beginning of 1945 the army had become so reliant on air supply that the Allied Ground Forces commander, Lieutenant General Sir Oliver Leese, "circulated a memorandum stating that without extra resources of transport aircraft not only would the advance to Mandalay and beyond be arrested but that he might even be forced to withdraw beyond the Chindwin for the 1945 monsoon."⁵⁸

Only by working in close concert with staff planners was the disruption to army campaign plans minimized to merely three, albeit serious, weeks of lost time. Slim subsequently re-balanced his remaining air transport assets to address this persistent shortfall, which was caused, ironically, by significant success. The faster the army advanced, the greater strain its movements placed on transports, whose payloads decreased with each additional kilometer.⁵⁹ With their relatively close proximity, newly captured airfields in the Arakan proved critical to turning limited aircraft on multiple delivery runs, thus maximizing cargo loads. This phase also introduced the increased use of airland delivery methods to improvised landing fields, as opposed to

⁵⁶ Farquharson, *For Your Tomorrow*, 229.

⁵⁷ Craven and Cate, *The Army Forces in World War II, Volume Five*, 254.

⁵⁸ RAF Air Ministry, *Wings of the Phoenix: The Official Story of the Air War in Burma* (London: His Majesty's Stationary Office, 1949), 118.

⁵⁹ RAF Air Ministry, *Wings of the Phoenix*, 118.

airdrop, as the most efficient means to deliver supplies while husbanding scarce aircraft resources. Slim placed a premium on new air strips separated by no more than 50 miles in order to exploit his limited air resources in concert with ground maneuver assets.⁶⁰ As soon as airfields were constructed by combat engineers, or seized by advancing forces, air transportable brigades and their combat stores were then airlifted in for continuing combat operations.

With supply concerns largely attended to, Slim maneuvered air-supported ground elements into a clandestine Irrawaddy crossing and marched upon Meiktila's prized airfield. Once secured, air transports airlifted in a brigade of reinforcements that helped capture Meiktila and, ultimately, Mandalay to the north.⁶¹ With the fall of these two cities, the remaining Japanese resistance coalesced in the south. Slim's army turned toward Rangoon and raced both the oncoming monsoon season and Allied amphibious plans to capture the capital should the rains limit the Fourteenth Army's air-ground maneuver. Allied transport aircraft efforts again proved to be the critical enabler as Combat Cargo Task Force transports carried over 332,000 tons of supplies and Tenth Air Force aircraft airlifted nearly 155,000 tons in support of Slim's rapidly advancing army.⁶² Rangoon fittingly fell, before the monsoon rains, after an 800-member airborne operation on 30 April–1 May 1945 and Japanese resistance, as well as the larger conflict in Burma, effectively ended.⁶³

LESSONS LEARNED

In his post-war private papers, Slim identifies five main lessons of the Burma Campaign:

1. Essential that air battle be won before the land battle

⁶⁰ Slim, *Defeat into Victory*, 497.

⁶¹ Craven and Cate, *The Army Forces in World War II, Volume Five*, 247.

⁶² Taylor, *Air Supply in the Burma Campaigns*, 148.

⁶³ Craven and Cate, *The Army Forces in World War II, Volume Five*, 250.

2. Effects of *properly organized* [emphasis in original] air transportation when used in combination with well trained, tough, mobile troops
3. The necessity to regard air transportation and supply as *normal* [emphasis in original] method for forward mobile formations
4. Correct judgment of administrative risks
5. Morale is the greatest factor in success⁶⁴

Slim's first three lessons will be further examined to more clearly understand the critical nature of air mobility to the success of Slim's overall campaign.

AIR SUPERIORITY

Burma air operations confirm the axiom that effective control of the air is not only a necessary prerequisite for general air campaigns but even more basic for successful air supply operations.⁶⁵ The successes, and setbacks, of the Allied forces in Burma reflect in large measure the degree of air superiority achieved. Slim elaborated, noting:

Though in the Army we had no great superiority in numbers and equipment, there was one thing in which we did have immense superiority, eventually, and that was in the air. In 1942 we were kicked out of Burma very thoroughly. I know because I was one of those kicked out. We were defeated soundly on the ground and even more completely in the air. In 1943 we still continued to be defeated on the ground, we scored no successes there at all; but in the air the Royal Air Force began to rebuild itself, the American Air Forces began to come in, and gradually we achieved, first, equality, and then superiority in the air. By October 1943, when the Fourteenth Army was formed, we had a reasonable degree of superiority in the air.⁶⁶

Others contend that, even as Japanese attack numbers dwindled, their more effective employment against cargo aircraft might have raised the cost of air mobility operations to prohibitive levels, in turn shaping overall operation design by making large-scale air supply impossible.

⁶⁴ William Slim, "Notes Relating to Burma Campaign," Churchill Archives Centre Cambridge, Slim 3/2, 1.

⁶⁵ Taylor, *Air Supply in the Burma Campaigns*, 142.

⁶⁶ Slim, "Some Aspects of the Campaign in Burma Lecture," 3.

Taylor argues “Certainly, if Japanese fighters had concentrated on transports rather than looking for ground targets, they could have made the air supply effort immeasurably more difficult. For fighters to attack front-line targets when the air a few miles away was full of helpless transports was as uneconomical as for a submarine to devote its efforts to shore bombardment while full-laden merchantmen passed over the horizon.”⁶⁷

In a corollary idea, the role of ground-based anti-aircraft fire against air supply must be considered. Operations in the Second Arakan’s Administrative Box illustrate this, as light anti-aircraft weapons and small arms fire proved effective against slow-moving aircraft compelled to maneuver at low altitudes for increased drop accuracy. George Hufflett, the Administrative Box veteran, recalled how “the first lot of Dakotas were set upon by Jap fighters and shot at from the ground—they had to scarper, without dropping.”⁶⁸ The aircraft soon returned, led by General Old himself, although his airplane was also splintered by enemy fire.⁶⁹ Ultimately the volume of fire drove changing tactics as air drops increasingly occurred at night.⁷⁰ Unfortunately, this produced a corresponding increase in off-zone drops that provisioned enemy forces, with potentially decisive long-term consequences.

Slim also highlights how critical air superiority was to air drops sustaining the 17th Indian Division’s initial retreat toward Imphal. The Japanese Air Force managed one large attack during this precarious juncture, only to be driven away by fighters from the 221 Group RAF. “Had our fighters not maintained continuous cover and given quick support at call,” Slim admits, “the withdrawal, if it could have been carried out at all, would have been a much grimmer and more protracted

⁶⁷ Taylor, *Air Supply in the Burma Campaigns*, 132.

⁶⁸ Annett, *Drop Zone Burma*, 81.

⁶⁹ Annett, *Drop Zone Burma*, 81.

⁷⁰ Allen, *Burma: The Longest War*, 178.

affair, with serious consequences to the main battle around Imphal.”⁷¹ In total, there seems no credible evidence supporting the conclusion that air superiority will be any less critical in future hostilities involving large air mobility operations.⁷² In spite of great advances in aircraft technology and capability, it seems unimaginable that cargo aircraft could consistently airlift vital supplies in strongly contested, non-permissible air environments, thus making air superiority a key requirement.⁷³

ORGANIZATION

The USAAF official historians Craven and Cate correctly assert that “the tangled command situation in the CBI [was] perhaps the worst in any theater of the war.”⁷⁴ These tangled lines were driven primarily by the diverging strategic interests of the key coalition members, most notably Great Britain and the United States. In many respects, the US and Great Britain were fighting two separate wars within the CBI Theater.⁷⁵ The US focused primarily on sustaining China in its fight against Japan and, as such, viewed Burma largely as a means to an end. Britain, however, sought to restore Burma to her colonial fold while further utilizing its central position to launch additional offensives to regain other lost colonies within Southeast Asia. While SEAC mollified many of the larger, potentially divisive political concerns, difficulties still persisted when translating direction to the lower operational and tactical levels of command.

These difficulties were magnified by the tension between strategic and tactical airlift allocation. The US maintained the overall preponderance of airlift resources in theater and the entire strategic

⁷¹ Slim, *Defeat into Victory*, 303.

⁷² Taylor, *Air Supply in the Burma Campaigns*, 142.

⁷³ Taylor, *Air Supply in the Burma Campaigns*, 142.

⁷⁴ Craven and Cate, *The Army Air Forces in World War II, Volume Four*, xiii.

⁷⁵ Daugherty, *Allied Resupply Effort in the China-Burma-India Theater*, 7.

arsenal of C-46 and C-87s heavy lift transports.⁷⁶ These latter ATC assets were carefully monopolized in support of China operations. This monopolization was best evidenced by Mountbatten's inability, even as the supreme commander in theater, to secure their reallocation within Burma without direct approval from senior US leadership. A bureaucratic, and mostly impenetrable, wall separated the two force structures.

Tension permeated the tactical level as well. The singular entity responsible for tactical airlift, Troop Carrier Command, was ultimately parceled out between two separate EAC components, Tenth Air Force supporting American efforts in the north and Third Tactical Air Force supporting Slim's movements in the south-central.⁷⁷ This organizational restructuring satisfied the requirements of supporting increasingly divergent American and British objectives but similarly erected bureaucratic walls limiting effective cooperation among the sub-elements.

The political realities of such a large theater, one that encompassed many fragmented and conflicting interests, necessarily dictated such an arrangement but the key dictum of centralized command, decentralized execution should not be readily dismissed in future operations. Taylor elaborates, "Probably the separation of theater air transport resources into two parts was the best solution to the problem that existed in India-Burma, but there can be little doubt that a single headquarters coordinated with a single ground force would have permitted more flexible and more efficient air supply."⁷⁸

Such a unified headquarters would be well placed to address other, persistent lessons learned from Burma: proper crew management, to prevent aircrew burnout from extended combat flying; streamlined

⁷⁶ Daugherty, *Allied Resupply Effort in the China-Burma-India Theater*, 15.

⁷⁷ Craven and Cate, *The Army Forces in World War II, Volume Five*, 205.

⁷⁸ Taylor, *Air Supply in the Burma Campaigns*, 133.

aircraft maintenance and basing to maximize mission capable rates against complex variables of weather and supply; and effective aeromedical evacuation policy and procedures, perhaps the mission most critical to sustaining morale among combat troops. The headquarters would be equally well-placed to coordinate mission allocation between strategic and tactical mobility assets with the overall goal of maximizing efficiency.

At the lower levels, the Burma campaign instructs on the benefits of integrated command between ground and air headquarters. Despite having to move multiple times over the course of the campaign, Slim noted “Army Headquarters needed a considerable amount of accommodation, but I was determined that, wherever we went, my headquarters and that of the air forces working with me should be together.”⁷⁹ He built on this advantage in the staffing process, noting that “my method of working out such a [campaign] plan was to first study the possibilities myself, and then informally to discuss them with my Brigadier General Staff, Major-General Administration, and my opposite number in the Air Force.”⁸⁰ Initial intent would then flow to the planning team, comprised of both army and air force personnel, for further refinement and course-of-action development.⁸¹ This construct produced the great synergy between air and land elements, a synergy bolstered by the introduction of the many innovative practices in maneuver and supply.

At the division and lower-level units, the Burma campaign informs on the importance of air-minded liaison officers to facilitate Army-Air Force integration. During the Chindit expeditions RAF officers under the leadership of Sir Robert Thompson, who would later become a leading counterinsurgency expert in Malaya and Vietnam, “put into practice with

⁷⁹ Slim, *Defeat into Victory*, 199.

⁸⁰ Slim, *Defeat into Victory*, 209.

⁸¹ Slim, *Defeat into Victory*, 209.

the signals teams [the] effective way of taking the British Army off the roads and into the air.”⁸² In effect these officers served as the key conduit in validating the idea of maneuver based entirely on air mobility principles. Additionally, the execution of this tenet also speaks to the critical role of establishing and maintaining communications with higher-echelon command-and-control entities. Such communication allows for fluidity in plans at the tactical or operational level while equally sustaining morale for troops largely isolated to their maneuver element.

Ultimately, the achievement of proper organizational structures within India-Burma was exceedingly complicated. Its many revisions never seemingly translated well to command and organizational charts.⁸³ In too many instances, structural deficiencies required supreme efforts on the part of individuals in order to achieve mission success. For this reason alone, the overall organization of CBI remains a fruitful arena for continued study.

NORMALIZED AIR TRANSPORTATION

The Burma campaign’s greatest achievement was its demonstration of the practicality of large-scale air supply, both in static defensive and offensive maneuver conditions, across a complex and extended campaign. This normalization of air transportation, however, does not just occur. As Slim further explains:

Of course it is not possible to feed a large army from the air by just getting the necessary number of aircraft and putting things into them. Just as big an organization is required and just as careful staff work, both by the Army and the Air Forces, as is needed for any large-scale operation. In many ways it is much more difficult. One of the few things that annoyed me about the Burma campaign was when I used to read in the newspapers from home that the Fourteenth Army ‘by a brilliant feat of improvisation’ had managed to feed several thousand men by air. Anyone who tries to feed

⁸² Allen, *Burma: The Longest War*, 148.

⁸³ Taylor, *Air Supply in the Burma Campaigns*, 133.

several thousand men by air and relies on improvisation is extremely rash.⁸⁴

Ultimately the successful execution of air mobility operations in support of ground forces requires effective supply chain management from both air force and army personnel. In general terms, this includes developing a sense not only of “air mindedness” but in particular “air mobility mindedness.” The foundation for sustained success begins with the proper processes and infrastructure to plan and execute for maximum cargo carrying efficiency. In the Burma theater, army and air force logisticians improved aircraft loading and cargo packing methods through rigorous study and experimentation.⁸⁵ In general, they adopted American industrial techniques familiar to Army personnel through their previous civilian employment.⁸⁶ Such techniques included standardized loads, production-line techniques in packing, prepackaging supplies and efficient building layout to cut waste and speed fueling, cargo loading or crew briefing operations.⁸⁷

Personnel also solicited suggestions for improvements and advanced industrial techniques from all ranks, with particular emphasis on adaptation to the jungle environment.⁸⁸ This practice was especially critical in resource-constrained Burma, whose supply requests only garnered serious attention after the European and Pacific theater lists had been filled. But necessity also spurred innovation and British and American logisticians utilized weight-saving Indian bamboo baskets to conduct drops and Indian-manufactured paper parachutes constructed of cheap-and-abundant jute.⁸⁹ With aircraft constrained to maximum

⁸⁴ Slim, “Some Aspects of the Campaign in Burma Lecture,” 5.

⁸⁵ Romanus and Sunderland, *Stillwell's Command Problems*, 104.

⁸⁶ Romanus and Sunderland, *Stillwell's Command Problems*, 104.

⁸⁷ Annett, *Drop Zone Burma*, 75.

⁸⁸ Annett, *Drop Zone Burma*, 75.

⁸⁹ Romanus and Sunderland, *Stillwell's Command Problems*, 104.

7,000 pound loads, the efficient distribution between beans and bullets assumed paramount consideration.⁹⁰

The processes and infrastructure during execution also proved critical to normalizing air transportation. This phase required joint attention because the majority of personnel at austere operating locations included army members. In common practice, standardization was difficult to achieve due to the range of dissimilar conditions across airfields—motorized vehicles on asphalt airstrips coexisted within miles of dirt air strips serviced by communal elephants. This contributed to inefficiencies subsequently magnified throughout the entire system. In surveying operations at Imphal, an Army Air Forces evaluation board noted several areas for improvement that, if properly addressed, could yield increased tonnage flow.⁹¹ Among these deficiencies were on-load delays of several hours due to lack of supplies or transport between depots and airfields, inadequate refueling facilities, and unnecessary damage to aircraft caused by inexperienced vehicle drivers.⁹² Improper packing of cargo assets for flight also contributed to delays. While systemic improvements were pursued, individual efforts usually overcame many obstacles to efficiency.

Normalizing air transportation also necessitated army and air force cooperation to determine the most effective means of delivery. Speed remains air mobility's greatest force multiplying tenet, yet this speed comes with higher overall utilization costs in relation to other transportation means. These greater costs demand consideration as a factor in campaign design. In Burma there were three primary means of air cargo delivery: via airland direct delivery to airfields, via parachute drop, or via free delivery for goods that could survive high-speed ground

⁹⁰ 27th Troop Carrier Squadron, Squadron History June 1944, USAFHRA, SQ-TR-CARR-27-HI, 1-2.

⁹¹ Miller, *Airlift Doctrine*, 149.

⁹² Miller, *Airlift Doctrine*, 149.

impact with little or no damage.⁹³ Along with a sound mechanism for validating and prioritizing field army requests, staff planners also required a system for determining how air mobility components could most efficiently deliver the desired payloads. In reality, this effort proved highly situational and largely ad hoc in practice.

In a corollary idea, two important considerations emerged from the Burma campaign. First, the capability to rapidly construct or repair existing airfields gained widespread demand. Direct delivery of supplies was generally considered the most efficient supply means, as the advance toward Rangoon subsequently corroborated. Larger quantities of cargo airlifted and built up over time also served as a hedge against unforeseen aircraft re-taskings. The improved proficiency of Slim's engineers ensured most air strips were fly-in ready less than 48 hours after construction began, with seven days the maximum time recorded.⁹⁴ Additionally, the Burma campaign highlighted the need for improved precision air drop. The crippling monsoon conditions often wreaked havoc on air drop attempts, ultimately leading some unit to experiment with radar-based deliveries to increase accuracy.⁹⁵ Additionally, drops outside of prepared zones either benefitted the enemy directly with increased provisions or indirectly as friendly units siphoned off combat power in supply recovery efforts.

The normalization of air transport does not occur spontaneously. Only when critical factors of planning and execution effectively merge does meticulous coordination masquerade as mere improvisation to the unknowing observer. Slim's staff of army and air force planners achieved such symbiosis in the process of normalizing air transport in campaign operations.

CONCLUSIONS

⁹³ Romanus and Sunderland, *Stillwell's Command Problems*, 104.

⁹⁴ Slim, "Some Aspects of the Campaign in Burma Article," 20.

⁹⁵ 27th Troop Carrier Squadron, Operational History, USAFHRA 02053253, 1-2.

To be clear, Slim's experience in Burma does not support the general conclusion that air supply is universally superior to normal surface supply.⁹⁶ Too many independent, context-driven factors conspire to preclude such a definitive pronouncement. Slim's experience does, however, vividly demonstrate the critical role air mobility may play in a complex, theater-wide campaign. This, in fact, remains Burma's greatest contribution to the art of warfare.

Quite simply, the Allied ground campaign in Burma from mid-1943 to its conclusion in 1945 was underwritten by air supply. Absent air mobility, the Wingate expedition would not have launched; the second Arakan operation would have resulted in disaster similar to the first; Imphal would have fallen to the Japanese; and an amphibious assault, most likely, would have led to the capture of Rangoon.⁹⁷ Indeed, each of Slim's successes was made possible through the employment of air mobility power. To the air mobility practitioner, the Burma campaign further offers important lessons on air superiority, organizational construct and general "air mobility mindedness" that remain instructive keys to success in both current and future theater campaigns. The next chapter builds upon the historical study to offer a primer on contemporary air mobility operations as a means of helping ascertain the potential impact of Burma operations on future air mobility development.

⁹⁶ Taylor, *Air Supply in the Burma Campaigns*, 142.

⁹⁷ Taylor, *Air Supply in the Burma Campaigns*, 141.

Chapter 4

The Contemporary Air Mobility Environment

My logisticians are a humorless lot...they know if my campaign fails, they are the first ones I will slay.

—Alexander The Great

The post-Cold War environment of the past two decades has evinced a compelling need for, and corresponding increase in, air mobility employment as an essential contribution to national security. Building from the 1990 Air Force White Paper codifying the “Global Reach, Global Power” construct, current worldwide operations dictate a mobility mission departure, on average, every 90 seconds, 24 hours a day, 365 days of the year.¹ This singularly American capability underpins the US armed forces’ ability to provide quick, tailored responses against a myriad of potential adversaries in the defense of vital national interests.

“Rapid, responsive air mobility,” notes Representative Jim Saxton of New Jersey, “promotes stability around the world by keeping the capability and character of the United States highly visible. The value of air mobility to the United States and the international community is priceless indeed.”² In transitioning from the historical analysis of air mobility development, and its subsequent employment in World War II Burma, this chapter orients readers to contemporary air mobility operations through a brief survey of organizing doctrine, foundational principles and current operating procedures. This orientation ultimately seeks to build a basic foundation of modern air mobility practice, or lens, from which to examine the continuing influence of the Burma air campaign. Additionally, although air mobility encompasses a wide range

¹ Carl H. Builder, *The Icarus Syndrome* (London: Transaction Publishers, 2003), 12.

² Keith Hutcheson, *Air Mobility: The Evolution of Global Reach* (Vienna, Virginia: Point One Publishing, 1999), vii.

of important mission types, this discussion limits itself to airlift and its closest associated elements.

ORGANIZATION

As both the interwar period and wide-ranging operations of the Second World War demonstrated, the complex nature of the global air mobility mission precludes any single or generalized model of organization, planning, and employment.³ In an attempt to enhance overall efficiency with limited and disparate air mobility assets, current doctrine divides resources between the regionally focused combatant commands operating in defined areas and the functional combatant commands charged with global responsibilities.⁴ This arrangement, while simultaneously promoting synergies between the two divisions, also seeks to address a persistent fault line across air mobility development by establishing the proper balance between strategic and tactical airlift resources.

GLOBAL AIRLIFT ORGANIZATION

Intertheater—or in common parlance “strategic”—airlift “involves forces operating between the continental United States and a geographic combatant command (theater) or between two geographic combatant commands.”⁵ These missions require close coordination between theater air elements and Air Mobility Command (AMC), the US Transportation Command component charged with executing the air mobility mission.⁶ As one of the Department of Defense’s four functional combatant commands, US Transportation Command serves as the focal point for military transportation taskings across air, sea and land.⁷ Intertheater airlift missions are, by definition, global and provide air lines of supply

³ Air Force Doctrine Document 3-17, *Air Mobility Operations* (1 March 2006), 11.

⁴ John Cirafici, *Airhead Operations—Where AMC Delivers: The Linchpin of Rapid Force Projection* (Maxwell AFB, AL: Air University Press, 1995), 9.

⁵ AFDD 3-17, *Air Mobility Operations*, 8.

⁶ USTRANSCOM Handbook 24-2, *United States Transportation Command Strategic Guidance FY 2002* (2002), 10.

⁷ USTRANSCOM Handbook 24-2, 10.

from rear echelon repositories to forward-based regional combatant commands.

AMC exercises command and control of intertheater, strategic assets through its numbered command, Eighteenth Air Force, at Scott Air Force Base, Illinois. In consonance with Air Force doctrine, Eighteenth Air Force operates the 618th Air and Space Operations Center (AOC) to coordinate, schedule, task and execute worldwide airlift missions.⁸ The AOC, also known as the Tanker Airlift Control Center (TACC), is the “single tasking and execution agency for all activities involving AMC assets and AMC-gained assets operating to fulfill CDRUSTRANSCOM-directed requirements.”⁹

THEATER AIRLIFT ORGANIZATION

In contrast intratheater—generally referred to as “tactical”—airlift is employed primarily at the theater level either under the direction of the geographic combatant commander or within a joint operational area (JOA).¹⁰ Importantly, forces are either assigned or attached to the theater for both operational and administrative purposes, and command and control is typically executed through theater AOCs. Within the theater AOCs, the Air Mobility Division (AMD) retains ultimate responsibility for planning, coordinating, tasking and executing air mobility operations. As one of five divisions comprising the AOC, the AMD receives direction from the AOC director while the AMD chief ensures all elements of the division integrate within the larger planning and execution process.¹¹ To accomplish this integration, the AMD consists of four teams spanning the airlift, air refueling, aeromedical, and command and control functions.¹²

⁸ Air Mobility Command Factsheet, available <http://www.amc.af.mil/library/factsheets/factsheet.asp?id=229>

⁹ AFDD 3-17, *Air Mobility Operations*, 8.

¹⁰ AFDD 3-17, *Air Mobility Operations*, 9.

¹¹ Air Force Doctrine Document 2, *Operations and Organization* (3 April 2007), 107.

¹² AFDD 2, *Operations and Organization*, 107.

Critically, along with developing air strategy and maintaining the mission execution processes for theater aircraft, the AMD retains responsibility for “integrating the execution of theater *and* [emphasis added] USTRANSCOM-assigned air mobility forces operating in the AOR/JOA in support of the Joint Force Commander (JFC) requirements/objectives.”¹³ Additionally, AMD personnel must “maintain information exchange with the 18 AF TACC to support air mobility operations into the AOR/JOA to include the passage of special instructions and other mission critical planning information to prepare intertheater mission aircrews.”¹⁴ This doctrinal guidance seeks to address a foundational air mobility concern, namely the “effective integration of intertheater and intratheater air mobility operations [so] critical to efficient and timely air mobility support to the warfighter.”¹⁵

These arrangements underscore another premise of air mobility doctrine, the key notion that “for air mobility forces performing primarily intertheater operations, the preferred command relationship between global/functional and regional/geographic organizations is support.”¹⁶ In this support role, as opposed to transferring strategic forces to theater operational command “ownership” with each transiting mission, intertheater airlifters retain access to robust USTRANSCOM resources to aid in mission accomplishment. Such resources would not be available within the smaller, and likely less capable, theater command structures, thus detracting from the effective pursuit of overall JFC objectives. This arrangement, while complicated, ultimately seeks to maximize air mobility efficiency.

These complementary requirements signal clear recognition that separate but integrated command structures, each exercising command and control over its forces, are crucial to a mobility system that must

¹³ AFDD 3-17, *Air Mobility Operations*, 23.

¹⁴ AFDD 3-17, *Air Mobility Operations*, 24.

¹⁵ AFDD 3-17, *Air Mobility Operations*, 2.

¹⁶ AFDD 3-17, *Air Mobility Operations*, 12.

maintain focus on its global mission while remaining responsive to the requirements of individual theater commanders. Put another way, this guidance tacitly acknowledges the notion that, “because of air mobility’s global responsibility, multiple competing common users, and the necessity to prioritize and apportion limited resources, centralized control is crucial.”¹⁷ The current air mobility structure allows for such centralized control, led by a single Airman within each separate chain, to pursue overall mission accomplishment.

To enhance centralized mobility control at the theater-level, the Air Force Commander (COMAFFOR) or Joint Forces Air Component Commander (JFACC) may also employ a director of mobility forces (DIRMOBFOR-AIR) to exercise leadership across the entire theater air mobility chain. Specifically, the DIRMOBFOR-AIR is the “COMAFFOR’s designated coordinating authority with all agencies affecting air mobility operations” and functions as an advisor on how to effectively and efficiently use air mobility assets.¹⁸

Importantly, the DIRMOBFOR-AIR does not exercise command authority, although some have argued the merits of such an approach.¹⁹ Instead, he or she serves largely as a liaison officer between the AOC, 18 AF TACC, theater command element, and theater logistics centers to expedite resolution of air mobility related concerns.²⁰ In certain rare circumstances, the COMAFFOR may reorganize the AOC for improved mission effectiveness, to include placing the AMD under direct control/supervision of the DIRMOBFOR-AIR. This possibility stresses the larger importance of co-locating the DIRMOBFOR-Air within the AOC to facilitate a close working relationship with the AMD.²¹

¹⁷ AFDD 3-17, *Air Mobility Operations*, 13.

¹⁸ AFDD 2, *Operations and Organization*, 107

¹⁹ Rolanda Burnett, "Control of Mobility Forces: Should the Director of Mobility Forces Command?," (Maxwell AFB, AL: School of Advanced Air and Space Studies, 2002), 112.

²⁰ AFDD 2, *Operations and Organization*, 107.

²¹ Burnett, "Control of Mobility Forces: Should the Director of Mobility Forces Command?," 51.

Below the headquarters level, other liaison officers also play critical roles, chief among them Air Mobility Liaison Officers (AMLO). An AMLO is a rated mobility officer specifically trained to counsel the supported Army or Marine Corps unit commander on the optimal employment of air mobility resources.²² AMLOs function at unit levels ranging from battalion to corps and, in special circumstances, even echelons above corps.²³ Extensively trained to implement the theater air control system and organize airlift assets under combat conditions, AMLOs are further granted authoritative powers to advise supported ground commanders while simultaneously representing ground force positions to Air Force elements.²⁴

As Lt Col Stacy Maxey, Combined Joint Task Force 101 Headquarters Air Mobility Liaison Officer, stated, “These [army] guys are on the frontlines of the fight [in Afghanistan]. Our job is to ensure that the guys in the air and on the ground can talk to each other so forward operating bases [FOBs] like these get the stuff they need.”²⁵ Another CJTF 101 Headquarters AMLO, Captain John Gruenke, offered additional elaboration: “My job is to give ground command perspective on what capabilities are needed for certain requirements. They know exactly what they want and it’s my job to explain how they can get it into these [austere] locations and how to successfully submit the requests up to the Air Force.”²⁶

To further facilitate army and air force coordination, AMDs may house the airlift section of the army’s Battlefield Coordination Detachment (BCD). Overall the BCD monitors the development of the battlespace while the airlift section focuses specifically on joint airlift

²² Joint Publication 3-17, *Air Mobility Operations* (2 October 2009), 11.

²³ JP 3-17, *Air Mobility Operations*, 11.

²⁴ JP 3-17, *Air Mobility Operations*, 11.

²⁵ Stacia Zachary, “Air Mobility Key to Outpost Sustainability,” *Air Force Print News Today*, 3 February 2011, 1, http://www.afcent.af.mil/news/story_print.asp?id=123240765

²⁶ Zachary, “Air Mobility Key to Outpost Sustainability,” 1.

movements supporting army forces.²⁷ Within BCDs, Ground Liaison Officers, the army counterpart to AMLOs, offer airlift status reports to parent army units while also advising air force mission commanders and staffs on air movement requirements, priorities, and similar matters affecting air mobility.²⁸ Overall, the airlift section of the BCD functions as the single point of contact within the AOC for coordinating Army airlift matters.

OPERATIONS

In line with the air mobility forces supporting Slim, current doctrine identifies four main operational airlift missions: passenger and cargo movement, aeromedical evacuation, special operations support and combat employment and sustainment.²⁹ Air mobility's ability to affect operations across these four dimensions and its impact on the tactical, operational, and strategic levels of conflict, represent an unparalleled advantage to national strategists. Mobility aircraft have repeatedly demonstrated the ability to transport the equivalent industrial tonnage and population of a small city to remote locations spanning the globe.³⁰ The aeromedical evacuation component's refined processes sustain casualty survival rates of 98%, an unprecedented accomplishment in the history of battlefield triage.³¹ The tremendous clamor for high demand, low density special operations assets now finds added relief through air mobility augmentation. Without dismissing the synergistic effects of any of these missions, however, this section focuses primarily on combat employment and sustainment.

In its simplest definition, combat employment and sustainment airlift "moves combat-loaded units to maximize their readiness for

²⁷ JP 3-17, *Air Mobility Operations*, 11.

²⁸ JP 3-17, *Air Mobility Operations*, 11.

²⁹ AFDD 3-17, *Air Mobility Operations*, 29.

³⁰ Scott T Sturkol, "20 Years after Operations Desert Shield, Desert Storm: Airlift Effort Was Compared to Moving 'A Small City,'" *Air Force Print News Today*, 9 March 2011, 1, www.amc.af.mil/news/story.asp?id=123248927.

³¹ House Resolution 1605, 111th Congress, 1st sess., 28 September 2010.

immediate engagement in combat operations within a theater, while combat sustainment airlift ensures those forces are kept supplied under hostile conditions.”³² This allows joint commanders to deliver forces rapidly and directly into hostile environments while also maintaining those forces within a demanding combat environment. While a wide spectrum of missions may fall, in some fashion, under the rubric of combat employment and sustainment, large-scale air assault and air drop packages generally predominate, with their payoff in potential impact frequently outweighing the investment in dedicated airlift missions. As doctrine further underscores, this “is a capability that in most circumstances cannot be accomplished by other means” apart from airlift and as such invokes large risks for both aircrew and ground forces.³³

To conduct combat employment and sustainment operations effectively requires strict adherence to several key tenets. First, operational effectiveness must be the primary objective while concerns over efficient aircraft use and support resources should remain secondary.³⁴ As a corollary, air mobility forces must be able to surge, even temporarily, in order to match increased demands in passenger and cargo movements.³⁵ This requirement also drives the necessary analysis of other factors—to include threats, aircraft technical limitations, aircraft defensive countermeasures, tactical procedures, forward based cargo handling limitations—that may ultimately influence payload capacity and offload capabilities for the customer. Combat sustainment planning also relies on the assumption that inserted forces will, for a period of time, be dependent on follow-on airlift missions for supply, fueling the imperative to reduce the uncertainty induced by the many variables involved.

³² AFDD 3-17, *Air Mobility Operations*, 30.

³³ AFDD 3-17, *Air Mobility Operations*, 31.

³⁴ AFDD 3-17, *Air Mobility Operations*, 32.

³⁵ AFDD 3-17, *Air Mobility Operations*, 32.

Although combat sustainment utilizes both airland and airdrop delivery methods, it is commonly associated with airdrop practices.³⁶

This common association largely holds true in current counterinsurgency operations in Afghanistan. Charles Dunlap Jr. notes irregular warfare doctrine's assertion that the "introduction of a large US ground force on foreign soil may exacerbate the local situation" while further capturing airpower's ability "to deliver a variety of effects from great distance without increasing force presence in a region or country."³⁷ As such, air mobility forces effectively underwrite the ground component commander's strategy of positioning small military outposts in strategic yet formidable locales throughout the country.

In an operational assessment reminiscent of WWII Burma, Army LTC David Preston, 801st Brigade Support Commander, Task Force Currahee, of the 101st Airborne Division, noted "We have outposts all over the place here. Our guys are bedded down in some of the most hostile places here. We can't get trucks in or out without serious risk. Air drops are the only way they make it out here."³⁸ AMC commander, General Raymond Johns, further elaborated, "We were putting our soldiers and Marines out along the villages. We called them FOBs, forward operating bases, near the Pakistani border. And our ability to support them in the outer lands was very difficult if you were using surface conveyance. So more and more of what we needed to do in Afghanistan was being done with airdrop."³⁹

Despite this reliance on airdrop, a foundational tenet of airlift states that "airland delivery, as opposed to airdrop, is the preferred method of aerial delivery when conditions permit, because it is the most efficient, safest, and least expensive way to deliver personnel and

³⁶ AFDD 3-17, *Air Mobility Operations*, 32.

³⁷ Charles J. Jr. Dunlap, "Making Revolutionary Change: Airpower in Coin Today," *Parameters* (Summer 2008): 60.

³⁸ Zachary, "Air Mobility Key to Outpost Sustainability," 1.

³⁹ Scott Fontaine, "Air Missions Soar in Afghanistan," *Air Force Times*, 31 January 2011, 16.

cargo.”⁴⁰ Airland delivery, or when aircraft land to unload cargo and troops, helps minimize risk of damage to supplies or injury to personnel while also promoting unit integrity.⁴¹ Additionally airland delivery methods increase allowable cargo loads, mitigate extensive specialized training demands, and provide additional opportunity to backhaul cargo and personnel out of forward locations.⁴² Its disadvantages, however, include the paucity of suitable airfields limiting maneuver, the necessity of cargo handling and other ground mission support infrastructure, and the potential prolonged exposure to air or ground attacks during arrival and departure.⁴³

Airdrop, conversely, utilizes identified drop zones and either parachutes or free drops of robust, difficult-to-damage supplies directly to ground forces not serviced by landing fields or other avenues of ground transportation. Airdrop offers a host of advantages to include minimized threat exposure, increased joint force maneuver through concentrated force delivery in reduced time and space, and the elimination of large-scale ground support materials and personnel.⁴⁴ The maturation of precision air drop seeks to further magnify these positive yields. Its constraints, however, warrant consideration as airdrop proves more costly and results in decreased cargo delivery capabilities due to increased rigging weights and parachute-imposed limitations.⁴⁵ Significantly, airdrop adds complexity to mission execution through increased specialized training demands for crews and logisticians.⁴⁶

Critically, these limitations imposed by both training demands and aircraft technology cannot be easily discounted in either airland or

⁴⁰ AFDD 3-17, *Air Mobility Operations*, 37.

⁴¹ JP 3-17, *Air Mobility Operations*, 13.

⁴² JP 3-17, *Air Mobility Operations*, 14.

⁴³ JP 3-17, *Air Mobility Operations*, 14.

⁴⁴ AFDD 3-17, *Air Mobility Operations*, 39.

⁴⁵ AFDD 3-17, *Air Mobility Operations*, 39.

⁴⁶ AFDD 3-17, *Air Mobility Operations*, 39.

airdrop missions. Both mission types require complex, perishable skills that atrophy without dedicated, realistic training opportunities. In recent years, the elevated operations tempo for air mobility aircraft has, at different junctures, eclipsed training in advanced assault landings vital to airland execution as well as large-scale air-drop exercises that comprise the airdrop mission.⁴⁷ These deficiencies are magnified throughout the mobility supply chain as Army units, along with Air Force cargo handlers and joint inspection experts, also forfeit opportunities to hone specialized cargo preparation and loading skills. New operating platforms and advanced technologies also entail additional training challenges within the air mobility fleet while contributing, in the near term, to decreased capability as crew qualifications lag acquisitions.⁴⁸

A final important air mobility capability resides in the structure of the air mobility system. AMC maintains a constellation of locations, both CONUS-based and en route, that provide command-and-control, aerial port and maintenance functions to transiting air mobility assets as part of the global air mobility support system (GAMSS).⁴⁹ Another critical component of this system is the highly mobile, expeditionary-capable forces that deploy to contingency locations where current air mobility operational support is lacking. Along with providing basic functions of command and control, aerial port and maintenance, these Contingency Response Wing (CRW) packages may also include supporting personnel from security forces, intelligence, weather or other functions as the situation dictates.⁵⁰ These forces, first employed when existing airfields are seized or new airfields are constructed, facilitate the rapid expansion

⁴⁷ Brian G. Chow, *The Peacetime Tempo of Air Mobility Operations: Meeting Demand and Maintaining Readiness* (Santa Monica, CA: RAND, 2003), 64.

⁴⁸ Richard J. Hazdra, *Air Mobility: The Key to the United States National Security Strategy* (Maxwell AFB, AL: Air University Press, 2001), 49.

⁴⁹ JP 3-17, *Air Mobility Operations*, 2.

⁵⁰ JP 3-17, *Air Mobility Operations*, 2.

of air mobility operations in support of the current mission while bridging the gap until a more robust presence may be established.⁵¹

CONCLUSIONS

Over the decades since its inception, air mobility processes have enlarged and improved commensurate with the capability's growing importance to the defense of the United States. Attempts to correct lingering concerns over proper organization, and the appropriate balance between strategic and tactical airlift command and control, have resulted in significant progress and a workable, albeit imperfect, system. Leadership, both at the headquarters level and below, has played a similarly critical role facilitating organizational constructs to effectively translate air mobility plans into air mobility execution. As one of the 17 Air Force core functions, airlift underwrites a full spectrum of options for national decision makers across all levels of strategy and four key sub-components, with combat employment and sustainment garnering particular note. The theorist T.E. Lawrence noted "Range is more to strategy than force," a revision of war's common equation that US air mobility elements prove every single day.⁵² The final chapter will build upon this foundational examination of contemporary air mobility practices to apply and assess the relevance of Slim's "lessons learned" in informing future air mobility strategists.

⁵¹ JP 3-17, *Air Mobility Operations*, 2.

⁵² T.E. Lawrence, "The Evolution of a Revolt," *Army Quarterly and Defence Journal* (October 1920): 8.

Chapter 5

Conclusions

There is nothing more common than to find considerations of supply affecting the strategic lines of a campaign and a war.
—Carl von Clausewitz

In his “Afterthoughts” to his war memoir *Defeat Into Victory*, Field Marshal William Slim reflected, “A most distinctive aspect of our Burma war was the great use we made of air transport. It was one of our contributions towards a new kind of warfare and I think it is fair to say that, to a large extent, we discovered by trial and error the methods of air supply that later passed into general use.”¹ Fittingly, however, in consonance with the general treatment of the “Forgotten Army,” many of Burma’s instructive lessons remain eclipsed by those derived from other historical air mobility operations. Indeed, even within the Second World War’s CBI Theater (itself a somewhat forgotten battle zone), strategic mobility missions over the “The Hump” to China, as well as Wingate’s innovative Chindit expeditions, largely overshadow the accomplishments of the Fourteenth Army’s air-enabled maneuver warfare in American post-war annals. To the careful air mobility strategist, however, the didactic role of Slim’s campaign should not be so casually relegated to the backwaters of airpower history. To this end, this chapter refracts the key lessons from Slim’s operations through modern air mobility doctrine as a means of capturing critical insights to better inform current, as well as future, practitioners.

AIR SUPERIORITY

In concert with general airpower theory, the Burma campaign illustrates the vital nature of establishing air superiority as a precursor to successful air mobility operations. Until such superiority is assured, air transport missions lack the requisite freedom of movement necessary

¹ Slim, *Defeat into Victory*, 544.

to support large-scale ground element maneuvers effectively, as early Allied operations in Burma attest. At the same time, however, current practices also require an expanded consideration of the basic concept of air superiority. While the threat to large, unarmed transports from enemy air interception remains, air mobility planners must also mitigate the more pressing effect of ground-based anti-aircraft weapons that may potentially frustrate both airland and airdrop operations. In 2010 alone, 125 mobility aircraft were engaged by enemy fire within the Central Command Area of Responsibility, the second- highest tally behind theater rotary-wing assets.²

Expanding upon the basic idea of air superiority, mobility planners must also account for secure access to the GPS constellation as part of the larger idea of “control of the air.” Increasingly, GPS signals undergird aircraft navigation as a proxy for diminishing land-based aids while simultaneously enabling precision-based airdrop capabilities. Consequently enemy interference with the GPS datalink would significantly hamper, if not completely curtail, mobility options in many parts of the world, a point Air Force Chief of Staff General Norton Schwartz emphasized to a 2010 Tufts University defense forum. “Our operations cannot grind to a halt for a degraded or denied system,” Schwartz stated.³ “Our reliance on information technologies is very well known” and remains a critical vulnerability “if the joint force does not reduce its dependence on GPS aid.”⁴

To counter these threats, and mitigate the penalties for unpreparedness that plagued early Burma operations, the air mobility community must continue its use of learning organization processes that

² Jim Garamone, "TRANSCOM Provides America's Greatest Advantage, Commander Says," *Air Force Print News Today*, 7 February 2011, 1, http://www.af.mil/news/story_print.asp?id=123241606.

³ Michael. Hoffman, "Schwartz Warns against Dependence on GPS," *Air Force Times*, 23 January 2010, http://www.airforcetimes.com/news/2010/01/airforce_schwartz_012310/.

⁴ Hoffman, "Schwartz Warns against Dependence on GPS."

adapt to both continuing and emerging challenges. Increased education naturally underpins any such efforts, and the mobility community should build upon positive trends already underway. Its two major weapon system platforms for tactical airlift and airdrop, the C-130 and C-17, both maintain focused weapons schools within the larger Air Force Weapon School construct. Importantly, Air Mobility Command also links weapons school graduates to increased promotion and command opportunities, in turn attracting high-performing candidates to its premier forum for tactical-level innovation. Post-graduation, mobility weapons officers receive outplacements to key billets, from the major command staff through theater mobility cells to the wing level, where their expertise helps further shape current operations across the complete spectrum, from technology acquisition to aircraft employment. These important mechanisms foment continued growth within the air mobility development process.

At the same time, however, efforts to develop and garner insights from the larger mobility force—apart from the weapon officer model—should be pursued by exploiting the technology investments of the US Air Force Expeditionary Center at Ft. Dix, New Jersey. As the center of excellence for air mobility matters, the center proves critical in capturing key benchmark practices for expeditionary mobility operations, to include non-permissive environments. Additionally, the center's previous investment in computer-based-training modules offers a powerful means of promoting important mobility lessons across the force. By marrying these two elements and producing an unclassified "best practices" tactical curriculum nested within an open forum, interactive framework, the center may drive innovative thought within the mobility force that supplements other learning organization efforts. If properly incentivized and legitimized through the stature of the expeditionary center, the program could surpass other disparate mediums as the primary resource for studying contested-environment operations.

ORGANIZATION

The debate over the proper organization for mobility assets, specifically the division between strategic and tactical aircraft, serves as a persistent thread linking the historical periods of air transport development. Certainly the wartime experiences in Burma highlight the consequences of poor organizational frameworks, where diverging British and American strategic ends induced disconnects between the ways and ends of a commander's campaign plan and the means available for execution. Mountbatten's inability to allocate mobility assets quickly for the defense of Imphal, despite his role as theater commander, and the necessarily complete revision of Slim's Mandalay-Meiktila campaign following the removal of transport aircraft to China offer two key examples.

The current mobility structure, under which the 618th AOC exercises centralized control over global air assets while theater AOCs exercise separate control through organic divisions, best addresses lingering organizational tensions that may never achieve complete resolution. Indeed, mobility decision makers must resist solutions that promise such resolution in the name of efficiency as additional, unintended inefficiencies may result. Specifically, command and control of all mobility assets should not migrate *completely* toward centralized control emanating from the 618th AOC at Scott Air Force Base, even if technology increasingly permits such consolidation.

Successful theater campaign operations depend upon the strength of the relationships involved, and the artificial nature of reachback processes to CONUS command organizations makes establishing such relationships at the theater level difficult. Indeed, the intangible "trust factor" brought about by face-to-face contact critically enables most successful operations; and it can neither be made superfluous nor adequately replicated by emerging technologies, particularly given the complex dynamics of rapid, large-scale campaigns. In recognizing this

precept, Slim labored to co-locate his air and land component elements to support relationship building.⁵ Burma operations, in general, benefitted from improved theater relationships following the SEAC reorganization. In the modern operational concept, a robust and properly functioning theater mobility staff—not simply a liaison cell—imbues the necessary confidence in the theater air commander to solidify important relationships with the other land and sea components and, critically, the joint force commander.

While eschewing complete centralization, global and theater command and control elements should employ emerging technologies to further enrich their existing relationship. Such technology, and associated processes, may help identify and exploit potential synergies between airlift operations at the intersection of the global and theater missions. As part of this, a deliberate effort to move away from aircraft-specific labels such as “strategic” or “tactical” airlifter should be implemented. With constricting labels diminished, new “effects-based” paradigms may emerge or efficiencies in standard delivery models realized as new relationships are explored within the specific operational context. Under the Theater Direct Delivery approach, for example, multi-role C-17s forward deployed to the CENTCOM AOR remain under the 618th AOC’s operational control but fly theater taskings unless coordinated to fulfill other, higher-priority, missions.⁶

Pragmatically, a robust theater-mobility command structure will prove vital during the fielding of unmanned aerial vehicles. Currently, both the Marine Corps and the Air Force are aggressively pursuing unmanned aerial vehicle platforms capable of conducting aerial resupply as a partial solution to chronic mobility shortfalls, with the Marines seeking a rotary-based platform while the Air Force investigates models

⁵ Slim, *Defeat into Victory*, 546.

⁶ Justin Brockhoff, "Deployed C-17s Deliver Millionth Ton of Cargo to U.S. Central Command," *Air Mobility Command News Service*, 11 November 2010, <http://www.amc.af.mil/news/story.asp?id=123231282>.

based largely on existing UAV templates.⁷ These tactically and operationally focused assets, however, face initial challenges integrating into existing airspace procedures and standard employment practices.⁸ Furthermore, these challenges would only magnify in correlation to the intensity of the conflict. To help the systems mature, theater command-and-control divisions, charged with the smooth integration of unmanned supply vehicles into campaign plans, promise the greatest returns in resolving potential obstacles to their ultimate acceptance within theater operations.

Finally, Air Mobility Command should continue refining its Contingency Response Wing concepts. These organizations repeatedly demonstrate the crucial ability to fill key enabling roles in crisis across the globe, many of which have direct transfer value to Burma-type operations. Critically, operational “lessons learned” are captured, catalogued and disseminated across the joint force in a practice that supports continual process improvement. Additionally, Air Mobility Command includes CRWs in company-grade officer broadening programs—on par with the weapons schools—with the equal benefit of attracting high-performing personnel with increased promotion and command potential who learn valuable, and different, skill sets early in their careers. These initiatives should persist as indications of a healthy learning organization construct.

NORMALIZATION

The complete normalization of air mobility as a viable, secure supply line in support of large and complex campaigns remains Slim’s most enduring contribution to contemporary airpower practice. Current operations in Afghanistan, for example, build upon Slim’s concepts. In

⁷ Matthew Cox, “USMC Developing UAV to Re-Supply Combat Forces,” *Marine Times*, 11 March, 2009,

http://www.marinecorpstimes.com/news/2009/03/army_cargo_uav_031109/.

⁸ Chad T. Manske, *Unmanned Airlift: A Viable Option for Meeting the Strategic Airlift Shortfall* (Maxwell AFB, AL: School of Advanced Airpower Studies, 2002), 110.

2010 alone, Air Force mobility assets dropped a record-setting 60.4 million pounds of cargo in Afghanistan, nearly twice the amount of the previous year, which aligned with continually doubling metrics since 3.5 million pounds were first dropped in 2005.⁹ Similarly to Burma, many of these drops targeted outposts and forward operating bases otherwise inaccessible due to terrain or threat condition. And, like Slim's forces, the increasing normalization of airdrop processes between Army and Air Force personnel greatly enabled mission success. Importantly, however, these processes require deliberate development in order to sustain the utility of air mobility as a normalized supply line. Specifically, by deliberately developing air mobility processes and then strengthening the linkage mechanisms to joint plans, air mobility's potential power may be realized earlier in campaign design as an innovative, yet economical, approach.

In returning to a common theme, this deliberate development begins foundationally with increased education. Army efforts currently demonstrate an advanced appreciation of this notion, as professional logistic journals such as *Army Sustainment* advocate holistic, design-inspired methodology as a means of better framing difficult sustainment problems.¹⁰ These approaches, in turn, encourage an equal if not greater likelihood that creative airdrop or airland operations may be considered in the initial planning stages and not entirely as a branch plan once conditions prevent the execution by traditional ground means.

Similarly, Air Force mobility planners must be better prepared to advocate the potential advantages of large-scale airdrop or airland missions in the course-of-action-development phase. To achieve this end Air Force officers, AMLOs and mobility planners specifically, should increase their familiarity with the joint planning process and how to

⁹ Fontaine, "Air Missions Soar in Afghanistan," 16.

¹⁰ Kevin M Baird, "Campaign Planning for Logistics Organizations," *Army Sustainment* 42, no. 1 (2010): 39.

wield influence within it. Additionally, professional military education courses should focus greater attention on Burma and similar actions as a balance to the traditional case studies of the Berlin Airlift, the Himalayan “Hump,” or the myriad of airborne troop-carrier operations, dramatic and inspirational though they may be. The fact that British, not American, forces primarily benefited from the air efforts in Burma has artificially limited its appeal in past American studies, although such interoperability ironically only increases its relevance in today’s strategic, coalition-based environment. Both the mobility-centric Advanced Study of Air Mobility program, as well as the Air University colleges, would provide excellent venues for further study.

From this increased focus at the conceptual level, deliberate education efforts should also identify and address additional elements critical at the execution level. In current Afghanistan operations, only two Air Force load specialists are assigned to conduct the required cargo inspections for airdropped materials.¹¹ This potential chokepoint places a premium on Army and other organizations possessing the requisite packaging skills to minimize cargo rejections that could frustrate the supply chain. These skills must be frequently exercised under both peacetime and wartime conditions to prevent atrophy. Additionally, parallel efforts within the acquisition community to obtain improved delivery containers, and related equipment and materials, would further complement these efforts.

Similar efforts in training and acquisition should be applied to both Army and Air Force ground elements that support airland cargo operations in austere environments, with the Contingency Response Wings providing overall direction stemming from real-world operational expertise. Furthermore, although airland remains the doctrinally preferred means of delivery, and consequently offers the greatest returns

¹¹ Emily F. Alley, "Airdrop Inspectors Work with Army and Air Force," *Air Force Print News Today*, 25 March 2011, <http://www.amc.af.mil/news/story.asp?id=123246600>.

in cargo efficiency, airdrop methods must be frequently revisited to sustain their viability as an option. One of airdrop's chief limitations—cost—has been mitigated through inexpensive, low-altitude aerial resupply procedures. Reminiscent of the “parajutes” of Burma, these simpler parachutes cost \$128 per system, as opposed to \$535 for other systems, while retaining overall accuracy characteristics.¹² The parachutes, furthermore, have a high recovery rate for use in subsequent operations. Critically, a young Army non-commissioned officer created the design on the back of a napkin in late 2008, subsequently earning high innovation honors from the Department of Defense.¹³ While a laudable outcome, more systematic attempts to promote the normalization of air mobility processes would hopefully capture important mobility advances before the need arises in a truly innovative, not necessarily improvisational, fashion.

In general, these combined educational and operational initiatives serve to promote a larger sense not only of “airmindedness” but specifically “air mobility mindedness.” As historical air mobility operations illustrate, the aircraft delivering the cargo supplies are only one link in a much greater chain spanning production to delivery. Any link failure necessarily affects the entire chain's ability to achieve a successful outcome. To execute air mobility operations effectively in times of crisis requires forethought and dedication in times of peace. Future efforts regarding the air mobility chain should not neglect this point.

TRAINING

The US Air Force currently maintains the best-trained Air Force in the world, yet Slim's emphasis on training as a key factor to success

¹² Nicholas C. and Daniel L. Labin Zello, "Low-Cost, Low-Altitude Aerial Resupply," *Army Logistician* 40, no. 2 (2008): 11.

¹³ Jake Lowary, "101st Sustainment Brigade Hones Airdrop Skills," *Army Times*, 24 September 2010, <http://www.armytimes.com/news/2010/09/gannett-army-campbell-101st-soldiers-practice-air-drops-092410/>.

remains instructive, particularly given the many challenges facing mobility forces. The first, and most persistent, challenge requires balancing specialized training needs against the demands of a high mission tasking tempo. Both airdrop and tactical airland proficiency remain highly perishable skills susceptible to deterioration if not consistently employed. Even the steady state nature of counterinsurgency support, while offering some tangible training benefits, does not readily translate to the levels of support required during other, higher-intensity forms of warfare.

Thus, mobility leaders must prioritize competing training concerns while balancing overall risk. As part of this, leaders must resist the temptation to retreat, under the auspices of benign predictions of future operational environments, to comfortable training programs that tacitly mask declining skills. Just as Operation Nickel Grass, the US logistical support of Israel during the 1973 Yom Kippur War, exposed the strategic necessity of air-refuelable aircraft, national decision makers may place similar short-notice, high-visibility demands on airdrop and airland expertise. Therefore training must be integrated across the entire mobility chain, not just the air mobility piece. Joint exercises should also provide realistic venues for training on cargo packaging, cargo handling within austere conditions, and cargo delivery under both static and dynamic conditions to ensure addressing the complete spectrum of possible contingencies.

Finally, mobility forces must train with coalition members to build confidence in interoperability matters. The Burma experience, in which American airpower resources supported other national armies, is becoming perhaps a more—rather than less—likely model for future conflicts. Mobility forces should move beyond simple airborne troop drops to robust, complex exercises with large maneuvering ground elements under non-permissive conditions. In addition to exercising key elements of the air mobility chain, such exercises would also address

critical aspects of communication and command and control that, among other essentials, prove vital to mission success.

LEADERSHIP

In concluding the discussion of World War II Burma, this essay briefly returns to the critical role of leadership. As numerous historical records attest, Slim's superior leadership abilities largely set the conditions for his armies' victories on the battlefield, although his own sense of humility would naturally cause him to downplay any such assertion. But excellent leadership was also evident in key positions throughout the Allied structure, as time and again commanders put the greater interests of the mission ahead of any personal feelings or sense of individual pride. Air Commodore Henry Probert succinctly captures the quality, noting that "given the differences of [strategic] priorities, it is a tribute to the British and American commanders within SEAC and EAC that integration worked so well. Despite many differences of opinion, patience and understanding at the top set a pattern for all elements of the command."¹⁴

For mobility leaders, the American commander of the Troop Carrier Command, Brigadier General William T. Old, exhibited qualities of personal courage in piloting the second wave of transports to resupply the besieged Administrative Box, after the first wave turned away due to the intense volume of fire.¹⁵ His example illustrated the way for the remaining transports to deliver their supplies, thus ultimately validating the aerial supply concept in its first major test. In a larger sense, his example continues to illustrate the critical role of the warrior ethos to the mobility community while simultaneously charging subsequent leaders to inculcate its essence as a key element for operating successfully in non-permissive operations. Today's Airmen, as numerous senior

¹⁴ Henry Probert, *The Forgotten Air Force: The Royal Air Force in the War against Japan: 1941-1945* (London: Brassey's Publishing, 1995), 303.

¹⁵ Allen, *Burma: The Longest War*, 187.

national leaders have noted, are the most battle-tested Airmen in history, making it easy to forget the necessity of the warrior ethos.¹⁶ But its importance in underpinning all facets of successful mobility execution, as well as the continuing need for superior leadership at all levels, cannot neither be overlooked nor overstated.

CONCLUSIONS

The parallels between World War II Burma and today's current operations are both relevant and numerous. Both operations may be categorized as being mobility-centric efforts, conducted among demanding terrain within a hostile environment, against a resourceful and resilient enemy, and at the end of long supply lines. As such, Slim's campaigns offer many important lessons for current and future airpower strategists. While acknowledging the primacy of air superiority to successful campaign execution, current strategists must also expand its basic framework to include evolving ground-based and space-based threats to air mobility's freedom of movement. Strategists must also revisit organizational constructs and assess how to arrange lines of command to ensure mission success. The current structure in which global assets synergistically support theater forces offers the most useful, if imperfect, template that preserves key relationships so significant in high-risk, combat operations. The critical linking of all elements of the air mobility chain, in the spirit of greater normalization, sustains air mobility as a viable option for future decision-makers while realistic training and superior leadership form the necessary foundation upon which the entire process functions.

Above all, the Burma example has utility only to the extent that the air mobility community continues to function as a larger learning organization. Spanning the present time, its record in this regard

¹⁶ Senate, "Hearing to Receive Testimony on Air Force and Navy Aviation Programs in Review of the Defense Authorization Request for Fiscal Year 2009 and the Future Years Defense Program," 110th Congress, 2nd sess, 2008, 8.

remains positive. But a future marked by resource scarcity, uncertain defense environments and emerging, unpredictable threats will not entertain the status quo as a satisfactory state. Only by seeking the critical lessons of the past, and employing them to shape and inform present and future conditions, may strategists truly foster proactive, innovative approaches to address the vital and pressing security concerns of the nation.

Bibliography

Academic Papers

- Atkins, John. "A Model For Modern Nonlinear, Noncontiguous Operations: The War in Burma, 1943-1945." Ft Leavenworth, KS: School of Advanced Military Studies, 2003.
- Burnett, Rolanda. "Control of Mobility Forces: Should the Director of Mobility Forces Command?" Maxwell AFB, AL: School of Advanced Air and Space Studies, 2002.
- Lenderman, Major Laura L. "The Rise of Air Mobility and its Generals." Maxwell AFB, AL: School of Advanced Air and Space Studies, 2007.
- Manske, Chad T. "Unmanned Airlift: A Viable Option for Meeting the Strategic Airlift Shortfall." Maxwell AFB, AL: School of Advanced Airpower Studies, 2002.
- Lundin, Walter E. "Slim's Generalship in the 1944 India-Burma Campaign." Quantico, VA: Marine Corps University, 2002.
- Wheeler, Mark E. "What Lessons Does the Burma Campaign Hold?" Newport, Rhode Island: Naval War College, 1994.

Articles

- Alley, Emily F. "Airdrop Inspectors Work with Army and Air Force." *Air Force Print News Today*, 25 March 2011. <http://www.amc.af.mil/news/story.asp?id=123246600> (accessed 3 May 2011).
- Baird, Kevin M. "Campaign Planning for Logistics Organizations." *Army Sustainment* 42, no. 1 (2010).
- Brockhoff, Justin. "Deployed C-17s Deliver Millionth Ton of Cargo to U.S. Central Command." *Air Mobility Command News Service* November 11, 2010. <http://www.amc.af.mil/news/story.asp?id=123231282> (accessed 2 May 2011)
- Cox, Matthew. "USMC Developing UAV to Re-Supply Combat Forces." *Marine Times* March 11, 2009. http://www.marinecorpstimes.com/news/2009/03/army_cargo_uav_031109/ (accessed 2 May 2011).
- Dunlap, Charles J. Jr. "Making Revolutionary Change: Airpower in Coin Today." *Parameters* Summer 2008: 60.
- Fontaine, Scott. "Air Missions Soar in Afghanistan." *Air Force Times*, January 31 2011.
- Garamone, Jim. "TRANSCOM Provides America's Greatest Advantage, Commander Says." *Air Force Print News Today*, February 7 2011. http://www.af.mil/news/story_print.asp?id=123241606 (accessed 26 April 2011).

- Hoffman, Michael. "Schwartz Warns against Dependence on GPS." *Air Force Times* January 23, 2010. http://www.airforcetimes.com/news/2010/01/airforce_schwartz_012310/ (accessed 27 April 2011).
- Lowary, Jake. "101st Sustainment Brigade Hones Airdrop Skills." *Army Times* September 24, 2010. <http://www.armytimes.com/news/2010/09/gannett-army-campbell-101st-soldiers-practice-air-drops-092410/> (accessed 4 May 2011).
- Lawrence, T.E. "The Evolution of a Revolt." *Army Quarterly and Defence Journal* (October 1920).
- Sturkol, Master Sergeant Scott T. "20 Years after Operations Desert Shield, Desert Storm: Airlift Effort Was Compared to Moving 'a Small City.'" *Air Force Print News Today* 9 March 2011. www.amc.af.mil/news/story.asp?id=123248927 (accessed 26 April 2011)
- Zachary, Technical Sergeant Stacia. "Air Mobility Key to Outpost Sustainability." *Air Force Print News Today* 3 February 2011. http://www.afcent.af.mil/news/story_print.asp?id=123240765 (accessed 25 April 2011)
- Zello, Nicholas C. and Daniel L. Labin. "Low-Cost, Low-Altitude Aerial Resupply." *Army Logistician* 40, no. 2 (2008).

Books

- Allen, Louis. *Burma: The Longest War (1941-1945)*. New York: St. Martin's Press, 1984.
- Annett, Roger. *Drop Zone Burma: Adventures in Allied Air Supply 1942-1945*. Barnsley, South Yorkshire: Pen & Sword Aviation, 2008.
- Astor, Gerald. *The Jungle War: Mavericks, Marauders, and Madmen in the China-Burma-India Theater of World War II*. Hoboken, NJ: John Wiley and Sons, Inc., 2004.
- Bayly, Christopher and Tim Harper. *Forgotten Armies: The Fall of British Asia, 1941-1945*. Cambridge: Belknap Press, 2005.
- Bickers, Richard Townshend. *Military Airlift Transport: The Illustrated History*. London: Osprey Aerospace, 1998.
- Black, Jeremy. *World War II: A Military History*. London: Routledge Press, 2003.
- Builder, Carl H. *The Icarus Syndrome*. London: Transaction Publishers, 2003.
- Burlingame, Roger. *General Billy Mitchell: Champion of Air Defense*. Westport, Connecticut: Greenwood Press Publishers, 1952.
- Cady, John. *A History of Modern Burma*. Ithaca, New York: Cornell University Press, 1958.

- Chant, Christopher. *The History of the RAF: 1939-1989*. London: Chevprime Limited, 1990.
- Charney, Michael W. *A History of Modern Burma*. Cambridge: Cambridge University Press, 2009.
- Cirafici, John. *Airhead Operations--Where AMC Delivers: The Linchpin of Rapid Force Projection*. Maxwell AFB, AL: Air University Press, 1995.
- Clausewitz, Carl von. *On War*. Edited and translated by Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press, 1976.
- Collier, Basil. *The Second World War: A Military History*. New York: William Morrow & Company, Inc., 1967.
- Corum, James S. *The Luftwaffe: Creating the Operational Air War, 1918-1940*. Lawrence, Kansas: University Press of Kansas, 1997.
- Craven, W.F. and J.L. Cate. *The Army Air Forces in World War II, Volume Four: The Pacific: Guadalcanal to Saipan*. Chicago: University of Chicago Press, 1950.
- Craven, W.F. and J.L. Cate. *The Army Forces in World War II, Volume Five: The Pacific: Matterhorn to Nagasaki*. Chicago: University of Chicago Press, 1953.
- Daugherty, Leo J. III. *The Allied Resupply Effort in the China-Burma-India Theater During World War II*. London: McFarland and Company, Inc., Publishers, 2008.
- Drea, Edward. *Japan's Imperial Army: Its Rise and Fall, 1853-1945*. Lawrence, Kansas: University of Kansas Press, 2009.
- Dupuy, Trevor. *Asiatic Land Battles: Allied Victories in China and Burma*. New York: Franklin Watts, Inc., 1963.
- Dupuy, Trevor. *Strategic Direction of World War II*. New York: Franklin Watts, Inc., 1965.
- Elliot, E.W. *Burma: The Forgotten War*. Bloomington, Indiana: AuthorHouse, 2005.
- Farquharson, Robert H. *For Your Tomorrow: Canadians and the Burma Campaign 1941-1945*. Toronto: Trafford Publishing, 2004.
- Finn, C.J. *A Brief History of the Royal Air Force*. Norwich: Crown Publishing, 2004.
- Fraser, George MacDonald. *Quartered Safe out Here: A Recollection of the War in Burma*. London: Harvill Publishing, 1992.
- Grant, Ian Lyall and Kazuo Tamayama. *Burma 1942: The Japanese Invasion*. Chichester, West Sussex: The Zampi Press, 1999.
- Griffith, Thomas E. *Macarthur's Airman: General George C. Kenney and the War in the Southwest Pacific*. Lawrence, Kansas: University of Kansas Press, 1998.
- Groocok, Deryck. "The RAF and the Far East War 1941-1945." In *A Symposium on the Far East War*. Royal Air Force Historical Society, 1995.
- Hazdra, Richard J. *Air Mobility: The Key to the United States National*

- Security Strategy*. Maxwell AFB, AL: Air University Press, 2001.
- Hogan, David. *India-Burma*. Washington D.C.: US Government Printing Office, 1992.
- Hudson, J.J. *Hostile Skies: A Combat History of the American Air Service in World War I*. New York: Syracuse University Press, 1968.
- Holmes, Richard, ed. *The Oxford Companion to Military History*. Oxford: Oxford University Press, 2001.
- Hutcheson, Keith. *Air Mobility: The Evolution of Global Reach*. Vienna, Virginia: Point One Publishing, 1999.
- Lee, Floyd, ed. *World War II and the Pacific and the War's Aftermath, with General Themes*. London: Cassell Press, 2002.
- Levine, I.D. *Mitchell: Pioneer of Air Power*. New York: Arno Press, 1972.
- Lewin, Ronald. *Slim: The Standardbearer*. London: Leo Cooper Ltd., 1976.
- Longstreet, Stephen. *The Canvas Falcons: The Men and Planes of World War I*. New York: Trans-Atlantic Publishing, 1995.
- Maurer, Maurer. *Aviation in the U.S. Army, 1919-1939*. Washington, D.C.: Office of Air Force History, 1987.
- Miller, Charles E. *Airlift Doctrine*. Maxwell Air Force Base, Alabama: Air University Press, 1988.
- Ministry, RAF Air. *Wings of the Phoenix: The Official Story of the Air War in Burma*. London: His Majesty's Stationary Office, 1949.
- Mitchell, William. *Winged Defense: The Development and Possibilities of Modern Air Power--Economic and Military*. Tuscaloosa, AL: University of Alabama Press, 1925.
- Moreman, T.R. *The Jungle, the Japanese and the British Commonwealth Armies at War, 1941-1945: Fighting Methods, Doctrine and Training for Jungle Warfare*. London: Frank Cass, 2005.
- Nunnally, John and Kazuo Tamayama. *Tales by Japanese Soldiers*. London: Cassell and Company, 2000.
- Pitchfork, Graham. *The Royal Air Force Day by Day*. Chalford: Sutton Publishing, 2008.
- Probert, Henry. *The Forgotten Air Force: The Royal Air Force in the War Against Japan: 1941-1945*. London: Brassey's Publishing, 1995.
- Pratihvi, Nath. *Wingate--His Relevance to Contemporary Warfare*. New Delhi: Sterling Publishers Private Limited, 1990.
- Ready, J. Lee. *Forgotten Armies: The Military Contributions of the Colonies, Exiled Governments, and Lesser Powers to the Allied Victory in World War II*. London: McFarland & Company, Inc., Publishers, 1985.
- Romanus, Charles and Riley Sunderland. *Stillwell's Command Problems*. Washington, D.C.: Office of the Chief of Military History: Department of the Army, 1956.
- Slim, William. *Defeat into Victory: Battling Japan in Burma and India, 1942-1945*. New York: Cooper Square Press, 1956.

- Smith, Jay. *Anything, Anywhere, Anytime: An Illustrated History of the Military Airlift Command, 1941–1991*. Scott AFB, IL: Headquarters Military Airlift Command, 1991.
- Steinberg, David. *Burma/Myanmar: What Everyone Needs to Know*. Oxford: Oxford University Press, 2010.
- Stillwell, Joseph. *The Stillwell Papers*. New York: William Sloane Publishers, 1948.
- Taylor, Joe. *Air Supply in the Burma Campaigns*. Maxwell AFB, AL: Air University, 1957.
- Warwick, Nigel. *Constant Vigilance: The RAF Regiment in the Burma Campaign*. Barnsley, South Yorkshire: Pen & Sword Aviation, 2007.
- Williamson, Murray. "British Military Effectiveness in the Second World War." In *Military Effectiveness Volume III*, edited by A.R. Millett, Murray, W. London: Unwin Hyman, 1988.
- Willmott, H.P. *The Second World War in the East*. London: Casell, 1999.
- White, Robert. *Mason Patrick and the Fight For Air Service Independence*. Washington D.C.: Smithsonian Institution Press, 2001.

GOVERNMENT DOCUMENTS

- Air Force Doctrine Document 2. *Operations and Organizations*, 3 April 2007.
- Air Force Doctrine Document 3-17, *Air Mobility Operations*, 1 March 2006.
- Air Mobility Command Factsheet, available from <http://www.amc.af.mil/library/factsheets/factsheet.asp?id=229> (accessed 25 April 2011)
- Joint Publication 3-17. *Air Mobility Operations*, 2 October 2009.
- USTRANSCOM Handbook 24-2. *United States Transportation Command Strategic Guidance FY 2002*, 2002.

HEARINGS

- Senate. "Hearing to Receive Testimony on Air Force and Navy Aviation Programs in Review of the Defense Authorization Request for Fiscal Year 2009 and the Future Years Defense Program." 110th Cong., 2nd sess, 2008.

HISTORICAL STUDIES

- Administrative History of the Ferrying Command, 29 May 1941 – 30 June 1942*. Army Air Forces Historical Study No 33, 1945.

- Brown, Genevieve. *Development of Transport Airplanes and Air Transport Equipment*. Historical Study, Air Technical Service Command, 1946.
- Bruce, D.H. *The Evolution of the Storage System of the Air Technical Service Command, Part 1, 1918-1940*: Air Material Historical Study No 262, 1945.
- Hinds, R.D. *The Development of Strategic Airlift for the Armed Forces of the United States, 1941-1965*. Scott AFB, IL: Office of MAC History, July 1968.

MEMORANDUM

- Westover, Major General Oscar. Chief of the Air Corps. To Adjutant General. Memorandum, 31 August 1938, USAFHRA, Maxwell AFB, AL, Call No. 145.93-23.

REPORTS

- Air Corps Plans Division, "Final Report on War Department Special Committee in Army Air Corps [Baker Board]," USAFHRA, Maxwell AFB, AL, Call No. 145.93-94.
- Air Corps Tactical School, "Critique of Air and Ground Maneuvers, May 1927," USAFHRA, Maxwell AFB, AL, Call No. 248.2122.
- Chow, Brian G. *The Peacetime Tempo of Air Mobility Operations: Meeting Demand and Maintaining Readiness*. Santa Monica, CA: RAND, 2003.

RESOLUTIONS

- US House. Resolution 1605, Honoring Aeromedical Evacuation Airmen, 111th Congress, 1st sess., 28 September 2010

UNIT HISTORIES

- History. 27th Troop Carrier Squadron, June 1944, USAFHRA, Maxwell AFB, AL, Call No. SQ-TR-CARR-27-HI, 1-2.
- History, Operational. 27th Troop Carrier Squadron, USAFHRA, Maxwell AFB, AL, Call No. 02053253, 1-2.

UNPUBLISHED PAPERS

- Slim, William. "Some Aspects of the Campaign in Burma Lecture Notes." Churchill Archives Centre, Cambridge, United Kingdom, Slim 3/2, 1946.
- Slim, William. "Some Aspects of the Campaign in Burma Article."

Churchill Archives Centre Cambridge, United Kingdom, Slim 3/2,
1946.