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AIR SUPPLY IN THE BURMA CAMPAIGNS

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By
Dr. Joe G. Taylor

USAF Historical Division
 Research Studies Institute
 Air University

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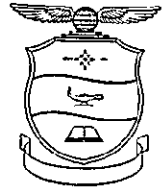
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By
Dr. Joe G. Taylor



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F o r e w o r d

This monograph describes air supply operations in the India-Burma Theater during the Second World War. Included in the discussion are brief accounts of the ground campaigns that the air supply effort supported as well as of the transport operations which delivered the supplies. Considerable attention is given to the command organizations developed to control air supply operations, to the procedures followed in allocating supplies, and to the ground supply organizations that procured, packed, and loaded the goods which air transport units delivered. The narrative covers both American and British operations.

This monograph was written by Dr. Joe G. Taylor of the USAF Historical Division. Dr. Taylor was a bombardier with the 12th Bomb Group, India-Burma Theater, during World War II

Like other Historical Division studies, this history is subject to revision, and additional information or suggested corrections will be welcomed.

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Introduction

Importance of Air Supply in Burma

AIR SUPPLY of ground forces was a significant development in every theater during World War II. In comparison with most others Burma was a theater of limited importance, but it was the only theater in which air supply was the chief and often the only means of supplying Allied ground forces in action against the enemy. British, Chinese, and American forces that penetrated into the Japanese-held areas of Burma were forced to rely upon aerial lines of communication (LOC) because no others were available. Despite obstacles imposed by terrain, weather, disease and the Japanese, complexities of command, and divergencies in the strategic aims of the three Allied concerned, air supply in Burma succeeded to such an extent that the ground forces in the final and successful Allied offensive were supplied entirely by air during much of the campaign. Thus a study of air supply in Burma has value not only as a record of events which deserve to be recorded, but also as a record which may prove useful to those planners who must make provision for possible military operations in the future.

Background

The geography of Burma. Burma, now an independent nation, was a British colony of approximately 16,000,000 people during World War II. From the extreme north to the extreme south, Burma is almost 1,200 miles long, and it is 575 miles wide at the widest point. The average dimensions are much less; the total area is only some 263,000 square miles. From Myitkyina, the

northernmost city of any size, to Rangoon is less than 500 miles, and the central plain, where most of the population is located, is less than 100 miles wide for much of its length, though wider in the Mandalay area and the extreme south.

Politically, Burma is bounded on the west by India, East Pakistan (part of India during World War II), and the Bay of Bengal; on the south by the Andaman Sea; on the east by Thailand, Laos (part of Indochina), and China; and on the north by China and India. During World War II, Thailand and Indochina were occupied by the Japanese, but India and western China (except that portion west of the Salween River) remained in Allied hands.

Far more important than the political boundaries were the natural barriers which almost prohibited access to Burma, except by sea. To the north, northwest, and northeast towered the Himalayas. To the east the Shan Hills, with peaks up to 7,500 feet within Burma, barred easy approach to the colony from that direction. To the west the Arakan Yoma, which included the Naga and Chin Hills with peaks up to 10,000 feet, shut off Burma from India. The Arakan Yoma extended to the coast near the India-Burma border, and thus was an obstacle to movement down the west coast.

Needless to say, there was no way of entering Burma from the extreme north. The great peaks of the Himalayas provided no trail for man or machine. On the east there were some poor roads, motorable in good weather, through the southern Shan Hills from Thailand into Burma, and before the end of the war the Japanese put a railroad into operation from Thailand to

Moulmein, but routes from Japanese-occupied Thailand into Japanese-occupied Burma were of no benefit to Allies attempting the reconquest of Burma. From western China the Burma Road ran to Lashio, north-east of Mandalay, but the Japanese had occupied this road from Lashio to the Salween River, well within China. The terrain in this area gave great advantages to the defenders, and hard fighting would be required to drive the Japanese from their prepared positions.

From India there were several possible routes into Burma, none of them suitable for the movement of large numbers of men and the supplies which would be required for large-scale military operations. From Allied positions south of Chittagong and Cox's Bazaar several poor quality roads gave access to the Kaladan Valley and the Arakan Coast. The Arakan terrain, hilly and jungle-covered, also gave many advantages to the defenders, and since this was the most obvious point for an Allied attack, the Japanese could be expected to be alert. An offensive in the Arakan, moreover, could bring no decisive results even though the main Japanese base at Akyab fell into Allied hands, because the main range of the Arakan Yoma would remain between the Allied armies and the interior of Burma.

There was no possible invasion route from India into Burma from the Arakan north to Manipur. However, a road ran from Dimapur, on the Bengal-Assam Railroad, to Imphal, in Manipur. From Imphal one road, or more accurately trail, led into the Kabaw Valley and southward to Kalewa, on the Chindwin River. Another road of still lower quality ran down the spine of the Chin Hills from Imphal to Tiddim and Fort White, then east to Kalemyo and Kalewa. Across the Chindwin from Kalewa lay the plain of central Burma. In the course of events, it proved possible with great labor to move men and a limited number of vehicles over these routes, but the troops depended almost entirely upon aircraft for their supply.

The final possible route was from Ledo, in Assam, southward through the comparatively low Patkai Hills and across the upper waters of the Chindwin River to Shaduzup, and from Shaduzup southeast to Mogaung on the Mandalay-Myitkyina Railroad. This was the route by which Lt Gen. Joseph W. Stilwell, whose forces had been driven out of Burma by the Japanese in 1942, hoped to return. It was Stilwell's plan to build from Ledo a road which would eventually make a junction with the Burma Road and thus provide land communications between India and China.

Within Burma the mountains, the rivers, and the climate all are obstacles to military operations. The mountains of the Arakan Yoma and the Shan Hills extend well into Burma, and in the north some peaks of the Kumon Range rise almost to 8,000 feet between the headwaters of the Chindwin and Irrawaddy Rivers. Much of the remainder of this northern area is very rough, with comparatively low but steep-sided and jungle-covered ridges. Even the level areas are difficult, swamps are abundant, and the level ground is often covered with almost impenetrable elephant grass twice as high as a man's head. All the mountains and ridges tend in a north-south direction, and the trails follow the higher ground. Because of this north-south orientation of the terrain, military forces moving into Burma from the east or the west had to overcome terrain difficulties as well as the resistance offered by the Japanese. Even in the Mandalay area and below there were hilly areas which could be used to good effect by determined defenders.

The rivers join in making the task of the invader a hazardous one. On the west coast short but deep and swift rivers such as the Naaf, Kaladan, An, and Lemru drop out of the Arakan Yoma and flow southwest into the Bay of Bengal, posing obstacles to military movement in Arakan. The chief rivers are the Chindwin, Irrawaddy, Sittang, and Salween, and their north-south courses lay across invasion routes from east or west. The Chindwin rises in the mountains of the northwest, flows down the eastern edge

of the Arakan Yoma, and joins the Irrawaddy southwest of Mandalay. The Irrawaddy has its beginnings in the Himalayas and flows almost due south past Myitkyina to Bhamo. At Bhamo it turns westward to Katha, then again makes its way south as far as Mandalay. Below Mandalay the Irrawaddy turns to the southwest to the edge of the Arakan Yoma, where it receives the waters of the Chindwin, then flows south into the Andaman Sea. The river reaches the sea through its delta by many channels. The Sittang River, east of the Irrawaddy, is much shorter. It rises south of Mandalay, but grows to considerable volume before it flows into the Gulf of Martaban. Easternmost of the great Burmese rivers is the Salween, which comes down out of the Himalayas and flows for a great distance through western China before it enters Burma south of Lungling. The Salween is a mountain stream and flows through gorges in the heart of the Shan Hills until shortly before it pours into the Gulf of Martaban at Moulmein.

Level ground is scarce in Burma. In the north there are some plains along the Irrawaddy River in the Myitkyina-Bhamo-Katha area, but the central plain around Mandalay is the first of any consequence, amounting to perhaps 7,500 square miles. This plain narrows considerably below Mandalay, but the range of low hills (the Pegu Yoma) between the Irrawaddy and the Sittang Rivers is no insuperable obstacle to military operations. Farther south the central plain merges with the alluvial coastal plain, and the land is almost flat 100 miles inland from the south coast. The coastal region is very swampy, however, and is cut up by the many mouths of the Irrawaddy and other bayou-like streams that make cross-country movement very difficult.

Climate also has an important effect on military operations in Burma. From June through October the wet monsoon* brings incredibly heavy rains over all the country

*The monsoon is a prevailing wind, blowing from one direction half the year, another the remainder. In Southeast Asia the south-wind monsoon is usually referred to as the wet monsoon, since it brings heavy rainfall.

except the plains around Mandalay. During the rains the rivers become torrents, the feeder streams take on the proportions of rivers, and the low-lying areas become impassable swamps. Even atop the ridges the trails become quagmires and afford the worst possible conditions for the movement of men and supplies. During the dry season movement is much easier, but water is then as scarce as it is abundant during the rains, and troops need great quantities during the intense heat of March, April, and May.

Tropical diseases were an obstacle at least as serious as terrain to military operations in Burma. Malaria was the most common health hazard to which troops were exposed; the routes by which the Allied armies had to enter Burma were through some of the most malarial areas in the world. Not so prevalent as malaria, but inflicting a much higher mortality rate, was scrub typhus. Dysentery was an ever-present threat to the efficiency of troops. The only comfort Allied commanders could draw from the fact that their troops were exposed to these and more exotic tropical diseases was the knowledge that the Japanese were similarly exposed.

The Japanese conquest of Burma. Before Pearl Harbor the Japanese had occupied all the ports of China as well as Indochina and Thailand. The German attack on Russia had cut off supplies to China from Russia. Thus before the United States and Great Britain went to war with Japan, the only surface supply route to China from the outside world ran from Rangoon north by rail to Lashio and thence over the Burma Road to Kunming.* The Japanese knew that the conquest of Burma would complete the isolation of China begun in 1937, and would provide an anchor for a Japanese defensive line extending down the Malay Peninsula to Singapore, through the East Indies, and in a great arc through the central Pacific. Finally, the Japanese knew that the colony was poorly defended and that the population was largely hostile to

*Goods could move up the Irrawaddy River to Mandalay.

the British. All these factors made Burma a definite Japanese objective.

Two Japanese divisions invaded Burma from Thailand on 20 January 1942 and on 22-23 February decisively defeated British forces in the Battle of the Sittang Bridge. Aided by Burmese guerrillas, the Japanese advanced rapidly. Rangoon fell to the invaders 11 days later, cutting off reinforcements that might have come to the Allies from India and providing a port of entry for Japanese supplies and reinforcements.

The British troops in Burma were reinforced from China, from which nine divisions crossed the border. Though among the better units in the Chinese Nationalist Army, these divisions averaged only about 6,000 men each, had very limited artillery resources, and with a few outstanding exceptions were very poorly led. British forces amounted to two divisions, composed almost entirely of Burmese and Indian troops, and an armored brigade, but these formations had already taken losses and suffered damage to morale in the campaign for Rangoon. Only a few Royal Air Force (RAF) aircraft and the war-weary P-40's of the American Volunteer Group (AVG), perhaps 50 outmoded aircraft in all, were available to support the British and Chinese forces, and after an effective Japanese attack on the RAF base at Magwe these remaining planes were driven back into India and China.

After the surrender of Singapore, 15 February 1942, reinforcements were available to the Japanese, and the Fifteenth Army in Burma was brought up to a strength of four divisions. Whatever they lacked in numerical superiority, these Japanese soldiers compensated for in experience, training, and morale. Also, they were supported by some 200 aircraft which soon gained control of the air over Burma.

The British-Chinese forces, now under the overall command of the American General Stilwell, made a stand on an east-west line extending roughly from Toungoo on the Sittang River to Prome on the Irrawaddy. Even though Stilwell had grossly underestimated Japanese strength, one Chinese division defended Toungoo tenaci-

ously, and in late March 1942 there seemed some prospect of an Allied victory. This prospect soon vanished because the British-Chinese partnership could not stand the strain of battle; cooperation could not be obtained. To make matters worse, Stilwell found that his orders to the Chinese units entrusted to his command were being countermanded from Chungking. Thus, just at the point where a victory had become a possibility (though not a probability), Allied resistance in Burma crumbled.

Toungoo fell, and Prome was evacuated on 31 March. The oil center of Yenangyaung fell, after a see-saw battle, on 19 April, Lashio on 29 April, and Mandalay on 1 May. Myitkyina, in north Burma, and Akyab, in the Arakan, were captured soon after, and except for a British garrison at Fort Hertz, more than 100 miles north of Myitkyina, the conquest of Burma was complete. The Japanese had occupied a territory as large as Texas in four months of campaigning, and in addition they had moved up the Burma Road into China as far as the Salween River. The surviving British forces retreated into India, most of the Chinese into China. General Stilwell walked out of Burma, leading a party through the Chin Hills to Imphal. Two Chinese divisions also made their way to India, and these troops, given American equipment and training and reinforced by men airlifted from China, were to be used by Stilwell when he returned to Burma.¹

Allied Strategy in Burma

American effort in the China-Burma-India Theater (CBI) was conceived and planned as a means of keeping China in the war against Japan. It was believed that military operations in China were containing large Japanese forces that might be used elsewhere if China dropped out of the war. Likewise, there was hope in the minds of American military planners that Chinese air bases could be used for the aerial bombardment of the Japanese home islands and that abundant Chinese manpower could be used in a final offensive to bring about the defeat of Japan.

Lend-lease assistance had been extended to China before Pearl Harbor, and an American military mission had gone to Chungking in September 1941 to administer the distribution of lend-lease material and to advise the Chinese as to its use. This mission was instructed to serve as a liaison agency between China and the United States in the case of war between the United States and Japan. After the outbreak of war, Stilwell went to China as chief of staff to the China Theater commander (Chiang Kai-shek) and as Commanding General United States Army Forces CBI. Stilwell's mission, in War Department orders, was to "increase the effectiveness of United States assistance to the Chinese Government for the prosecution of the war and to assist in improving the combat efficiency of the Chinese Army."²

Prewar planning and the conclusions reached in December 1941 and January 1942 at the ARCADIA Conference in Washington between the Combined Chiefs of Staff (CCS) of the United States and Great Britain were based on the assumption that the Burma Road would remain available as a supply route into China. Even after the fall of Rangoon, there was hope that this land route of communications could be restored.³

The completion of the Japanese conquest of Burma in May 1942 made all plans based on the Burma Road obsolete without altering the fact that military supplies were the medicine required to keep the Chinese war effort alive. All concerned realized that air transport was a means whereby a minimum of lend-lease material could be moved into China, but the potentialities of air transport for large-scale movement of goods were not appreciated. Therefore, plans were based on an apparent necessity for opening a new land route which would run from India to China across north Burma.

On New Year's Day 1942 the Chinese delegation to Washington had requested lend-lease material for the construction of a road across north Burma from Ledo through Myitkyina to Lungling and a junction with the Burma Road. The Chinese

estimated that such a road could be completed in five months, but the American mission in China warned that construction time would be nearer 30 months. The plan nonetheless received support in Washington, probably from the President. Upon receipt of American approval, Generalissimo Chiang Kai-shek went personally to India and negotiated with the British an agreement that authorized the construction of two roads across Burma, one from Ledo and one from Imphal, both of which would enter China by way of the original Burma Road. The British-Chinese agreement was announced in February, and the United States agreed to provide lend-lease material for construction. Work began on the Ledo Road, under British auspices, during the Japanese conquest of Burma.⁴

In the autumn of 1942, in the course of planning a campaign against the Japanese in Burma, American and British commanders designated the Imphal and Arakan fronts as British areas of responsibility and made the Ledo front the zone of action for Stilwell's Chinese-American forces. With the Ledo-north Burma area went responsibility for construction of the Ledo Road.

American engineers took charge of this project in December 1942. By the end of February 1943, the road had reached the Burma border, 43 miles from Ledo, but it advanced only five more miles in the next three months. Then the coming of the wet monsoon halted all work until the next autumn. The rains were one obstacle to further progress; another was the simple fact that the road could not carry enough traffic to support construction activity.⁵

This experience should have been enlightening insofar as strategic planning was concerned, but the restoration of land communications with China, which meant the completion of the Ledo Road and later the reopening of the Rangoon-Lashio-Kunming supply line, remained the goals to be achieved in Burma. This American-supported strategy was set forth during the Casablanca Conference in January 1943 and was reiterated in Washington in May

(TRIDENT), at Quebec in August (QUADRANT), and at Cairo in November (SEXANT). At Casablanca it was stated that the overall purpose of operations in Burma was to keep China in the war, to keep pressure on the Japanese, and to establish airpower in China for attacks on Japanese shipping. Apparently no one concerned realized that these aims could have been accomplished more economically by air transport than by building roads of necessarily poor quality *6

Neither China nor Great Britain subscribed wholeheartedly to the stated strategy, which involved driving the Japanese out of north Burma. Chiang was reluctant to commit troops to an offensive across the Salween and attempted to make an amphibious invasion of Burma a prerequisite to his cooperation. He refused outright to begin the campaign until Allied naval superiority in the Bay of Bengal was guaranteed. Since he did not relish campaigning in Burma, Chiang was readily converted to the view of Brig. Gen. Claire L. Chennault, commander of the China-based Fourteenth Air Force, that air operations in China should have priority over a ground campaign in Burma 7

British government and military leaders also had strong reservations concerning a land campaign in north Burma. Prime Minister Winston S. Churchill and his advisors had little confidence in the ability or willingness of the Chinese to fight and considered Burma a decidedly secondary theater of operations. Left to themselves, the British would have preferred a campaign directed against Singapore, beginning with an amphibious operation against the Japanese on Sumatra. 8

American views prevailed, and the CCS maintained their position that operations in Burma should be directed toward keeping China in the war by means of a road across Burma. As carried out, this strategy involved a Chinese offensive in the Salween area, a Chinese-American offensive from Ledo into north Burma, and British offensives from Imphal and in the Arakan. In-

asmuch as the British and Chinese, who provided almost all the infantry for the war in Burma, were not in full sympathy with this strategy, delays and half-hearted preparations were almost inevitable. Each of these two Allies welcomed the delays imposed by the other, and when these delays were compounded with Burmese terrain and weather, Japanese resistance, and an ambiguous Allied command organization, the Burma campaign became one long chronicle of exasperation for the Americans concerned.

Command in the China-Burma-India Theater

In the CBI the three Allies engaged against the Japanese had little in common but the common enemy. Between 1 January 1943 and the end of World War II, the divergencies in their aims and interests were reflected in a command situation that was of such rich complexity that it first fascinated and then frustrated the makers of command charts. A complete exposition of this tropical proliferation would be exceedingly difficult if not impossible and certainly would be profitless, but the main outlines, however blurred, must be understood in a discussion of operations in Burma.

One source of confusion lies in thinking of the CBI as a unit. In reality, there was a theater for each ally. Lord Louis Mountbatten's Southeast Asia Command (SEAC), over which he assumed operational control 16 November 1943, included India, Burma, Ceylon, Thailand, the Malay Peninsula, and part of the East Indies. Within those areas he was supreme Allied commander. Chiang was supreme Allied commander in his theater, which included China and Indochina. Finally, the American CBI included both these areas with Stilwell as commander of American forces until his recall in October 1944. 9 Stilwell, in addition to his duties as American theater commander, was Chiang's chief of staff in the China Theater and Mountbatten's deputy commander in SEAC and directly commanded Chinese troops in India and north Burma (these

*At that time the CBI was split into the India-Burma Theater under Lt. Gen. Daniel I. Sultan and the China Theater (CT) under Lt. Gen. Albert C. Wedemeyer.

*See below, p. 18

duties were assumed by Wedemeyer in China and Sultan in India-Burma after Stilwell's recall). As may be easily seen, this situation promised all sorts of opportunities for conflicts of authority at the highest levels. At the level of air force command, the situation was even more complex.⁷

After the dissolution of the AVG in July 1942, Chennault's air units in China operated as the China Air Task Force (CATF) of the Tenth Air Force, the Tenth was under the command of Maj. Gen. Clayton Bissell from 18 August 1942 until 20 July 1943. Thus, even though Chennault commanded the only air force in Chiang's China Theater, the chain of command ran back to Bissell in India and then to Stilwell as commanding general of American forces in CBI. As a result, harsh words passed back and forth over the Hump, especially in regard to matters of logistics and administration. This particular source of Chennault's dissatisfaction came to an end when his command became the Fourteenth Air Force in March 1943. Thereafter, for all practical purposes, Chennault controlled all air operations in China except those of the B-29's so long as he retained his command.⁸

No such simple solution could resolve the command difficulties of the Army Air Forces and RAF in India. Until July 1943 the Tenth Air Force commander reported directly to Stilwell, but at that time Maj. Gen. George Stratemeyer assumed command of Headquarters, United States Army Air Forces, India-Burma Sector (USAAF IBS), CBI, thus interposing an echelon between Tenth Air Force and Stilwell. All units of the Tenth Air Force came under Stratemeyer's direction, but not the India-China Wing, Air Transport Command (ICW ATC), which was engaged in ferrying supplies to China.

In August, command of air units was further complicated by the appointment of Air Chief Marshal Sir Richard Pierse as Air Commander, SEAC. Then, in December

⁷This discussion, like that which follows, is somewhat oversimplified. As might be expected, the details of command organization changed rather frequently. For instance, before the establishment of SEAC Field Marshal Sir Archibald P. Wavell had exercised roughly the same authority that Mountbatten assumed.

1943, the Eastern Air Command (EAC), which included both RAF and AAF forces in India except for the ATC wing and air service forces, was established under Pierse with Stratemeyer as its commander, making Tenth Air Force an administrative unit. Thus Stratemeyer was American air commander under Stilwell and held operational control of both British and American air units as Commander EAC.¹⁰

As first established, EAC was divided into four parts, the Third Tactical Air Force (TAF) and the Photographic Reconnaissance Force (PRF) under RAF commanders and the Strategic Air Force (SAF) and Troop Carrier Command (TCC) under AAF officers. The TCC commander was Brig. Gen. William D. Old. At the time of EAC's creation, the 1st, 2d, 27th, and 315th Troop Carrier Squadrons (later organized as the 443d Troop Carrier Group) and the 177th Transport Wing, RAF, with an equal number of squadrons, composed TCC, but two of the RAF squadrons were in northwest India engaged in the training of a parachute brigade.¹¹

In May 1944 TCC was placed under Third TAF, but this arrangement was short-lived; in June TCC was dissolved. A new organization of EAC made Tenth Air Force, commanded by Maj. Gen. Howard C. Davidson after Bissell's recall, again an operational command. After the dissolution of TCC, the 443d Troop Carrier Group was placed directly under Tenth Air Force for support of Stilwell's operations in north Burma. Other components of TCC became part of Third TAF, but in September 1944 a new command, Combat Cargo Task Force (CCTF), under Brig. Gen. Frederick W. Evans, was created to support British-Indian forces on the central and Arakan fronts. CCTF contained not only British and American transport units, but also the tactical and liaison squadrons of the 1st and 2d Air Commando Groups. CCTF was disbanded in June 1945 and American units on the central front were rapidly withdrawn; RAF 232 Group exercised command of transports in that sector for the remainder of the war. EAC was also dissolved in June,

and Tenth Air Force Headquarters moved to China. American air units which remained in north Burma came under the command of the North Burma Air Task Force (NBATF) or, in the case of most transport squadrons, ICW ATC.¹²

Competition for Air Supply Resources

The CBI was at the end of a supply line that stretched half way around the world; furthermore, it had a low priority in a world at war. There was never enough of anything to go around, and air transport capacity was in great demand.

Air transport was needed, first of all, for the aerial supply line to China. The Hump route was operated by ATC, but the aircraft engaged in flying supplies to China could be used equally well for delivering supplies to ground forces in Burma. Likewise, aircraft engaged in air supply operations in Burma could be pressed into use for delivering goods to China. As the exigencies of operations in China or Burma predominated, there was a tendency to take resources from the Hump for use in Burma or from Burma for use on the Hump.

Another demand for air supply resulted from the operations of Chinese ground forces in the Salween area along the Burma Road, which finally began in May 1944 and lasted until January 1945. Here as elsewhere, land routes proved inadequate for supplying the Allied forces engaged, and airdrops became necessary. The 27th Troop Carrier Squadron was detached from the India-Burma Sector and assigned to Fourteenth Air Force in order to make possible the aerial delivery of supplies to this front. The Japanese offensive in China in 1944 and 1945 made it necessary to divert other transports from Burma operations, some permanently, but most temporarily.

From the autumn of 1943 onward, Stilwell's operations in north Burma depended upon air supply to a large extent. The Chinese forces under his command were partly supplied by air before they were committed, and were supplied entirely by air after they had entered Burma. During late 1943 and all of 1944 construction of the

Ledo Road received much of its logistic support from the air because the road could carry only a part of the tonnage needed to support itself. Merrill's Marauders,* the only American infantry unit in the Burma campaign until mid-1944, was supplied by cargo aircraft during its forays into enemy territory. Lastly, air supply supported a number of Office of Strategic Services (OSS) outposts, weather observation stations, and air warning stations; and transport aircraft delivered weapons and other supplies to irregular native forces in Burma.

British forces, too, had much need for material delivered by air. From the time the Japanese captured Myitkyina, supply of Fort Hertz by land had proved impractical. When an abortive British offensive in early 1944 left a division in the Arakan surrounded by the enemy, air supply enabled the division to survive and retain its combat efficiency. The operations of Maj. Gen. Orde Wingate's Long Range Penetration Groups (Chindits) behind enemy lines in 1943 and again in 1944 depended upon transport aircraft for all logistic services. When the last Japanese offensive cut off Imphal and Kohima in mid-1944, air transport by flying in reinforcements and supplies made it possible to hold the threatened positions, even though resources were strained to such a point that medium bombers were used as transports. Finally, the British offensive of 1944-1945, which followed the Japanese through the mountains from Manipur and drove them out of central Burma, provided the spectacle of an entire army operating hundreds of miles from its bases without significant surface lines of communication.

Competition for air supply resources was to be expected when there was much to be done and little with which to do it. Certainly the fact that there were three geographically distinct areas of ground operations, each under the command of a different ally, tended to make the competition for air supply resources especially keen and to make recriminations especially bitter. A commander who was unable to obtain vitally needed supplies because the aircraft needed

*This force approximated regimental strength. See also p 18

to deliver them had been allotted to a commander of a different nationality frequently suspected that skulduggery was involved. The real explanation of such disappointments was much simpler. Usually, enough supplies for all who wanted them were not available, and when the supplies were on hand, the aircraft to deliver them might not be present. If by some chance the supplies and the aircraft could be found, the airfields available might not support the

necessary number of missions. The fact that a strategy that required the reconquest of Burma from the north was successfully applied, even though air transport proved the only practical means of giving logistic support to the troops involved, is evidence in itself that the meager resources available were used with reasonable efficiency. What might have been accomplished with better organization and a better strategy is another story.¹³

CHAPTER 11

Early Air Supply Operations in Burma, January 1942-October 1943

Air Transport Operations during the Japanese Conquest

WHEN THE JAPANESE invaded Burma in January 1942, 31 Transport Squadron, Royal Air Force, was operational in India, and the Chinese National Air Corporation (CNAC), owned jointly by Pan American Airways and the Chinese Nationalist Government, was operating an airline from Calcutta to Kunming. The RAF squadron flew some supplies into Rangoon during the early fighting in Burma, and both RAF and CNAC transports evacuated civilians from Rangoon. In March 1942 American heavy bombers that had fled from the East Indies to India flew a battalion of British troops (456 men) into Magwe Airfield in Burma and brought out 426 women and children when they returned to India.

In April transports taken over from United States civil airlines and manned by civilian pilots arrived in India and began flying gasoline into China. This gasoline was meant for the use of the Doolittle raiders, who were expected to land in China after bombing Japan. Before the gasoline delivery had been completed these planes, reinforced by a few Army Air Forces transports with military pilots, were ordered by General Stilwell to deliver weapons, ammunition, and medical supplies to Chinese troops and the American Volunteer Group at Lashio. Some of the civilian pilots, conscious of the fact that they could claim no belligerent rights if shot down and cap-

tured, refused to continue flying, but other civilians and the AAF pilots on hand sufficed to keep the flyable planes in the air.

Very few supplies were delivered because, as the retreat in Burma turned into a rout, evacuation of wounded troops and civilians became the chief task of the transport pilots. Myitkyina was the main aerial evacuation point, and during the last days of April the transport aircraft, usually overloaded, made three round trips a day evacuating casualties and civilian refugees from Myitkyina to Dinjan. American, RAF, and CNAC transports continued this effort until 2 May, when a Japanese bombing attack put the Myitkyina Airfield out of commission. Altogether, during this period Allied aircraft evacuated from Burma 8,616 persons, 2,600 of whom were wounded.

Few able-bodied troops and only part of the civilians desiring to leave Burma were evacuated by air. The remainder had to walk, and rations for only a few days could be carried on the trek. Feeding these refugees was another task for the few transport aircraft in the theater. Approximately 54 tons of food were dropped along the trails which the refugees followed in their attempt to reach safety. Much of this food was wasted—a daily sortie to supply Stilwell's party made only one successful drop—but it nonetheless saved many people whose names would otherwise have been added to the great number of those who died of hardship, exposure, and starvation.¹

Miscellaneous Air Supply Operations,
June 1942-October 1943

The delivery of supplies by air continued after the Japanese conquest was complete. British troops still held Fort Hertz, and the enemy occupation of the Myitkyina area had cut normal supply lines at the same time that the arrival of a flood of retreating troops and refugees had increased the need for supplies. Several caravans of native porters and at least one mule train were sent overland from Assam to Fort Hertz, but these attempts accomplished little more than to demonstrate that consumption en route by men and animals was so great that very little reached the fort. A Dakota of RAF 31 Squadron dropped food to the garrison on 9 May 1942, and before the end of May an American C-47 had landed on an emergency airfield at Fort Hertz. Thereafter, for all practical purposes, the post was supplied entirely by air.

After the debacle in central Burma in April 1942, the Chinese Fifth Army had retreated into the hills north of Myitkyina, hoping to reach China through the mountains. In this desolate region the army was trapped by the wet monsoon, and when food confiscated from the hapless natives had been consumed, the troops faced starvation. CNAC transports, with some help from AAF planes, dropped four tons of rice to these men in May and delivered 80 tons in June. The amount dropped increased still more in July; more than 17 tons were dropped on one day. Most of the men whose lives were saved by these air supply operations eventually made their way to Assam, increasing the strength of Stilwell's forces by several thousand.

During the exodus from Burma in April and May 1942, the greater part of the refugees made their way through the Chin Hills to Imphal. Significant numbers, however, attempted to follow the roads and trails northwest from Mogaung to Ledo, in Assam. This route was a poor one at best, and the wet monsoon came before most of these unfortunates could complete their escape, trapping them in the neighborhood

of Shingbuiyang. Disease, exposure, and exhaustion took a heavy toll during the rainy season (June-October), but regular airdrops of food prevented complete disaster. The survivors made their way to Assam when the rains ended.

Transport aircraft were also used to reinforce Stilwell's Chinese units in India. The survivors of the defense of Burma were not numerous enough to carry out the general's plans even after the Fifth Army survivors had been added to those on hand. In October-November 1942, by agreement with the Chinese government, 17,000 men were flown from China to Dinjan to strengthen the forces on the Ledo front. This project imposed little burden on ATC, because planes flying material into China seldom had significant cargo for the return trip.

A more serious burden was air supply of isolated posts. Fort Hertz has already been mentioned, but smaller posts, particularly air warning stations set up to give advance warning to Assam bases in case of Japanese air attack, also had to be supplied, and the necessities of life could be delivered to these stations only by air. During 1942 all such supply missions lessened the flow of material to China, but air defense of Assam was rightly considered essential to continued operation of the Hump route. Supply of such posts continued through 1943, and in 1944 until the Allied advance into Burma had rendered them unnecessary. RAF transports, in addition to making most of the sorties to Fort Hertz, were assigned the task of supporting the British garrison at Tiddim, a frontier post in the Chin Hills that protected the approaches to Imphal. Finally, in early February 1943, "13 containers weighing about 115 pounds each, packed with everything from pencils, sewing kits, and combs to Thompson sub-machine guns, ammunition, and food" were dropped to the first Office of Strategic Services mission to enter Burma. Support of OSS missions and the irregular native forces raised, equipped, and directed by them was a continuing chore for transport pilots.²

The First Arakan Campaign

In December 1942 the first Allied ground offensive against the Japanese in Burma was launched in the Arakan. Original plans had been for a full-scale attempt to drive the Japanese out of Burma by means of an American-British-Chinese attack from Ledo and Imphal, a Chinese attack across the Salween, and a British amphibious landing on the coast. This plan was too ambitious for the means at hand and was never fully supported by the British and Chinese. Eventually the idea of a major offensive was abandoned, and an amphibious assault in the Arakan with the limited objective of securing the airfields in the Akyab area was substituted. This too proved beyond the means available, because the shipping necessary for even so limited an amphibious operation was needed for the invasion of North Africa. The final outcome of all these plans was an advance by 14 Indian Division, supported by 26 Indian Division, down the Mayu Peninsula in an attempt to take Akyab by land.

Only two Japanese battalions defended Akyab at the beginning of the campaign, and swift movement on the part of the Allies might have brought success—near the end of December a patrol reached the end of the Mayu Peninsula directly opposite Akyab Island and the main body of troops was only ten miles to the north. Just at this point, however, the advance was halted for reorganization and bringing up supplies. This delay, which lasted for two weeks, doomed the enterprise. The Japanese 55th Division had time to move additional units into the battle, and soon barred farther progress. Fighting continued on the Mayu Peninsula for five months, with both British and Japanese reinforcements being fed into the battle, but the advance toward Akyab was definitely halted.

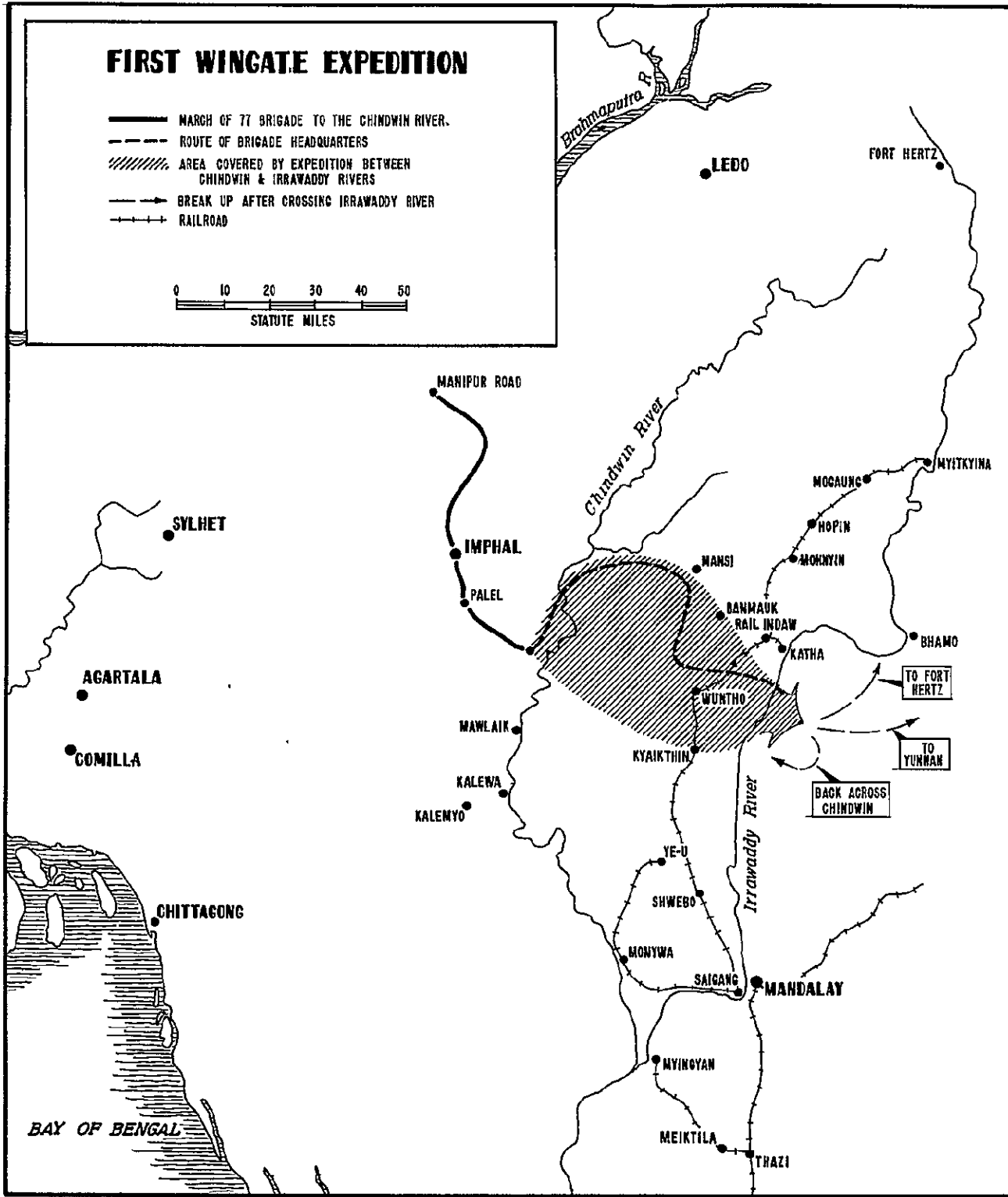
During the fighting, a battalion of the Japanese 33d Division made its way across the Arakan Yoma from the Irrawaddy Valley and entered the Kaladan River Valley to the left and rear of the Allied forces. Then the Japanese 55th Division took the

offensive, moving around the flanks of the road-bound Indian formations, cutting lines of supply with roadblocks, and isolating small units. These tactics, the same ones the Japanese had used in their original conquest of Burma, succeeded admirably, forcing the Allied divisions to fall back in order to maintain their communications. By May 1943, 14 and 26 Divisions were back at their starting points, weaker by 2,500 killed and wounded and a much greater number of sick. Just as weakening was the fact that the morale of these and other Allied troops was lowered by another demonstration of Japanese superiority in jungle fighting.³

The Japanese conquest of Burma had shown that Allied ground troops with conventional land lines of communication could not match the Japanese in jungle warfare. The Arakan campaign of 1942-1943 demonstrated this fact once more. The Indian Divisions in the Arakan greatly outnumbered their opponents in the first stages of the campaign, and they retained numerical superiority throughout, but numbers proved of no avail when more strength had to be devoted to maintaining the supply line than to fighting the enemy. When the Japanese succeeded, as they so often did, in blocking communications to the rear, Allied units had to choose between starvation and retreat. The first Arakan campaign demonstrated the necessity for some radically new means of supplying troops fighting the Japanese in the jungles of Burma.

The First Wingate Expedition

The first step toward development of a tactic that would enable the Allies to match the Japanese in jungle warfare had been taken during the evacuation of Burma, but few commanders appreciated the significance of the food drops and evacuation flights of that campaign. Information concerning the use of transport aircraft for supply of American and Australian troops in Papua filtered into Allied headquarters in Southeast Asia, however, and when combined with the earlier experience in Burma, this information did make an impression. As a result there was a growing desire to



see what could be accomplished in Burma by using air transport to supply ground troops operating against the enemy in the jungle.

Brigadier Orde Wingate, a man with wide experience in irregular warfare in Palestine and Ethiopia, was selected to head the ground forces in a test of the practicability of air supply. Wingate's men were not picked troops; his 77 Brigade was composed of somewhat overage British garrison troops, Ghurkas, and a battalion of Burmese veterans of the 1942 campaign. Stripped of all surplus equipment and provided only with animal transport, the Chindits, as Wingate's forces came to be known, were put through a rigorous period of training to prepare them for operations behind enemy lines. Their only communication with the outside world was to be by means of the radios they would use to ask for supplies.

According to the original plans, the task of the Chindits was to disrupt communications between Mandalay and Myitkyina and between Mandalay and Lashio while regular Allied forces from India and China attacked the Japanese in north Burma, the Salween region, and the Arakan. This plan was another victim of the unwillingness of the Chinese to attack and the willingness of the British to accept delay, and it was cancelled. Wingate's Chindits, however, were allowed to proceed into Burma with the mission of disrupting Japanese communications and propagandizing among the people of Burma.

Wingate divided his brigade into seven columns, each of which was a self-contained unit with its own animals, radio, and RAF liaison officer. After crossing the Chindwin River southeast of Imphal on 18 February 1943, six columns (one was turned back by a Japanese ambush) made their way individually to the Mandalay-Myitkyina Railroad, where demolitions were carried out. Instead of turning back toward India when the demolitions had been completed, Wingate ordered his columns to continue to the east and across the Irrawaddy River. The objects of this move were twofold, to evade

the Japanese who presumably expected a march back toward the Chindwin, and to take advantage of any opportunity to damage the railroad to Lashio. The last objective could not be achieved, and the approach of the monsoon combined with Japanese pressure forced Wingate to break his brigade into small groups that made their way back as best they could. Most of these parties went west and crossed the Chindwin, but one went east to Yunnan, and another made its way north to Fort Hertz. About 30 percent of the original force were casualties; most of the wounded and exhausted were of necessity left behind.

Directly, the expedition accomplished little. Casualties inflicted on the Japanese were not particularly heavy because the Chindits avoided fighting whenever possible, but the Japanese did report that Allied automatic weapons were very effective against those troops actually engaged with them. No doubt some good was accomplished by demonstrating to the people of Burma that Allied ground forces were still in existence, but the Japanese were succeeding very well in making themselves unpopular before Wingate's men arrived. Damage was done to the Mandalay-Myitkyina Railroad, but it could have been done more economically by bombers, and the Japanese were able to make repairs very quickly. By keeping Japanese busy marching about Burma in search of the Chindits, the expedition did interfere to some degree with preparations for the Japanese offensive of 1944.

Indirectly, the Chindit operations were of great importance. By operating in Burma without ground lines of communication, Wingate demonstrated the feasibility and military economy of air supply of ground forces in jungle combat. This new factor was thereafter taken into account in planning, and it bore fruit in the Arakan, at Imphal, and in north Burma during the dry season of 1943-1944.

By later standards, air supply of the first Wingate expedition was primitive and inefficient. Each column requisitioned its supplies separately by presenting a list of the

items needed to the accompanying RAF liaison officer. The liaison officer transmitted the list to the supply base in Assam, and there the goods were packaged and prepared for dropping. As soon thereafter as possible the liaison officer, from his maps, selected a likely dropping zone (DZ) somewhere ahead on the column's line of march and radioed the location of the drop zone to the RAF 31 Transport Squadron. Nearly all drops were made at night, and fires were set to guide the transports to the DZ. Communication at the scene of the drop was by Aldis Lamp.

Sometimes not enough transports were available to deliver all of the supplies requested, and a considerable proportion of the supplies which were dropped were not recovered. Losses were due to dropping at the wrong place, to inaccuracy that scattered the supplies over too large an area, or to Japanese pressure that forced columns to move away from a DZ before all supplies dropped could be recovered. Since the Chindits were on short rations at the best, the loss of any part of the required items was serious, and weakness from hunger brought about a decided decrease in efficiency.

Some of the wastage of supplies could have been eliminated by direct radio communication between the troops on the ground and the transport aircraft overhead, but such communication was not included in the plans for the expedition. Radio communication between columns and with base was a continual problem; gasoline for battery chargers was soon exhausted, and the consequent deterioration in transmitting power was a major handicap. The expedition demonstrated a very definite need for better communications between combat units, base supply units, and the delivery aircraft.

After the brigade broke up into small parties for the return to India, radio equipment was left behind, and the parties attempted to live off the country. The RAF succeeded in finding some of the parties and dropped food to them, and in one case a Dakota landed and flew out casualties after a suit-

able landing field had been discovered.* Significantly, this party had one of the few radios which was still working. Most of the Chindits received no drops after they started back to India. Casualties, which had amounted to only 6 percent before the retreat began, mounted to the final figure of 30 percent on the way out.⁴

Early Organization for Air Supply

No provision had been made for air supply in India and Burma before the outbreak of war, and the few air supply efforts made during the Japanese conquest of Burma were organized on a day-to-day basis. It soon became evident that the delivery of supplies by aircraft required not only the air organization to fly the goods to their destination, but a ground organization to receive the supplies at rear bases, store them, package them for dropping, transport them from warehouse to aircraft, and load them aboard. Also required was a new specialist, the "kicker" who pushed the packages out of the aircraft over the drop zone.

Aircraft for supply drops were originally provided by RAF 31 Transport Squadron or by the AAF Ferry Command. Since the primary mission of Ferry Command, and of its successor, the India-China Wing, Air Transport Command (ICW ATC), was to ferry supplies to China, supply drops in Burma were a diversion from the main effort. Nevertheless, from late 1942 through June 1943 it was necessary for Ferry Command or ATC to use up to four aircraft per day for supply of ground units.

In February 1943 the 1st and 2d Troop Carrier Squadrons, AAF, arrived in India. The 1st Squadron, based at New Delhi with a detachment at Agra, took over intra-India air transport from ATC, permitting greater ATC concentration on the Hump. The 2d Troop Carrier Squadron was first based at Yangkai, China, and aided ATC by participating directly in the delivery of material over the Hump. From February to 1 July 1943 ATC continued to fly up to four flights a day in supplying ground units in

*See below, p 67.

Burma while the troop carrier squadrons more than replaced the effort thus subtracted from India-China air transport.

In June 1943 the 2d Troop Carrier Squadron was ordered to return to India and take over supply-dropping operations from Dinjan. The squadron flew its first supply-dropping mission on 1 July and during the month, despite the wet monsoon and the fact that most of its aircraft were in poor condition—practically all in need of 3d and 4th echelon maintenance—some 750 tons of supplies were delivered. During the next two months some help was received from the 1st Troop Carrier Squadron, and in October 1943, at the beginning of the dry season, the 1st Squadron was moved to Sookerating and began full-time air supply operations. These two squadrons were to deliver the supplies for the first phases of the north Burma campaign of 1943-1944.

During the evacuation of Burma, the ground organization for air supply had been as impromptu as that of the air element. In September 1942 at least one air supply unit had been established in the supply section of the British army and was at work packing and loading supplies for Fort Hertz and for refugees trapped in Burma. The British Fourteenth Army set up details for packing and loading the supplies to be delivered by 31 Squadron to Wingate's Chindits. One such detail, located at Tinsukia, was studied by American officers before the first American unit of this type was established. The British were able to give much practical advice on packaging, loading, and the selection of drop sites.

The first American unit consisted of details from an ordnance company and a laundry company at Chabua. These details packed the supplies to be delivered and loaded them aboard the delivery aircraft.

Presumably, also, members of these details served as kickers for supply drops.

As the early drops proved successful, the demand for air supply increased. As the volume of goods to be processed and loaded increased, the task became too much for the original details, and a new organization was established. An ordnance officer at Dinjan (Lt. F. L. Wood) was designated base dropping officer and was given personnel from three ordnance companies for packing, loading, and kicking.

The capacities of this group too were quickly outstripped by expanding air supply activity, and in late March 1943 Services of Supply (SOS) used Quartermaster truck companies as a source of personnel for a third and longer-lasting organization. A base detachment, under SOS base transportation, stored goods, packed them, loaded them aboard transports, and provided kickers. Seven detachments, each consisting of one officer and nine enlisted men, were sent to the units being supplied in order to receive and distribute supplies after the aircraft had made delivery. The overall command of these detachments was exercised by an air dropping officer with headquarters at Ledo.

Originally the base detachment of this new organization operated from Sookerating, but it soon moved to the main ATC base at Chabua. In July 1943, after the 2d Troop Carrier Squadron assumed the delivery functions previously carried out by ATC, the base detachment joined the 2d Squadron at Dinjan. Experience and increased deliveries of supplies by air made certain elaborations of the original organization necessary, but the main outline remained the same until October, when changes were made in preparation for Stilwell's offensive into north Burma.*5

*See below, p 21

Air Supply in the North Burma Campaign

Plans and Preparations

EXCEPT FOR THE abortive Arakan offensive and the first Wingate expedition, all plans for an Allied offensive against the Japanese in Burma during the dry season of 1942-1943 had come to naught. The coming of the rains in June 1943 ended all possibilities of an Allied advance before autumn. Ambitious plans were drawn, however, for operations on every front during the approaching dry season of 1943-1944. As approved by the Combined Chiefs of Staff (CCS) at the Cairo Conference, these plans provided for.

1. An amphibious attack on the Andaman Islands.
2. An advance down the Mayu Peninsula in the Arakan.
3. An advance from Imphal via Tiddim and the Kabaw Valley across the Chindwin River.
4. An advance from Ledo down the Hukawng Valley and along the trace of the Ledo Road to Mogaung and Myitkyina.
5. An advance across the Salween from Yunnan to secure the eastern part of the Burma Road.
6. Operations by a new long-range penetration force to disrupt Japanese communications and support the drives from Imphal, Ledo, and Yunnan.
7. An airborne operation against the Japanese airfield at Indaw; the airborne troops, reinforced, were to hold the airfield until forces from Ledo reached it.

Like so many China-Burma-India (CBI) plans, these were largely cancelled by lack of means and by procrastination. The first change came when the landing craft intended for use against the Andaman Islands were diverted to the Mediterranean. Generalissimo Chiang Kai-shek cancelled the Salween offensive on the grounds that cancellation of the Andaman operation broke promises made to him at Cairo. Believing that abandonment of the Salween offensive negated the value of the airborne operation against Indaw, Admiral Lord Louis Mountbatten, Supreme Allied Commander, Southeast Asia Command (SEAC), cancelled that part of the offensive. By attacking Imphal, the Japanese effectively countered the proposed advance across the Chindwin. Thus, of the seven operations originally planned, only the Wingate penetration, the land operation in the Arakan, and the Ledo offensive remained on the schedule.¹

Lt Gen. Joseph W. Stilwell, who regarded opening the Ledo Road as the primary mission of American forces in the India-Burma Sector (IBS) of CBI, was prepared to send his Chinese-American forces into Burma as soon as the 1943 rains ended. Stilwell's plans provided for air supply of his troops as they moved forward. Road construction was to follow up the ground advance, but since the fighting front would always be a considerable distance ahead of completed sections of the road, air supply of forward elements, including road construction personnel, would be necessary throughout the operation. Airfields were to be constructed at suitable sites along the line of advance so that supplies, insofar as possible, could

be landed rather than dropped. The 1st and 2d Troop Carrier Squadrons were designated as the delivery agents.

This plan presented the spectacle of air supply being used to support the building of a road designed to do what transport aircraft had already done, because the Hump air route to China was already in operation, though on a limited scale. On the other hand, one objective of the campaign was the capture of Myitkyina Airfield, the utilization of which would greatly increase the efficiency of air transport operations, therefore, the results of the campaign would be beneficial, whatever the motives might be.²

Transport aircraft played a minor part in building up supply stocks at Ledo in preparation for the offensive. Since Ledo was on the Bengal-Assam Railroad, stockpiles could be accumulated by rail, but the capacity of the railroad was not equal to all the demands made upon it, and some air transport was required to supplement rail shipments. Both the 1st and 2d Troop Carrier Squadrons helped build up stockpiles at Ledo. For example, the 2d Squadron delivered more than 800 tons of material to bases in Assam between 1 July 1943 and the end of October in addition to the 2,316 tons of food and other supplies it dropped to OSS detachments, the Fort Hertz garrison, air-warning stations, and Chinese troops guarding the approaches to Ledo. Planes of this squadron brought some 300 more tons to Ledo during November 1943.³

The Advance to Kamaing

Ground force action. From Ledo, Stilwell's main base on the Northern Combat Area Command (NCAC) front, the trail into Burma led over the Patkai Hills to the Hukawng Valley; the completed section of the Ledo Road went part of the way. From Shingbwiang, at the head of the Hukawng Valley, a dry-weather road improved by the Japanese led through Maingkwan and Shaduzup on into the Mogaung Valley to Kamaing and Mogaung. The Kumon Range, a southward extension of the Himalayas,

separated the Hukawng and upper Mogaung Valleys from the valley of the Irrawaddy River to the east. Myitkyina, the main objective of the campaign, lay in the Irrawaddy Valley. Thus it appeared necessary for Stilwell's forces to drive the Japanese out of the Hukawng Valley and the upper Mogaung Valley before they could attack Myitkyina. The Kamaing-Shingbwiang Road, which was the main Japanese supply line north of the Mandalay-Myitkyina Railroad, was of necessity the axis of any drive south from Shingbwiang.

At Stilwell's direction, the Chinese 38th and 22d Divisions began moving eastward in mid-October 1943. Much to the surprise of NCAC intelligence officers, advance elements of the Japanese 18th Division were encountered on 30 October. Shingbwiang was occupied without serious resistance, but as the Japanese moved in reinforcements and the Chinese commanders demonstrated considerable reluctance to attack, a stalemate developed around Yupbang Ga, on the upper waters of the Chindwin River. Not until Stilwell returned from the Cairo Conference could the Chinese be prodded into serious attacks, but with his return increasing pressure was put on the Japanese. The key position at Yupbang Ga was overrun on 24 December 1943, and by 14 January 1944 the last organized Japanese resistance had been cleared from the area.

Farther south in the Hukawng Valley the Chinese captured Taihpa Ga, then set out toward Maingkwan, aided now by the 5307th Composite Unit (Provisional) of the United States Army. This task force, better known as Merrill's Marauders, in honor of its commander, Brig. Gen. Frank D. Merrill, approximated regimental strength of jungle-wise volunteers. As the Chinese moved toward Maingkwan, the Marauders left the road and made their way by jungle trails to Walawbum, south of the objective. A roadblock at Walawbum cut Japanese communications and reduced the strength of the forces resisting the Chinese advance. Attempts to dislodge the Marauders failed; Maingkwan fell on 5 March, and

the surviving Japanese retreated through the jungle toward Shaduzup.

The same tactics were used for the Allied attack on Shaduzup. One Marauder group established a roadblock just south of the village, another did the same at Inkangah-tawng, 15 miles farther south. Again the roadblocks succeeded in cutting off Japanese reinforcements and in drawing off sufficient Japanese strength to weaken the defending forces to the north. Shaduzup fell on 29 March. The Japanese commander attempted a flanking movement of his own at this point, and two battalions of the Marauders were drawn into an exhausting battle at Nhpum Ga, first to protect the flanks of the advancing Chinese and then, as the Japanese made a major effort, to save their own lives. This battle lasted from 28 March to 9 April, and when it was concluded the numerical strength and combat efficiency of the Marauders had been greatly reduced.

After the occupation of Shaduzup, the commanders of the 38th and 22d Divisions again showed reluctance to advance. Both divisions had taken rather heavy casualties, but their relative numerical advantage over the Japanese was greater in April than at the beginning of the campaign. Indications were that they had received orders from Chungking to hold back their efforts. When offensive movements were made under direct orders, they were halfhearted and quickly abandoned. In May, without any explanation, the Chinese attitude changed. The 38th Division emulated the Marauders by moving through the jungle to the road south of Kamaing and setting up a block; all Japanese attempts to dislodge them failed, and Kamaing was occupied on 16 June. Below Kamaing contact was made with elements of the second Wingate expedition's 77 Infantry Brigade, which had taken Mogaung as the remnants of the Japanese 18th Division, only half the men who had begun the campaign, retreated south out of the Mogaung Valley.

While the Chinese-American forces moved south, engineers were hard at work behind them. The Ledo Road was opened into

Shingbwiayang on 27 December 1943, and the first truck convoy from Ledo arrived the same day. During January a subdepot with facilities for bulk gasoline storage was built at Shingbwiayang, and an all-weather airstrip was completed soon after. The airstrip proved a more important means of supply than the road.

In the Hukawng Valley the engineers' first task was to improve the old Kamaing Road to provide a temporary route from Shingbwiayang southward. On 1 February 1944 work began on a permanent road, located on higher ground north and east of the old trace. Two pipelines were laid along the right-of-way; at the peak of pipe-laying activity, 5,340 men were busy on this project alone. The road builders and pipeline crews were supplied from combat supply points, which meant that they too were largely fed, clothed, and equipped by transport aircraft.¹

Air supply of the drive to Kamaing. Between December of 1943 and June of 1944, some supplies for Stilwell's forces were trucked into Shingbwiayang via the Ledo Road and from that point distributed to units along the road to the south, but even during this dry season aircraft were a more important means of supply. The C-47 could carry a heavier load, was not bound to the roads, and could make ten or more round trips while a truck was making one. The greater the distance into Burma the Chinese-American army penetrated, the greater was the advantage of the transport aircraft as a supply vehicle. Besides, the Ledo Road became impassable much of the time during the 1944 rains.

Demand for supplies rose constantly, and the tonnage delivered increased from 638 tons in October to 1,669 tons in December, 3,107 tons in January, and 7,309 tons in April, without including approximately 15 tons a day delivered to Merrill's Marauders or Army Air Forces (AAF) supplies put down at forward airfields. Net tonnage (actual supplies, not including weight of parachutes, packing, etc.) delivered to NCAC forces in Burma between 1 October

1943 and 31 May 1944, with the same exceptions noted above, was 23,451 tons. Slightly less than 20 percent of these supplies were landed; 42 percent were free-dropped; and the remainder was parachuted. No supplies were landed before March, but the quick turnaround that unloading on the ground permitted contributed to the increase in tonnage delivered in April and May.

The 1st and 2d Troop Carrier Squadrons, based respectively at Sookerating and Dinjan, delivered this NCAC tonnage plus that delivered to Merrill's Marauders, AAF units, Fort Hertz, and Kachin elements in north Burma. The plane and pilot strength of the two squadrons was too small to meet all demands, however, and from 15 through 29 February each unit was reinforced by four C-47's and crews drawn from the newly-created 315th and newly-arrived 27th Troop Carrier Squadrons. Further reinforcement arrived in April when the 64th Troop Carrier Group from Sicily arrived in India for temporary service. The 18th Squadron of this group was based at Sookerating and aided the 1st and 2d Squadron in supplying Stilwell's forces. In the aggregate, troop carrier aircraft on the NCAC front flew well over 8,500 missions between 1 October 1943 and 31 May 1944.

Losses during this period were not high in proportion to the number of sorties flown, but the 2d Squadron suffered an undue proportion of the losses. Two of this unit's C-47's were shot down south of Fort Hertz in December 1943, and Japanese fighters destroyed three more in the same general area on 18 January 1944. The 1st Squadron lost only one of its own transports, plus an attached C-47 of the 315th Squadron, but neither of these losses was attributed to enemy action. The 18th Squadron lost four aircraft during its stay in India, but none before the end of May.

Until mid-December 1943 the Assam-based troop carrier aircraft were under the operational direction of the 5320th Air Defense Wing (Provisional) of the Tenth Air Force. In December they came under Troop Carrier Command (TCC) of Eastern Air

Command (EAC). Since TCC Headquarters was located at Comilla in eastern Bengal, the actual operations of the 1st and 2d Squadrons were not closely supervised.

Under TCC procedure, monthly operational programs were set up in advance. Stilwell, in his capacity as Commanding General NCAC, and Lt. Gen. Sir William Slim, commander of the British-Indian Fourteenth Army, submitted to the commander TCC by the 15th of each month their air supply requirements for the coming month. TCC consolidated these requests, determined the extent to which they could be met with available air transport resources, then submitted its program to EAC for approval. EAC then set up priorities with the advice of CBI Headquarters and British-Indian ground force headquarters (11 Army Group). Movement of air force units, delivery of unscheduled but urgently needed material, and accomplishment of emergency requests were to be carried out at the discretion of the commander TCC if not in conflict with primary commitments.

In practice, this system proved too inflexible for air supply of the NCAC front. The squadrons at Dinjan and Sookerating were assigned a tonnage quota to be delivered to certain targets, which amounted to orders to fly so many sorties. This resulted, too often, in the delivery of relatively unimportant material stockpiled at the bases where aircraft were available whereas urgently needed supplies stored elsewhere might not be delivered for days or weeks.

On the other hand, because they could not be sure what they would need a month in advance, ground commanders tended to submit exaggerated estimates of needs. In part this was due to prudence—no commander wished to take any chance on not being able to feed his men or carry out the military tasks assigned to him. Too many requests, however, were inflated because the requesting commander did not expect to get everything he asked for, and because he believed, probably correctly, that the more he asked for the more he would receive.

As a result of this system, the number of high priority loads requested for the NCAC front mounted to such an extent that often there were not enough aircraft to make scheduled priority deliveries. It became necessary for G-4 NCAC to deal directly with air authorities and to decide which deliveries should be made of those scheduled, and thus to decide which ground units should do without part of the supplies they had requested. In other words, G-4 NCAC and Tenth Air Force set up a new order of air supply priorities for the NCAC front. Since at that time Tenth Air Force was serving essentially as an administrative headquarters, this arrangement was somewhat irregular, but it was successful, and later control of troop carrier squadrons in the NCAC area was restored to Tenth Air Force when EAC was reorganized in June 1944. The success of air supply on the NCAC front through May 1944 was indisputable; airdrops to ground force units had proved just as dependable as any other means of delivery, much faster, and less laborious. The efficiency of air supply was being increased as forward airfields were opened. "Because of the generous backing of the AAF, inadequacies in planning and the extravagance of some demands, even when presented on short notice, never really proved serious hindrances to operations."

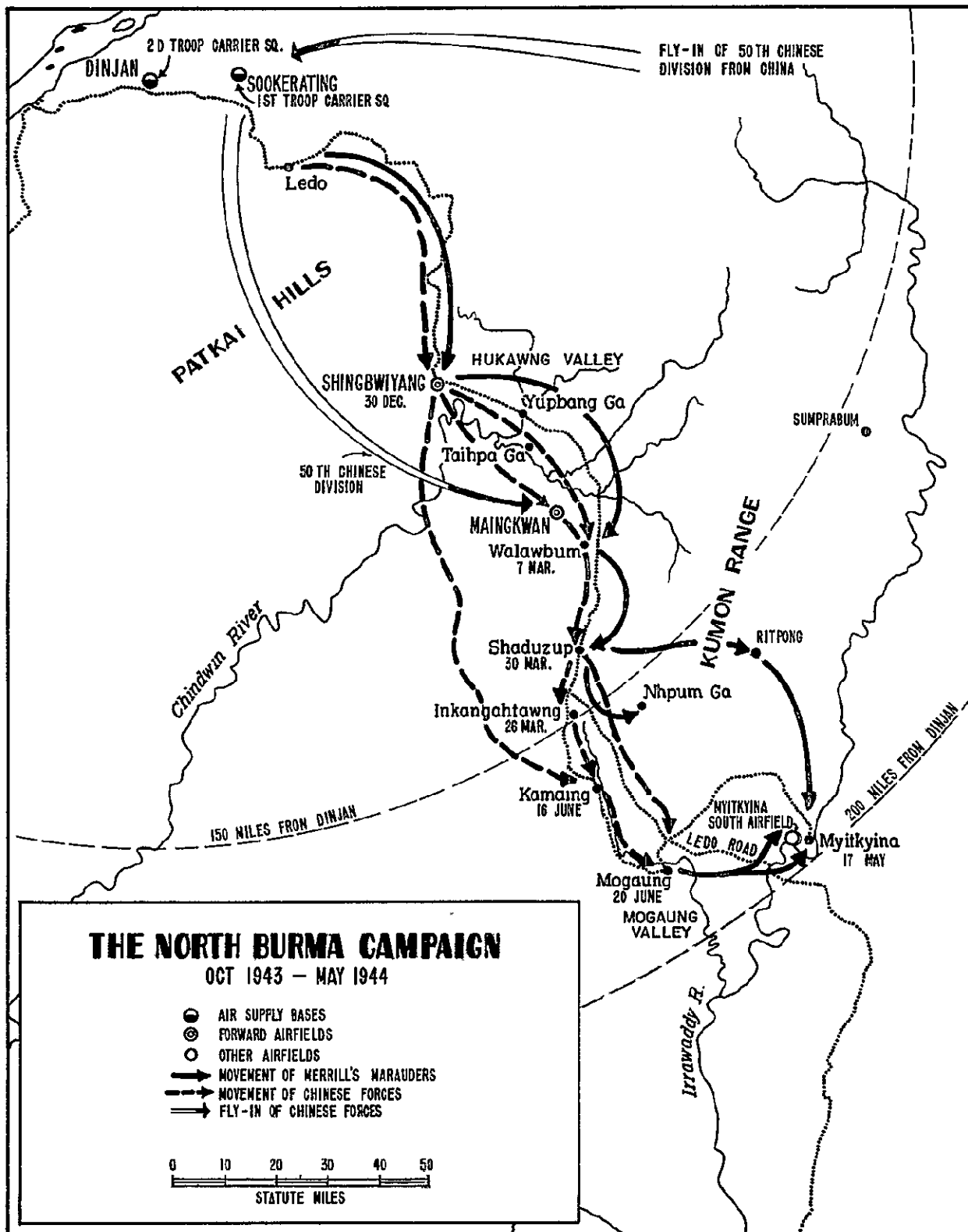
With the beginning of the NCAC offensive in October 1943, the ground force air supply organization was expanded in anticipation of increased air supply operations. The 518th Quartermaster (QM) Battalion (Mobile) with headquarters at Dinjan took charge of packing and loading supplies for airdropping. The 3841st QM Truck Company provided kickers to eject supplies from the transports, and the 3304th QM Truck Company provided the advance parties to receive and distribute the supplies dropped. During November the advanced QM unit was relieved of its duties at the front, and distribution of supplies was left to the consuming units. When the 1st Troop Carrier Squadron began operations from Sookerating, the 518th QM Battalion and the 3841st QM Truck Company were split

in half, one part remaining at Dinjan, the other moving to Sookerating.

The ground force air supply organization was expanded again in February 1944 when Services of Supply (SOS) issued a memorandum dividing SOS air supply responsibilities between two new organizations, Base Air Dropping Section and the Air Dropping Supply Unit. Base Air Dropping Section, with headquarters at Ledo, was made responsible for coordination and general supervision of all SOS air supply activities. It issued instructions to the Air Dropping Supply Unit and processed requisitions from combat troop headquarters. It arranged for transportation of supplies from Ledo to the airfields, and it coordinated requisitions by the Air Dropping Supply Unit for materials and equipment used in packing and loading. Finally, the Base Air Dropping Section maintained records of supplies delivered by air.

The Air Dropping Supply Unit was made up of the 518th QM battalion and the 3841st Truck Company already stationed at Dinjan and Sookerating. In practice, each detachment of the unit functioned more or less independently of the other. The unit was responsible for the ground force share of the physical work connected with air supply operations. It received, stored, and packed supplies, marked them, moved them to the airfield, loaded them aboard the transports, and kicked them out over the drop zone. The Air Dropping Supply Unit was also responsible for liaison with the air unit on its bases in order to obtain the flights needed to deliver the supplies. It was planned that new Air Dropping Supply Unit detachments would move into new transport airfields as they were opened.

When Merrill's Marauders arrived on the NCAC front in January 1944 they brought their own packing and kicking detail with them. Warehouses were assigned at Dinjan, and about 250 officers and men carried out the ground functions of air supply. The Marauders' packing and kicking detail functioned effectively, but no more so than the QM units. From the CBI point of view, the



Map 3

most interesting characteristic of the Marauder air supply detachment was that it had some American supply dropping equipment with which to work.

Dropping techniques during the first half of 1944 were much the same as they were to be for the remainder of the war. Such items as rice, sugar, salt, and animal forage were freedropped. It was early discovered that when these items were packed in only one bag, the bag ruptured upon impact, but this was corrected by using two bags; the inner container still burst, but the outer remained intact. Eventually two smaller sacks, each holding 35 pounds, were placed in one larger bag for freedropping. All bags were marked with an appropriate code letter to designate the contents and facilitate sorting.

Rations, ammunition, and other more fragile supplies were parachuted. Early drops to the Marauders were made entirely with American parachutes and containers, but although these were somewhat better than Indian-manufactured equipment, they were so costly that the Indian equipment was soon used for most drops. This equipment consisted of wicker baskets manufactured in Assam, wrapped in Hessian cloth of Indian make, and bound with Indian-made ropes strong enough to stand the shock of a parachute's opening. The parachutes, attached to the ropes, were made of Indian cotton; they were normally 18 feet in diameter and could safely carry a 150-pound pack released at 120 miles per hour.

Rice, animal forage, prepacked rations, and prepacked ammunition were the usual items dropped. Gasoline was delivered successfully by lashing bumpers made of bags filled with rice husks to 55-gallon drums and attaching three parachutes to each drum. The drums were never filled to capacity because full drums were more likely to rupture on impact. Both the Chinese and the Marauders received 75-mm. pack howitzers by airdrop and were able to put the guns into operation within a few hours of their delivery. Two-wheeled ammunition carts, too large to be loaded in a C-47, were

cut down into smaller pieces, fitted with braces and bolts for assembly on the ground, and parachuted to troops in Burma. For special occasions live poultry, goats, and pigs were delivered by airdrop, and delivery of fresh eggs became almost routine.⁷

Fly-in of the 50th Chinese Division. From 5-12 April 1944 the 1st Troop Carrier Squadron gave an impressive demonstration of the ability of transport operations to expand to an almost unbelievable extent for a short time. In seven days, while maintaining supply dropping operations at almost a normal level, the squadron flew an entire Chinese division and its equipment from Sookerating to Maingkwan, in the Hukawng Valley of Burma.

By March of 1944 the 22d and 38th Chinese Divisions had been in action for almost six months. Combat casualties and disease had greatly reduced their effectiveness. Another division, the 30th, was available in Assam, but it would be needed at Myitkyina if that airfield was to be captured before the monsoon broke. Reinforcements were needed in the Kamaing area, but Merrill's Marauders were the only American infantry in the CBI, and events in Manipur* made it clear that every available British-Indian unit would be needed on that front. A Chinese division was preferable for operations in north Burma at any rate; it would require fewer supplies and would preserve the homogeneity of Stilwell's forces.

After a conference with Stilwell, Mountbatten asked the CCS to approach the Generalissimo as to the possibility of transferring one of the American-trained divisions in Yunnan to NCAC. At Mountbatten's urging President Franklin D. Roosevelt and Prime Minister Winston S. Churchill personally seconded the CCS request. Chiang, who still refused to commit himself to an offensive in the Salween, agreed to send his 50th Division to Burma.

Transfer of the troops from Yunnanyi, China, to Sookerating was easily accomplished. They simply boarded Air Transport

*See below, pp. 74-89.

Command (ATC) aircraft which ordinarily would have returned empty to India after unloading the cargoes they had carried to China. An ATC transport delivered the first load to Sookerating at noon on 5 April, and by 1500 these early arrivers had been processed and were being loaded aboard C-47's for the flight into Burma.

Planning for the movement, though somewhat hurried, was complete. A local transient camp with a capacity for 1,500 men was first used, but after a few days a larger camp with a 3,000-man capacity was taken over. As the Chinese troops disembarked at Sookerating, trucks, alerted an hour ahead of time, took them aboard and drove them to the transient camp. There they were deloused, their old uniforms were burned, and they were fitted with new uniforms and such other equipment as necessary. As troop carrier C-47's became available, the men again boarded trucks that delivered them to the C-47's which were ready to take them to Burma.

1st Troop Carrier Squadron made its plans with the understanding that the troop movement would have priority over supply dropping, and that supply dropping would be held to a minimum while the division was being moved. Events in Burma forced a revision of this plan, and during the seven-day period the squadron flew more trips with supplies than with troops. The sudden demands for high-priority supplies did result in some overcrowding in the transient camps. Also, since the Chinese troops were not allowed out of the trucks at the airfield until time for loading (because of a tendency to scatter to the four winds), inability to plan flights a day ahead sometimes resulted in men's being held aboard trucks for long periods. On 9 April, for example, several truckloads were on the airfield for loading at 1300, but unexpected calls for supply dropping made it necessary to hold them there until 1800 before sending them on to Burma. These men had had their last meal at 1000 and had to march five miles and then cook their food when

they arrived at Maingkwan. Despite these and similar problems, the entire 50th Division was in Maingkwan by midnight of the 12th.

When in addition to the troop transfer, the 1st Troop Carrier Squadron found itself committed to supply dropping operations almost as heavy as normal, it had to seek help from other organizations to supplement its 12 aircraft. Three C-47's and crews from the 27th Troop Carrier Squadron were attached throughout the troop movement, and two ships and crews of Royal Air Force (RAF) 62 Transport Squadron for six of the seven days. These attachments gave the squadron an average strength of 16 aircraft and 22 crews for the first five days of the operation. On the night of 10 April four crews and one transport of the 2d Troop Carrier Squadron joined in the effort. During the last two days, 11 and 12 April, the 18th Troop Carrier Squadron, newly-arrived from the Mediterranean, contributed 31 flights.

During this seven-day period with an average strength of 16 aircraft and 22 crews (not including the 18th Squadron) the 1st Troop Carrier Squadron and attached aircraft and crews flew 280 supply missions that delivered almost 1,000 tons of supplies to ground forces in Burma and flew 203 trips that transported 7,221 troops with their personal and organizational equipment. This was an average of more than three trips per day per crew, and more than four trips per day per aircraft. Night operations were necessary for this record to be achieved, and field lighting was hurriedly installed at Maingkwan. Some pilots flew round trip after round trip from 0630 hours one day to 0200 the next, then flew almost as much the following day. Surprisingly, there were no accidents and no casualties during the week. When the troop transport effort ended, 1st Squadron was able to return to normal air supply operations, as is demonstrated by the fact that the squadron accomplished 1,097 supply missions and delivered 3,000 tons of supplies during the month.⁸

The Capture of Myitkyina

Capture of Myitkyina South Airfield. As April 1944 drew to an end, Stilwell's NCAC forces definitely held the initiative in north Burma. Thanks to air supply, the Hukawng Valley had been cleared, and it was evident that in due time Kamaing and Mogaung must fall, opening the way toward Myitkyina. Only the greatly weakened Japanese 18th Division stood in the way; other Japanese units were busy in Manipur, on the Salween, in the Arakan, and around a road-block established by the second Wingate expedition at Mawlu.* Some elements of the 18th Division were engaged north of Myitkyina, fighting British-led Kachins and Ghurkas who were advancing south from Sumprabum, which they had captured earlier.

Despite these advantages, the success of NCAC's north Burma effort was in serious jeopardy. The entire campaign had been directed toward the capture of Myitkyina, and by late April it was evident that the wet monsoon would arrive before Kamaing and Mogaung could be cleared. The coming of the rains would make the long march to Myitkyina impossible if the Japanese offered significant resistance. Furthermore, the Chinese units already in Burma would have their hands full completing the Mogaung operation, and Merrill's Marauders had been so exhausted and depleted by their long marches and hard fighting that their combat effectiveness was greatly reduced.

Under these circumstances, it was evident that a quick stroke was required to attain the campaign's objective, and Stilwell had little choice but to ask one more effort of the tired Marauders. Reinforced with Chinese troops and a detachment of Kachin guerrillas, Merrill's command was divided into three combat teams and sent on a long flanking movement across the 6,000-foot Kumon Range. The Marauders traversed the mountains over almost-forgotten Kachin trails so perilous that a score of mules lost their footing and plunged down precipices

*See below, p 70.

to destruction. After a seven-day march, the Marauders emerged into the Irrawaddy Valley near Ritpong, a village some 40 miles north of Myitkyina.

One of Merrill's combat teams fought a short engagement with a Japanese force found at Ritpong; another moved east and blocked interference from the Japanese facing the Fort Hertz garrison. In the meantime, the third team marched straight south toward Myitkyina. This group encountered only scattered enemy patrols, and on the night of 16 May the Marauder team bivouaced south of the Mandalay-Myitkyina Railroad and only four miles from Myitkyina South Airfield, which really lay about three miles west of the town. At 1000 on the morning of 17 May the Marauders swept over the field, attaining complete tactical surprise. A message had already been sent alerting NCAC headquarters to have reinforcements ready, and as soon as the field was taken, a prearranged signal was transmitted to announce that the field was ready for the reception of reinforcements.

Myitkyina was the main objective of the NCAC forces for the dry season of 1943-1944. After the capture of the airfield, long and bloody fighting was required to clear the town of Japanese, but the taking of the airfield was the culmination of the still-progressing drive down the Hukawng-Mogaung Valleys and opened the way to Bhamo and a junction with the Burma Road. More important, Allied possession of the airfield made possible a more southerly ATC route to China; ATC transports could fly at lower altitude, and lower altitudes permitted them to carry less fuel and greater pay loads. Also, possession of the airfield made possible rapid reinforcement of the small body of troops which had effected its capture.^o

Reinforcement of Allied forces at Myitkyina. The rapid strengthening of the Allied force at Myitkyina was so important that Brig. Gen. William D. Old, TCC commander, went to Assam to supervise the operation. He completed his plans for the fly-in of troops and equipment on 15 May.

The crews which were to take part were briefed, and ten gliders loaded with engineering equipment for repairing the runway were readied to be lifted from Shing-bwiyang.¹⁰

When the message that the airfield had been taken was broadcast, several C-47's of the 2d Troop Carrier Squadron had arrived in the Myitkyina area to drop supplies to the Marauders. Four of these aircraft landed on the strip about 1600 despite Japanese fire which knocked out the hydraulic system of the first one down. The next aircraft to arrive was an L-5 from Shaduzup, carrying panels for visual direction of glider pilots and an SCR 284 radio for control of aircraft. Before the panels could be laid out, the gliders appeared overhead and began landing.

The first glider landed safely, but the pilot failed to carry out his instructions to act as a "T" for the guidance of following pilots. The remaining gliders came into the field from all points of the compass under no ground control whatsoever. Four pilots deliberately landed at right angles to the runway, taking very seriously a warning given at briefing that the strip might be mined. Eight of the ten gliders were wrecked, but there were only three casualties to personnel aboard and most of the engineering equipment remained operable. One of the tow planes landed and evacuated the casualties. The engineers immediately began work improving the runway.¹¹

Air transport operations into Myitkyina continued from 17 May 1944 to the end of the war, but the operations of the first three days, 17-19 May, may be considered as the fly-in phase because it was during this period that the troops necessary to hold the airfield and the equipment necessary for the emergency repair of it were landed.

The exact number of planes reaching Myitkyina on the night of 17/18 May cannot be determined, but all accounts agree that it was more than 40 and less than 50. The total would have been greater, but bad weather closed the field at 2200 on 17 May, and landings were not resumed until dawn.

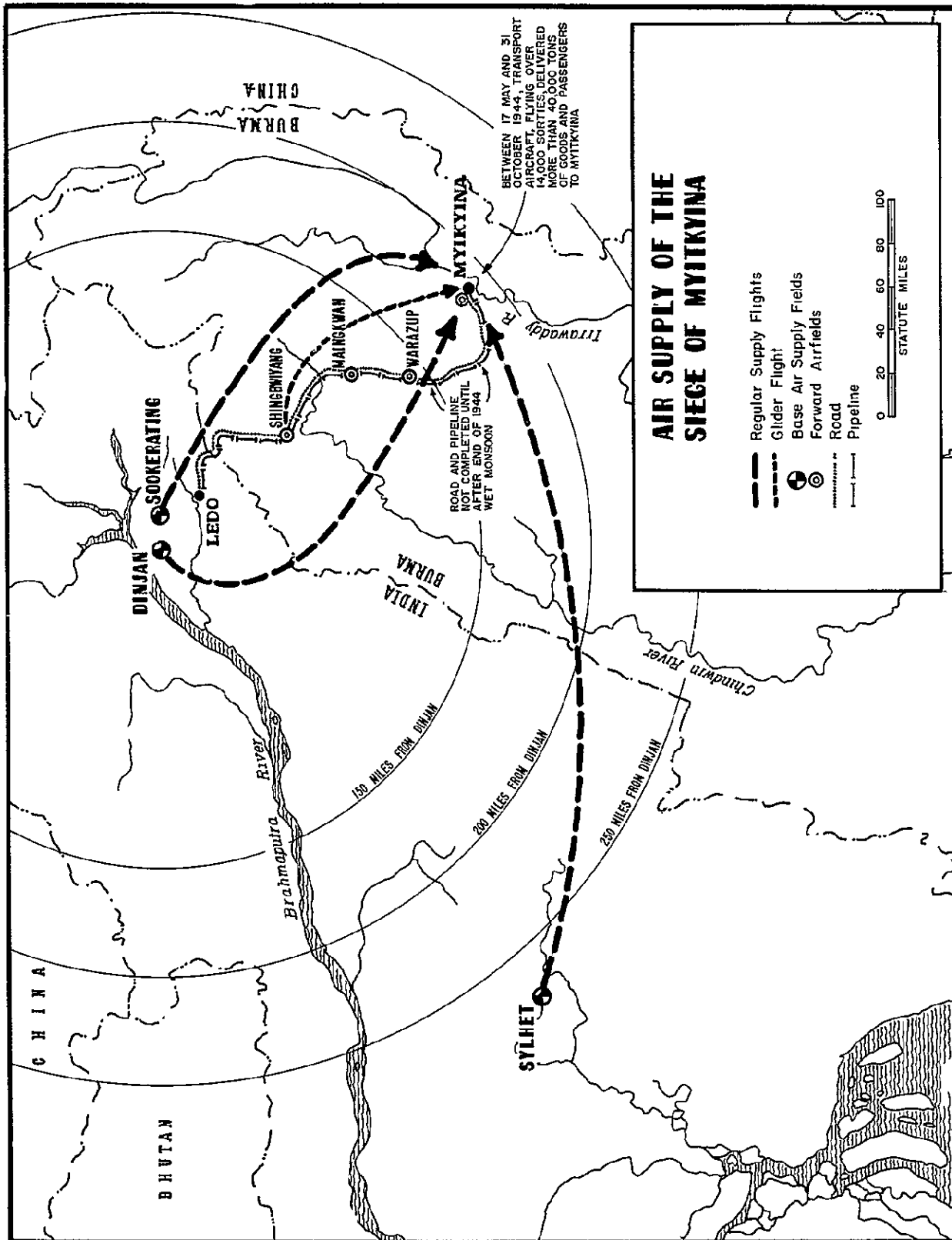
The C-47's that landed before the weather broke brought in kerosene flares to light the runway; additional engineering equipment and personnel, an American battery of .50-cal. antiaircraft guns, and a Chinese infantry battalion.

At daybreak on 18 May transports from Dinjan and Sookerating began flying in troops and supplies. Twenty-four C-47's from Sylhet, including some RAF ships, brought in a British Bofors battery of 12 guns and crews early in the morning. The gunners, very recently evacuated from the Chindit airfield at Broadway,* were rushed into action as infantry, leaving the transport crews to unload the heavy guns. Just as the last of these Sylhet-based C-47's were departing, and just after fighter cover had left the area, six Japanese fighters swept over Myitkyina. They destroyed one transport, damaged several others, and indirectly damaged two more, which collided on the ground in the resulting confusion. Even so this incident delayed landings and takeoffs only a short time.

The total number of flights reaching into Myitkyina by 2400 of 19 May also cannot be determined. At least 24 trips were flown by Sylhet-based transports, and some ATC aircraft carried loads in during this period. The main effort, however, was made by the 1st, 2d, 4th, and 18th Troop Carrier Squadrons from Dinjan and Sookerating. During the three-day period, the transports belonging to these units made 245 trips into Myitkyina, delivering 3,722 men and more than 500 tons of supplies. By midnight of 19 May, in addition to the units mentioned earlier, an entire regiment of the Chinese 30th Division, a battery of 4 2-inch mortars, and a hospital unit had been landed; a further boon to the troops on the ground was the evacuation of 185 casualties.

This fly-in, although successful, was far from a perfect operation. Tower communications at Myitkyina were not reliable, and the officers who briefed the transport crews gave no information concerning dangerous soft spots in the runway resulting from

*See below, p 67



Map 4

hastily filled bomb craters. After a three-plane collision, the commander of the 1st Troop Carrier Squadron, Lt. Col. Loren P. Cornell, marked the worst spots with flags and personally directed the engineers in compacting the soil in these danger areas. He also saw to it that radio homing equipment was brought in and installed at Myitkyina.

Failure of the engineers to concentrate first on the most urgent repairs to the airfield was a symptom of the lack of real central control, air or ground, over supply operations at Myitkyina South Airfield. Perhaps more serious than the condition of the runway was the fact that no ground organization was established to receive and distribute the supplies delivered. Cargoes were unloaded at any convenient parking place and left there unguarded, subject to pilfering. As a result, ground force units that needed certain items were not able to find them, even though the material had been delivered to the airfield. The situation was so disorganized that by catching rides on transports going back to India some infantrymen absented themselves without leave.¹²

Siege of Myitkyina. Confusion on the airfield at Myitkyina was not out of place, because elsewhere all was in confusion in the neighborhood of that unhappy village. On 17 May the Japanese force in Myitkyina and the immediate vicinity probably numbered fewer than 700 men, many of them service troops. On that day a determined attack on the town might have been successful, but the Allied troops on hand were simply not numerous enough or fresh enough to maintain their hold on the airfield and also attack the town. So far as that goes, 700 Japanese might have held the town for more than one day against any number of attackers.

As soon as the Japanese command realized what the Allies had accomplished, reinforcements began to flow into Myitkyina. The Japanese buildup of combat strength was actually faster than that of the Allies, though the Allies held numerical superiority. The difference in combat potential

was due to the experience and good physical condition of the Japanese veterans; in contrast, the American element of Stilwell's command was made up of the exhausted remnants of the Marauders, green replacements, and combat engineer companies with no combat experience and little combat training. Two detachments of the Chindits were in the neighborhood, one across the Irrawaddy and one near Hopin, but they were as exhausted and disease-ridden as the Marauders and contributed little to the fighting. The Chinese troops available were in part fresh, but Stilwell, with considerable justification, had no confidence in their effectiveness against strong fixed positions like those at Myitkyina except when an American spearhead prepared the way.

Coupled with the above, a breakdown in morale made the Allied situation desperate. Merrill's Marauders had taken heavy casualties, had a very high sickness rate, and had been led to expect that they would be relieved after the capture of the airfield. So acute was the need for trained infantry, however, that they were kept in the line. Sick men were not evacuated until they had had 102 degrees of fever three days in succession, and men who had already been evacuated as unfit for duty were flown back to Myitkyina from the hospitals where they were under treatment. Marauder morale broke under this strain; atabrine discipline was disregarded, and the men whose fighting ability had held up so long were soon incapacitated by malaria. The engineers and replacements who reinforced the attackers suffered heavy casualties, in large part because of lack of training and experience. These casualties, failure to make progress in the siege of the town, and the infectious example of poor morale set by the Marauders led to demoralization of all American ground units on the scene.

Casualties were almost certainly higher than they need have been. Stilwell remained convinced throughout most of the battle that only 500 Japanese defended Myitkyina. In reality, Japanese strength amounted to approximately 3,500 at the height of the fighting. This understimation of Japanese

strength led to attacks, time after time, which probably would not have been ordered if the real Japanese strength had been known. Fortunately, the Japanese were guilty of an equally gross error—overestimating Stilwell's strength—which prevented their launching a major counter-attack which might have driven the NCAC forces from the airfield. Stilwell's Chinese troops eventually reverted to eighteenth-century siege methods, and advanced toward the town by means of traverses and parallels.

Increased experience made better infantry of the green American troops; by July they were able to give a much better account of themselves. Chinese siege methods kept pressure on the Japanese, and the capture of Mogaung gave the Allies added strength while cutting off one route of Japanese reinforcement. Transport aircraft brought added artillery to the attackers until eventually 14 guns, including two 155-mm. howitzers, were firing on the Japanese positions. Finally, close air support, including fighter-bombers based on Myitkyina Airfield, aided the infantry. Most of the surviving Japanese evacuated Myitkyina on orders from Japanese Thirty-third Army, having held out for 76 days. Chinese troops occupied the town on 3 August 1944.

Myitkyina was worth the cost of its capture. It provided a good base for the continuation of the north Burma campaign. In Allied hands, it greatly facilitated the air transport of goods to China; a large part of the subsequent increase in Hump tonnage can be credited to its possession. But the fact remains that casualties at Myitkyina were higher than they need have been; with better intelligence, better planning, and better command the cost need not have been so great. Total Allied casualties were 6,551, of whom 1,224 were killed. That the Chinese bore the brunt of the battle is revealed by their 972 dead as compared to 272 for the Americans. Chinese incapacitated by sickness numbered only 188, as contrasted with 980 Americans so removed from action. Significantly, the

Japanese defending Myitkyina had taken a toll in Allied casualties well in excess of their own numbers, and some of them escaped to fight again.¹³

While the siege went on, Myitkyina became one of the busiest airports in the world. Between May and October 1944 more than 14,000 transport landings were made, delivering over 40,000 tons of supplies, troops, and equipment. During this same period, supply dropping to troops distant from the airfield continued, casualties were evacuated, and the remainder of the Chindits was transported back to India. Overall, troop carrier and combat cargo aircraft were delivering over 1,000 tons a day to north Burma by October 1944, and the available aircraft averaged two trips a day. Tonnage and trips would have been even greater, but traffic at Myitkyina was so heavy that some transports had to circle for hours before they could be cleared for landing. This delay in the air not only cut down the number of trips aircraft could make in a day, but also, by increasing fuel consumption, reduced the tonnage that could be transported. Another limiting factor, though not so serious as had been anticipated, was the weather of the wet monsoon, which brought extremely poor flying conditions to north Burma from May to October. Even so, the transports delivered all the supplies needed by an army in action—food, ammunition, artillery, barbed wire, clothing, and hundreds of other items. During daylight hours transports were landing or taking off from Myitkyina every 75 seconds.

Heavy engineering equipment was likewise delivered by air. This equipment—2½-ton trucks, 8-yard earth graders, concrete mixers, 16-ton bulldozers, and 20-ton cranes—had not been designed with air transportation in mind. Through trial and error, aviation engineers developed practicable procedures for disassembling these heavy units, loading the parts aboard C-47's and C-46's, and reassembling them after landing. No fewer than 45 bulldozers were air-transported to north Burma during the campaign, most of them to Myitkyina.

Transport aircraft also made possible completion of the pipeline from Assam to Myitkyina and beyond. Between 13 and 23 August, troop carrier and combat cargo aircraft, the C-47's of the 10th Combat Cargo Squadron, particularly, flew more than 950 tons of pipe into Myitkyina and Warazup. This pipe could not be transported over the Ledo Road, because as a result of the rains the roadbed had gone to pieces and bridges had been washed out. With the pipe went joints, pumps, fittings, and sufficient tank steel to construct more than three million gallons of storage capacity. The engineers, enabled by air transport to build from both ends, were able to complete the pipeline to Myitkyina much more quickly than would have been the case otherwise.

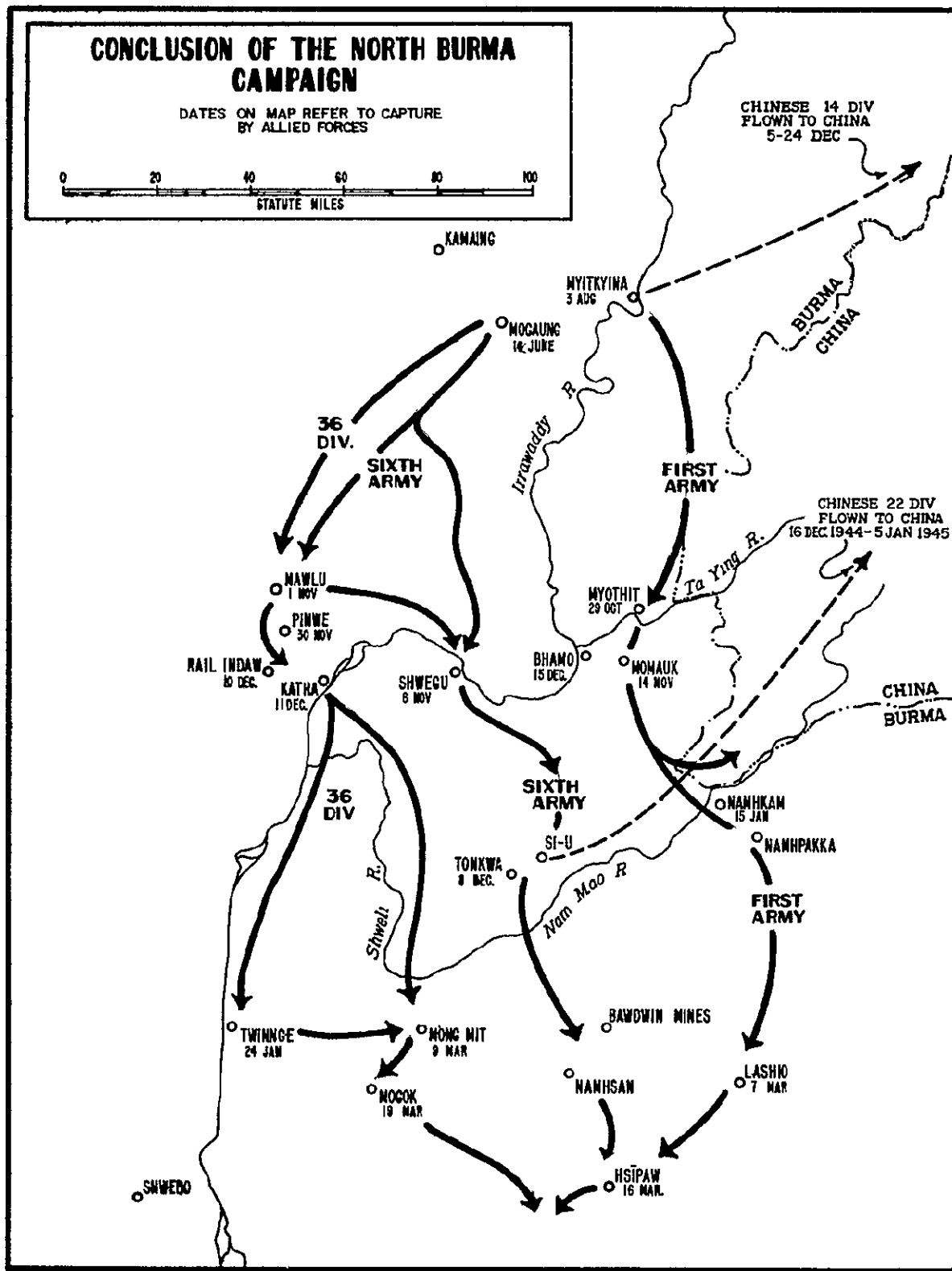
During the May-October period of 1944, when Indian and Burmese weather was at its worst for flying, transport units of Tenth Air Force recorded an outstanding performance. A total of almost 99,000 tons, including 75,000 troops, had been moved from India to north Burma. Within north Burma 3,975 tons, including 7,693 troops, had been moved from one point to another. About 28,000 men, including casualties and the remainder of the Chindit forces, had been evacuated from Burma to India. Stockpiling had been sufficient to enable NCAC forces to initiate a new offensive against the Japanese. If Chinese forces in Yunnan would cooperate (and they did), the opening of a land line of communication from India to China had become much more than a possibility for some remote time in the future. The fact that Myitkyina had been captured without the benefit of land lines of supply, and the fact that possession of Myitkyina would double and treble the volume of air transport traffic over the Hump, should have made it clear that the proposed land line of communications to China was unnecessary. This obvious conclusion was not drawn, however, and completion of a road from India to China remained the objective to be attained by the North Burma Campaign.¹⁴

Conclusion of the North Burma Campaign

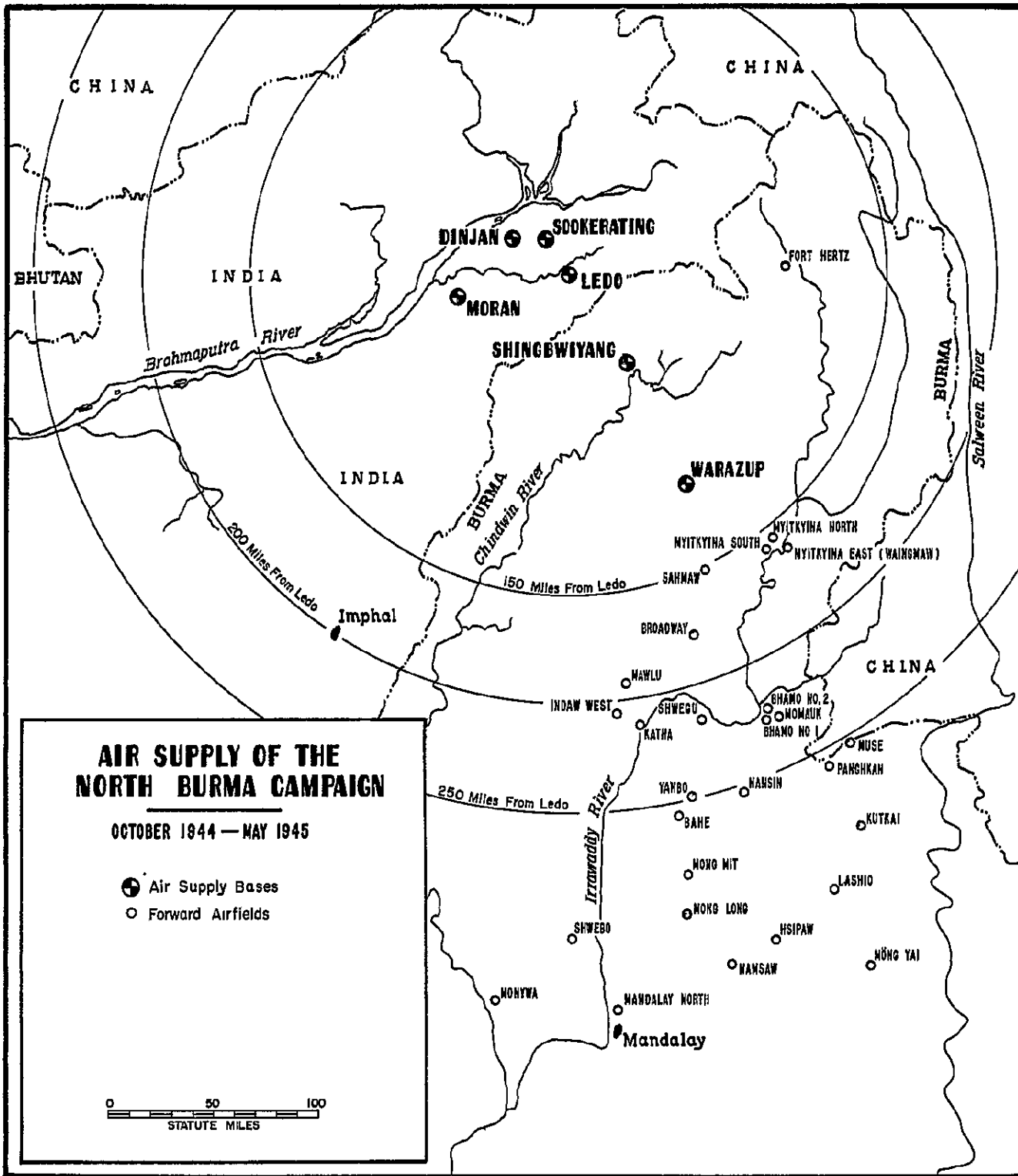
During the siege of Myitkyina, Chinese armies under NCAC command, with considerable assistance from Chindit forces, continued their drive on Kamaing and Mogaung. With the fall of Mogaung, on 20 June, the trace of the Ledo Road was cleared from Ledo all the way to Myitkyina, though the completed section was put out of action during the worse part of the wet monsoon. After the long-delayed conquest of Myitkyina, NCAC forces could make their way south, clearing north Burma of Japanese and opening the trace of the road on to the China border. The final objective of this offensive was Lashio, site of a good airfield and the terminal of a railroad from Mandalay.

NCAC forces were adequate for the task. American veterans of the Myitkyina campaign and 4,000 fresh troops from the United States were formed into two regiments that made up the 5332d Brigade, better known as Mars Task Force. Also available was the British 36 Division, which was to do the hardest fighting in the approaching offensive. Five Chinese divisions were organized into the First Army (30th and 38th Divisions) and the Sixth Army (14th, 22d, and 50th Divisions). In addition to these major units, NCAC combat strength included a separate Chinese regiment, a Chinese tank battalion, and a force of Kachins raised by agents of OSS.

The final offensive was in three parts. Farthest to the west, 36 Division drove south down the railroad from Mogaung. After hard fighting, this unit captured Mawlu, Pinwe, and Indaw between 1 November and 10 December 1944. At Indaw 36 Division left the railroad, and on 11 December it overran Katha. From Katha, reinforced by an Indian brigade, the division fought its way south through difficult terrain, taking Twinngone on 24 January, Mong Mit on 9 March, and Mogok on 19 March. From Mogok it advanced southeast to a junction with the Chinese 50th Division, after which it moved out of NCAC control



Map 5



and into the British Fourteenth Army zone of operations north of Mandalay.

The Chinese Sixth Army followed 36 Division part of the way down the railroad, then moved to the east to capture Shwegu, which fell on 6 November 1944. At Si-U the 22d Division was withdrawn from Burma and flown to China. The 50th Division, with help from Mars Force, took Tonkwa on 8 December, then continued southward, overrunning the Bawdwin Mines and Namhsan and capturing Hsipaw on 16 March 1945. From Hsipaw contact was made with 36 British Division to the west and Chinese First Army to the east, ending 50th Chinese Division's participation in the war in Burma.

First Army moved due south from Myitkyina, accompanied by Mars Force most of the way. Myothit was occupied on 29 October, whereupon 30th Division bypassed Bhamo and, on 14 November, took Momauk Bhamo, cut off from reinforcement, was besieged until the garrison evacuated its positions and retreated southward, making possible the occupation of the town on 15 December. The Chinese 14th Division, which had been held in reserve at Myitkyina, was at this time withdrawn from Burma and flown to China. The advance of the remaining divisions went more rapidly after the occupation of Bhamo; Stilwell's Chinese soldiers took Namhkam on 15 January, and ten days later made contact with Chinese forces from Yunnan.* The Ledo Road, soon to be known as the Stilwell Road, was thus opened, and on 28 January a truck convoy crossed the China-Burma border, symbolizing the accomplishment of the NCAC objective. First Army continued on south to Namhpakka, which had been captured by Mars Force driving eastward from Tonkwa. From Namhpakka the Chinese and American units pressed

*The Chinese offensive from the Salween River to the Burma border was part of the Burma campaign in the larger sense, and the Allied troops engaged were partly supplied by air. A description of the campaign and its air supply is not included in this monograph. One reason for the omission is that the ground fighting in the Salween offensive was mainly inside China. A more important reason for not including the campaign in this discussion is that the air supply of these Chinese troops was not essentially different from air supply within Burma. A description of the Salween offensive would simply add to the length of the monograph without appreciably increasing the reader's knowledge of air supply accomplishments and techniques.

down the Burma Road to Lashio, which fell on 7 March 1945.¹⁷

Thus, in 17 months of hard campaigning, NCAC had accomplished its main task, the opening of a land route of communication between India and China. In the process, all of north Burma had been cleared of Japanese. Ironically, the most valuable strategic result of the campaign was not the road, which had little use except for propaganda and servicing the pipeline and an excellent telephone line both of which were soon extended from Assam on to Kunming, but rather making possible a more southerly air transport route to China. Air transport had made the Stilwell Road possible, but it was evident long before the road was opened that air transport had made it unnecessary.¹⁸

Administration of NCAC Air Supply, June 1944-May 1945

Tenth Air Force. At the time of the capture of Myitkyina South Airfield (17 May 1944), all air supply activities in India-Burma were under the direction of General Old's TCC. For the support of NCAC forces the 1st and 2d Troop Carrier Squadrons of the 443d Troop Carrier Group were stationed at Sookerating and Dinjan. Aiding these two units were the 4th and 18th Troop Carrier Squadrons of the 64th Troop Carrier Group, which was on loan to CBI from the Mediterranean Theater of Operations (MTO). The 27th Troop Carrier Squadron, which had been engaged mainly in support of the second Wingate expedition since arriving in the theater, was transferred to the China-based Fourteenth Air Force on 21 May 1944 and left the India-Burma scene. The 315th Troop Carrier Squadron, based at Sylhet, also devoted most of its attention to supporting the Chindits, but it took part in the reinforcement of the attackers at Myitkyina.

June brought many changes in the air supply organization. TCC was abolished on 4 June, and its units were divided between Third Tactical Air Force and Tenth Air Force. On the same date orders were issued for activation of the 3d Combat Cargo

Group, which was divided between Third TAF and Tenth Air Force. Headquarters of the 443d Troop Carrier Group and the 315th Troop Carrier Squadron moved from Sylhet to Dinjan early in June. Finally, on 8 June, the 64th Troop Carrier Group was ordered back to the Mediterranean. As a result of these changes, at the end of June air supply operations on the NCAC front were carried out by the 443d Troop Carrier Group (1st, 2d, and 315th Squadrons), and the 11th Combat Cargo Squadron, which was attached to 443d Group for operations. The 9th, 10th, and 12th Combat Cargo Squadrons one by one came under Tenth Air Force control, and by the end of September three troop carrier and four combat cargo squadrons were engaged in air supply operations in the NCAC area under respective group headquarters.¹⁷

The idea that led to combat cargo groups originated in the United States, and two groups had been activated and had commenced training when the imminent departure of the 64th Troop Carrier Group from India-Burma made it imperative that a new air transport group be provided for that theater. Rather than disrupt the training of the two groups in the United States, it was decided to hasten the activation of a third group. From throughout the zone of the interior 150 aircrews, largely ATC and Ferrying Command personnel with many hours of transport experience, but including some newly-commissioned pilots, were gathered together, provided with 100 C-47's, and sent to India. Col. Charles D. Farr, formerly commanding officer of the 443d Troop Carrier Group, was selected to command the new combat cargo organization. When the crews arrived in India they were immediately organized into squadrons; the 3d Combat Cargo Group, leavened by experienced staff officers and commanders from the 443d Group, was already hauling cargo to north Burma and Imphal when it was officially activated on 8 June 1944.

The combat cargo squadron was assigned 25 C-47 aircraft (as compared to first 13 and later 16 for troop carrier squadrons), but the ground echelon was streamlined to

one-half the strength of the ground echelon of a troop carrier squadron. In the beginning this placed a heavy burden on the units located on the same bases with combat cargo organizations since they had to assume part of the combat cargo maintenance, but soon four new airdrome squadrons (329th, 330th, 331st, and 332d) arrived in India, and each one of them was assigned to support one of the combat cargo squadrons.¹⁸

Ground operations in north Burma had continued during the wet monsoon of 1944, but in October, as the rains came to an end, it was expected that ground action would increase in scope. Air supply operations could also be expected to increase, and need was felt for an intermediate headquarters between Tenth Air Force and the 3d and 443d Groups to oversee these air supply operations. EAC had already established the Combat Cargo Task Force (CCTF) to control air supply operations in central Burma and the Arakan, and this may have influenced the Tenth Air Force action.

Air Cargo Headquarters, Tenth Air Force, was activated 1 November 1944. The 3d Combat Cargo Group, including the four airdrome squadrons assigned to it, and the 443d Troop Carrier Group were put under the new headquarters for operational control. Colonel Farr was named commanding officer of the Air Cargo Headquarters, and was made "responsible for the operation of assigned unit in furtherance of plans previously approved by this [Tenth Air Force] Headquarters."¹⁹ No operational directive was issued at the time of activation, but the assumed function was "to direct the communications, intelligence, and operations" of the units under Air Cargo control.²⁰

An Air Cargo Headquarters operational directive issued 6 March 1945 confirmed the functions which had been carried out since November 1944. The Air Cargo mission was to "insure the delivery of maximum tonnage of supplies forward to" NCAC, SOS, AAF,*

*Including Tenth AF, ASC, and AACs.

OSS, and British Civil Affairs. The responsibilities of the headquarters were: (1) Allocation of loads to subordinate units in conformity with priorities set up by G-4 NCAC; (2) Scheduling of aircraft to airfields where loads were available and delivery to airfields as indicated by allocation of loads and in conformity with established priorities; (3) Liaison with supply packing and shipping agencies (Air Service Command, SOS, Air Cargo Resupply Squadrons* 36 Division, OSS, Air Warning, etc) to insure availability of loads at airfields where aircraft were based, to expedite loading, unloading, turnaround, and reconsignment of transports, and to insure accuracy of manifests; (4) Keeping the maximum number of aircraft in commission and continuously utilized; (5) Setting up safe flying procedures to include routes and altitude regulations, navigational aids, alert procedures, liaison with fighter organizations, briefing on escape procedure, and inspection of newly-opened airstrips; (6) Seeing after the welfare of flying personnel by providing for feeding transient crews, limiting the number of hours flown, and providing rest and recreation; (7) Establishing airdropping procedures to include training of aircrews and kickers, communications with ground forces by radio and visual means, and liaison with the ground forces with respect to proper selection of DZ's.

The directive also provided that Air Cargo Headquarters should station a "transport traffic control officer" and a "transport flight control officer" at all airfields where more than ten transport landings a day were the rule. At fields where transport aircraft were based, the squadron operations officer would normally act as flight control officer. At fields where traffic was light, one officer might fill both positions. The duty of the transport traffic control officer was to supervise the loading, unloading, turnaround, and reconsignment of transport aircraft. The transport flight control officer was given full authority in all matters pertaining to actual flight of transports under Air Cargo Headquarters ar-

*See below, p 41

iving at or departing from his station, regardless of the squadron or group to which the aircraft were assigned. Among his duties was keeping a tally of aircraft available, inspecting flight equipment (parachutes, emergency rations, water, navigational equipment), and checking loads to make sure they were properly tied in place with proper weight distribution.²¹

In terms of quantity, the high point of air supply operations on the NCAC front was reached in November 1944, when 27,607 tons of supplies were delivered in north Burma, 22,268 passengers carried, and 1,508 casualties evacuated. Total weight hauled during this month was more than 30,000 tons. This peak was never again attained, but the average total weight in supplies and passengers delivered to Burma monthly during the period December 1944 through April 1945 was more than 25,000 tons.

The decrease in tonnage after November 1944 is easily explained. In November, after monsoon damage to the Ledo Road had been repaired, the first Allied truck convoy reached Myitkyina. This and succeeding convoys took on part of the burden of supplying Allied troops in north Burma. Likewise, completion of the pipeline to Myitkyina reduced the need for the delivery of gasoline and oil (POL) by air. With the good weather of the dry season, a much greater portion of the supplies for forward troops could be landed at hastily-built fair-weather strips and then trucked forward to the consumers. When the load could be landed, the net useful tonnage was a much higher percentage of the gross weight delivered because the weight of parachutes and special packaging was eliminated.

It was well that the operation of these factors kept up the amount of supplies delivered to the ground forces, because the flight rate of troop carrier and combat cargo transports declined steadily as the Japanese were driven southward. In the early days of air supply in Burma, C-47's flew less than 300 mile round trips from Assam to the Hukawng Valley to drop supplies. Even though some time had to be spent over the DZ's discharging cargo, a

transport could make three round-trip flights per day. Even when the front had reached Myitkyina and Mogaung, three sorties daily per available aircraft were possible when traffic congestion did not overly delay landing and taking off. During June, July, and August 1944, the average flying time per round-trip flight was only a few minutes more than 2½ hours. By March 1945, the average round-trip distance from Assam had increased to nearly 600 miles, and from Shingbwiyang, inside Burma, the average mission covered almost 500 miles. Time consumed from takeoff to return to base increased to four or more hours on the average, with some missions requiring eight hours in the air. Under these conditions the number of trips per day per aircraft was reduced to a maximum of two and an average of less than two. Although the tonnage delivered decreased somewhat, the number of hours flown increased slightly. It must be emphasized that Allied forces in north Burma never went without necessary supplies.²²

Insofar as possible, transport units were moved to air bases within Burma so as to lessen the distance to delivery points. The 2d Troop Carrier Squadron went forward to Shingbwiyang in August 1944, and a detachment of 315th Troop Carrier Squadron operated from that field for a time. In December the 9th Combat Cargo Squadron moved to Warazup, where it was joined by the 1st Troop Carrier Squadron in April 1945. Such movements forward could be carried out only to a limited extent, because the railhead remained at Ledo. Only Shingbwiyang and Warazup were ever stocked, and much of the stocking had been done by transport aircraft. Stock levels were maintained by truck convoys from Ledo, but trucks could hardly have supported heavy air supply operations after the wet monsoon had reduced the capacity of the road through the Hukawng Valley. The ability of the road to support such a volume of traffic was not put to the test, because the NCAC campaign came to an end with the beginning of the wet monsoon of 1945.²³

As the NCAC campaign drew to a close, Tenth Air Force made ready to move to China. In preparation for this move, the North Burma Air Task Force (NBATF) was created to control continuing operations in north Burma. In late April 1945 Air Cargo Headquarters was disbanded and the squadrons of the 443d Troop Carrier and 3d Combat Cargo Groups (except the 12th Combat Cargo Squadron and the 332d Air-drome Squadron, which had been sent to Tuihal temporarily, under control of CCTF) were placed directly under NBATF for operational control. NBATF assisted Tenth Air Force in its move to China, and continued air supply operations in north Burma for the remainder of the war. The chief task of transports under NBATF control during May and early June was the removal to China of the Chinese troops remaining in Burma. Carried out in cooperation with ATC, these troop movements required 1,446 flights by NBATF transports between 15 May and 22 June. These flights transported more than 21,000 troops, more than 1,700 tons of cargo, and 159 mules. Most of the animals belonging to the Chinese units were carried by ATC, to the great satisfaction of the combat cargo and troop carrier crews. During June ATC took over the 443d Troop Carrier and the 3d Combat Cargo Groups, and the 319th and 317th Troop Carrier Squadrons of the 1st and 2d Air Commando Groups were assigned to NBATF to carry out the reduced air supply missions still required in north Burma.²⁴

For the remainder of World War II, air supply operations in north Burma were similar to those carried out earlier, but were on a greatly reduced scale. The 317th and 319th Squadrons, based at Ledo, made some drops to combat troops in the Shan States south of Lashio, but most of the 3,000-4,000 tons they delivered monthly to north Burma was in the form of meat, mail, post exchange supplies, British Civil Affairs material, and odd items required by the garrisons in the reconquered areas. These deliveries continued for some time after the end of hostilities as air supply in north Burma, its objectives accomplished,



Figure 1. Paratrop on Drop Zone along Stilwell Road



Figure 2. Drop Zone after Paratrop

gradually subsided to a level comparable with its beginnings.²⁵

Priorities and Procedures. During the existence of TCC, air supply operations in north Burma had demonstrated the need for some central authority in the NCAC area to decide which requests for air supply were justified, what priority should be assigned to individual requests, and which depot should supply the goods requested. Three agencies were concerned with air supply, and each of these agencies, NCAC Headquarters, SOS, and Tenth Air Force, could advance arguments justifying its contention that it should have control over air supply. SOS had developed the techniques in use for packing, loading, and kicking supplies delivered by air, had provided and trained personnel for carrying out these duties, and had generally administered the processing of supplies from base depots to the troops which received them. SOS also maintained that, according to accepted doctrine, supply of ground forces was a function of SOS and that the means of transporting the supplies were incidental to this main point. Tenth Air Force pointed out that it was air effort which had made air supply feasible, and contended that since the air command controlled the means of delivery, it was responsible for delivery. Since authority should be commensurate with responsibility, it was logical that the air commander should control the ground activities directly related to air supply. NCAC, finally, had the most vital interest in the success of air supply since the outcome of its operations was dependent upon the result of air supply efforts.²⁶

These considerations were receiving considerable attention, especially from SOS and Tenth Air Force, in the spring of 1944. The approaching dissolution of TCC and the restoration of Tenth Air Force as an operational as well as an administrative command made a decision necessary; otherwise lack of coordination in air supply efforts might have endangered the success of the Chinese-American effort in north Burma.

In April Col. Russell Scott of the CBI Air Service Command and Col. Richard Smykal, G-4 NCAC, made a joint inspection of the ground activities carried out in connection with air supply at Dinjan, Sokerating, and Ledo. Colonel Scott concluded that the AAF, "not apprised of day to day tactical operations, unable to interpret their implications, and unfamiliar with the detailed ramifications of the administrative system in use by the services, was not prepared to take over control of these phases."²⁷ On the other hand, Tenth Air Force was certainly not prepared to relinquish operational control of troop carrier squadrons to SOS.

In late May a meeting was held to deal with this problem at the headquarters of Maj. Gen. Howard Davidson, commander of Tenth Air Force. The meeting was attended by General Davidson, Maj. Gen. Lewis A. Pick, commander of Advance Section 3, SOS, and by Colonel Smykal. Since it was apparent that except for projects primarily concerned with the ATC airway to China most installations in north Burma and Assam were in existence for the support of ground troops fighting the Japanese in north Burma, it was agreed that a priorities system for the control of air supplies to Allied units in north Burma should be established under G-4 NCAC.

This decision in effect gave control of air supply operations to NCAC, because the setting of priorities determined what supplies were to be flown to any unit in Burma. The nature of the supplies to be delivered influenced the decision as to which SOS unit should pack the supplies and from what air base they should be flown. The quantity of supplies to be delivered determined the number of sorties to be flown. Since only one or at most two squadrons of transport aircraft were located on a base, this procedure amounted to designating the air unit which would fly the sorties. In sum, G-4 NCAC had the function of deciding what supplies should be packed by SOS, what supplies should be delivered by the AAF, what air units should deliver the sup-

plies, and what ground unit should receive them.²⁸

It should be understood that Tenth Air Force (acting through Air Cargo Headquarters after 1 November 1944) had not formally given up control of its transport operations, and in reality it exerted a considerable amount of quantitative and negative control. A monthly allocation of tonnage was still part of the system, and Air Cargo Headquarters, through its knowledge of its capabilities, could set an upper limit on the allocation. When the schedule of deliveries set up by G-4 NCAC under the procedure to be described below violated air policy or was beyond available transport capacity, Air Cargo Headquarters stepped in and, in coordination with G-4 NCAC, changed the schedule. When there was no such conflict, however, the delivery schedule promulgated by G-4 NCAC was allowed to stand.²⁹

Under the system that evolved as a result of the May 1944 decision to give G-4 NCAC the power of establishing priorities for air supply in north Burma, units desiring to receive supplies by air made their requests directly to G-4 NCAC by available communications, whether radio, telephone, teletype, or courier. Requests had to reach G-4 NCAC by 1500 of the day preceding delivery. A simple code was developed, with the initial letter standing for the particular type of material, as "A" for ammunition. Within that general category, two-letter groups denoted specific items, for instance "BS" for 2-inch high-explosive mortar shells. If no number followed the letters, only one unit of the item was desired; otherwise the number indicated the quantity wanted. "ABS 60," for example, was a request for 60 rounds of mortar ammunition, and "NBH 75" was a request for 75 tins of Ovaltine. Formal requisitions were required for certain classes of supplies, but the coded request initiated action by G-4 NCAC on the assumption that the requisition would follow. To some extent G-4 NCAC maintained records on the quantity of rations, ammunition, and POL possessed by forward units and initiated automatic shipments of these

items when necessary, thus cutting down the number of routine requests.

To administer the air supply functions of G-4 NCAC, an Air Control Section was formed in NCAC Headquarters. The main duties of the Air Control Section were the assignment of priorities, control of the opening and location of DZ's, maintenance of an up-to-date map of DZ's and landing strips, maintaining records on the personnel, ration, and ammunition status of NCAC forces in Burma, processing of requisitions, and close liaison with Tenth Air Force, Air Cargo Headquarters, troop carrier and combat cargo squadrons, SOS air supply units,* and air cargo resupply (ACR) squadrons.†

In October 1944 the Air Control Section was split into two parts, a forward echelon at Myitkyina (later moved to Bhamo) and a rear echelon that remained at Ledo. The forward echelon processed requisitions for Class II and IV supplies, consolidated requests for air supply from units in the forward areas, and controlled the opening and location of DZ's. The rear echelon of the Air Control Section continued the same duties earlier performed by the united section, but its work was greatly simplified by the consolidation of requests and supervision of supply targets effected by the forward echelon.

As might be expected, most units requesting supplies demanded the highest priority, designated "urgent" in the NCAC area; in June 1944 90 percent of requests were in this category. The Air Control Section arbitrarily limited urgent priority to a maximum of 10 percent of the total tonnage that could probably be delivered. In practice, urgent priority was given only to emergency combat requirements. First priority, which was limited to a maximum of 90 percent of the probable tonnage available, was assigned to rations, ammunition, and forage for combat units, the same items plus small arms for OSS formations, combat requirements for fighter squadrons, supplies for forward engineer construction details, and supplies for air warning units. Inso-

*See above, p 21
†See below, p 41

far as possible, the Air Control Section made sure that requested items were really needed before assigning first priority. Second priority included everything else requested. Goods in this category were delivered only when all urgent and first priority demands had been satisfied or when first priority items were not available for loading. Each unfulfilled request was reviewed daily, and a second priority item of one day might become a first or even urgent priority item the next day.

The Air Control Section began making up a daily priorities sheet for the next day's operations after 1500 each day. This sheet listed all loads, specified where they were to be landed or dropped, assigned a priority to each, and named the air supply base from which each was to originate. This daily priorities sheet was then transmitted by teletype to all agencies directly or indirectly concerned. Upon receipt of the priorities sheet, SOS, British Army Base (BAB),* Air Service Command, or OSS began putting supplies aboard trucks and moving them to the air supply base where they would be packed and loaded.

Neither this system nor any other could have succeeded if communications in Assam had not been greatly improved during the spring of 1944. Coordination of effort was essential to the air supply operation, but coordination was almost impossible to achieve with the hodge-podge of radio, telephone, and courier communications that existed prior to May 1944. For example, the only means of normal communication between the air bases at Sookerating and Dinjan was a single telephone line which passed through Ledo.

A wire teletype system was introduced in May with machines in key headquarters. The teletype was not used solely for air supply communications, however, and its use was not coordinated with other media. As a result, since the wires were overloaded, it was not always possible to send a message at the time when it should have been sent. Moreover, the teletype circuit was not adequately maintained and often went out of

commission at critical moments. In July 1944 the theater signal officer, after frequent complaints, improved the system and enforced coordination of commercial, SOS, and AAF communications by teletype. At the same time, and most important of all, messages originating from the Air Control Section were given top priority on the teletype after 1500 each day. Some difficulties continued, especially during periods of intense tactical operations, but generally communications were satisfactory from July 1944 through the remainder of the north Burma campaign.

Great savings in time and effort were brought about when permission was finally obtained to abandon the standard Signal Corps practice of spelling out numbers and transmitting the whole message as a single paragraph. Messages transmitted in this form were much longer than necessary, took considerable time to prepare, and were so hard to read that still more time was consumed in rewriting them into more rational form. When Signal Corps composition was abandoned, teletyped air supply messages were sent in the most logical form, just as if they had been typewritten. This was especially helpful insofar as the daily priorities sheet was concerned, because the packing units could take the priorities sheet just as it came from the teletype and use it as a work order.

When the new control system went into effect, SOS remained responsible for packing, loading, and kicking supplies. The work involved was done by the Air Dropping Supply Unit detachments at the transport airfields.* Later a British packing unit† and three air cargo resupply (ACR) squadrons shared this task. Each of these units operated a complete ration, ammunition, and POL depot. When the daily priorities sheet was received, the part pertaining to the base on which the packing unit was located became a work order and was acted upon. A formal order from SOS was received later, confirming the tasks assigned by the priority sheet.

*See below, p 43

*See above, p 21
†See below, p 43

Rations, ammunition, and POL were usually on hand and prepacked; other items were delivered to the base and turned over to the packing unit. When it was ascertained that the supplies were available and packed, a manifest was made up for each planeload. This manifest was then turned over to a truck driver who proceeded to collect the specified items from warehouses, loading them inversely to the order in which they were to go aboard the transport. Planes were loaded at night for predawn takeoffs. For loading of returning planes, trucks were waiting at the airfield when the transport landed, so refueling and reloading could be done simultaneously. The pilot of the transport signed one copy of the manifest and returned it to the truck driver for delivery to the officer in charge of packing and loading, he kept one copy, enabling him to check his load and destination; the third copy was marked with a streamer and dropped or landed with the load. When loads were freedropped or parachuted, the ground units receiving the supplies often failed to recover the manifest.

At regular intervals throughout the day the packing units transmitted progress reports to the Air Control Section, enabling the section to keep abreast of the day's operations. Each evening a final status report was addressed to Air Control Section, Air Cargo Headquarters, Tenth Air Force, and SOS. This final status report listed loads delivered in each priority category and the status of each individual order, thus enabling the various headquarters to determine the degree of completion of any order and to take any needed corrective measures for the next day's operations.

In connection with the formation of combat cargo groups, the AAF had created air supply packing units known as air cargo resupply (ACR) squadrons (TO&E 1-470, 23 May 1944) to pack, store, and kick supplies and to serve as rear echelon supply units for airborne operations. These squadrons were to be controlled by the AAF. When the directive to this effect was received in India, CBI Theater Headquarters issued a proposed standing operating pro-

cedure (SOP) assigning to the AAF the functions of the ACR squadrons. NCAC Headquarters and SOS objected strongly to the proposed SOP, and Tenth Air Force gave it little active support. As a result, the SOP was withdrawn and operations were continued as before by the expedient of assigning ACR squadrons, when they arrived in the NCAC area, to SOS for operational control while Tenth Air Force maintained administrative control. By January 1945 ACR squadrons and attached truck companies (aviation) were functioning under SOS control at Dinjan, Shingbwiyang, and Warazup. At Ledo the SOS Air Dropping Unit continued to carry out its duties, and at Moran, from whence the British 36 Division was supplied, an Indian air supply company received, packed, loaded, and kicked supplies.¹⁰

The air supply control system in the NCAC area was one of divided responsibility, but the difficulties that arose were minor. The efficiency that was attained was undoubtedly due to the fact that Tenth Air Force, NCAC, and SOS made every effort to cooperate fully. The acceptance by Tenth Air Force and SOS of the "suggestions" contained in the daily priorities sheet as operational orders was the chief factor which made the system succeed. If prior approval by Air Cargo Headquarters and SOS had been required before AAF and SOS units acted, the system would have been characterized by interminable delays. In practice, the daily priorities sheet was accepted as a definite set of instructions, even to the extent of providing for night loading and staging aircraft from one base to another to pick up loads.

Some difficulties could have been avoided if Air Control Section NCAC, SOS, and Air Cargo Headquarters had been located adjacent to one another. The Air Control Section and SOS were both at Ledo, but they were eight miles apart. Air Cargo Headquarters was 50 miles away at Dinjan. When demands exceeded capability and rapid decisions were needed on matters which required coordination, much valuable time was lost putting through calls on the over-

worked telephone lines. If these three headquarters had been located in the same building, there would have been a reduction in communications traffic, savings in time, and better understanding on the basis of close personal liaison, all of which would have contributed to a smoother operation.

On a lower echelon, the packing and loading units were too often careless in determining the weight of loads. This resulted on the one hand in overloading aircraft, on the other in failure to make use of the full carrying capacity of the transports. Most pilots rightfully refused to fly when aircraft were overloaded, and this brought about delays as part of the cargo was unloaded and new manifests made out. Packing units, on the other hand, reported a few instances in which pilots refused to accept loads that were within the weight limits, and elected not to fly even though the weather was good.* The chief difficulty from the overall point of view was that these contingencies could not be anticipated, and their occurrence upset planned operations.

Several times higher air headquarters made reductions in the number of hours aircraft or pilots could fly in a month. Such action was taken because the pilots and C-47's of the troop carrier and combat cargo units were being drastically overworked. The normal operational rate for C-47's was supposedly 120 hours per month, and the supposed maximum sustained rate was 160 hours per month, but the transports flying over the NCAC front averaged more than 200 hours per month for months at a time. Some individual aircraft flew more than 250 hours per month. Believing that such intensive operations were borrowing against the future, AAF India-Burma Theater made several attempts to cut down the hours flown. Such efforts were short-lived and came to nothing in the face of the imperative demands for supplies, but they did throw the Air Control Section into confusion for short periods.³¹

*This may have been because the weight distribution of the load was unsatisfactory. There may also have been a difference of opinion as to whether the load was within the weight limits.

There can be no question but that air supply in the NCAC area improved after the establishment of the system described above. As noted earlier, tonnage delivered showed a steady increase from May to November 1944, and this increase in tonnage was out of proportion to increased numbers of aircraft available. In fact, an increase in tonnage delivered from 13,000 tons in May 1944 to over 20,000 tons in July 1944 was effected without any increase in available aircraft. Much of this increase, which came about during the worst part of the wet monsoon, may be credited to increased experience on the part of pilots, to improved maintenance, and to the initiation of certain specific procedures, but a great deal of the improvement was due to the coordination brought about by the Air Control Section NCAC. In fact, some specific speed-up procedures were initiated by G-4 NCAC or suggested by Air Control Section observers at the air bases from which supply missions were flown.

Among specific measures that added to the efficiency of air supply operations was the improvement in communications resulting from the installation of the teletype system.* Another was the rearrangement of warehouses to facilitate truck loading. Packing units made a contribution by building up stockpiles of prepacked American, British, Chinese, Chinese field officer, and animal rations in their warehouses. During critical periods of demand, the packing of supplies was carried out on 24-hour shifts, and production-line methods were used at Ledo for packing rations, ammunition, and POL for parachute drops. The time transports spent on the ground was reduced by having fuel trucks and trucks loaded with supplies waiting when the aircraft landed. Thus loading, refueling, and briefing the crew could all be carried out at the same time. This reduced time on the ground between sorties, which had been almost an hour, to merely 10-12 minutes for a standard load of rations, ammunition, or POL. Another time-saving innovation was night loading for early morning sorties. When-

*See above, p 40

ever possible, heavy or otherwise hard to load items were scheduled for early morning delivery so loading could be done at night. If the transport so loaded picked up normal loads for its second and third sorties, no flying time was lost in loading the difficult material. There was, of course, some loss of time if unloading at the other end of the air supply line took longer than usual.

Supply of 36 Division The functioning of the NCAC air supply system from the point of view of the combat unit on the ground may be demonstrated by a description of the air supply of British 36 Division.* The equivalent of two battalions of this division plus some 300 vehicles reached Mogaung via the Ledo Road, but all the rest of the unit was flown from Assam to Myitkyina. From the time it commenced operations against the Japanese (August 1944), 36 Division's 18,000 men were supplied and reinforced entirely by air, and casualties were evacuated by the same means. The division had some land communications within its zone (including a jeep-powered rail line from Mogaung southward), but it used no land communications with Assam.³²

Because the supply system of the British Army differed from that of the American and Chinese units supplied earlier by NCAC sources, two additions were made to the air supply system to accommodate these differences. A British officer was made a member of the NCAC G-4 staff and served on the Air Control Section. He set the priorities for 36 Division requests and assisted in coordinating supply of this division with other NCAC air supply activities. For securing British type supplies, and for supervising the storing, packing, loading, and kicking of these supplies, a British Army Base (BAB) Headquarters was set up at Ledo under SOS to carry out for 36 Division the same functions which SOS carried out for American and Chinese units. An Indian air supply company of 18 officers and some 500 enlisted men, located at Moran, did the

actual work of packing, loading, and kicking supplies for the British forces.

Missions to deliver supplies to 36 Division were normally flown from Moran by C-47's of the 3d Combat Cargo Group. Under normal conditions 16 aircraft, each flying two trips a day, could meet the needs of the division, but during periods of peak operations up to 60 flights per day were required. The British division was enthusiastic in its commendation of the combat cargo squadrons that maintained it.

Within the division, requests for supplies were passed through normal channels to the division supply officer. Requests for supplies and reinforcements went directly from division headquarters to Air Control Section NCAC with information copies to NCAC Forward Command Post at Shaduzup, BAB at Ledo, and the packing unit at Moran. On the strength of this request, BAB and the air supply company could begin assembling supplies, and six aircraft were loaded with standard requirements before the priority sheet was issued. The daily priority sheet was, however, the effective order for packing and loading. Air Control Section requisitioned through BAB items not available at Moran. Communications between 36 Division and Air Control Section were by radio, and experience proved that messages concerned with air supply had to receive a priority equal to all but the most important operational messages.

The division also maintained radio communication with the aircraft that delivered the supplies, particularly those which dropped supplies rather than landing them. Every effort was made to provide a receiver and a transmitter for each DZ. Such air-ground communication at the DZ was useful in helping the transport drop its load accurately, and it enabled the ground troops to contribute to the safety of the transports by warning pilots of danger from enemy ground fire or friendly artillery.

In addition to the communications between DZ's and supply aircraft, a radio station was established at 36 Division Headquarters. Because it was often impossible

*The reader should bear in mind that conclusions reached by officers accustomed to working with the British supply system would not necessarily apply to an American division.

to predict where a battalion in action when a request was submitted might be by the time the supplies were delivered the next day, pilots flying loads for battalions in the line were instructed to report in to this station, describing their cargo. When the battalion at the front established its DZ, it immediately informed division headquarters of the location. Then, when the pilots reported in, each was directed to an appropriate DZ. The British officers soon learned that map references meant nothing to the pilots, but that if they were given a bearing and distance from a known point and warned of other DZ's they might fly over, they would locate the proper place for the drop. The headquarters radio station was also used to divert standard loads* from one DZ to another when this was desirable.

From their experience, officers of 36 Division concluded that an ideal DZ was at least 800 yards long and 100 yards wide, having within a mile of either end no obstacles more than 220 feet above the level of the DZ. It was also desirable that there be no obstacle more than 20 feet above the level of the DZ within 800 yards of its center. A suitable drop zone had to be accessible from the ground line of communications, and during the monsoon dry spots for dumps had to be located nearby. If possible, a DZ was selected that had its long axis in the direction of the prevailing wind, and that was in the vicinity of some easily recognized landmark, such as a bend in a river. Unfortunately, ideal drop zones were seldom encountered in north Burma.

The division officers discovered that the tops of ridges made the best DZ's in hilly country, and that in jungle, during the dry season, chaungs (dry stream beds) could be used. Seldom if ever was it possible to find a location that met all the specifications listed above, and sometimes it was necessary to use very small areas in unsuitable terrain. This was done only when absolutely necessary, because drops under such conditions resulted in the small target's being missed by a large quantity of

material, too much of which could not be recovered.

Losses of material were greatest during the rains. Not only did the difficulty of moving on the ground force the division to use unsatisfactory DZ's from the viewpoint of size and adjacent obstacles, but the zones were always wet and often waterlogged. The muddy ground caused considerable spoilage of supplies, especially such free-dropped items as tea, sugar, flour, and forage. During the worst of the rainy season, wastage of these items averaged 75 percent, and for some drops the loss was 100 percent. Best results during the wet monsoon were obtained when the drops were made along a road because the roads, however wet, were usually located on the driest ground in the area. Dropping on the road had its disadvantages, because all traffic had to be halted from the beginning of the drop until the supplies were collected. The division report emphasized the fact that a dry area was no good as a DZ if neither mules nor jeeps could reach it.

Dropping zones became a very important consideration in operational planning. No long halt could be made at any point unless nearby there was a DZ which could supply the troops concerned. Furthermore, the DZ had to be defensible without immobilizing the whole force. Plans involving a march through thick jungle had to provide for the capture of the objective and establishment of a DZ within a time limit determined by the rations that could be carried, and had to provide for a withdrawal to a DZ for replenishment if the objective could not be captured during the time limit.

The marking of DZ's was also important, especially in the rainy season when pilot visibility was usually limited. Markings consisted of panels forming an arrow to show the desired direction of flight, Roman numerals giving the number of the DZ, and a triangle to indicate the point at which supplies were to be released. Since the tendency of drops was to be over instead of short, the triangular "drop here" panel was located near the end of the DZ from which the C-47's approached rather than in the

*See below, p 46

center. Care had to be taken with the direction of the arrow panel so that drops short or over would not fall among troops or installations. When a DZ was closed, it was marked with an "X" panel, plus an arrow pointing in the direction of the new zone. Panels were made of old parachutes. It was found that the panels prescribed by regulations were too small for pilots to see easily, and 36 Division required a minimum length of 30 feet for panels and preferred them longer, up to 70 feet. The panels were proportionately wide.

For clearing supplies from a DZ, it was necessary to place one officer in complete charge. In battle areas, working parties were a problem since infantry units were likely to be busy with the enemy and the use of specialist units reduced their efficiency in the performance of their special tasks. As a choice of evils, infantry was generally used, and it proved better to use entire units under their own officers rather than to take details from various units. As soon as the military situation made it possible, civilian labor was engaged for clearing DZ's but, though this was better than using military formations needed for other tasks, it had a number of disadvantages. No given number of Burmese workers per day could be anticipated, and the workers reporting one day might be an entirely different group from those used the preceding day. As a result of this last condition, instruction in the work to be done had to be given daily. Because of the low energy diet of the people of north Burma, civilian laborers could not do as much work as an equal number of soldiers. Finally, civilian workers used at one DZ could not leave their wives and children and accompany the advance to the next dropping area.

Payment of Burmese was still another problem. In one area cloth might be demanded in payment, in another food, in yet another salt. In a region of relative prosperity, money might be acceptable. Damaged parachutes and rations which had been damaged by dropping could often be used as payment.

Providing security for the DZ's against enemy attacks was, of course, a duty of the infantry, but measures also had to be taken to prevent enemy infiltration and friendly pilfering. On at least one occasion, several Japanese soldiers in Burmese clothes were engaged for work on the DZ, and this probably happened more than once. Division headquarters stated that it was impossible to thoroughly screen a constantly changing civilian labor force, and occasional espionage was accepted as a legitimate risk.

Security against pilfering was even more difficult than security against enemy action and espionage, because division troops, Allied troops, and natives all showed larcenous tendencies. In addition to the infantry who guarded the zones against the Japanese, it was necessary to have military police (MP) guards to protect the supplies from the infantry and others. Except for the authorized representatives of communications and ordnance detachments who had to watch for certain particular items, no personnel except the work party were allowed on the DZ until all supplies had been collected.

Clearing the supplies from a DZ was done in three distinct steps. First the area around the identification panels was cleared to enable drop aircraft that might arrive later to identify the zone. Next, in order to reduce pilfering, the supplies dropped outside the zone were picked up. Finally, the remainder of the supplies were gathered; the last phase, of course, accounted for the bulk of the material dropped.

Some form of transport for moving supplies from the DZ to the supply dump had to be provided if the zone was to be cleared in a reasonable length of time. In good weather handcarts were useful if the approaches were not too rough, and often trucks and jeeps could be used. Mules and bullock carts could move supplies to the dumps even in moderately bad weather, but movement by this means slowed down considerably when DZ's were waterlogged and the approaches very muddy. Thirty-six Division discovered that hand trolleys on

Decauville track* were the most efficient transport from DZ to dump under adverse conditions.

The 36 Division report on air supply concluded that a special unit was needed for clearing DZ's. This conclusion resulted from the difficulties encountered in making military labor available, the disadvantages of civilian labor, and the observation that military units used for DZ clearance rapidly increased their skill and efficiency. It was suggested that special units set up for this purpose should be attached to divisions or brigades wholly or partially dependent upon air supply. These units would have the primary duties of clearing supplies from DZ's, unloading aircraft at forward landing strips, salvaging airdrop equipment, and aiding in the unpacking of supplies. Plenty of useful employment for such a unit could be found when it was not carrying out its primary duties.

From the time 36 Division went into action until the end of the wet monsoon, practically all the supplies it received were dropped. A strip was built at Mawlu (the old White City of the Chindits)†, and the delivery of landing loads to this point began on 17 November 1944. Other strips were opened as the advance moved farther south. These strips always had one runway, with parking bays at the ends. After landing, transports taxied back down the runway to the downwind parking area; there the cargo was unloaded directly into trucks that carried it to a nearby dump. When unloaded the transport could immediately take off into the wind.

The landing of supplies was much more efficient than airdropping, though not so flexible. Landing gave the division a much greater net return per trip, since about one-third the weight of a dropped load was made up of packaging, harness, and parachutes. Transports that landed could deliver supplies that either could not be dropped at all or that could be dropped only at great trouble and expense. The loss

of supplies from landed loads was negligible, in contrast to loss on parachute drops and freedrops that averaged 5 percent under the best conditions, 30 percent under bad conditions. When supplies were landed there was no problem of salvaging and returning airdrop equipment. Finally, a given amount of material could be unloaded from transports and moved to a dump in much less time, and with much less labor, than was required to clear the same amount from a DZ.

The chief disadvantage of landing supplies was that considerable flexibility was lost. DZ's were obviously much easier to locate and prepare for use than were landing strips. The division was never able to have more than one landing strip available at a time, as contrasted with several DZ's.

In October 1944, when the end of the rains made rapid ground movement possible, 36 Division supply section increased the natural flexibility of airdropped supply by adoption of a standard load for transport aircraft. A standard load was a mixture of rations and small-arms ammunition sufficient to supply one-half of a battalion in action for one day. Thus two aircraft so loaded could be requested for each battalion in action before it could be known where the battalion might be when the aircraft arrived. Pilots carrying standard loads reported in to the divisional headquarters radio station after 1400 hours, by which time battalions had prepared their DZ's for the day. The standard load proved such a useful device that such loads were often asked for when the location of a battalion DZ was known in advance, because it was easy to divert the cargo from one DZ to another in an emergency.

One important conclusion of 36 Division staff concerning jungle campaigning on air supply was that normal reserves were not only unnecessary, but were at times a handicap. At the beginning of its campaign in north Burma, the division built up reserve dumps of ammunition and other supplies according to normal practice. These dumps proved very little help and considerable embarrassment. Those established around Sah-

*A narrow-gauge steel "railroad" track, built in small sections and put together in the same manner as the track for a toy railroad. For temporary use it could be laid atop the ground with little or no preparatory filling and grading.

†See below, p. 70

maw were, with great difficulty, moved to Katha, and from Katha were flown forward to the battle zone. This procedure was followed only to prevent waste; the supplies could have been delivered from Moran just as easily.

From this and other unhappy experiences with dumps, the 36 Division commander concluded that the smallest possible reserve should be kept with an air-supplied division on the ground. The right place for stockpiles was the air base from which air supply deliveries were made. Two or three days ration supply could be accepted, because such reserves were rapidly eaten up. In the 36 Division no ordnance stores reserve was held, and only a minute reserve of fast-moving engineer supplies was maintained. Eventually the small-arms ammunition reserve of the entire division was kept at an amount equal to one-half day's intense expenditure by one brigade—four hours' intense expenditure by the whole division. Subordinate units kept only enough ammunition for the task at hand, depending upon air supply for replacement if the supply ran low.

The 36 Division report on air supply noted that "Maintenance by air cannot be treated in the same way as normal maintenance by ground L of C. It has separate problems of its own. Each problem must be tackled on its own merit. Risks must be taken, and accepted military principles broken. Rapid decisions, considerable forethought, and good communications are vital." Although shortages and delays in delivery had occurred, the division had always issued full rations and had never delayed an attack for lack of ammunition; no advance had ever been held up for lack of POL. The delays that did occur were no worse than would have been the case if the division had been supplied over fairly easy ground lines of communication. The division supply section noted that "The most vital link in the chain . . . is the air unit responsible for providing the airlift," and that the division "was quite prepared to continue being maintained by air indefinitely, in the full confidence that the

system can be worked under all conditions of terrain and weather."³³

Air supply of Mars Task Force. Since Mars Task Force was under NCAC command administratively as well as operationally, its supply was in many respects simpler than the supply of British or Chinese units. The most important factor in simplifying Mars supply was the fact that American rations could be used, avoiding the complications that existed in catering to the differing dietary customs of British, Indian, and Chinese troops.

Mars Force made its requests for supplies through regular channels to Air Control Section, G-4 NCAC. Ammunition and animal rations for the force were flown from Shingbwiyang, where the 2d ACR Squadron, of which the former air supply section of Merrill's Marauders made up the nucleus, packed and loaded the supplies and provided kickers. Human rations were also provided from Shingbwiyang insofar as the 2d ACR Squadron could provide them after packing ammunition and animal rations. The remainder of the troop rations and all other Mars Force supplies were packed and loaded by the SOS Air Dropping Unit at Ledo. Reserve dumps were laid down at Myitkyina, but these were drawn upon only in emergencies.

NCAC had learned during the Marauder operations and during the siege of Myitkyina that troops who subsisted on K-rations alone for long periods suffered from nausea and malnutrition, and that their combat efficiency dropped seriously. For Mars Force, therefore, SOS provided more variety. Rations were of two kinds, Threapac and Fourapac; the first contained food for one man for three days, the second food for one man for four days. The packs consisted of a three or four day supply of C- and/or K-rations, plus fruit juices, candy bars, dehydrated soup, coffee, tea, sugar, evaporated milk, peanuts, and salt, vitamin, and halazone tablets. The packs were about 14 inches by 32 inches, and weighed about 17 pounds. Thus they could be fitted into the soldier's jungle pack, and

each man could carry several days' supply of food.

Mars Task Force was supplied by air throughout its drive south through eastern Burma. The unit fought some hard battles, and generally fought as well as had the Marauders. At the conclusion of the north Burma campaign, it was still an effective combat unit and was moved into China to take part in an offensive that was prevented only by the Japanese surrender. Improvements in air supply were not the only reason for the happier fate of Mars Force, as compared to the Marauders, but they must receive some of the credit.³⁴

Supply of Chinese forces in north Burma. In some respects, supply of Chinese units was much easier than supply of British or American troops. Chinese rations were light as compared to those provided for occidentals, had fewer components, and one main ingredient—rice—could be freedropped. Furthermore, the Chinese worried little about the future after they had been convinced, with considerable difficulty, that air supply was reliable. When a Chinese element received a drop, nothing more was heard from it until its rations or ammunition approached exhaustion; then another drop would be requested.

On the other hand, the Chinese provided many problems not encountered with units of other nationality. One problem concerned the location of drop zones, which were usually placed at the point most convenient to the unit being supplied with no thought given to the problems of the aircraft making the drop. Many of the DZ's laid out by the Chinese were so close to the frontlines that the C-47's that dropped there often returned with holes from Japanese small-arms fire. In fact, transports over some zones were so exposed to Japanese fire that it became necessary to send fighter escort to strafe enemy positions and inhibit firing at the transports.

Then Chinese were themselves careless with their weapons. Whether from exuberant spirits or inability to distinguish between C-47's and Japanese aircraft, Chinese troops sometimes fired on the transports

as they dropped supplies. Also, the Chinese ignored the danger to the transports of their own artillery and mortar fire; one C-47 was destroyed by a mortar shell from a Chinese position.

American air supply authorities were also exasperated by the failure of their oriental Allies to clear DZ's of obstacles. This led to loss of supplies and also endangered the dropping aircraft. In one instance pilots reported that a tree left in the middle of a DZ looked like a Christmas tree after the drop—festooned with multi-colored parachutes with supplies pendant.

The Chinese were careless, to say the least, about marking their DZ's. Once a drop had been made on a particular zone, the Chinese on the ground often behaved as if all pilots thereafter could find it again without markings. On the other hand, some Chinese units set up unauthorized DZ's, and by this stratagem secured supplies intended for some other unit. Because of this practice on the part of the Chinese it was suspected, though never proved, that the Japanese too set up markers and received supplies from Allied aircraft.

Some of the savings effected by the lighter weight of Chinese rations and their suitability for freedropping were negated by a consistent Chinese habit of asking for more than was needed. In the case of ammunition, this had a tendency to slow down the offensive mobility of the requesting unit because the excess ammunition was stockpiled, and Chinese commanders were very reluctant to leave their stockpiles behind.

Investigation revealed that rations dropped to the Chinese 38th Division in December 1943 were 280 percent of requirements according to the strength report for the same month, and rations dropped to the Chinese 50th Division early in 1945 were 170 percent of what should have been necessary. Ten percent of overage could legitimately be charged to parachute container failures, breakage, or drops so far short or over that they could not be recovered, but the remainder was clearly in excess of requirements. This exorbitant inflation of requests over needs was attributed

to unnecessary abandonment of supplies when units changed position, large-scale pilfering, bartering with the natives, and attempts to make up in quantity what the Chinese rations lacked in quality. Of all these reasons for excess supply, pilferage was probably the most important.

The pilfering that went on at Chinese DZ's created hardships for American liaison and medical personnel serving with the Chinese units. American rations were naturally delicacies to the Chinese infantrymen, and packages marked for American personnel were seldom recovered. As a result, the Americans lost not only their rations, but also, in many instances, mail, personal items of equipment, and medical supplies.

It is evident that personnel at Chinese DZ's were practically without discipline. One American liaison officer reported that "More Chinese were killed by falling rice bags than ever suffered for lack of food."³⁵ Casualties on the DZ's were, judging by the comments available, rather high. Pilots could see Chinese soldiers standing on the sidelines or actually on the DZ when the supply-dropping run began, and each of the watchers tried to catch a parachute as it came floating down. When freedrops of rice and animal rations were mixed with the paradrops, casualties were almost inevitable; a bag of grain freedropped from an aircraft flying 120 miles per hour was a deadly missile. Liaison officers reported that some pilferers were neatly decapitated by bags of rice. Casualties (and pilfering) were not confined to enlisted men, one Chinese colonel was crushed by a bag of rations from the sky.

Much of the trouble encountered in supplying the Chinese could have been avoided if American personnel had been assigned to each battalion and regiment for receiving and distributing airdropped supplies. American airdrop teams did supervise divisional DZ's, but the supplies collected were then fed into the Chinese supply system, and much material, especially items intended for American liaison personnel, disappeared before it reached the intended recipient.

Probably such losses were inevitable in supplying Allied troops whose outlook and mores were so different from those of the Americans. If NCAC had taken over supply within the divisions, which would have been the only solution, many additional American personnel would have been required. Furthermore, the authority of the Chinese commanders would have been reduced, and complications in relations with the Chinese government might have resulted.

Despite these and other headaches, Chinese troops were used successfully against the Japanese in Burma; they fought bravely, once they had been committed to battle; and their maintenance, despite the abuses which occurred, cost only a fraction of what an equivalent strength in American infantry would have cost.³⁶

Fly-out of New Chinese Sixth Army. In the autumn of 1944, the Japanese armies in China were concluding an offensive which had carried them from Yochow to Luichow in six months. Fourteenth Air Force bases in east China had fallen one by one to the advancing enemy, and the effectiveness of Chinese ground forces in the combat area had been almost completely destroyed. By November the Japanese had reached the limits set by their plans and had no intention of advancing farther to the west, but Allied commanders in China had no way of knowing this, and to the Chinese Government and Lieut. Gen. Albert Wedemeyer, American commander in China, there appeared to be a serious threat to the communications center of Kweiyang and to Kunming, the Chinese terminus of the Hump air route. Since no reliable troops were available in China, Wedemeyer persuaded the CCS that two Chinese divisions then in Burma should be returned to China for the defense of Kunming. Mountbatten, as Supreme Allied Commander SEAC, protested the transfer of these troops, but in vain.

It was decided that the 14th Division, which was in reserve, and the 22d Division could best be spared from Burma. The Chinese New Sixth Army Headquarters, a

heavy mortar regiment, two mobile hospitals, and a signal company were also included in the move. The transfer of these 25,491 men (including 396 Americans), their equipment, more than 1,500 horses and mules, 42 jeeps, 48 howitzers, 48 heavy mortars, and 48 antitank guns began on 5 December and was completed on 5 January. Originally dubbed operation GLOW-WORM, the movement was known as Operation GRUBWORM after Col. S. D. Grubbs, Deputy Chief of Staff, Tenth Air Force, was put in charge.

Operation GRUBWORM was an excellent example of coordination between ATC, Tenth Air Force, and Fourteenth Air Force. It was carried out so as to interfere as little as possible with normal air supply operations on the NCAC front. The troops were flown from five separate airfields in Burma, but since only one of the fields, Myitkyina South, had facilities for night operations, aircraft engaged in supply flights shuttled troops to Myitkyina by day so that ATC could maintain a 24-hour schedule from that base. In daylight transports flew directly to China from all fields, though it was sometimes necessary for them to stop at Myitkyina for fuel.

Transport of the animals was the task of the 317th and 319th Troop Carrier Squadrons of the 1st and 2d Air Commando Groups. With the aid of Chinese labor, bamboo stalls were built in the Air Commando C-47's, and thick matting and straw were laid on the floors to prevent urine's reaching and corroding the control cables. Four or five animals, plus handlers, were moved per flight. The horses and mules were loaded into the aircraft directly from trucks or by means of ramps. Thought was given to quieting them with drugs, but this proved to be unnecessary, especially since the altitude flown had a quieting effect. Only one horse was lost; it had to be destroyed when it broke a leg being unloaded in China without a ramp.

Operation GRUBWORM required a total of 1,328 C-47 and C-46 sorties, of which ATC flew 597, the Air Commando squadrons 488, and Tenth Air Force 243. The Tenth Air Force sorties were flown by Combat Cargo

C-47's, some of which had been temporarily relieved from air supply duties on the central front for service in China during the emergency. Since some of the ATC trips were flown by C-46's, which carried 45 Chinese troops as compared to 25 in a C-47, ATC transported a larger proportion of the men moved than is indicated by the trip total. Only three aircraft, one combat cargo and two Air Commando C-47's, were lost in the entire operation.³⁷

Summary

Operations in north Burma during the last two years of World War II did not proceed according to plan, but they did accomplish the aims established for operations in that area. With assistance from Wingate's Chindits, NCAC forces made their way down the Hukawng Valley to within striking distance of Myitkyina, then captured Myitkyina South Airfield. Use of the airfield as a supply head enabled the Allied forces to capture the town of Myitkyina after months of hard fighting, and thereafter a steady advance cleared the enemy from north Burma and opened the Ledo-Burma Road, aptly renamed the Stilwell Road, to traffic.

Ironically, the opening of the road in itself accomplished little. By early 1945 the Hump air route was delivering freight to China at a rate that the road could never expect to match, and at less cost than material delivered over the road. Undoubtedly the road had propaganda value, but the chief strategic accomplishment of the north Burma campaign was the improvement in the Hump route made possible by the acquisition of Myitkyina South Airfield. The pipeline and telephone line, which paralleled the road to Myitkyina and were eventually extended on to China, had considerable value, but it is at least open to question as to whether they too were worth the cost.

Whatever the north Burma campaign accomplished, it was possible only because of air supply. Air supply operations in north Burma expanded from occasional sorties to isolated air warning stations to full-scale supply of five Chinese divisions, one British

division, two American regiments, and thousands of construction workers. Ground force units of divisional size could be moved from one place to another in a fortnight and supplied after they arrived without seriously interfering with routine air supply operations. The wet monsoon, which did bring road traffic to a halt, did not prevent the continuation and expansion of air supply operations. A control system,

improvised and improved within the NCAC area, coordinated air and ground elements of the air supply lines. Air supply operations in north Burma demonstrated clearly and conclusively that sufficient air transport, provided with adequate bases, could, under conditions of air superiority, provide supplies for ground forces with a reliability equal to that of normal ground lines of communication.



Figure 3. Supplies Being Dropped to Jungle DZ

CHAPTER IV

Air Supply Operations During the Japanese Offensive, January-July 1944

Troop Carrier Command

AS NOTED EARLIER, Troop Carrier Command was created in December 1943 as one of the constituents of Eastern Air Command.* Under the command of Brig. Gen. William D. Old, TCC was given the mission of providing air transportation for airborne forces and air supply of Allied land and air forces in Burma. It was conceived as an integrated Army Air Forces-Royal Air Force headquarters to oversee the operations of American and British transport aircraft on the Burma front.

When it began to function, TCC controlled the 1st and 2d Troop Carrier Squadrons in Assam and RAF 177 Transport Wing, made up of 31, 62, 117, and 194 Transport Squadrons. The 1st and 2d Squadrons were already engaged in supplying Lt. Gen. Joseph W. Stilwell's offensive in north Burma; their operations are discussed in the previous chapter. Of the RAF units, only an eight-plane 31 Squadron detachment based at Agartala was already engaged in air supply operations. It had supplied the first Wingate expedition and since that foray had been occupied with supply dropping to isolated posts in the Chin Hills and the Arakan. The remaining portion of 31 Squadron, based at Kharaghpur, was flying mail and passengers within India. RAF 177 Wing was based in northwest India and was taking part in the training of parachute troops when TCC began operations, but 62 Squad-

ron moved to Comilla and began air supply missions on 7 January. The remaining two 177 Wing squadrons were shifted to Bengal bases in February.

The order activating TCC placed the 27th and 315th Troop Carrier Squadrons under its command. Neither unit was immediately available; the 27th was en route from the United States, and the 315th was to be activated in India around a cadre drawn from the 1st and 2d Squadrons. The 98th Air-drome Squadron, also en route from the United States, was to serve as a housekeeping unit for the 27th and 315th Squadrons until assigned ground personnel arrived in the theater. These two units were based at Sylhet and were in operation on a limited scale by the middle of January 1944. They were combined with the 1st and 2d Squadrons to form the 443d Troop Carrier Group.

Thus, by March, TCC controlled four American troop carrier and four British transport squadrons. Each troop carrier squadron was normally equipped with 13 (later 16) C-47 aircraft, and the RAF table of equipment (T/E) called for 25 Dakotas (British C-47's) per transport squadron.* Twenty of these were to be operational, five in reserve. In practice troop carrier squadrons were often one or more aircraft short of their T/E complement, and the RAF units had far less than the T/E called for. The RAF reserve transports existed only on paper, and in January 1944 neither 31 nor

*See above, p 7

*Hereafter the term C-47 will be used to apply to both British and American aircraft of this type

62 Squadron had 20 operational planes. The remaining RAF squadrons did have 20 transports each, but five of those assigned to 117 Squadron were withdrawn for use in training personnel of the second Wingate expedition and did not become available for TCC air supply operations until mid-March. By that time all RAF units were up to, or almost up to, full operational strength, but the reserve aircraft called for by the RAF T/E were still missing.

By March, therefore, TCC had available some 130 C-47's. During February, before this total had been attained, the Arakan emergency had resulted in the diversion of 20 Air Transport Command C-46's to supply dropping operations under TCC control.* The Japanese attack on Imphal necessitated air supply operations of such magnitude that TCC resources were completely inadequate. ATC transports were again diverted, and five troop carrier and one RAF transport squadrons were borrowed from the Mediterranean Theater of Operations.† In May the 27th Troop Carrier Squadron was transferred to the China-based Fourteenth Air Force, leaving TCC in command of eight American and five British squadrons plus 20 ATC C-46's, some 230 transport aircraft in all. Thus the shortage of aircraft, though always a problem for TCC, was always overcome to a great enough extent to permit the carrying out of essential tasks.

Bases were another serious problem in TCC operations. Bases were scarce in eastern Bengal, and final authority on the assignment of bases was in the hands of Air Marshal Sir John Baldwin, commander of Third Tactical Air Force (TAF). Naturally enough, Baldwin's first concern was the deployment of the combat aircraft under his own command, and TCC units sometimes found themselves relegated to unsatisfactory bases. The resulting area of disagreement between Baldwin and Old was sharpened by the fact that Old believed tactical and transport aircraft could successfully operate from the same base, and by the

fact that Baldwin definitely thought otherwise. The conflict over bases intensified as the rainy season of 1944 approached and fair weather strips from which a large proportion of TCC's operations had been conducted became unserviceable.

The predominately American TCC Headquarters found itself in disagreement with both TAF and British Army representatives on the advisability of seeking the diversion of ATC transports from the Hump for the purpose of aiding TCC in the accomplishment of air supply tasks. Old had formerly been assigned to ATC and shared the general American view of the importance of China in the war against Japan. He was willing to call for aid from ATC when a real emergency beyond TCC capabilities developed, but only when all other resources had been exhausted. British air and ground commanders, on the other hand, thought of the Hump operation as definitely less important than the war in Burma. As a result, or so it seemed to General Old and the American members of his TCC staff, British commanders looked for pretexts for calling on ATC for help, and in at least one instance called for and received unneeded ATC transports in order to establish a precedent.

Old had little control over such calls on ATC resources because his command originally had no part in planning ground force operations. Plans were made, the amount of air supply needed to carry out the plans was computed, and this figure was then presented to TCC as a requirement. If TCC could not deliver the stated amount of supplies, the stage was set for a request for ATC aircraft. TCC's difficulties under this system were compounded by the fact that army requirements were never stabilized, but continued to grow as operations progressed. Eventually Southeast Asia Command (SEAC) Headquarters became aware of this undesirable state of affairs and ordered the British Fourteenth Army to base its plans on TCC capability insofar as air supply was concerned. This order had little effect; the siege of Imphal had begun by the time it

*See below, pp 62-64
†See below, p 77

was issued, and Fourteenth Army's minimum supply and reinforcement requirements for that battle were so large that the acquisition of additional aircraft by TCC was an absolute necessity

From the beginning of TCC operations, there was a fairly quiet but nonetheless real command conflict between TCC and Third TAF. At the first meeting of Baldwin and Old, the former made it clear that he believed TCC should come under his command, he never changed this opinion. Apparently Baldwin's ideas were shared by Air Chief Marshal Sir Richard Peirse, SEAC air commander. This conflict led to numerous difficulties, especially in the command of TCC's RAF units. These squadrons were under RAF administrative command, just as American units were under the administrative command of Tenth Air Force, and administrative channels to the RAF squadrons ran from Peirse through Baldwin and 177 Wing. Operational channels, however, ran from Peirse through EAC (Maj. Gen. George Stratemeyer) and TCC. As TCC commander, Old found it necessary to appeal to Stratemeyer for backing in order to prevent operational instructions' being issued to RAF units through administrative channels, bypassing TCC Headquarters. In each case Stratemeyer upheld Old's position until on 1 May 1944, after an unrecorded conference with Peirse, he suddenly placed TCC under Third TAF for operational control. This condition continued until 4 June 1944, on which date TCC was abolished and command of transport squadrons in India-Burma was divided between Tenth Air Force in the northern sector and Third TAF in the southern.

Stratemeyer had intended that TCC should be an integrated RAF-AAF headquarters. In form this integration was achieved; the commander of 177 Wing became Old's deputy, and other RAF officers carried out staff duties side by side with Americans. Probably a majority of officers of each nationality made an earnest effort to bring about integration in attitude and action as well as on the organization chart, but there were others who made no such

effort. Several American officers demonstrated very definite anglophobia, and some British officers openly resented American influence in the headquarters. The existence of nationalistic prejudices in so small a headquarters made itself felt, and these prejudices were intensified by the TCC-Third TAF command disagreement, which was in many respects a quarrel between AAF and RAF.

These problems of TCC had a very definite effect on operations. It was not coincidence that the 1st and 2d Troop Carrier Squadrons in Assam, separated geographically from the remainder of TCC units and with the single mission of supporting Stilwell's forces in north Burma, operated with greater efficiency than the RAF and AAF squadrons supporting British forces in central Burma and the Arakan.

In spite of the difficulties encountered, TCC-directed air supply and reinforcement operations saved British forces from disaster in the Arakan and made the second Wingate expedition possible. TCC was in charge of air transport support of the Allied forces at Imphal from the beginning of the battle until 4 June 1944. The success of air supply in these three campaigns and in the north Burma area made possible the final offensive, which cleared Japanese troops from Burma.¹

The Second Arakan Campaign

Plans. Originally, Allied plans for the dry season of 1943-1944 had included an amphibious assault on the Andaman Islands,* but when lack of amphibious resources made this and a subsequent plan for a landing on the Arakan coast impossible, Admiral Lord Louis Mountbatten, Supreme Allied Commander, SEAC, remained determined that his forces should take some action against enemy forces in the Arakan. Finally SEAC Headquarters approved a British Fourteenth Army plan of action similar to that followed during the first Arakan campaign,† but in greater strength. Two divisions of Fourteenth Army's XV

*See above, p 17.

†See above, p 12

Corps were to advance south astride the Mayu Range, 5 Indian Division on the west and 7 Indian Division on the east, with control of the Maungdaw-Buthidaung Road as their first objective. To block any attempt to turn the Allied flank via the Kaladan Valley, as the enemy had done in 1943, 81 West African Division was to advance south down that valley, protecting the left flank of the main force and exerting additional pressure on the Japanese. XV Corps had 26 Indian Division in reserve, and 25 Indian and 36 British Divisions were available in Fourteenth Army reserve.

The plans provided that 7 Indian Division should be supplied by road, 5 Indian Division by road and river. Since no roads ran into the Kaladan Valley from the north, 81 West African Division was to be supplied by air from stockpiles collected at Comilla.

The Japanese did not choose to allow Allied plans to determine the course of action in the Arakan. Their troops in Burma had been heavily reinforced, and their commander had determined on an offensive of his own. The Allied base at Imphal, in the Manipur Valley, was to be the main objective of the Japanese attack, but the Japanese were fully aware of Allied strength in the Arakan and decided to counter it with a limited offensive in that area. If all went well, the two forward Allied divisions might be destroyed and Chittagong captured; at the worst, the Japanese believed, the Allied units in the Arakan would be so buffeted that reinforcements for Imphal could not be taken from the Arakan.

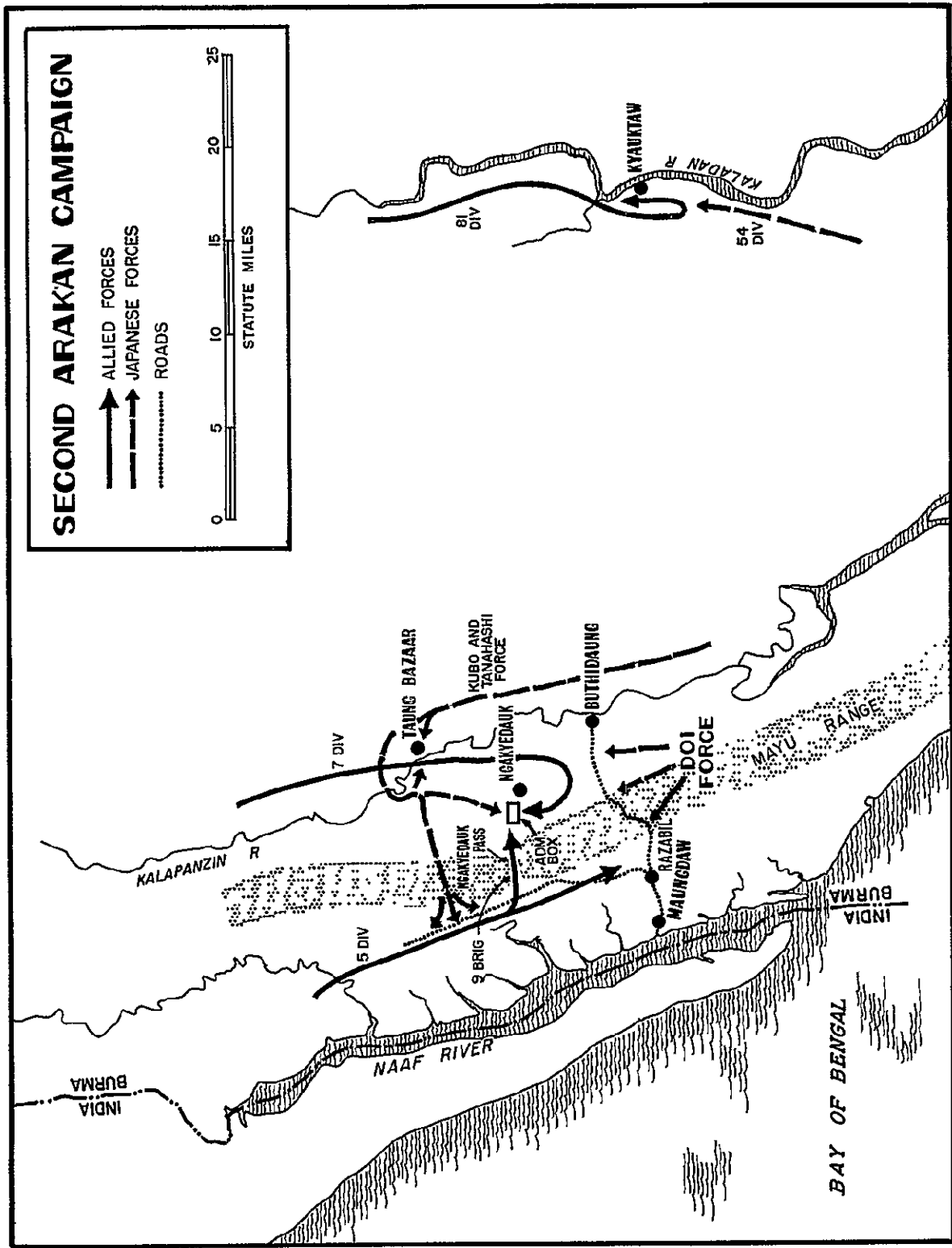
The Japanese plan, based upon the infiltration tactics which had brought them so much success in earlier campaigns, was to divide the 55th Japanese Division into three task forces, each named after its commander. Tanahashi Force, five battalions strong, was to infiltrate around the eastern flank of 7 Division, overrun the Allied airstrip at Taung Bazaar, then seize and hold Ngakyedauk Pass through the Mayu Range, thus cutting 7 Division's line of supply. Kubo Force, about one battalion, was to cross the Mayu Range behind 7 Division and cut 5 Division's supply line west of the

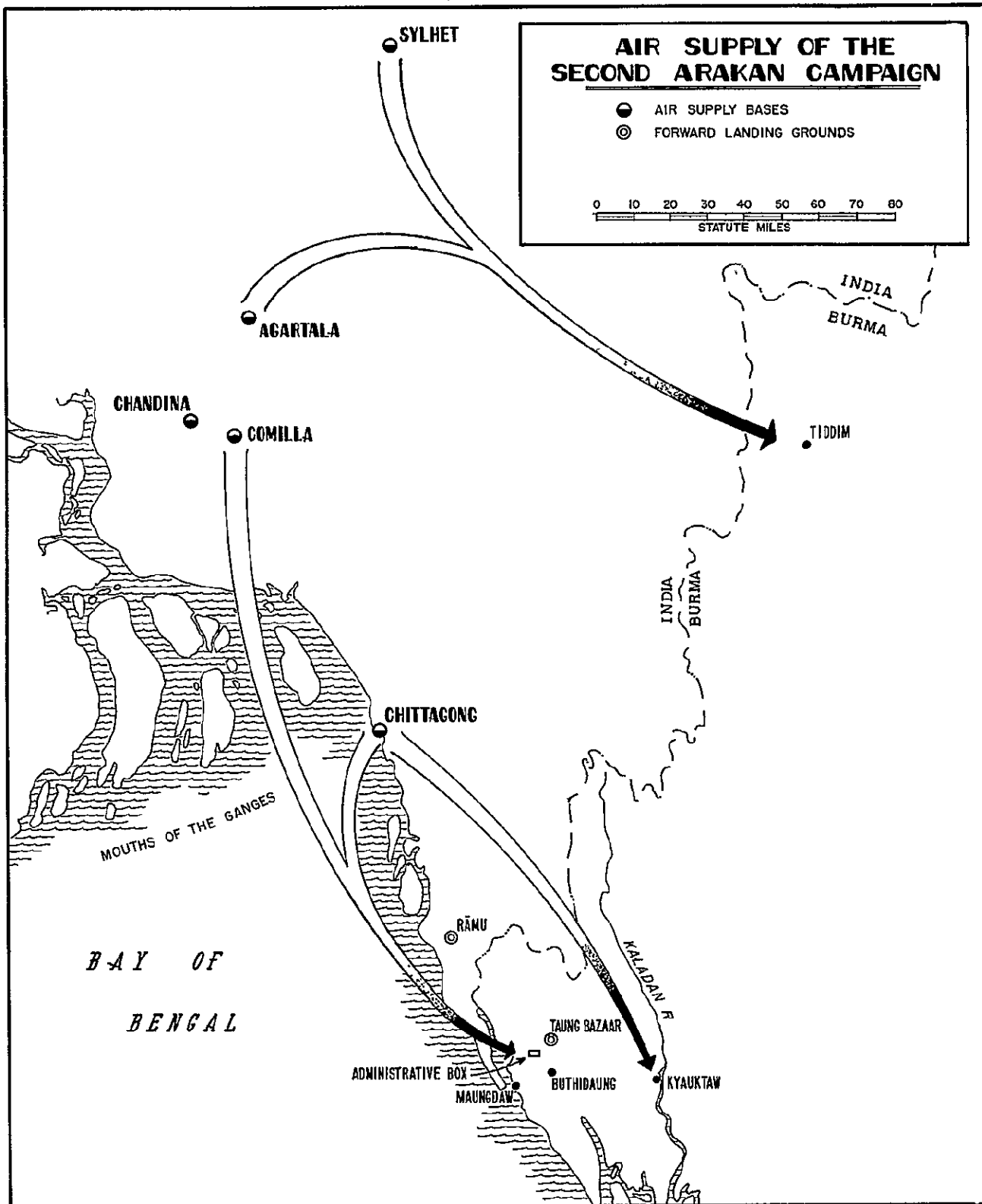
hills. Finally Doi Force, about two battalions, was to make a frontal attack on 7 Division to cover the movements of the other two forces. The Japanese plans called for bomber and fighter support on a fairly large scale during the first stages of their Arakan attack, but this support was to be applied to the front lines rather than Allied airfields. The Japanese failed to realize that Allied air supply techniques had put an end to that period of military history during which small forces infiltrating through the jungle could cut supply lines and force stronger opposing units to fall back.²

Ground operations in the Arakan, January-March 1944 During January the Allied advance southward on the Mayu Peninsula and in the Kaladan Valley met only minor opposition. By 1 February 5 and 7 Divisions had reached the Maungdaw-Buthidaung Road, but here Japanese resistance was strong enough to bring the advance to a halt. Fourteenth Army and XV Corps Headquarters suspected that an enemy counterattack against 7 Division was in the offing and moved one brigade of 5 Division across the Mayu Range to reinforce 7 Division. Aware of Japanese tactics in previous campaigns, but conscious also of the potentialities of air supply, Fourteenth Army ordered XV Corps to hold fast if its ground supply lines were cut.

Thus the Japanese failed to achieve strategic surprise, but tactically they were much more successful. While the British-Indian units were on the alert for flank attacks, Tanahashi and Kubo Forces made their way undetected completely around the eastern flank and struck from the rear. As so often before, the Japanese had managed, with an inferior force, to surprise and for all practical purposes surround a larger Allied formation. Headquarters of 7 Division was overrun in the initial Japanese assault, but that unit and the attached brigade of 5 Division gathered within a fortified "Administrative Box" recently established by XV Corps.

Thus concentrated, the Allied forces were supplied by air and in heavy fighting turned back every Japanese attack. Across





Map 8

the Mayu Range Kubo Force proved too weak to completely sever 5 Division's land lines of communication, and enough additional material came by water to keep that formation adequately supplied. Soon it was the Japanese who were short of rations and ammunition, pinned between 5 and 7 Divisions to the south and 26 Division pressing down from the north, Kubo and Tanahashi Forces were almost annihilated. Doi Force suffered severely in the fighting around the Box, and the end result of the battle was the practical destruction of the Japanese 55th Division as an effective fighting unit.

The sacrifice of 55th Division might have seemed worth while from the Japanese point of view if the Arakan battle had succeeded in preventing the shipment of reinforcements to Imphal. This was not the case, however; the same transport aircraft that had supplied 7 Division in the Arakan could transport troops to Imphal when the Japanese attacked there. The two divisions, that had borne the heaviest share of the fighting in the Arakan were in action in Manipur before the middle of April.

During the fighting at the Box, 81 West African Division had continued southward in the Kaladan Valley. In March the Japanese 54th Division halted this advance, then sent the West Africans reeling back. Inasmuch as 81 Division's efforts had accomplished nothing in themselves, and since the division's presence in the Kaladan Valley had not prevented Tanahashi Force's making its undetected descent upon the Allied rear, the Kaladan phase of the second Arakan campaign can hardly be considered successful. It was significant that none of the reverses suffered by 81 Division were attributed in any way to lack of supply.

Although at its conclusion, the second Arakan campaign was hailed as a great Allied victory, it would have been more accurate to say that the Allied units had avoided a serious defeat. If sick are included, the Allied losses were roughly equal to those suffered by the enemy; however, the numbers of Allied dead were in no way comparable to the number of Japanese

killed. At the conclusion of the battle, the lines were again along the Maungdaw-Buthidaung Road. It proved impossible to exploit the victory, if such it was, because the troops and supply aircraft needed for further advances were required in the Imphal area. With the coming of the rains, Allied ground forces were withdrawn to the north, where they could be supplied over all-weather roads. The final defeat of the Japanese in the Arakan was delayed until the dry season of 1944-1945.³

Air supply operations in the Arakan. When TCC assumed control of air supply in India-Burma, a detachment of RAF 31 Transport Squadron was already engaged in supply drops to British forces in the Tiddim area of the Chin Hills. Supply of 81 West African Division began on 7 January 1944 and was carried out by RAF 62 Transport Squadron. Between 7 January and 8 February, 62 Squadron flew some 374 trips and delivered almost 1,350 tons of supplies, all by airdrop. During roughly the same period, 31 Squadron averaged 9 trips and 33 tons per day to Tiddim. Two new AAF troop carrier squadrons, the 27th and 315th, operated 12 days out of the period, flew 173 trips, and delivered more than 500 tons to Tiddim. This experience came before the crisis developed in the Arakan; without it the operations during the emergency might not have been successful.⁴

Operations during January and the first week in February also served to acquaint TCC Headquarters with some of the problems it would face in directing a major air supply operation. Losses were not heavy—only one transport was lost during the period, and weather was believed responsible. Enemy air action led to the cancellation of a few sorties but did not interfere to any serious extent. Maintenance of aircraft was at least as good as had been expected.

On the other hand, army planning was subject to such rapid change, with resulting changes in air supply commitments, that TCC was always in a state of uncertainty as to what its commitments were to be in the near future. Preparation for the

second Wingate expedition necessitated the withdrawal of 27th and 315th Troop Carrier Squadrons from operations in late January so that pilots of these units could be trained in glider towing and night flying. A projected paratroop operation against the Boronga Islands in the Arakan would have required the withdrawal of 62 Transport Squadron from air supply activities for rehearsal and for the operation. This plan, fortunately, was cancelled before it wrecked air supply operations in the Arakan, but it contributed to the inability of TCC to plan realistically for the future. A foretaste of difficulties in acquiring and maintaining adequate bases was realized when the runway at Comilla began to break up under 62 Squadron operations

A more serious problem was the inability of the packing units to keep up with the carrying capacity of the C-47's. The ground force supply service, in Bengal the Royal Indian Army Supply Corps (RIASC), was responsible for packing air supplies and for loading them aboard transports. The packing and loading personnel were organized into air supply companies (ASC's),* but these companies were cellular in structure; they could function as a whole for large-scale air supply operations from one base, or detachments could perform the same functions on a smaller scale. During the early weeks of 1944 the RIASC air supply companies were still inexperienced, and on several occasions failed to have supplies ready for transports that were ready to fly. This happened most often at Agartala, from which supplies were flown to the Tiddim area. Sometimes the ground supply system failed to move goods to the air bases in time, but more often the ASC's simply could not keep up with their work. Fortunately the experience gained by the ASC's before the crisis in the Arakan increased the efficiency of their performance during the crisis.⁵

Before the Japanese struck in the Arakan, increasing army demands, over which TCC had no control, had exceeded what TCC could deliver in the near future with

*Sometimes these were referred to as air despatch companies

the aircraft assigned. In addition to the continued supply of 81 Division and the continued buildup of stocks at Tiddim (the tonnage scheduled for this area had almost doubled), the projected Wingate and paratroop operations would require large-scale air supply. Parenthetically, it should be noted that these projected demands in the British sector of the Burma front would reach their height at approximately the same time that the advent of Merrill's Raiders and general intensification of ground operations would create increased demand for air supply in north Burma. A tentative schedule of air supply operations in support of Fourteenth Army for February and March 1944 showed a shortage of aircraft for the two months as a whole and a deficiency of more than 500 sorties in March.

From the British point of view, ATC was the obvious source of aircraft to make up this shortage. This was first suggested to General Old by a staff officer of Third TAF, then was formally proposed by Lt. Gen. Sir William Slim, Fourteenth Army commander. Old suspected that army requirements had been set high in order to give an excuse for requesting the diversion of ATC transports, but he had no choice but to present to EAC his schedule showing a shortage of aircraft if the demands as stated by Fourteenth Army were to be satisfied. He did express his reservations in a letter to Stratemeyer, and this letter may have inspired action that made diversion of ATC planes unnecessary. The planned paratroop operation was cancelled, and the remainder of RAF 177 Transport Wing was ordered to Bengal. As a result, 117 and 194 Transport Squadrons were available for use by TCC when the crisis arose in the Arakan.⁶

The news that Taung Bazaar, the casualty evacuation strip behind 7 Division lines in the Arakan, had fallen to the Japanese came to Comilla on 4 February 1944. By the next day it was apparent that the Japanese maneuver seriously threatened Allied communications, and Fourteenth Army warned TCC that it might be necessary to fly in

reinforcements and to deliver supplies to isolated units by air. During the first four days of the battle the situation was so confused that XV Corps was unable to specify dropping zones (DZ's) to which supplies could be delivered, but by 7 February the development of the battle at the Box was evident, and on that day requisitions were made for rations and ammunition to be delivered to 7 Division the next day.

TCC planned to send 27 flights to the battle area on 8 February. The first wave, seven aircraft of 31 Squadron, took off at dawn, proceeded to the Box, and began dropping their cargo of rations. After they had unloaded about one-half of the rations carried, they were attacked by Japanese fighters. One of the transports was shot down, another damaged. Six 62 Squadron transports on the way to the Kaladan Valley turned back when their Hurricane escort was engaged by Japanese interceptors. Thus only a small part of the effort planned for the day was accomplished. Less than 20 tons of supplies reached the besieged 7 Division.

Ammunition, part of which had been flown from Calcutta during the day, was delivered to the Box that evening by four 315th Squadron C-47's, led by General Old. Darkness gave protection from Japanese fighters, but Old's plane was severely damaged by ground fire, and another suffered lesser damage.

TCC immediately demanded that TAF supply escort for air supply missions to the Arakan. Air Marshal Baldwin responded by assigning two squadrons of Hurricanes to this duty, but TCC pilots were cheered but little. In Old's opinion, the Hurricane "was about as much value in escort as a cap pistol." It was evident that the greater part of supply operations in the Arakan would have to be carried out at night so long as the Japanese Air Force remained active, but the perilous situation of the 22,000 isolated troops would make some daylight flights necessary.⁷

During the night of 9 February operations increased in volume as 31, 62, 194, and 315 Squadrons flew 52 trips and de-

livered almost 200 tons of material to 7 Division. Including flights to the Kaladan Valley, more than 325 trips were flown to the Arakan during the week ending 15 February 1944, and well over 1,100 tons were dropped. With this logistic support the besieged troops were able to throw back the Japanese attacks on the Box and begin offensive operations designed to restore land communications.

TCC's effort was not without cost. Ground fire in the area of the DZ's was heavy, and damage sustained on the nights of 10 and 11 February put eight transports out of service for longer or shorter periods. A new threat appeared when Japanese night fighters attempted interception in the battle area, but the interceptors had no airborne radar and their nocturnal forays accomplished little except to alarm Allied commanders and pilots. The heaviest blow to the supply effort came at Comilla when a British transport heavily loaded with artillery ammunition lost an engine on take-off and crashed among parked C-47's. The crash and the resulting fires and explosions destroyed two other transports and severely damaged another for a total loss of four. Within a week the emergency operations in the Arakan had cost TCC four transports destroyed and ten damaged.

Strong measures were taken to overcome the disabilities thus incurred. Transports with bullet holes in gas tanks were used anyway, carrying fuel in undamaged tanks. Repairs were hastened by every means available, including cannibalization. The remaining transports were flown more hours to compensate for those out of action. C-47's of the 27th and 315th Troop Carrier Squadrons were recalled from glider-towing and night flying training and brought to Comilla for emergency deliveries to the Arakan. In the battle zone fighter-bombers and army artillery bombarded the known areas from which ground fire had been received. Whenever possible dangerous DZ's were abandoned and new ones laid out at safer locations.

In the meantime, Third TAF was winning the battle for air superiority over the



Figure 4 Supplies Loaded aboard a C-47



Figure 5. "Kickers" Ejecting Supplies from a C-47

Arakan. By the middle of February Spitfire squadrons claimed 65 enemy aircraft destroyed or damaged against an Allied loss of three fighters. These losses, and the necessity for supporting the impending Japanese Fifteenth Army attack on IV Corps in the Imphal area, resulted in the withdrawal of the Japanese 5th Air Division from the Arakan fighting. By 14 February it was again possible to send supply missions to the Arakan in daylight, but for a week or more most flights were still made at night.⁸

By 15 February the time had passed when a Japanese victory in the Arakan was possible. Because of air supply Allied combat effectiveness had remained high while that of the Japanese was deteriorating. Even so, the Japanese troops on the British line of communications continued to fight viciously—partly because Japanese preferred to fight to the death, partly because the Japanese high command wished to keep Allied troops in the Arakan occupied to the last possible minute so as to prevent their being used to reinforce Imphal. Therefore, even though Allied commanders could be sure of eventually restoring the broken ground supply line, no one could foretell, in mid-February, how soon it could be done.

This inability to foretell when the Arakan emergency would end, when it was combined with the approach of Maj. Gen. Orde Wingate's second penetration of Burma, created a situation that was embarrassing at the best and dangerous at the worst. The transport aircraft available to TCC were simply not numerous enough to transport and supply Wingate's forces and at the same time supply the Arakan at the mid-February rate. Again it was believed necessary to request the diversion of transports from ATC.

The history of this request has some interest. Fourteenth Army, after calculating its March requirements on the basis of the continuation of the Arakan emergency, requested that 63 additional C-47's be assigned to TCC. When General Old and Air Marshal Baldwin reviewed base facilities, they found that only 38 additional aircraft

could be accommodated. When this fact was pointed out to army representatives, Slim agreed that 38 additional C-47's could supply the demand during the peak period. Brig. Gen. Charles B. Stone, Chief of Air Staff, EAC, then reviewed the army requirements and decided that 30 C-47's would be enough. Mountbatten, who made the formal request for the diversion to the United States Joint Chiefs of Staff (JCS) through the British Chiefs of Staff (BCS), returned to the higher figure of 38 C-47's. Still another change was in store; when the request was approved, ATC provided 25 C-46's as the equivalent of 38 C-47's.⁹

It was still necessary for TCC to supply the isolated troops in the Arakan while the JCS decided whether to grant Mountbatten's request. The three available RAF squadrons, reinforced by 117 Squadron on 25 February, flew almost 400 flights during the ten days following 15 February. These flights delivered almost 1,400 tons of supplies to the besieged 7 Division and to the West Africans in the Kaladan Valley. The absence of Japanese fighters made it possible to fly most missions in daylight. Ground fire continued to be a problem, but fortune smiled on the Allies. Many transports were hit, but the damage was in every case superficial and no tonnage was lost as a result.

Arakan air supply operations were facilitated by the establishment of an air supply depot at Chittagong. Air Marshal Baldwin consented to this with reluctance because Chittagong was the southernmost all-weather airstrip in Bengal and therefore much in demand for tactical operations and somewhat exposed to enemy attack, but the advantages of the base for air supply operations overcame his objections. Chittagong was near the Arakan front; its use shortened the turnaround time for supply aircraft. Goods could be delivered to Chittagong by sea, thus avoiding the delays involved in shipping goods from Calcutta to Comilla by rail. The advantages afforded by the base's location were, however, reduced by the fact that the ASC at Chittagong was inexperienced and unable

to pack and load cargo for more than 20 C-47's a day. More annoying, the truck drivers who carried supplies from the warehouses to the waiting transports were almost criminally careless; three C-47's were lost to operations for several days after being rammed by trucks.¹⁰

Word reached ATC on 24 February that the JCS approved Mountbatten's request for the temporary assignment of Hump transports to TCC, and orders were issued for the immediate movement of 25 C-46's. These aircraft were to be equally divided between Sylhet, Agartala, Chittagong, Chandina (near Comilla), and Tezgaon, with 50 maintenance personnel at each base. The force at Tezgaon was not to engage in operations, but was to serve as a reserve for the other detachments. All ships and personnel left Assam on 25 February, and all were on the prescribed bases ready for operations at dawn of 26 February. ATC had made hurried but adequate preparations; the C-46's could have delivered 200 or more tons of cargo a day for the time they were available.

Unfortunately, the Bengal bases were not prepared. ATC personnel, who had been told that they were needed immediately to save 7 Division from disaster, received their first shock when they discovered that the commanders of some of the bases where they landed had not been informed of their coming. These commanders had no idea what to do with the C-46's—three of those which went to Sylhet were sent to Agra to bring back supplies for Wingate's forces (which were not to make their descent on Burma until 5 March) while 25 C-47's of the 27th and 315th Squadrons sat idle on the ground. Finally, none of the bases had packing and loading contingents capable of providing full loads for the ATC transports.

The C-46's began supply operations to the Arakan on 26 February and operated through 4 March. During that period cargo was provided for 91 sorties, enabling the planes to drop about 520 tons of supplies. Though 20 serviceable ATC aircraft were always available, the average number of flights per day was less than 12. Some of

the C-46 flights delivered less than full loads—they could easily deliver six tons (and could manage seven) over the distance flown, but the average per sortie was only 5.7 tons. To make matters worse, total deliveries to the Arakan actually declined during the period the C-46's were in TCC service. Average delivery per day during the ten days ending 25 February was slightly more than 137 tons, average delivery per day from 26 February through 4 March was only 103 tons. For this latter period TCC C-47's flew only 80 trips to the Arakan and delivered little more than 300 tons.

The Allied ground forces did not suffer because of this reduced tonnage. They were rapidly gaining the upper hand in their battle with the Japanese. Communications with 5 Division were fully restored by 25 February, and by the end of the month the ground supply lines to 7 Division had been cleared. Some air supply of 7 Division had to continue until the ground line of communications (LOC) could be restored to full operation, and 81 Division in the Kaladan Valley was still dependent upon air supply, but for all practical purposes the emergency in the Arakan had ended by 1 March 1944.

The first major diversion of ATC aircraft from the Hump to the support of ground armies was a badly bungled business. The original reason for requesting the diversion was fear that the emergency in the Arakan might overlap the Wingate invasion, in which case TCC would have had insufficient aircraft to meet all commitments. Until the second Wingate expedition commenced, TCC was perfectly capable of dealing with the emergency in the Arakan. Yet the diversion of the C-46's went into effect nine days before the fly-in of Wingate's Chindits was scheduled to begin. There was no real need for the C-46's when they arrived, and the need for them lessened during their period of service. Such flying as the ATC transports did accomplish was not in addition to TCC capability; the C-46's simply delivered cargo that would otherwise have been carried by TCC C-47's. As a result of this useless expenditure of ef-

fort, four C-46's were damaged, two by collision with vultures, two by ground fire. The ATC transports based at Chandina and Chittagong did nearly all the flying accomplished by the C-46's, but the planes at these bases averaged less than two hours a day flying time per plane in commission—compared to approximately nine hours per day per aircraft in commission in normal Hump operations.¹¹

The explanation of this bungling is more difficult than a description. Some American officers believed that the key factor in explanation was the British desire to establish a precedent for withdrawing transports from the Hump. When a situation arose which might develop to the point where there might be genuine need for the diversion of ATC aircraft, SEAC Headquarters was not content to wait until the need was definite. Rather than asking for the diversion when and if the need developed, Mountbatten asked for the transports immediately. As a result, even though a week's time was consumed in getting JCS approval of the request, the diverted transports arrived at TCC stations nine days before the anticipated emergency. When it was evident that the anticipated crisis would be avoided, the C-46's were already on hand, and a face-saving attempt to use them was necessary.

Failure to prepare for the reception and use of the C-46's is partially explained by the above. The fact remains, however, that General Old was informed on 24 February that the C-46's were coming, and he had already reached a decision as to where they would be based. Yet the commanders of some of the bases were surprised when the ATC transports landed. No provision had been made for housing or feeding the personnel, and the British ASC's had made no preparation for increasing their output. TCC communications were notoriously bad, but careless administration must have had a part in such surprising lack of preparation.¹²

The evacuation of sick and wounded personnel was a secondary function of transport aircraft during the second Arakan

campaign. Casualty evacuation began before the Japanese counterattack was launched, casualties being lifted out of Ramu and Taung Bazaar. Taung Bazaar was in Japanese hands for several days, but was soon recovered by British-Indian forces. The movement of casualties from the battle area to the transport fields was improved when liaison aircraft of the 1st Air Commando Group were made available. Before the end of February all seriously wounded Allied troops in the Arakan were rapidly evacuated from the battle area to a transport strip by liaison aircraft, and thence to the hospital at Comilla. The liaison planes were put under TCC command, somewhat against General Old's will, but they performed their duties well and required little or no supervision from the higher headquarters. Early in the campaign TCC was somewhat concerned when transports were kept waiting on the ground too long before patients were loaded, but this was soon corrected. Casualty evacuation was no strain on TCC resources, because transports could land and pick up casualties after dropping supplies.¹³

Air supply in the Arakan had made it possible for Allied arms to inflict a stinging setback to the Japanese. The Allies lost no territory, and they decimated a good Japanese division. When the battle ended Allied dominance was so complete that the divisions that had fought hardest in the Arakan could be withdrawn from that front and transported to Manipur. The Japanese had gained nothing and had lost much.

More important than the check given to Japanese ambitions was the demonstration that Japanese jungle tactics could be defeated. The Japanese victories in Malaya and Burma had been accomplished by infiltration attacks on Allied lines of communication. Such tactics were successful so long as air supply was not available to the Allies, but air supply was available in the second Arakan campaign, and Japanese roadblocks had little effect. From February of 1944 on, Allied troops in Burma could pay less attention to communications and more to defeating the enemy. The experi-

ence gained in the Arakan made it possible to defeat the Japanese at Imphal and, finally, to oust them from Burma.

The Second Wingate Expedition

Introduction. The second Wingate expedition was as much a part of the north Burma campaign as of the battle on the central front. Much of what the expedition accomplished benefitted Stilwell's forces from the beginning, and in mid-May the Chindit troops remaining in Burma came under Stilwell's command. On the other hand, the expedition was under British command during its period of greatest activity, and its battles also aided the Allied forces besieged at Imphal. The fly-in and air supply of the expedition was, until mid-May, completely separate from the air supply of Stilwell's forces

Planning. Maj. Gen. Orde C. Wingate's first expedition had been widely publicized and had caught the attention of the Allied world. British Prime Minister Winston S. Churchill took Wingate with him to the first Quebec Conference, and there the Chindit leader proposed a new and larger expedition that, like the first, would be supplied by air. In addition to air supply of the new Chindit force, Wingate proposed that it should be transported into Burma by air, and that a light plane force should be used to evacuate sick and wounded men.

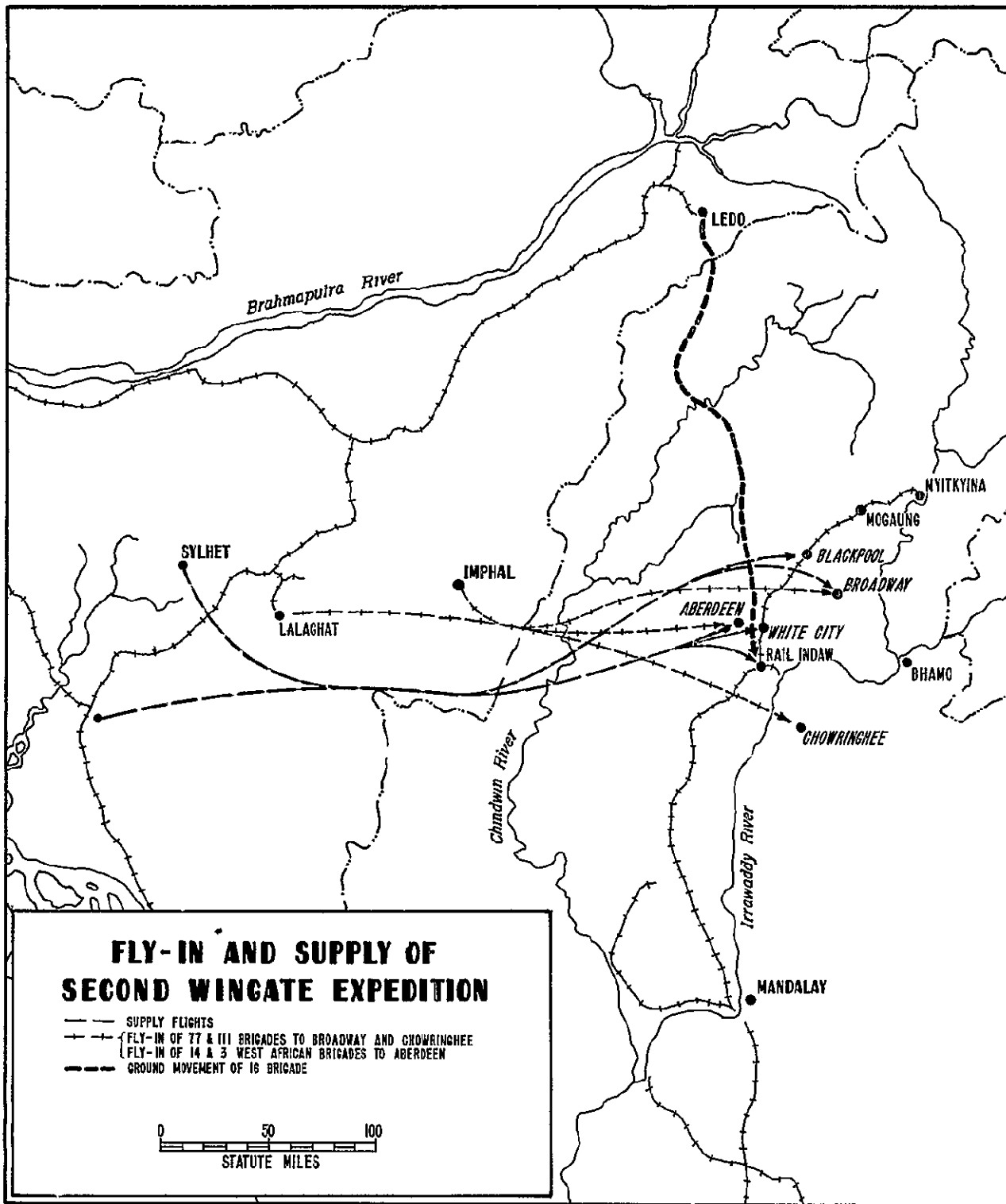
General Henry H. Arnold, Commanding General AAF, was interested in Wingate's suggestions and agreed to provide a small air task force to support the projected expedition. Upon his return to Washington, Arnold selected Lt. Col. Philip G. Cochran to command what later became the 1st Air Commando Group* and Lt. Col. John Alison to be second in command. Both of these officers were soon promoted to colonel. The project was given high priority, and by October 1943 the Air Commandos had completed a hurried training program and were on their way to India.

*Cochran's task force was first known as Project Nine, then as the 5318th Air Unit (Prov), and finally as the First Air Commando Force before becoming the 1st Air Commando Group

First Air Commando Group was a well-rounded, though small, task force. Total personnel numbered about 1,000, some of whom were added after the unit reached the theater. The aircraft complement was composed of a striking force of 25 P-51's and 12 B-25G's (the latter added in India), a transport force of 13 C-47's and 10 C-64's, a light plane force of approximately 100 L-1's and L-5's, and a glider force of 225 gliders, not all of which had been assembled by the time the second Wingate expedition was launched. In addition to a headquarters, the 1st Air Commando Group had engineering, communications, supply, medical, and photographic sections, and it included the 900th Airborne Engineering Company for airfield construction.

Wingate's ground forces for his second invasion of Burma were much stronger than the brigade which had made the original penetration in early 1943. Collectively, his units were known as 3 Indian Division, but this designation was for purposes of deception; the force had no less than five brigades, 14, 16, 23, 77, and 111, none of which were Indian brigades. Number 23 Brigade took no part in the invasion of Burma, being employed in Manipur against the Japanese attack on India, but a West African brigade was added to 3 Division during the campaign. Sixteen Brigade marched into Burma from Ledo; it was supplied by air throughout its part in the operation, and was evacuated by air.¹⁴

Detailed planning of the second Wingate expedition was beset with difficulties. Three headquarters were concerned: 1st Air Commando Group, 3 Indian Division, and TCC; aircraft of the latter organization would fly in the bulk of Chindit personnel after airfields had been prepared in Burma, and they would take part in the glider tow. Cochran's headquarters were at Lalaghat, Wingate's at Imphal, and Old's TCC Headquarters were at Comilla. The wide separation of headquarters made considerable travel necessary and, because communications in India were slow and unreliable, made it difficult to secure agreement on changes in plans. No one of the three head-



Map 9

quarters had command of the entire operation, so all differences had to be settled by negotiation. Cochran's directive made him to some extent independent of the theater air command, this created difficulties in his dealings with TCC, but facilitated his planning sessions with officers of 3 Indian Division. A week before the airborne movement began, 3 Division set up a temporary headquarters at Lalaghat, and TCC agreed to make Lalaghat its headquarters while the fly-in was in progress.

The Japanese also imposed obstacles to planning. First plans provided that the spearhead of the invading force should be lifted in gliders from Tamu, an airfield in the Kabaw Valley south of Imphal and across the Chin Hills from Lalaghat. The Japanese offensive against Manipur, which coincided with Wingate's expedition, made the use of Tamu impractical, so plans had to be made for the departure of the initial elements from Lalaghat. One consoling feature of the almost continuous revision of plans was the fact that the planners, by the time the operation began, were able to turn out new troop, glider, and transport schedules at a moment's notice.

On the morning of 5 March 1944 supposedly final plans were for a glider landing that evening and before dawn the following morning upon two clearings in north-central Burma known as Broadway and Picadilly. Eighty gliders, equally divided between the two landing grounds, would land security forces and engineering personnel and supplies; the security forces would defend the landing area while the engineers prepared runways for C-47 landings. Subsequently a glider descent would be made upon another clearing (Chowringhee), and in addition Kachin Levies directed by British officers from the original airheads would prepare a fourth C-47 strip. Numbers 77 and 111 Brigades were to go in first, 14 Brigade a few weeks later.

It was fortunate that skill had been developed at drawing up plans on short notice, because 30 minutes before takeoff time, a photograph taken earlier in the day was developed; examination of this photograph

revealed that Picadilly was obstructed by logs. Since Picadilly was the field from which some casualties of the first Wingate expedition had been evacuated,² and since it had been pictured in *Life Magazine*, the Allied commanders decided that obstruction of this one landing area did not necessarily imply that the entire plan was compromised. A new schedule was immediately drawn up, and pilots were hurriedly briefed to tow all gliders to Broadway.¹⁷

The fly-in Despite the last-minute change in plans, the first glider tow took off from Lalaghat at 1812, only an hour behind schedule. Twenty C-47's, some of them TCC aircraft with pilots from the 1st Air Commando Group, took off in the first wave, each towing two gliders. Here again it seemed that the operation might fail before it had well begun. Double tow had been planned originally for takeoff from Tamu, and this feature was retained for operations from Lalaghat despite the fact that it would be necessary for aircraft to climb to 8,000 feet before crossing the mountains which rose abruptly just east of the takeoff base. This climb placed a terrible burden on engines, and when combined with the fact that many of the gliders were overloaded, rapidly reduced the fuel reserves of the towing aircraft.

Another difficulty arose from towrope breakage. To some extent this breakage was due to turbulent air over the mountains, overloading of gliders, and lack of skill on the part of tow and glider pilots. More significant was the fact that to eliminate kinks towropes had for almost two weeks been stretched out alongside the runways at Lalaghat. They had been exposed to rain, dew, and sunlight, and they had been run over by trucks. Finally, inspection of towropes before takeoff was not begun until a number of breaks had made it clear that some of them were unreliable. As a result of towrope failures (plus several instances of premature release because of fuel shortage), only 35 of the 54 gliders launched on the night of March 5/6 reached Broadway.

²See above, p. 15

Eight of the gliders which failed to reach the designated landing ground came down in friendly territory. Of those which came down in enemy territory, nine were east of the Chindwin River. Most of the personnel aboard these gliders either made their way back across the Chindwin or east to Broadway.

The field at Broadway was not as smooth as it had appeared from the air. There had been no deliberate obstruction, but buffalo wallows and deep ruts left by lumbering operations were numerous. The first gliders to touch down snapped off their landing gear. The personnel aboard were unable to remove these crippled machines before others descended, and each glider which reached the ground became an obstruction to those that followed. Nearly all the gliders landed at Broadway on the night of 5/6 March were damaged so severely that repair was not worth the effort.

Casualties, on the other hand, were relatively light: 30 killed and 33 injured. All told, 539 men, 3 mules, and 29,972 pounds of supplies were delivered to Broadway the first night. Also delivered were three light bulldozers, two of which were still in commission after the landing. Ten C-64's were scheduled to drop supplies at Broadway before dawn, but three of these single-engine transports were lost and only two reached the DZ.

Despite the abundant errors of commission and omission, the first phase of Operation THURSDAY, as the second Wingate expedition was designated, was successful. Observers at Lalaghat, noting only the confusion and the numerous towrope failures, feared that only a handful of the force dispatched had reached the destination. When wrecked gliders at Broadway became too numerous and a message was sent cancelling additional flights, officers at Lalaghat were convinced that the operation had failed. Within Burma, however, the security forces encountered no Japanese, and the engineers with their bulldozers were soon clearing away wrecked gliders and leveling a strip for C-47 landings. On late afternoon of 6 March a message was sent to Lalaghat

saying that the field could receive transports that night.¹⁰

On the evening of 6 March TCC C-47's, mainly from the four RAF squadrons but with some assistance from the 27th and 315th Troop Carrier Squadrons and the 1st Air Commando Group, began flying men and supplies into Broadway from Lalaghat and Imphal, landing and taking off without difficulty on a strip 4,700 feet long. Sixty-two landings and 60 takeoffs were made that night. Two slightly damaged C-47's were flown out several nights later.

On the same evening 12 C-47's, each towing a single glider, took off from Lalaghat and released their gliders over Chowringhee. Only one of the gliders was wrecked, but this one contained the only bulldozer, and this essential piece of equipment was destroyed by the impact. Without a bulldozer, preparation of the strip went slowly, but early the next night (7/8 March) two more bulldozers, one from Broadway, the other from Calcutta, were glided into the clearing and the work was hastened. Seven C-47's landed safely at Chowringhee on the night of 7/8 March, and 92 landings were made into Broadway.

The fly-in continued at full speed through the night of 10/11 March, and four more flights to complete the movement were put into Broadway the next night. Chowringhee was abandoned after receiving a total of 125 landings through the night of 9/10 March. This field was much more exposed than Broadway; troops landed there had to cross the Irrawaddy River from east to west before they could unite with the main body of Chindits; and by the night of 9/10 March it was evident that Broadway could without serious difficulty accommodate the flights remaining to be flown. Japanese aircraft attacked Chowringhee shortly after two crippled C-47's had been flown out and just after the last ground troops had left the area.

From the night of 5/6 March through the night of 11/12 March, 74 glider sorties and 579 C-47 sorties by TCC and the 1st Air Commando Group had moved 9,052 men, 1,359 animals (mainly mules), 254.5



Figure 6. Obstructions on Clearing at Picadilly



Figure 7. Damaged Gliders on Ground at Broadway

tons of supplies, one Bofors antiaircraft battery, and one 25-pounder artillery battery into Broadway and Chowringhee. The Chindits began operations against the Japanese before the fly-in was completed, and as soon as it had been completed TCC and the 1st Air Commando Group began air delivery of supplies and air evacuation of sick and wounded men.¹⁷

Chindit operations, March-May 1944. With the landing of 77 and 111 Brigades at Broadway and Chowringhee, three brigades of 3 Indian Division were within 25 miles of Indaw on the Mandalay-Myitkyina Railroad; 16 Brigade had reached that area after a long march southeast from Ledo. By mid-March 77 Brigade had established a strongly fortified block across the railroad near Mawlu, and this block remained in place for more than six weeks despite desperate Japanese attempts to break it. Eventually the Japanese used the equivalent of 17 battalions against this position and suffered heavy losses. The Chindits built an airfield inside their lines near Mawlu, and this strip, known as White City, received a few C-47's. It was exposed to enemy fire, however, and was used mainly for light-plane evacuation operations. When 77 Brigade evacuated the White City block in mid-May, 111 Brigade, which had to some extent been screening White City, established a new block, known as Blackpool, farther north at Hopin. The Hopin block was soon evacuated, but both Blackpool and White City were of direct assistance to Stilwell in his campaign against Myitkyina.

General Wingate was killed in the crash of an Air Commando B-25 on the night of 24 March, but Brigadier W. D. A. Lentaigne, formerly commander of 111 Brigade, assumed command of 3 Division, and the pace of operations did not slacken.

When 16 Brigade reached the Meza Valley after its march from Ledo, it prepared an airstrip (Aberdeen), and on 23 March TCC began landing 14 Brigade on this strip. Sixteen Brigade was almost exhausted after its long march, but the two units launched an attack against Indaw, where the Japa-

nese had a good airfield. The exhaustion of 16 Brigade, poor coordination, and strong Japanese defenses doomed this attack to failure. Early in May 16 Brigade was evacuated from Burma by air, and 3 West African Brigade was flown in to replace it. Fourteen Brigade began moving northward toward the NCAC front.¹⁸

Air supply of 3 Indian Division. After reaching its initial objectives in Burma, 3 Indian Division depended entirely on air supply. Sixteen Brigade was supplied by air throughout its march from Ledo to the Meza Valley. Experience gained during the 1943 campaign led to improved techniques of air supply, and these improvements, combined with the increased availability of transport aircraft, led to efficient supply operations. Chindit operations during the 1944 campaign were not hampered by supply failures.

The brigades operating in Burma in 1944 were, like the single brigade that made the 1943 penetration, divided into columns. Each brigade was composed of eight of these columns, plus a headquarters and a "stronghold" force for defense of the landing grounds. Each column numbered about 400 men, and supplies were requisitioned and dropped on a column basis. At the height of the operation there were 32 of these columns operating in Burma. It should be noted, however, that there were never this many columns in action separately, since two or more were combined for important movements. Each column had an RAF liaison officer, and each made separate requests for supplies. Advance planning schedules assumed a drop to each column every five days.

A column desiring supplies sent a message to a rear brigade headquarters at Agartala or Sylhet, as the case might be. Items desired were designated in an elaborate code, and the coordinates of the DZ were given. Representatives of the brigade's rear headquarters and the TCC staff held a conference each morning for the purpose of reviewing requests and allocating available transport flights. Instructions drawn up at this morning conference determined the

loads and destinations of the supply aircraft sent out that evening.

Supplies for 16, 77, and 111 Brigades were packed and loaded at Sylhet, supplies for the remainder of 3 Division at Agartala. Two RIASC ASC's were divided into three sections each and did the packing and loading. One section of about 110 men could handle the supplies for one brigade. A typical day for the section supporting 16 Brigade involved the packing and loading of 65,000 pounds of supplies into 12 aircraft. To accomplish its tasks, the section normally worked a 12-hour day.

An air supply sortie might carry anything needed by the troops in Burma, but the bulk of the tonnage to each column consisted of five days' rations. The basic ration was the American K-type, but in order that the troops might have some variety in their diet, one "luxury meal" was delivered with each drop. The luxury meal consisted of 14 ounces of bread, a 7½-ounce can of fruit, 2 ounces of margarine, 2 ounces of rum, and 1 raw onion per man. Usually the Chindits ate this meal at the dropping zone. In addition to the luxury meal, 6¼ ounces of tea, sugar, salt, and powdered milk per man were provided in each drop. The salt was, of course, needed for seasoning and to prevent heat exhaustion; the other items made possible the hot tea which was so essential to British troops.

Supplies for the Chindits were normally packed in canvas containers of British manufacture. Eighteen-foot cotton or jute parachutes were used, limiting the weight of packs to 180 pounds. Nylon parachutes of the same size could have supported a much heavier pack. The most common pack contained five days' rations for five men and a 30-pound sack of mixed grain for mule feed, the grain sack was placed in the bottom of the pack and acted as a shock absorber. One item consistently free-dropped was hay for the mules. The ground troops much preferred parachute to free-drops because, until late in April, drops were made at night; the parachutes were of considerable importance as markers to

aid the men on the ground in finding the supplies in darkness.

As indicated above, the message from a column to its rear brigade headquarters requesting a supply drop designated the DZ (or named the airfield where the supplies were to be landed). For night drops the DZ was identified by fires on the ground in the shape of the letter "L." The transports made their drops outside the long arm of the letter. In a few instances when a column was located adjacent to a light-plane landing ground, landing lights were used as a substitute for fires. Such electrical DZ marking was much preferred when enemy troops were nearby, because to tend fires men had to remain exposed in the open. DZ's for day drops were marked with panels in the usual manner.

Because the columns in Burma in 1944 were usually able to remain at one place as long as they wished, wastage of supplies was slight as compared, in proportion, to the first Wingate expedition. Some drops, especially those to 16 Brigade during its trek, were made on incorrect DZ's, but in a number of instances the supplies were recovered. Such drops were sometimes caused by errors on the part of aircrews; at other times the columns gave erroneous coordinates in their request messages. During periods of close combat, a few packs drifted into Japanese positions, but the wastage from this cause was slight. Probably the chief cause of lost supplies was the tendency of parachutes to hang in tall trees. Packs so suspended could sometimes be recovered by burning through the parachute lines with a flame thrower.¹⁹

After completion of the fly-in, both 1st Air Commando Group and TCC delivered supplies to 3 Division. Commando transports landed supplies at Broadway and Aberdeen and made some drops, but this organization's work was hampered by the fact that glider pickup equipment on its C-47's reduced pay load by some 1,000 pounds per sortie. Much of the Air Commando effort was devoted to providing supplies for the light-plane units that joined the Chindits in Burma, and therefore sup-

ported 3 Division indirectly. The Commandos kept few records, but it is known that from 5 March through 5 April the C-47's assigned flew 576 trips and delivered 1,728 tons of material. Presumably the effort from 5 April to 20 May, when the group temporarily ceased operations, was comparable. The seven C-64's which survived the operations of the night of 5/6 March are credited with moving more than 400 tons of freight during the following 30 days, but four more of these light transports were lost, leaving only three available on 5 April.

The 27th and 315th Troop Carrier Squadrons and 117 Transport Squadron made the bulk of deliveries to Wingate's men. The 27th and 315th Squadrons belonged to the 443d Troop Carrier Group, which had its headquarters at Sylhet, and 117 Squadron came under 443d Group for operations. During April these three squadrons completed 790 supply sorties and dropped or landed 2,089 tons of supplies for the Chindits. All sorties were flown at night until late in the month, but then the increasingly bad weather that heralded the approach of the wet monsoon made some daylight operations necessary. During May the same three squadrons completed 1,424 sorties and delivered 2,712 tons of supplies, but some of these sorties went into Myitkyina rather than to support 3 Division.

An AAF Evaluation Board report concluded that 48 C-47 flights per day delivering 140 tons of supplies were required to support the second Wingate expedition. Another estimate was that a brigade required, for its support, 30 tons per day. Complete figures are not available, but if the records consulted are typical, 3 Indian Division actually received about 120 tons per day, carried by 48 C-47 flights.

The transport aircraft did more than deliver supplies. The fly-in of 14 Brigade has already been mentioned, and 3 West African Brigade was flown in to defend Broadway as 16 Brigade was flown out. On the way out of Burma after landing men or supplies, the C-47's evacuated sick or wounded troops. Liaison aircraft of the 1st Air Commando Group collected these cas-

ualties from small landing strips. During April, for example, C-47's of the 27th, 315th, and 117 Squadrons evacuated a total of 914 casualties.

The transport organizations reported few difficulties in carrying out their missions. Location of 16 Brigade DZ's was sometimes difficult during February, and throughout the operation pilots felt that the ground officers who selected DZ's showed little appreciation of the operational characteristics and limitations of aircraft. Since RAF liaison officers accompanied the columns, this criticism may not have been justified. Many factors other than the optimum conditions for dropping determined the location and preparation of a DZ when columns were maneuvering against the enemy.

The location of Aberdeen strip did afford good ground for complaint. Hills surrounding this field made landings and takeoffs dangerous and limited loads to 4,000 pounds. Three C-47's were lost on flights into or out of Aberdeen, which had the additional disadvantage of being much more exposed than Broadway to Japanese attack. The poor characteristics of this landing ground made it necessary for most of the exhausted 16 Brigade to march from the Meza Valley to Broadway before they could be evacuated in May of 1944.

Enemy air action did not seriously interfere with air supply of the Chindits. So long as night missions were the rule, enemy aircraft were unable to operate effectively, though one C-47 was seriously damaged by a night fighter as it approached Aberdeen. After daylight supply sorties began, Japanese fighters were more of a threat, but escort was sometimes provided, and Allied fighters and bombers ranged over the Japanese airfields at every opportunity, thus reducing the capabilities of the Japanese Air Force in Burma. Such air effort as the Japanese could mount was largely directed against Allied installations in Manipur.

Antiaircraft fire was a more serious problem. At White City and later at Blackpool the Japanese brought up light antiaircraft weapons and emplaced them about the Chindit positions in such a way as to give

them a field of fire against low-flying C-47's making supply drops. Artillery and mortar fire from the Chindit positions, bombing and strafing by Allied fighters, and constant changes in the pattern flown by dropping aircraft reduced the effectiveness of the Japanese fire, but never completely eliminated it. The number of C-47's hit was large, but most holes were in the fuselage or wings, damaging no vital area. Patching these holes took little time, and Japanese ground fire had no effect in reducing the volume of air supply to 3 Indian Division.²⁰

Summary and conclusions. There is considerable question as to whether the second Wingate expedition was worth the effort involved. The exploits of the Chindits did not cause the withdrawal of any Japanese troops from the attack against Manipur, and the garrison of Myitkyina was able to hold out for more than two months despite the blocks which had cut the railroad to Mandalay. Likewise, the Japanese in the Salween were able to hold out for many long months when the Chinese forces in Yunnan finally began their drive west.

Japanese comments generally credit the Chindits with greater accomplishments than have been credited to them by Allied sources, but it must be remembered that Japanese evaluations may have been inspired by a desire to make excuses for their failure to capture Imphal. According to the Japanese, Wingate's descent upon Burma so alarmed Japanese Fifteenth Army Headquarters, which directed the move against Manipur, that the headquarters dared not move forward before the end of April. Because of this delay, distance between army and division headquarters became so great that communications were very difficult. Poor communications, in turn, led to misunderstandings, and these misunderstandings led to animosity between army headquarters and some division commanders, much to the detriment of operations.

Additional results of the Chindit operations as listed by the Japanese were as follows: The difficulties of supplying the force in Manipur were increased because vehicles could not be transferred across Burma. The

elements of the Japanese 15th Division, 53d Division, and 24th Independent Mixed Brigade employed against Wingate's forces possibly could have been used against Imphal. The necessity for applying some Japanese air effort to attacks on Broadway, Chowringhee, and White City reduced the weight of the Japanese 5th Air Division's attacks on Imphal. Finally, the supply situation of the Japanese 18th Division, which opposed Stilwell's troops in the north, was weakened considerably by the Chindit railroad blocks.

Whether the approximately 20,000 men in the Wingate expedition, the supplies they consumed, and the tactical and logistical air effort that supported them could have been used more effectively elsewhere is a question which cannot be answered by historical method. Certainly 20,000 additional fighting men would have been most useful in the Hukawng Valley or in Manipur, but they would not necessarily have accomplished more than was accomplished along the railroad. Also, as noted above, the exhausted remnants of the Chindits did take part in Stilwell's campaign against Myitkyina and Mogaung.²¹

Whatever may be the conclusions regarding the wisdom of mounting the second Wingate expedition, there is no question but that the air supply operations in its support were highly successful. With the sole exception of 16 Brigade, a force of more than 20,000 men was flown into Burma with its equipment and pack animals, and was supplied with rations, ammunition, and all other needed equipment. Part of the force was evacuated by air during the period under discussion, and the remainder was flown out later. This feat was accomplished while TCC was straining every nerve to supply Stilwell's army, to reinforce and supply the garrison at Imphal, and to supply troops in the Arakan. Despite all other activities of TCC, that command and the 1st Air Commando Group supplied 3 Division so effectively that lack of supplies was never a handicap to Chindit operations.

The above should not imply that the entire air transport phase of the second Win-

gate expedition was without fault. Planning was effected under many handicaps, and the early planning was useful mainly as practice for the personnel involved. The glider operation on the night of 5 March was almost botched. There was no good reason why double tow should have been attempted after Tamu became unavailable as a launching base. Nor is there any justification for the fact that glider towropes were abused before the operation and not adequately inspected before takeoff. Had Japanese resistance been encountered at Broadway, the expedition might have aborted before well begun, because so many of the gliders failed to reach their objectives.²²

Most of the shortcomings noted in the preceding paragraph may be attributed to the fact that the operation was under no central command. Colonel Cochran assumed complete responsibility for the glider tactics despite the fact that some TCC aircraft were to take part in the towing. General Wingate maintained throughout the planning period that he was the final authority on troop and equipment loading, and this may be the explanation for the overloading of gliders. Likewise, Wingate insisted that there should be no reconnaissance of the intended landing grounds in Burma, and only because Cochran disregarded his wishes was there a last-minute discovery of the condition of the field at Picadilly. Had this reconnaissance been made earlier, there would have been no need for radical changes in plans at the eleventh hour.

The assignment of the 1st Air Commando Group to the single task of supporting the second Wingate expedition was in itself a debatable measure. There was no apparent reason why TCC and Third TAF, given the equipment available to the Commandos, could not have carried out the same tasks equally well. The assignment of a private air force to a division commander certainly served to further that commander's operations, but it resulted in a sizable component of the potential Allied airpower in the theater being available only for certain

limited operations. Even operations designed to benefit 3 Indian Division could not count upon the cooperation of Cochran's forces in the event that Wingate had some other mission in mind. Intentionally or otherwise, General Arnold was a party to compartmentation of airpower when he gave Cochran the sole task of supporting Wingate.²³

Air Supply during the Siege of Imphal

The Japanese attack. The Imphal Plain is the heart of Manipur Province, which lies in the Chin Hills between India and Burma. The Plain is roughly 50 miles long from north to south, and half as wide; Imphal Town lies near the northern end. The Plain is completely surrounded by mountains, and on the east and west ranges approximately 100 miles wide separate the area from, respectively, the Chindwin River and the Surma Valley.

By early 1944 the British had completed an all-weather road that ran from Imphal north through Kohima to the railhead at Dimapur, in Assam. This road was intended as a supply route by means of which Imphal could be stocked to serve as a base for offensive action against Japanese forces in Burma. The only other outlet from the Plain to India was the Bishenpur-Silchar Track to the Surma Valley; this route was primitive and unsuited to motor vehicle movements.

Two roads of poor quality ran south from Imphal. The easternmost of these routes ran through Palel and on through the mountains to Tamu at the head of the Kabaw Valley; this valley had a motorable road (in the dry season) to Kalewa, on the Chindwin River. To the west a road ran down the spine of the Chin Hills to Tiddim, then turned east through Kalemyo (where it joined the Kabaw Valley Road) to Kalewa. These were the only motorable roads leading into Burma from Imphal, but mountain tracks ran northeast to Ukhrul and thence to the Chindwin.

British plans envisaged an eventual offensive, based at Imphal, down the two southern routes to the Chindwin. At the

beginning of 1944 both Tamu and Tiddim were in Allied hands, and TCC transports were building up a forward stockpile of supplies at Tiddim

In Japanese plans, the Japanese offensive in the Arakan was merely a preliminary to the main assault on Imphal. Perhaps, if the enemy commanders had taken time to digest and understand their Arakan experience, their plans for the central front might have been altered. These plans called for the same basic tactics used in the Arakan, though three divisions were to be used instead of one. The British-Indian IV Corps was to be isolated on the Imphal Plain and besieged from the east and south by two divisions while the third Japanese division captured Kohima and blocked the Imphal-Kohima Road. As in the Arakan, Japanese resupply would depend largely upon captured enemy material

Despite the fact that air supply had brought about the defeat of a similar offensive in the Arakan, the Japanese carried out their attack on Imphal in accordance with their original plans. Their 31st Division crossed the Chindwin at Homalin, drove a British parachute regiment out of Ukhru, then turned to the northwest where it besieged Kohima and blocked the Imphal-Kohima-Dimapur Road. The 15th Japanese Division crossed the Chindwin at Thaugdut and moved directly west through the mountains to attack Imphal from the east and cut the Dimapur Road only a few miles north of Imphal Town. Finally, the Japanese 33d Division moved up the Kabaw Valley and the Tiddim Road to attack the Plain from the south. By the end of March the Imphal-Dimapur Road was blocked, the garrison at Kohima was encircled, and IV Corps troops had been driven back to the Imphal Plain. The Japanese had failed, however, to capture the dumps at Imphal, and they had missed a fleeting opportunity to take the greater dumps at Dimapur. If air supply could provide food and ammunition for isolated IV Corps, and if reinforcements could be brought up to strengthen IV Corps and to open the Dimapur Road,

the Allies had an opportunity to inflict a decisive defeat on the Japanese.²⁴

Air supply commitments. The combat strength of IV Corps at the beginning of the Japanese offensive consisted of three divisions plus a two-battalion parachute brigade and an irregular brigade of Chin Hill natives under British officers (the Lushai Brigade). One regular division and the Lushai Brigade were in the Tiddim area when the Japanese struck, and the parachutists were in Ukhru. The two remaining divisions were immediately committed to the defense of other points under attack, leaving IV Corps without a reserve. For this reason, the first necessity was to reinforce the garrison. TCC was given the task of moving 5 and 7 Divisions from the Arakan and 4 Brigade of 2 Division from Amarda Road (near Calcutta) to the battle area in the north. Some of these reinforcements were to be landed on the Plain, others were to be delivered to the Dimapur area, there to be a part of British-Indian XXXIII Corps' effort to relieve Kohima and reopen the road into Imphal.

Since the Japanese attack isolated approximately 170,000 men at Imphal, it was fortunate that the supply dumps on the Plain had about 30 days' supplies on hand. The stocks were not well-balanced, however, and during April air supply was expected to bring the short items up to a 30-day level while the garrison was eating long items down to 30 days, with the overall object of balanced 30-day stocks on 1 May. Beginning 1 May, TCC was to deliver to Imphal as great a quantity of supplies as possible, but since it was understood that during May considerable diversions of transport effort would be necessary, the stocks on hand were to be eaten down to a 15-day level. When this stage was reached, approximately 1 June, air supply was to provide full maintenance for IV Corps. On full rations, IV Corps consumed 532 tons per day, but with reduced rations, 436.25 tons per day was the required amount.*

Delivery of supplies to IV Corps was the major commitment of TCC (of Third TAF

*All tonnage figures are in short tons (2,000 lbs)

after 4 June), but there were other commitments in connection with the Manipur campaign. The most important of the remaining commitments was supply of RAF units at Imphal; the bombs, bullets, gasoline, and rations needed to keep these units operating amounted to approximately 50 tons per day. There could be no thought of moving all these squadrons out; not only were fighter bombers needed to give ground support to the defending infantry, but the air supply operation depended upon the ability of RAF fighters to maintain air superiority over Manipur.

In addition to the tonnage commitment to IV Corps and to RAF units at Imphal, TCC had to fly in replacement personnel. The transportation of reinforcements did not obviate the need for replacements, because the replacements were used to keep formations up to strength IV Corps fixed its replacement requirements at 250 men per day. Although this figure was not attained, a substantial number of trips was devoted to the delivery of replacements.

The remaining tasks of air transport, the evacuation of casualties and "useless mouths" from Manipur, did not require additional effort, since aircraft which had landed with supplies or reinforcements could fly out personnel and lose little time in so doing. The number of casualties to be evacuated would depend upon the bitterness of the fighting. Useless mouths were the administrative and logistic personnel, military and civilian, who had been needed when Imphal was a supply base but who had so little combat capability that they were a burden when Imphal became a battlefield.^{*25}

Air transport capabilities. As of mid-March 1944 TCC still consisted of four AAF troop carrier squadrons and four RAF transport squadrons. This amounted roughly, as planes were lost and new ones acquired, to 144 C-47's. Two AAF squadrons of 32 transports were fully committed to support of Stilwell's forces on the NCAC front, leaving 112 transports for use on the central and southern fronts. The two re-

maining AAF squadrons and one RAF squadron were committed to supply of 3 Indian Division, and since the Chindits were completely dependent upon air supply for the means to fight and to avoid starvation, this commitment was irrevocable. Of the 60 remaining aircraft, a substantial part had to be used for supply of 81 West African Division in the Arakan and the Lushai Brigade in the Tiddim area. With the exception of the NCAC front, each of these commitments could be cut to some degree, but not enough to alter the fact that TCC's resources were entirely too slight to reinforce and supply Imphal while fulfilling existing requirements.²⁶

Quick reinforcements for TCC could be drawn only from ATC, but only the U.S. JCS had the authority to divert Hump aircraft. Mountbatten's directive as Supreme Allied Commander, SEAC, specified that emergency diversion of ATC transports should be requested via a channel that ran from Stilwell to the JCS. Mountbatten refused to make a request through his deputy, and in the Arakan emergency had communicated through the British Chiefs of Staff (BCS) and CCS to the JCS. Seven days had passed from the time the request was made until authority for the diversion had come from Washington.

Mountbatten felt that the need for rapid reinforcement of Imphal was too urgent to warrant any such delay. On 16 March he wired the BCS and the British Joint Staff Mission in Washington that he would divert 30 C-47's or their equivalent from Hump to TCC on his own authority unless he received contrary orders by 18 March. At the same time he confirmed earlier vocal orders to Stratemeyer that the transports be diverted. The JCS approved Mountbatten's request, but at the same time refused him permission to make emergency diversions of ATC transports on his own authority. Twenty C-46's (equivalent to 30 C-47's) and crews were temporarily assigned to TCC.²⁷

These 20 C-46's flew loads into Imphal until 25 April, at which time 10 of them returned to Assam. The remaining 10 ATC

*See below, p 81

transports continued to take part in the supply of Imphal until about 1 June 1944, when they too returned to ATC control. This help from ATC enabled TCC to deliver scheduled reinforcements to IV and XXXIII Corps, but when plans were made for the sustained supply effort (Operation STAMINA), which began 18 April, it was again evident that transport resources were inadequate to the task to be accomplished. At the same time, scheduled air supply operations in support of NCAC troops in north Burma exceeded the capabilities of the 1st and 2d Troop Carrier Squadrons. Mountbatten therefore requested that the JCS divert the equivalent of 70 more C-47's from the Hump. This the JCS refused to do, but they offered an acceptable alternative, the loan of C-47's from the Mediterranean Theater of Operations (MTO). When this offer was eagerly accepted, the 64th Troop Carrier Group with a fifth squadron attached (4th Troop Carrier Squadron) and the RAF 216 Transport Squadron left the MTO and arrived in India early in April. Four of these squadrons were used in STAMINA, two for support of NCAC in north Burma. Originally the units were scheduled for return to MTO early in May, but the CCS finally extended their stay in India-Burma to early June.

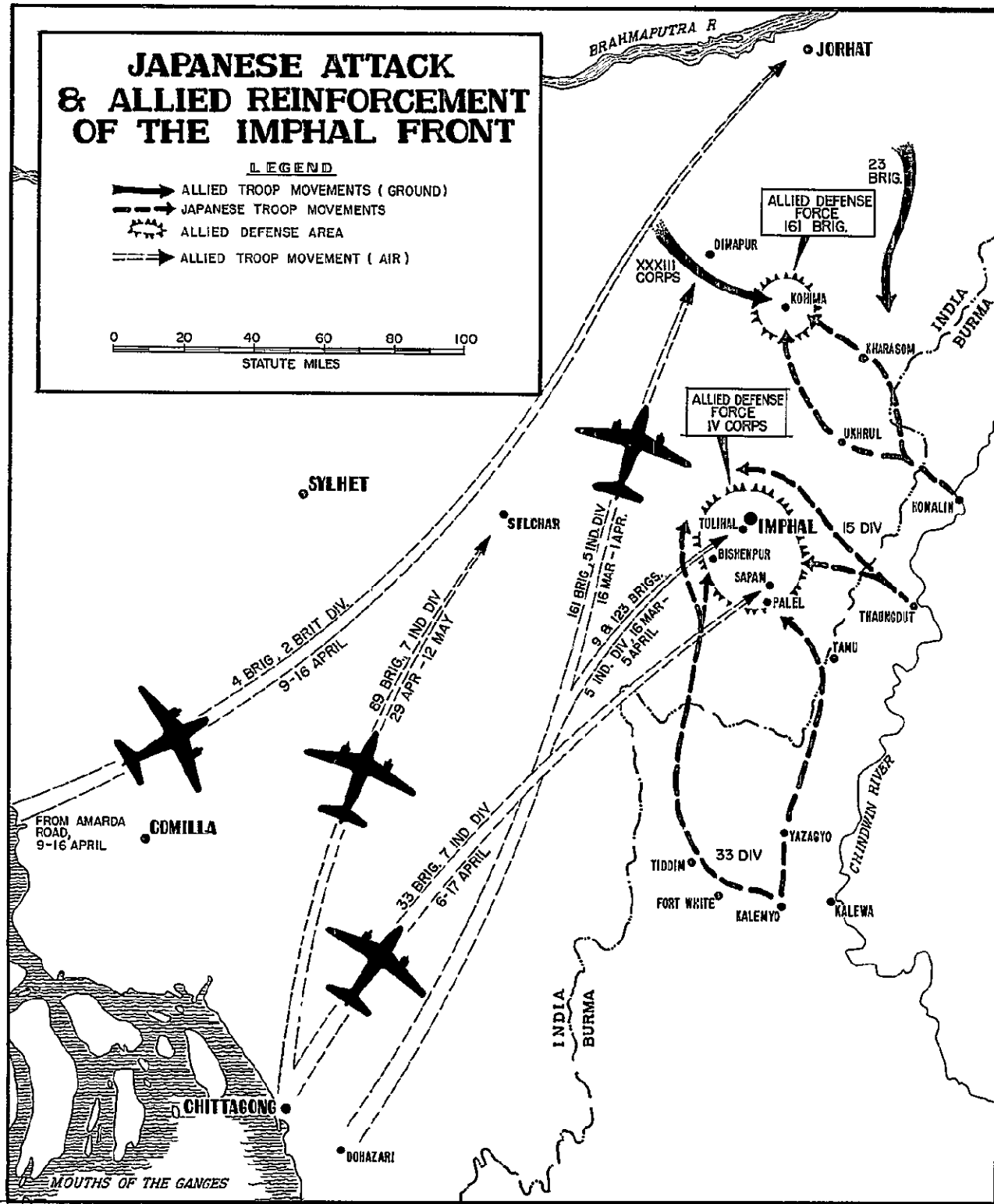
The ATC C-46's and the MTO squadrons enabled TCC to supply the NCAC attack on Myitkyina and to deliver enough tonnage to Imphal to meet the minimum needs during May. But with the coming of June and the requirement for the full maintenance of the garrison, transport resources were again short of the need, and the situation was worsened by the fact that the squadrons from MTO were soon to return to their home bases. Again there was talk of diverting ATC transports, but in this emergency Stratemyer made B-25's and Wellingtons of Strategic Air Force available for supply missions. In the meantime 3d Combat Cargo Group was activated,* and it began operations on 5 June, three days before the MTO squadrons departed from India-Burma. Two of the new combat cargo squadrons began

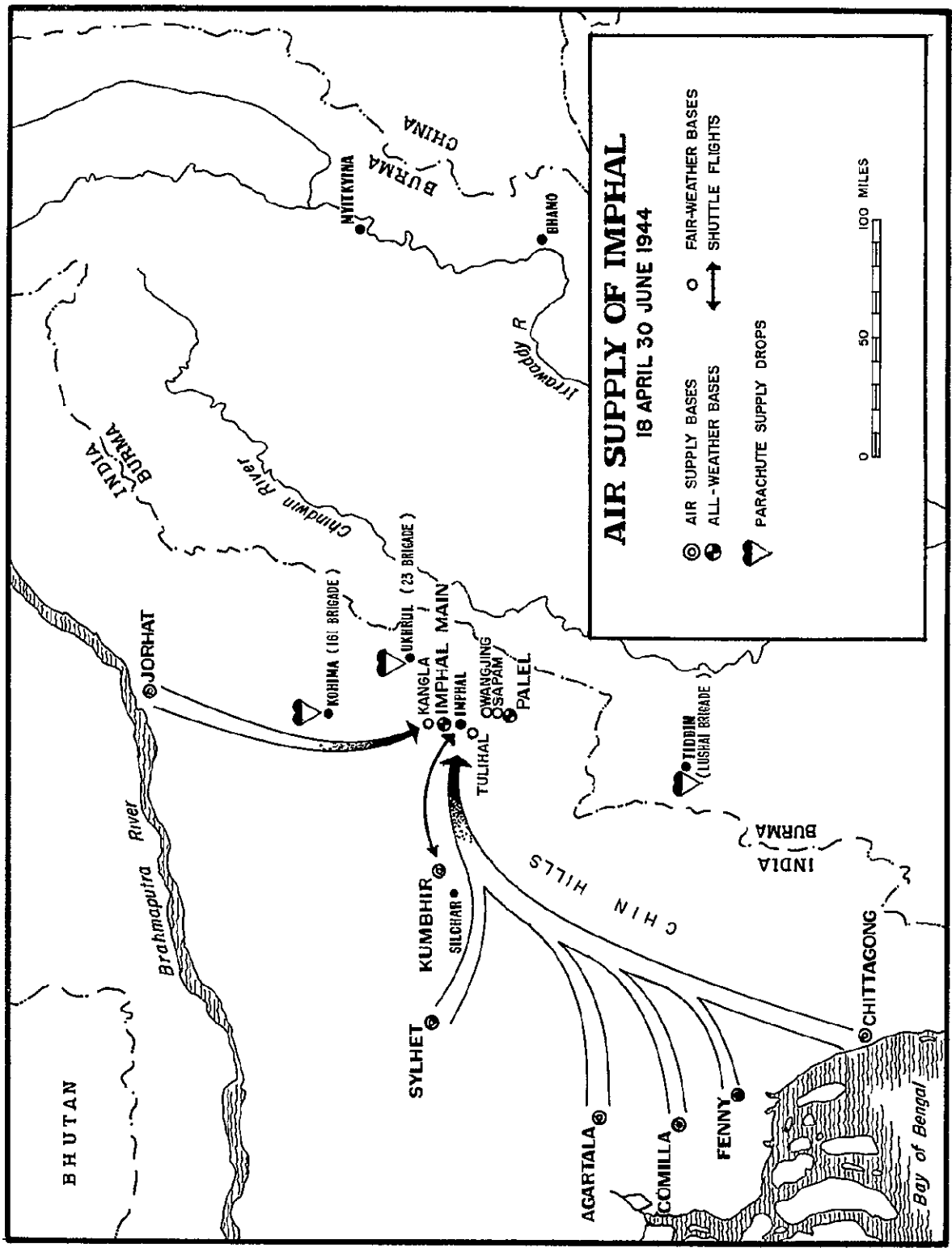
flying into Imphal, and another took over air supply operations in the Arakan, releasing RAF transports for the Imphal run²⁸

As is revealed in the above account, it was only by seeking air transport resources wherever they might be found that SEAC managed to carry out the reinforcement and supply of Imphal by air. The operation was an outstanding success, but there were moments when success depended upon decisions beyond the control of any authority in CBI. If ATC C-46's had not been made available, or if the CCS had not decided to send MTO squadrons to SEAC, either Imphal or Myitkyina would have been given up. In either case, victory in Burma would have been long delayed. The fact that air transport resources could be transferred so swiftly from one function to another and from one theater of war to another was eloquent testimony to the flexibility of airpower.

Reinforcement of Imphal. When it became evident that the Japanese move against Imphal was a major offensive, reinforcements were the first need of the garrison. In mid-March the veteran 5 Indian Division was withdrawn from the Arakan battle line and made available for movement to the central front. Informed of the impending move on 14 March, TCC estimated that 780 C-47 sorties would be required for the troops and their light equipment; heavy equipment was to travel to Dimapur by rail. The movement of the troops was carried out by the 20 C-46's diverted from ATC. From their bases at Chittagong and Comilla they flew daily to Dohazari, loaded men of 5 Division, and delivered them to the central front. Two of the three brigades were landed on the Plain, but a third (161 Brigade) was put down at Dimapur to provide a defense for that supply base. This proved to be one of the decisive maneuvers of the campaign, because 161 Brigade moved forward from Dimapur to Kohima and arrived just in time to enable the scanty garrison of that town to survive a heavy assault by the 31st Japanese Division. Had Kohima fallen, Dimapur

*See above, p 34





Map 11

would have been next, but when it held, 31st Division initiated a siege instead of bypassing, giving Fourteenth Army time to bring up XXXIII Corps and prepare for the battle that relieved the garrison of Imphal as well as that of Kohima.

After the men of 5 Division had been put down on the Imphal Plain or at Dimapur, the movement of 7 Indian Division began. One brigade, the 33d, was to go into Sapam, on the Plain, but the remainder of the division was to join XXXIII Corps at Dimapur. The movement of 33 Brigade began on 6 April and continued through 17 April. Originally the plans called for 14 C-46's and an equal number of C-47's to carry out this task, but on 9 April the C-46's were withdrawn to move 4 Brigade, 2 British Division, from Amarda Road to Jorhat. The movement of 33 Brigade was continued by TCC C-47's. Dohazari was the initial embarkation airfield, but this fair-weather strip soon became unserviceable under the impact of unseasonable rains and most of the troops were lifted from Chittagong. Indeed, weather interfered so much with this operation that before it was completed it was necessary to assign two of the newly-arrived squadrons of the 64th Troop Carrier Group to help in the work.

Orders to transport 4 Brigade came while TCC was in the midst of moving 33 Brigade. Since the strip at Dimapur had broken up, the men of this unit were delivered to Jorhat, whence they moved by rail to Dimapur. Amarda Road and Jorhat both had all-weather runways, so weather interfered with the 4 Brigade move less than with that of 33 Brigade. Approximately 120 C-46 and 190 C-47 flights delivered 4 Brigade to Jorhat; the last man was put down on 16 April.

C-46 crews put in exhausting days during this operation. Taking off from Amarda Road, they delivered a load of troops to Jorhat. At Jorhat they picked up a load of replacements for the Imphal garrison and flew them into the Plain. From one of the Imphal strips they took off empty for Silchar, where they loaded bombs for the isolated RAF units. After delivering these bombs, they picked up a load of casualties

or evacuees and delivered them to Comilla or Alipore. Then the weary crews flew back to Amarda Road, often arriving after 2100. To cope with this exhausting routine, ATC sent additional personnel, making a total of two crews per aircraft. All-out 24-hour operations were impossible because of night thunderstorms, so throughout the 4 Brigade movement the C-46's departed Amarda Road at dawn or as soon thereafter as possible, spacing takeoffs so as to prevent congestion at Jorhat.

The final major troop unit air transported into the Manipur battle was 89 Brigade of 7 Division. This brigade began its flight north, from Chittagong to Silchar, on 29 April. Crews and aircraft of the 64th Troop Carrier Group did the work, completing their task on 12 May. The weather had worsened considerably by this time; on two days flying was entirely suspended. In a vain search for better flying weather, part of 89 Brigade was sent to Sylhet by rail and lifted from there to Silchar, but weather was as much an obstacle at Sylhet as it had been at Chittagong.

In all, transport aircraft carried six brigades of infantry, units of three divisions, to reinforce IV and XXXIII Corps. This was equivalent to the fighting strength of two full divisions and was in itself the largest movement of troops by air accomplished up to that time. Significantly, one brigade of 3 Indian Division and one Chinese division were flown into Burma during the same period, and significant numbers of replacements were delivered to NCAC forces.

While this movement of major troop units was in progress, transport aircraft delivered an antitank company with its guns to Imphal, and shifted each of eight RAF squadrons from one base to another in order to strengthen the air defense of the Plain. And on 18 April, as related below, the supply of the Imphal garrison began on a large scale.

In addition to moving organized units, transport aircraft delivered replacement personnel. Plans called for 250 replacements a day, but this number was attained or exceeded on only 18 of the 74 days between

18 April and 30 June 1944. A total of 1,480 replacements were flown in in April, 5,110 in May, and 6,495 in June. The average was 175 men per day. For the same period, an average of 140 sick and wounded were evacuated per day. Since the ratio of sick and wounded to killed could hardly have been less than four to one, this rate of replacement was adequate to keep up the fighting strength of the units defending Imphal.²⁹

Evacuation from Imphal. Air evacuation of sick and wounded had become a normal procedure in India-Burma as a result of the experience gained with Stilwell's troops in north Burma, the Chindits in north-central Burma, and XV Corps in the Arakan. Evacuation of casualties did not ordinarily place additional burdens on aircraft resources because planes which flew supplies in could take casualties out. Men wounded in the Imphal fighting could in most cases be moved directly to the airstrip by motor vehicle, so liaison-type aircraft were not so important a part of the evacuation chain as they had been in the Arakan or north-central Burma.

When it became evident that Imphal's land communications with the outside world were going to remain severed for some time, two hospitals then located on the Plain were flown to rear areas by transports that had brought in reinforcements. Removal of the hospitals and evacuation of sick and wounded personnel contributed to reducing the amount of supplies needed by the garrison.

During April only 744 sick and wounded men were evacuated, but in May the fighting was much heavier, and the number flown out rose to 4,400. The characteristic determination of the Japanese to fight on even though defeat was inevitable made June the bloodiest month of all, and 5,295 casualties were evacuated, bringing the total to 10,439. Most of these casualties were delivered to Comilla, where a large British hospital was located, but a considerable number were taken to the hospital

at Chittagong. Casualties were first-priority cargo for flights out of Imphal.³⁰

From a tactical point of view, the evacuation of useless mouths from Imphal was as important as the evacuation of casualties. Almost half the approximately 50,000 service troops on the Plain walked out over the Bishenpur-Silchar Track before that route was cut by the Japanese, but the remainder was flown out by transports that had unloaded cargo or reinforcements on the Plain. The number flown out during April was only 550, but in May almost 27,000 departed by air. The largest number carried out on any one day was 2,600 on 14 May, but more than 2,000 were lifted on three days, and more than 1,000 on twelve days. The movement of useless mouths was almost completed during May, leaving only 2,190 to be evacuated during June.

Like the evacuation of casualties, the evacuation of useless mouths cost little in transport effort. The aircraft that took these men away from Imphal would otherwise have returned to base empty after unloading supplies. Indeed, the operation was a positive contribution to the air supply of the garrison, because it reduced by many tons the weight of rations needed to keep the defenders of Imphal fed. Even on reduced rations, consumption per man at Imphal was at least two pounds per day, and the air evacuation of 30,000 useless mouths reduced food consumption at least 30 tons per day. Since the fly-out was practically completed by the end of May, the saving in air supply during June was in the neighborhood of 900 tons.³¹

Air defense of Imphal. Air supply of the Imphal garrison depended upon the maintenance of air superiority over the air supply route. By March 1944 Allied aircraft in India-Burma greatly outnumbered those available to the Japanese, but the Japanese Air Force nonetheless enjoyed a number of advantages. Burma boasted a rather large number of airfields, making it possible for the Japanese to disperse their aircraft to almost any desired extent. The main Burma air bases at Rangoon were out of range of all Allied aircraft save heavy bombers; even

²⁹The Allied ratio of sick and wounded to killed during the battle at Myitkyina was more than four to one, and in that battle the Allies were attacking rather than defending.

heavy bombers had difficulty in attacking Japanese rear bases in Thailand and French Indochina. It was possible for the Japanese Air Force to fly bombers and fighters into central Burma late in the afternoon, attack Imphal the next day, and then make a swift retreat to bases in the south. Allied air units, if they were to destroy these enemy planes, had to destroy them during the few hours they were on the ground in central Burma or shoot them out of the air.

The more numerous Allied air units, in contrast, labored under a number of disadvantages. British day fighters available in India-Burma were the obsolete Hurricanes and short-ranged Spitfires. The Spitfire was a good fighter, but in the defense of Imphal its lack of range limited it to interception over Manipur. Fortunately, Air Commando P-51's and P-38's of the 459th Fighter Squadron, though few in number, were available for attacks on Japanese airfields in central Burma.

During the battle of Imphal, the mountains which surrounded the Plain made early detection of enemy aircraft almost impossible. Before the Japanese attack, radar and observer posts were located in the surrounding hills, but these sites were quickly overrun. The loss of these posts definitely reduced the effectiveness of the Allied defenses, because Japanese aircraft were often over the Plain before the defenders were aware of their presence.

Considering the handicaps under which Allied fighters operated, the toll of air supply transports taken by the Japanese was remarkably low. The Japanese Air Force flew more than 1,000 sorties over the Imphal area, appearing nearly every day of good weather in April and May, but they succeeded in destroying only seven air supply aircraft (including one B-25 and one Wellington) and damaged only eight. In view of the fact that the transports were for all practical purposes unescorted, that they were flying hundreds of sorties on days when the weather was good, and that they all had the same destination, it is strange that the Japanese pilots did no better. The task assigned to the Japanese 5th Air

Division in the siege of Imphal was support of Fifteenth Army, and this instruction was apparently taken literally. It seems doubtful that the Japanese ever realized that destruction of the air supply line to Imphal was their only hope of victory.

Nevertheless, measures taken to protect the transports were pitifully few. Gasoline in the Imphal area was in too short supply to permit a continuous fighter patrol, but Spitfires did climb to intercept whenever warning was received in time. After transports had been attacked several times during April, a corridor for supply flights was established along the western side of the mountains to Silchar and then due east to Imphal. From the date this corridor was established, no transport was intercepted so long as it remained on its scheduled flight path. The corridor was patrolled by Spitfires based in the Surma Valley during those hours of the day that Japanese air action was most likely. The corridor route was longer than the direct approach to Imphal from the south, but the added safety compensated for the added flight time. Since Japanese fighters had sufficient range to sweep this corridor, the only explanation for their failure to intercept transports is that they felt that their instructions to support Fifteenth Army limited them to attacks on targets on the Plains.

Small as were the Allied losses in supplying Imphal, they were damaging to the air supply effort. During the same three months, nine other transports were lost and ten damaged while supplying Stilwell's men and the Chindits. Thus total losses were 16 transports, the equivalent of the plane complement of a troop carrier squadron, and 18 other planes were damaged. Fortunately, many of the crew members of the lost aircraft were saved, and replacements soon made up for the lost planes. These losses do, however, point up the fact that the Japanese Air Force might have changed the outcome of the siege of Imphal; the air supply situation was perilous as it was, and heavier transport losses might have made success impossible. Es-

cort was not practical, and night operations could not have delivered sufficient tonnage during the weather of April and May; in June night operations would have been impossible.

Allied counter-air efforts had a part in reducing the effectiveness of Japanese air action. Over the Imphal Plain RAF Spitfires claimed 47 enemy planes destroyed or probably destroyed, 60 damaged. Antiaircraft units on the Plain claimed 58 enemy aircraft destroyed or damaged. Probably the most important blows against the Japanese Air Force were carried out by Air Commando P-51's and 459th Squadron P-38's; these fighters used their range to strike Japanese airfields in central Burma, and they claimed 176 enemy planes destroyed or damaged during March and April. Thus, during the period of fighting in Manipur, Allied aircraft and antiaircraft units claimed almost 350 enemy aircraft destroyed or damaged. Since enemy fighter sweeps over Imphal continued, though on a diminishing scale, throughout the battle, it seems likely that the failure of the Japanese to make a major effort to seek out and destroy transports, rather than Allied countermeasures, kept transport losses so low.³²

Operation STAMINA. All the Allied efforts to maintain air superiority, fly in reinforcements, and evacuate casualties and surplus personnel in the course of the Imphal battle would have gone for naught if air transport had not met the needs of the ground and air units on the Plain for food, gasoline, and ammunition. Hauling in these items was the major air transport task from 18 April to 30 June. This air supply operation, the largest in history up to that time, succeeded only by a narrow margin. Considering the effort expended to achieve success, its code name, Operation STAMINA, was very apt.

As noted above, STAMINA may logically be divided into three phases. April operations were to leave the garrison with a balanced 30-day supply stock when the month ended; to accomplish this, 3,180 tons of ammunition, rations, and engineer supplies

were to be landed on the Plain between 18 and 30 April. Plans for May can best be described as providing for the delivery of as large an amount of supplies as possible while providing for the needs of NCAC forces in the north and 3 Division troops as they moved north. At the end of the month, it was expected that supplies on hand at Imphal would be down to a 15-day level.

On 1 June 1944 rations actually on hand at Imphal were sufficient for 16 days at reduced consumption rates, aviation gasoline stocks were down to a 7-day level, and the garrison had no basic reserve of ammunition. Fourteenth Army hoped for 527 tons per day during June, but Third TAF refused to commit itself to more than 436 tons per day. Air Marshal Baldwin doubted that this figure could be attained during the monsoon weather of the month, especially since RAF units desired another 50 tons per day.³³

Responsibility for STAMINA lay with TCC until 1 May, with Third TAF thereafter. Actual direction of day-to-day operations was in the hands of an improvised joint staff of TCC/TAF officers and Fourteenth Army supply officers. The great majority of supplies scheduled for delivery were for IV Corps units; and to determine priority among various types of supplies, the Corps drew up a weekly priority list. Each list was issued a week before it was to take effect, thus allowing time to move priority items to the airfields where they would be needed. Airdrops, whether to 81 West African Division in the Arakan, the Chindits in north-central Burma, the garrison at Kohima, or the Lushai Brigade in the Chin Hills, had priority over supplies to be landed on the Plain. When conflicts arose between demands of RAF and IV Corps at Imphal, the final authority for decision was the commander Third TAF.

On the basis of the weekly priority list issued by IV Corps, Fourteenth Army and Third TAF issued a daily "Stamina Wire" to the air transport units and the ASC's engaged in the operation. This message amounted to an operations order; it

specified the number of flights to be flown from each base, the cargo to be carried, the origin and delivery point of the cargo, and the desired estimated time of arrival (ETA) of each flight at the delivery point. Upon receipt of the wire, each transport squadron was responsible for providing aircraft and flight crews and for delivery of the cargo to its proper destination.

A RIASC ASC was located at each air supply airfield. Each of these companies was responsible for collecting and packing the goods specified by the Stamina Wire, for liaison with the local air commander as to the location of aircraft and the time for loading, and for including an accurate manifest with each load. It was also the responsibility of the ASC commander to secure and direct any additional labor and transportation vehicles which might be required.

Air supply of Imphal necessitated a radical reorientation of the IV Corps supply system. Before the Japanese attack supplies for Imphal had moved north from Calcutta to Dimapur by rail, then by truck from Dimapur to Imphal. This route may be considered a pipeline that was full at the time of the Japanese attack. When supply by air was undertaken, the surface flow of supplies from Calcutta changed from a northerly to an easterly direction, by water to Chittagong, or by rail to Fenny, Comilla, Agartala, or Sylhet. This line of supply was already in operation, since it had been used to move supplies for the Arakan and for the second Wingate expedition, but if considered as a pipeline to IV Corps, it was far from full. The depots along the route did not contain adequate stocks for the supply of Imphal on the scale envisioned, and time was needed to get goods to the airfields from which they would be lifted to the north. It was only because the air effort during April and May was reduced by weather and scarcity of aircraft that Fourteenth Army was able to provide cargo for the sorties flown. Even during June, when the ground supply system had begun to function as intended, air transport capacity slightly exceeded Fourteenth Army's ability to provide cargo.

A mild controversy was carried on between air and ground headquarters on the subject of single-commodity airfields. Fourteenth Army would have preferred to have one specific type of supply delivered from each airfield, a procedure which would have greatly simplified the shipment of material over rail LOC to the airfields, since all ammunition, for example, would have gone to one field and all rations to another. Ground supply administration would also have benefited from the fact that only one type of storage facility would have been needed at each airfield. Finally, the ASC at a single-commodity airfield would have been able to handle a single type of supply more efficiently because more specialized skills would develop and the sorting of supplies would require much less effort.

On the other hand, the air force preferred to maintain mixed depots at each airfield. The availability of all types of supplies at any transport base greatly reduced the staging of aircraft through other fields to secure priority loads. When a transport carried a load of supplies to Imphal from its own base, it amassed less flying time than when it had to pick up its loads elsewhere. Less flying time per trip meant that the aircraft could make more trips per week or month as well as more trips between inspections and engine changes.

The result of this air-ground difference in opinion was, as might be expected, a compromise. Chittagong, Fenny, and Sylhet became single-commodity airfields from which ammunition, POL, and rations, respectively, were lifted. Agartala, Comilla, and Jorhat (the last-named of which came into limited service in early June) carried all other types of supply plus rations and, in the case of Comilla, ammunition. Thus most calls for mixed loads could be met by planes based on mixed commodity airfields, while calls for full loads of ammunition, POL, or rations could be met by planes based at Chittagong, Fenny, or Sylhet. If demands for some particular item were so large that planes on the base where it was stored could not deliver the whole quan-



Figure 8. Unloading C-47 at Imphal

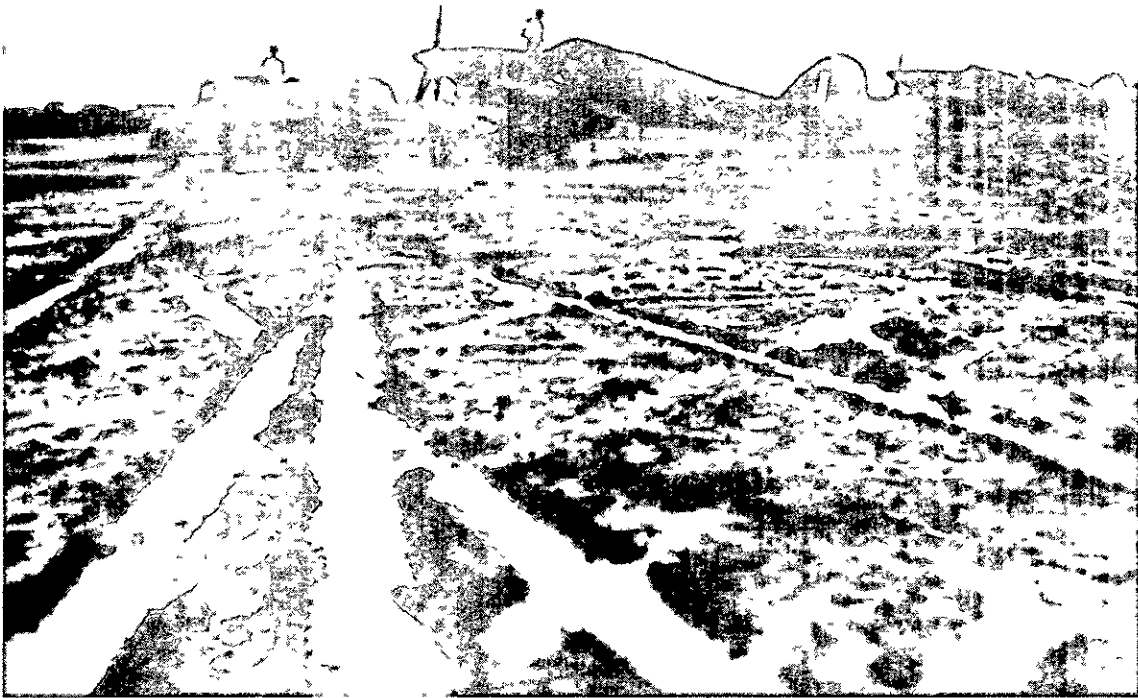


Figure 9. Indian Airfield during the Wet Monsoon

tity, transports from other fields could stage through and pick up cargo.

For unloading cargo at Imphal, no particular organization existed. Normally a British supply officer was in charge of a mixed military-civilian labor force which unloaded the cargo from transports and delivered it by truck to supply dumps. Manipuri women were often employed for this unloading work. Occasionally no designated unloading crew was on hand when a transport landed; in such cases the aircrew and whatever ground personnel were in the neighborhood unloaded the cargo and left it to be picked up by a truck while the aircraft went back for another load.

The experience at Imphal demonstrated the need for a regular organization, or organizations, for carrying out the ground force functions of air supply at rear and forward bases. It led to the appearance of the Rear Airfield Maintenance Organization (RAMO) and the Forward Airfield Maintenance Organization (FAMO) during the Allied offensive of 1944-1945.¹¹

STAMINA was beset by obstacles in plenty. The enemy's interference and the tribulations encountered in securing a barely sufficient number of transport aircraft have been discussed above. In April and May the diversion of transports to support 3 Division and Stilwell's forces at Myitkyina had a very definite effect in reducing the tonnage delivered at Imphal. These diversions were necessary, however, and air commanders could not have prevented them even had they wished to do so.

From the point of view of interference with the planned operations of the available transport aircraft, weather was the major obstacle. The wet monsoon normally begins about 1 June in India, but in April and May its approach is heralded by sporadic thunderstorms. Buildups of cumulus clouds are especially likely to occur along the western edge of the Chin Hills, and it was necessary that transports entering the Imphal Plain cross the western half of these mountains. In April and May of 1944 the pre-monsoon rains were heavier than usual,

and they very definitely interfered with air supply operations.

Weather reports for each day of STAMINA are not available, but between 18 and 30 April there were three days when weather reduced supply and reinforcement sorties to Imphal to a fraction of those scheduled, and deliveries were reduced significantly on two other days. The increasingly frequent thunderstorms interfered still more in May; even though the aircraft available had a collective average delivery capacity of more than 300 tons (430 tons were delivered during the most successful day's operations), less than 100 tons were put down at Imphal on nine separate days.

The story in June, even though weather did cause the cancellation of literally thousands of flights, was different. Plans assumed that one day out of three in the month would be unfit for flying, and transport resources were allocated on that basis. However, the weather, though it was worse than that encountered in April and May, was better than had been expected. On only two days did the transports fail to deliver 100 tons to Imphal, and the average for the month was almost 450 tons per day, during the last half of the month deliveries amounted to more than 500 tons a day.

The effect of weather on six days of STAMINA was analyzed by Air Marshal Baldwin in a letter to General Stratemyer. From 18 to 23 June inclusive, Third TAF scheduled 2,041 transport sorties to Imphal. No less than 582 sorties were cancelled because of weather, and 98 others were abortive for the same reason. Thus over this six-day period, weather cost the Imphal garrison more than 2,000 tons of supplies. It is evident that if schedules had not been drawn up and aircraft assigned with the expectation that weather would bring many cancellations, deliveries to Imphal would have fallen far below the necessary minimum.¹²

The use of all-weather fields at Jorhat and Kumbhir helped in countering the effects of June weather. The depot which began operating at Jorhat in June provided some 50 tons of supplies per day for delivery

to Imphal. Jorhat was nearer Imphal than the main air supply bases to the south, and transports flying from there approached Imphal from a different direction. Thus sorties could sometimes be completed from Jorhat when aircraft from the south could not get through.

Kumbhir, northeast of Silchar and almost due west of Imphal Town was even more important. Transports that reached Silchar and found that they could not penetrate weather over the Chin Hills to land at Imphal were instructed to land and unload at Kumbhir before returning to base (except aircraft based at Sylhet). Whenever it was known that transports could take off from their home bases but could not penetrate to Imphal, they also were instructed to leave their cargo at Kumbhir. A depot with 300 tons capacity was provided at this airfield, and the operations officer was authorized to retain up to 12 C-47's for use in shuttling supplies across the Chin Hills when a break in the weather gave an opportunity. This shuttle system, which began to function effectively about 1 June, added considerably to the overall efficiency of the last month of Operation STAMINA.³⁶

Another obstacle to successful operations with which the directors of STAMINA had to deal was the limited availability of all-weather airfields. Before World War II, and during the early part of the war, there was a general assumption in India that large-scale air activities would not be carried out during the wet monsoon. Since sod strips were serviceable during the dry months, it was supposed that only a few all-weather fields would be needed. By the time the error of this assumption was apparent, the building of all-weather runways and parking areas could not keep up with the constantly expanding air effort. As a result, when the rains in the spring of 1944 began to make sod strips unserviceable, there were all too few surfaced strips in Bengal to serve the needs of tactical and transport aircraft under Third TAF direction. The great majority of supply missions to Imphal were flown from Sylhet, Fenny,

Agartala, Comilla, and Chittagong. These airfields, despite limited facilities, might have served the transport operation adequately, but because TAF tactical squadrons had to use the same bases some overcrowding, confusion, and delay in operations was almost inevitable.

The airfield situation was much worse on the Imphal Plain than in Bengal. At the beginning of the Japanese offensive, there were two all-weather strips in Manipur, one at Imphal Town, one at Palel, on the southern part of the Plain. Sod strips were in use at Wangjing, Sapam, Tulihal, and Kangla. Palel was poorly constructed and soon broke up, it could not have been used long in any case, because it was soon under Japanese artillery fire. After the battle began, an effort was made to provide an all-weather surface for Tulihal; some 370 tons of "bitness" (bituminized hessian cloth) were flown in by C-46's. Because the ground was already soggy when the surface was put down, Tulihal was never firm enough for the landing of loaded transports. It did support fighter aircraft, however, and its use for this purpose lowered the burden upon Imphal Main, the only other surfaced strip available during the rains. Imphal Main's runways were narrow, and parking areas were so cramped that many aircraft mired in the adjacent mud. Accidents were frequent, and with more than 200 flights a day the rule rather than the exception during June, Imphal Main was badly overworked. It is doubtful that this one airfield could have absorbed all the supplies flown in during June, but the Allied cause received an unanticipated bonus when it was discovered that the fair-weather runway at Kangla drained so well that transports could land there soon after rain stopped falling. Air Marshal Baldwin referred to Kangla as "a Heaven-sent safety valve."³⁷

Another serious problem in STAMINA, indirectly a result of weather, was that operations had to be carried out in comparatively short periods of intense activity, followed by lulls. When the weather cleared, every available minute had to be used;

when the clouds gathered again, flying might cease entirely.

These peaks in operational effort greatly increased the ground support required for air supply operations. The average output of an airfield depended upon ground LOC capacity to the field and airlift from the field, and over a long period of time airfields used for STAMINA maintained an average rate so determined. It was not enough, however, to provide transportation and labor sufficient to load (or at the other end of the line, to unload) the average daily capacity of the airfield. Sufficient trucks and personnel had to be on hand to transport, load, and unload the tonnage handled on a peak day of operations. Sylhet, for instance, had the rail and airlift capacity to average 250 tons a day to Imphal, but actual tonnage lifted per day during June ranged from 10 to 300 tons. Therefore labor and transport capable of handling 300 tons per day had to be provided. Fourteenth Army reported that although six Indian laborers could load one C-47, it was necessary to provide 16 laborers per aircraft to make sure of keeping up with demand for loads during peak periods. Likewise, although one truck could transport material for loading several aircraft per day if operations were ideally staged, under the conditions that prevailed during STAMINA it was advisable to have a 3-ton truck available for every transport in operation. This number of trucks could not always be obtained, and shortage of motor transport was from time to time a factor in reducing the tonnage delivered.

The air units too encountered difficulties in the support of peak operational periods. Maintenance was not a limiting factor—conclusive figures are not available, but it would appear that aircraft in commission rates were better than the planners had anticipated. The lulls during periods of bad weather afforded maintenance crews time to repair the ravages of intense operations. Nor was aircrew exhaustion a serious factor in reducing airlift. Aircrews also benefitted by lulls, and toward the close of the operation a number of Strategic Air

Force pilots were given transition training and used to relieve regular C-47 pilots. The chief limiting factor for which the air arm was responsible was refuelling. Fuel trucks were in short supply at every base (transports were not refuelled at Imphal), whether the planes based there were British or American. At Comilla, which was the normal loading point for two transport squadrons as well as a center of tactical air operations, not only were tank trucks in short supply, but the number of bulk filling points at the gasoline storage area was too small to serve the trucks available. Air Marshal Baldwin concluded that if tank trucks of the capacity of those available (500 gallons for the British model, 750 gallons for the American) were to be used, one truck should be on hand for every aircraft if the field was the base for a squadron or smaller detachment; if two squadrons or more were being serviced, he recommended that the number of tank trucks be three-fourths the number of aircraft.

To some extent lack of loads for the aircraft available limited the tonnage delivered. It is impossible to say how important this factor may have been overall. Of the 2,041 trips planned from 18 through 23 June, only 40 were cancelled for lack of cargo, but since more than 500 trips during the same period were cancelled on account of weather, lack of cargo might have been much more serious in a similar period of good weather. Failure to provide loads for transports sometimes was caused by failure of the ground LOC to move supplies to the air supply depots, sometimes by the inability of the ASC's to keep up with their work, sometimes by a shortage of trucks to move the goods from the depots to the aircraft.

Less significant, but intensely annoying, was the lack of skill of the Indian truck drivers and the low caliber of the laborers doing the loading. A large number of C-47's were damaged by trucks which backed carelessly, and Third TAF strongly recommended that drivers be tested for skill before being assigned to such duties. The

labor parties were too often physically incapable of handling the goods to be loaded aboard the transports. When this was the case, the aircrew had to pitch in and help the work party complete its job. Presumably because Third TAF knew of no way to improve the Indian diet, there was no recommendation for improvement of this condition.³⁸

Despite weather and the lesser obstacles to successful completion of STAMINA, the Allied transports did keep the garrison at Imphal supplied. During April and May the tonnage delivered was much less than had been hoped for, but it nonetheless amounted to 2,211 tons of ground force supplies and 177 tons of RAF supplies in April, 5,542 tons for the ground forces and about 440 tons for the RAF in May.

In June Operation STAMINA went into high gear. By 22 June, when the Imphal-Kohima-Dimapur Road was opened, deliveries had reached a rate equal to consumption. It was then decided that the air supply effort should continue to the end of the month so as to provide data for future planning. Sources differ slightly as to the total tonnage delivered in June, but it amounted to approximately 12,400 tons of ground force supplies and 1,000 tons of RAF material. For the entire operation, RAF units on the Imphal Plain had received about 1,600 tons, and IV Corps had received more than 20,000 tons.³⁹

Without air supply, Imphal would have fallen to the Japanese. Probably a large part

of IV Corps could have fought its way out, but the Japanese victory would have had tremendous effect in India and China. Air supply on the scale attained in April and May could not have saved the garrison if large stocks of material had not already been on hand, but without air supply those stocks would have been exhausted by 1 June—and it was not until 22 June that land communications between India and Manipur were restored. At the end of the siege some 118,000 troops were wholly maintained by air supply and were accumulating a slight surplus. A good proportion of those troops had been flown into Imphal, and casualties and 30,000 noncombat personnel had been flown out. The Allied divisions in Manipur when STAMINA ended were weary, but they were still combat-worthy. The Japanese, on the other hand, had suffered tremendous casualties—perhaps 30,000 in all—and the survivors were in such poor condition that their combat effectiveness was reduced almost to zero.

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.

CHAPTER V

Air Supply of the Final Allied Offensive in Burma**Introduction**

THE FAILURE OF the attempt to overrun Imphal marked the end of Japanese initiative in Burma, and the fall of Myitkyina gave emphasis to the new situation. At Imphal and at Myitkyina Allied forces were taking the offensive as the monsoon rains of 1944 came to an end. The conclusion of the north Burma campaign, which had as its object the reestablishment of land communications with China, has been described earlier.* More decisive in bringing about the final defeat of the Japanese in Burma was the British-Indian offensive, which, supplied by Royal Air Force and United States Army Air Forces transports, destroyed Japanese military strength in central Burma and then drove on south to win complete victory in Burma before the final Japanese surrender.

The air supply operations that supported this offensive were of a greater magnitude than had ever before been attempted anywhere † From the days when a handful of transports had dropped food to refugees fleeing before victorious Japanese troops, air supply had grown until first it could support an entire division, then a corps, and finally, in 1945, an entire army. All but a trifling proportion of the rations, ammunition, bridging material, and other supplies used by the fighting men of Fourteenth Army in Burma were transported by air. At the same time the gasoline and oil (POL) required by up to seven RAF fighter squadrons were provided by air transport, and considerable amounts of supplies were

delivered to XV Corps in the Arakan (now removed from Fourteenth Army control) and to civilian relief agencies in Burma. It must also be remembered that while the air supply effort described below was going on in central and south Burma, Tenth Air Force transports were carrying on major operations in the north.

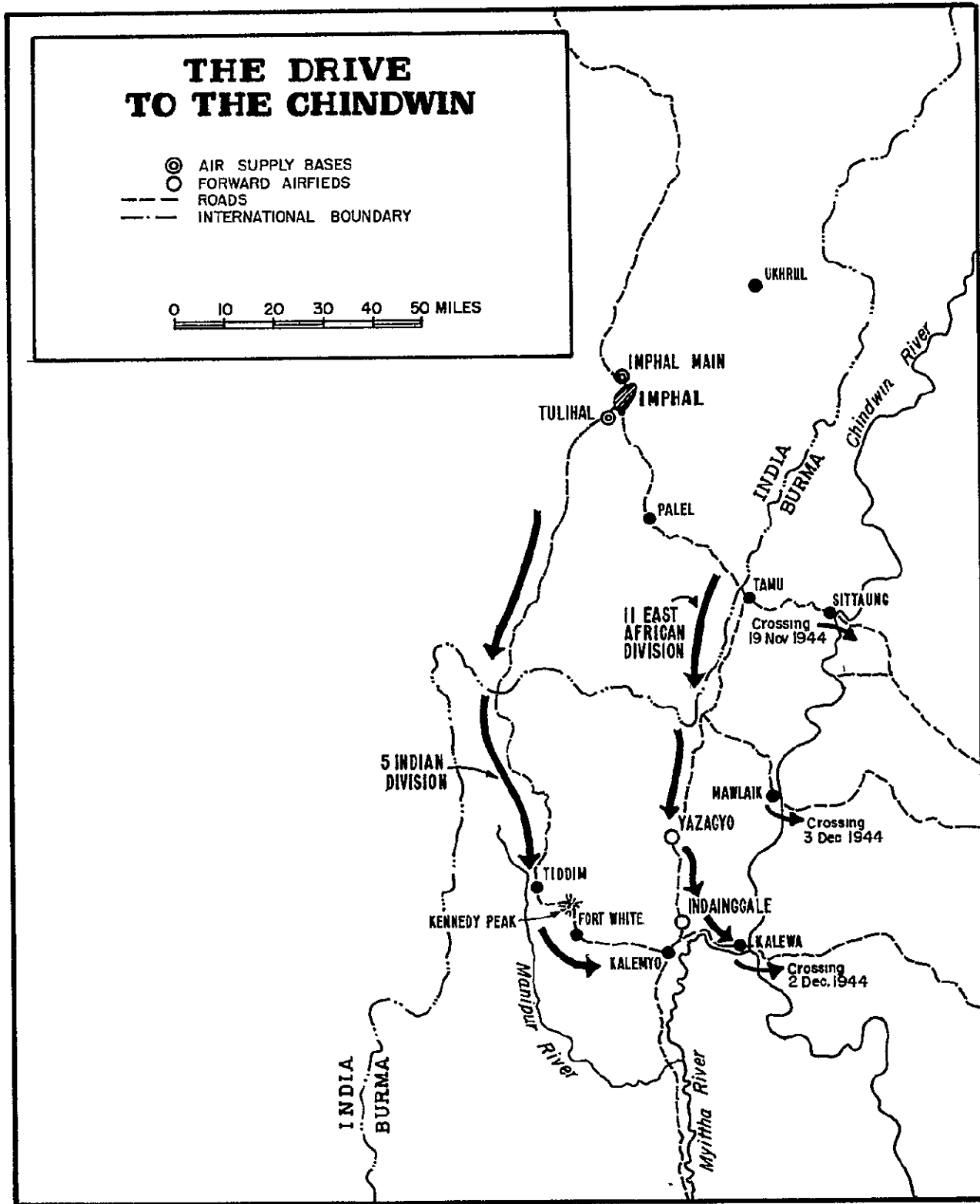
The transport aircraft that supported Fourteenth Army were not supply vehicles alone; they flew in reinforcements, evacuated casualties, and shifted ground units from quiet zones to areas where they could find use for their weapons. The soldier who depended upon air transport for beans, bullets, beer, and shoelaces also depended upon the transports to bring him help when he needed it, to succor him when he was wounded, and to take him to India when he was granted leave. The final Allied offensive in Burma is unique in military annals, and the air supply effort that made it possible is indeed worthy of study by those interested in the art of war.

The Drive to the Chindwin

Movements on the ground. At the end of June 1944, the Japanese effort to capture Imphal had been frustrated, but it was still necessary to mop up those Japanese who preferred to die rather than retreat. Ukhrul fell to the Allies on 10 July, and 7 Indian Division then proceeded to clear the Japanese from the mountain trails between Imphal and the Chindwin on the east. On the southern Imphal Plain, 2 British Division drove the Japanese 33d Division (which had been strengthened by reinforcements and had retained more combat capability

*See above, pp 20-23

†The air supply effort of the last year of the war in Burma has been exceeded since only by the Berlin Airlift



Map 12

than other Japanese formations in the Imphal battle) back into the mountains. By the end of July, the Imphal Plain was cleared of Japanese troops.¹

At the end of July the wet monsoon was at its height. It would have been impossible for the whole Fourteenth Army to move forward through the mud of the Kabaw Valley and the Chin Hills even if logistic support of such a move had been practical. It was necessary, however, to maintain pressure on the retreating Japanese lest they use a breathing space to recover from their defeat. XXXIII Corps Headquarters (IV Corps Headquarters had withdrawn to India to plan and train for operations across the Chindwin) ordered 11 East African Division to pursue those Japanese retreating down the Kabaw Valley and sent 5 Indian Division down the Tiddim Road after the 33d Japanese Division.

Early in August the East Africans relieved the exhausted 2 British Division, which had just recaptured Tamu. Supplied partly by air and partly by four-wheel drive vehicles that could plow through the hub-deep mud of the Kabaw Valley, 11 Division pushed southward slowly but surely. On 4 September one brigade took Sittaung and established a patrol base on the east bank of the Chindwin. The main body of the division continued down the Kabaw Valley and captured Yazagyo on 4 October, just before the end of the rains. With the coming of dry weather, the advance gained momentum; after passing through Indaingale, the Africans entered Kalemmyo on 15 November.

Mud, mountain grades, landslides, and the Japanese all opposed 5 Indian Division as it followed the Tiddim Road down the spine of the Chin Hills. The division received most of its supplies by air from the beginning of the pursuit; after crossing the Manipur River on 15 September, it made no attempt to maintain surface lines of communication (LOC) to the rear. Using the Japanese tactics of infiltrating and road blocking, 5 Division toiled its way to Tiddim, which fell on 18 October as the rains ceased. Kennedy Peak, the strongest Japa-

nese position along the road, fell on 4 November after a three-day aerial bombardment by Hurricanes and B-25's. Moving over drying ground and downhill, 5 Division followed the East Africans into Kalemmyo in mid-November.

IV Corps Headquarters returned to action and took command of units in the Sittaung area during the last stages of the descent upon Kalemmyo. Patrols quickly determined that the area just east of the Chindwin was lightly defended, and major IV Corps units crossed the river on 19 November. Farther south, XXXIII Corps troops took Kalewa on 2 December and began erecting a Bailey bridge. The next day elements of 20 Indian Division crossed the Chindwin at Mawlaik, between Sittaung and Kalewa. At mid-December 2 Division, rested and restored to strength, relieved 11 Division at the Kalewa beachhead and began enlarging the area under Allied control at that vital point.

By the middle of December, then, Fourteenth Army had major elements of its two corps across the Chindwin and beginning to advance to the east. At the same time 36 British Division, under Northern Combat Area Command (NCAAC), was fighting its way southward down the Mandalay-Myitkyina Railroad to an eventual junction with Fourteenth Army. These successful preliminaries to an all-out offensive into Burma, like all major campaigns in the India-Burma Theater, were possible only because of air supply.²

Air supply of the Chindwin drive. By the end of June 1944 those air units that had taken part in the supply of Imphal were almost as weary as the ground troops they had supported. In view of their exhaustion and the monsoon weather, it was fortunate that there was almost a lull in transport operation on the central front. The transport units continued to fly into Imphal, carrying supplies and reinforcements and evacuating casualties and leave personnel, and a few supply drops were required for isolated ground units, particularly those chasing the Japanese from the Ukhrul area; but for the moment there were more than

enough transport aircraft and crews available to carry out the tasks assigned, and the sense of urgency that had characterized the Imphal operation no longer existed. Those squadrons of 3d Combat Cargo Group that had flown into Imphal moved north to join the Tenth Air Force,* and 31 and 62 RAF Transport Squadrons were withdrawn for rest and training; upon their return to operations in October, 117 and 194 Squadrons moved to rest and training posts. This left only two RAF squadrons and the 319th Troop Carrier Squadron of the 1st Air Commando Group to deliver supplies to Imphal, but reinforcements were at hand, and the demands of air supply in the Imphal and (occasionally) Arakan areas were met.³

As 11 East African Division pushed down the Kabaw Valley and 5 Indian Division crossed the Manipur River, the need for air supply increased. Airdrops to these units were necessary until the end of the rains because airfields could not be constructed in the monsoon mud. Indeed, 5 Division received all its supplies by airdrop until it reached Kalemyo, even in dry weather transport strips could not be constructed in the forbidding Chin Hills.

The 1st Combat Cargo Group arrived in India in August 1944 and commenced operations on 1 September, but for most of the month its operations were at a slow pace, delivering supplies to Imphal, evacuating casualties, and making some drops in the Kabaw Valley and Chin Hills. Many of the group's aircraft and crews went to China on detached service until October, leaving 117 and 194 Squadrons to do most of the air supply work in central Burma.⁴

In October, as better weather speeded up operations and made flying easier, air supply moved at a faster pace. The new air supply headquarters, Combat Cargo Task Force (CCTF)† reported an assigned strength in October of some 131 C-47's in two RAF and five AAF squadrons. During the month these aircraft flew slightly more than 8,000 hours and delivered 8,905 tons of supplies and 11,550 personnel, they

evacuated 4,475 casualties from Imphal. The bulk of the tonnage delivered went to 5 and 11 Divisions, the remainder to XV Corps in the Arakan, the Lushai Brigade, and to airfields on the Imphal Plain. All reinforcements were delivered to Imphal, and all evacuated personnel boarded transports there.

Six transports were lost in October, but none as a result of enemy action. Crews reported that drops in the Kabaw Valley were easy, but that drops to 5 Division were a pilot's nightmare. Three of the transports lost during the month belonged to the 1st Combat Cargo Squadron, and all three crashed while dropping supplies in the Chin Hills.⁵

Airdrops to 5 Division continued until its troops came out of the Chin Hills onto level ground at Kalemyo. In the Kabaw Valley a transport landing ground was established at Yazagyo as soon as weather permitted, and in mid-November, when this field opened, supplies were landed there and trucked forward to consuming units. Late in December a new field was opened at Indainggale, between Yazagyo and Kalemyo. Not only were supplies for immediate consumption landed at these Kabaw Valley airfields, but a surplus of rations, ammunition, and other items was built up to serve as a stockpile for the offensives soon to be launched across the Chindwin and Irrawaddy Rivers. Yazagyo and then Indainggale became, in terms of traffic, two of the busier airfields in the world as C-47's and C-46's (after the arrival of the 4th Combat Cargo Group) landed and discharged their loads. During December stockpiling was carried on at the rate of 336 tons per day in excess of immediate needs.⁶

The supplies delivered to these airfields were mainly routine loads of rations, ammunition, and POL, but also included were bridging and boat-building material for use in crossing the rivers. The bulky pontoons for the Bailey bridge at Kalewa were trucked and manhandled down the Kabaw Valley, but the planking and other components were delivered by air. Transports also delivered steel and lumber to be used in

*See above, p 77
†See below, pp 96-99

building gunboats to patrol the rivers. When the gunboat hulls were finished, Royal Navy Sunderland flying boats brought from Calcutta marine engines that were lifted directly from the aircraft into the hulls. It should be noted that the delivery by air of bulky construction material slowed down air supply to some extent because loading and unloading such cargo consumed more time than was required for normal loads.⁷

The Japanese Air Force struck at transports dropping supplies in the Chin Hills on 8 November; three RAF and two AAF transports were shot down in this engagement, and many others were damaged or suffered narrow escapes. The attack was apparently an afterthought of Japanese pilots who had just completed a strafing attack on Allied ground troops, but this loss, and the subsequent loss of four more transports to fighter attack over central Burma in December, made it evident that Japanese fighter strength, though slight, was still sufficient to seriously interfere with air supply. For the remainder of 1944 aircraft engaged in supply dropping flew to the dropping zones in formation, covered by fighters on the way to and over the DZ's. This necessary precaution slowed down operations somewhat, but not so much as they would have slowed had heavy losses continued. Fortunately for the Allied cause, the Japanese, except for these two incidents, repeated the mistake they had made during the Imphal fighting and devoted the few fighter sweeps they were able to mount to bombing and strafing ground troops, allowing air transport operations to go on almost unmolested.⁸

During November, with an average of 163 transports assigned and 137 in commission, CCTF delivered 13,748 tons of supplies to Allied forces in Burma and airlifted more than 28,000 personnel. Most of the passengers were casualties and leave personnel transported between Burma and India, but well over 5,000 reinforcements were flown forward. Of the supplies delivered in November, most went to XXXIII Corps of

Fourteenth Army, but XV Corps received some 1,500 tons in the Arakan.

Air supply operations increased in December as the number of Allied troops facing the Japanese increased. With an average of 167 transports operational out of an average 209 assigned, CCTF lifted a total weight of 23,778 tons (including the weight of casualties lifted by liaison aircraft). More than 46,000 personnel were transported, approximately 11,000 of whom were casualties (a majority being typhus and malaria cases). Many of the remainder were men of 11 East African and 5 Indian Divisions moving back to Imphal for a rest. Flying hours per assigned aircraft for the month were well under 100, so there was room for an increase in effort when it should prove necessary. However, three squadrons of the 1st Combat Cargo Group went to China on detached service during December, thus reducing the available airlift.⁹

Comments on air supply by 5 Indian Division. Five Indian Division had considerable experience with air supply in the Arakan and during the siege of Imphal, but its experience in being supplied wholly by airdrop from mid-September to mid-November 1944 was unique. This air supply effort was carried out over the worst terrain for supply dropping (and perhaps for ground fighting as well) encountered in the Burma war, so the division's comments are worth recording.¹⁰

Knowing in advance that it would depend upon air supply, 5 Division split its headquarters into forward and rear echelons, and major subordinate formations assigned one or more officers to the rear echelon. The rear headquarters relieved the forward headquarters of much routine administration, but it was mainly concerned with supply. Located on the Imphal Plain near the airfield (Tulihal) from which supplies were delivered, the rear echelon could effectively represent the troops in the field.

Since not even a liaison strip was available to 5 Division until the monsoon had ended and Tiddim had been captured, it

was planned from the inception of the campaign that casualties would be taken with the division as it advanced. Eventually the mobile hospital was caring for more than 600 cases, many of them typhus victims, but no insuperable difficulties were encountered. When a liaison strip was opened at Tiddim (where L-5's landed uphill on a mountainside), the worst cases were evacuated to rear hospitals. Medical supplies were requisitioned from a medical stores depot at Imphal and delivered like other material.

Since 5 Division operated for over a month in monsoon weather, there were some days when supplies did not arrive. Several times it was necessary for troops to go on half-rations, and strict economy in ammunition expenditure was enforced throughout the advance; however, it is significant that shortages of food never existed for more than a day or two, and that there was always enough ammunition available to carry out necessary tasks.

Radio telephone (R/T) communications linked the forward division headquarters, brigade headquarters, the rear echelon at Imphal, and the air supply depot at Tuhlal. After a visit to the division by the commander of the 3d Combat Cargo Squadron early in the campaign, a "private" radio link was established between division and squadron headquarters. Much of the credit for effective air supply should be given to efficient communications. Effort was made to install R/T sets at all DZ's, and when such air-ground communications were available, they were credited with improving the accuracy of dropping and thus decreasing wastage of supplies.

The use of standard loads was beneficial, mainly because such loads were prepacked and could be sent out on short notice. Perhaps as important, a prearranged schedule of standard drops decreased traffic on the communications net. When special loads of ammunition or other supplies were needed, it was advisable and usually possible to give three days' advance notice to the air supply depot. Most of the time, through strict supervision of ammunition

expenditure, the division used only the fairly small proportion of ammunition in the standard loads; the same was true of the standard-load POL supply. Out of a total daily requirement of 100 tons, 70 tons were devoted to rations, and most of the remainder to ammunition and POL.

The division reported that the work expended to prepare a good DZ was worthwhile. After several planes had crashed on dropping runs, no DZ's were established in valleys; mountain spurs made the best sites, but it was often necessary to receive drops along the road, even though traffic was halted for several hours. Losses varied with the quality of the DZ's and the skill of the pilots making the drops. Freedrop supplies might be recovered 100 percent when dropped on good DZ's by skilled pilots, but 50 percent might be lost when poor pilots dropped on poor DZ's. Losses of parachuted supplies were less—such as there were usually being due to parachute failure.

As a result of British Army administrative procedures, canteen stores (equivalent to American post exchange supplies) were a headache throughout the campaign. Invoices were often lost, and frequently it was impossible to account for accountable items. Often, too, in the absence of manifests, it was impossible to determine whether certain items, especially cigarettes, were free issue or accountable. The division's report on air supply expressed foreboding: "It is anticipated that the financial aspects of canteen supplies will involve months, if not years, of correspondence with force paymaster."¹¹

The report also noted that "If large deficiencies in sugar, tinned milk, and tinned fruits are reported, anti-pilfering patrols on Drop Zones should be reinforced, as troops and locals invariably find 'manna from heaven' very acceptable."¹² Pilfering was indeed a serious problem for 5 Division as it was for other units that received large quantities of supplies by airdrop. The division included one company of porters brought along especially for clearing supplies from DZ's. These porters, divided into parties and allocated to various zones, were

an advantage, because they were well-fed and not so larcenous as local labor. It was necessary to use some local people, however, and the division's military police (MP) unit was not sufficiently strong both to control road traffic and provide enough DZ guards to prevent pilfering by natives and division troops. The division report suggests that an additional company of porters and additional MP's would have paid their way in recovered supplies. The most objectionable pilfering took place when local laborers or camp followers found mailbags and tore letters to shreds in a hurried search for enclosed valuables.

The most significant feature of air supply of 5 Indian Division was the ease with which the unit was kept in action despite terrain and, for a good part of the period, weather that added greatly to the difficulties of supply dropping. The division report noted that with good communications and the application of common sense, "air supply works extremely well and is far less of a 'headache' than ground supply on a difficult line of communications."¹³ The division's confidence in air supply was so great that at no time during the advance did it carry more than two days' reserve in full rations.

Organization of Combat Cargo Task Force

When Troop Carrier Command was disbanded in June 1944, British and American transport aircraft based to support operations on the central front and in the Arakan came under control of Third Tactical Air Force.* This command directed the last stages of the air supply of the battle at Imphal and maintained control of transport operations in the central area through the summer of 1944. It was apparent by the middle of the year, however, that a greater transport effort than ever before undertaken would be necessary to support the major land campaign in Burma then being planned. Air commanders decided that a headquarters concerned primarily with transport operations (rather than with tactical operations, as was the case with Third

TAF) was needed for control of the envisaged air supply operation. After several conferences between RAF, AAF, and army representatives, a new Combat Cargo Task Force (CCTF) Headquarters was established. Experienced personnel from the defunct TCC were not used in the new headquarters—presumably for fear that some of the bad feeling that had existed at TCC might be revived.*

Despite the new name and new personnel, CCTF was in many respects a revival of TCC. The missions assigned to the headquarters upon its activation (15 September 1944) were "Delivery by air of supplies to . . . Fourteenth Army and other forces as required, in accordance with plans previously approved by AC [Air Commander] EAC [Eastern Air Command]" and "troop transport and evacuation." CCTF differed from TCC in that it was given no control over transport squadrons operating in support of NCAC forces in north Burma. The order activating the new command attempted to save it from one of the stumbling blocks encountered by TCC—constantly increasing army requirements over which the transport command had no control. The CCTF commander was charged with full responsibility for accomplishment of tasks assigned to him in operational plans approved by EAC and for additional tasks assigned him directly by EAC, but all demands were to be submitted to EAC for approval before they became binding upon CCTF. In other words, the air supply requirements of ground force plans did not take effect until approved by EAC, nor could they be increased without EAC approval. In effect, this gave EAC a veto over air supply proposals beyond the capacity of CCTF transport resources.¹⁴

CCTF was activated (under the command of Brig. Gen. Frederick W. Evans, an AAF officer) as of 15 September 1944, but the headquarters remained in Calcutta for ten days, recruiting personnel and preparing for operations. On 25 September CCTF Headquarters opened at Comilla. The headquarters was integrated for planning pur-

*See above, p 54

*See above, p 54

poses, but operational control of American squadrons was to be exercised through General Evans, and operational and administrative control of RAF squadrons came temporarily under Third TAF (which was dissolved 15 December 1944). Operational control of the RAF units was actually exercised by Air Vice Marshal J. D. I. Hardman, Deputy Commander, CCTF, throughout the campaign.

When CCTF began to function, the American transport units assigned were the 319th Troop Carrier Squadron of the 1st Air Commando Group and the four squadrons, 1st, 2d, 3d, and 4th, of the 1st Combat Cargo Group. The 319th was engaged in flying fresh meat and vegetables and providing passenger service between Calcutta, Chittagong, and the Imphal Plain. CCTF also controlled the liaison and combat aircraft of the 1st Air Commando Group, but control of the combat aircraft was delegated to 221 Group, RAF. The same procedure was followed when the 2d Air Commando Group arrived in the theater. Administrative command of all AAF units in CCTF remained with AAF India-Burma Theater (AAF IBT). RAF 117 and 194 Transport Squadrons, operating originally under RAF 177 Wing, were based at Agartala with a detachment of 194 Squadron at Imphal. With the end of the monsoon these units were withdrawn and replaced by 31 and 62 Transport Squadrons, which also were based at Agartala.¹⁵

Thus, at its inception, CCTF controlled five AAF and two RAF transport squadrons. In November the 4th Combat Cargo Group, equipped with C-46's, arrived to begin an expansion that was to continue until June of 1945. The combat cargo C-46's first operated from Agartala, but in January 1945 they moved to Chittagong from whence they operated so long as they remained under CCTF control. Three squadrons of the 1st Combat Cargo Group went to China on detached service in December 1944; the 1st Squadron remained in China until the end of the war, but the 2d and 4th Squadrons returned to CCTF in January 1945. To replace the detached squadrons, RAF 117 and 194 Transport Squadrons were re-

called from rest areas. Late in December 1944 Royal Canadian Air Force (RCAF) 435 Transport Squadron arrived on the India-Burma scene, followed soon after by RCAF 436 Transport Squadron. During February, by which time the 2d and 4th Combat Cargo Squadrons were back in operation, CCTF was further strengthened by the arrival of the 2d Air Commando Group (including the 317th Troop Carrier Squadron) and RAF 267 and 238 Transport Squadrons. For a time, beginning in late March 1945, the 12th Combat Cargo Squadron of the 3d Combat Cargo Group came under CCTF control for supply of 36 British Division after that unit moved out of the NCAC area into Fourteenth Army's zone. The last reinforcements for CCTF came in May 1945 when RAF 96 and 215 Transport Squadrons arrived in the theater. By this time, however, American units were making preparations to move out. Throughout its existence, CCTF had at one time or another 21 transport squadrons, 11 American and 10 British, under its control, but never this many at any one time. In May, before the departure of the first American units to leave, there were 18 squadrons under the command simultaneously, though two of them had not yet begun operations.¹⁶

The withdrawal of AAF units of CCTF began in May 1945 after the capture of Rangoon. The 317th and 319th Troop Carrier Squadrons of the two Air Commando groups moved to Assam, where they took over air supply operations in the NCAC area,* and the 12th Combat Cargo Squadron was restored to Tenth Air Force control. On 15 June 1945 the 4th Combat Cargo Group was withdrawn from CCTF and assigned to the India-China Wing, Air Transport Command (ICW ATC). On 25 June the headquarters and the 2d and 3d Squadrons of the 1st Combat Cargo Group were also assigned to ICW ATC. The 1st Squadron of this group had been in China since December 1944; the 4th Squadron remained in east Bengal for the remainder of the war and continued air supply operations in south Burma for most of the period. The

¹⁶ See above, p. 36

AAF detachment of CCTF Headquarters was also disbanded as of 25 June. Thereafter CCTF Headquarters was entirely British and coincided with Headquarters 232 Group, Transport Command, RAF; thus it continued to function until after the surrender of Japan.¹⁷

Like most commands in CBI, that of CCTF was beset with complications. For American units the chain of command was complex enough, though not comparable to the complexity that beset the RAF units. Operationally, the American squadrons obeyed a chain of command that passed through their group headquarters (317th and 319th Troop Carrier Squadrons were united into the 1st Provisional Troop Carrier Group in early 1945) to CCTF Headquarters. From CCTF this operational chain of command ran to EAC, thence to Air Command, Southeast Asia (ACSEA), and to the Supreme Allied Commander, Southeast Asia Command (SEAC), Admiral Lord Louis Mountbatten. The RAF and RCAF transport squadrons were assigned to various mobile transport wings that operated directly under CCTF. Generally these wings controlled squadrons in a certain area (for instance, in February 1945, 341 Wing controlled British transport units on the Imphal Plain, 900 Wing those in the Comilla area), and when a squadron changed its base it came under another wing. Eventually three of these mobile wings were in operation under CCTF. Above the wing level, the operational chain of command for British units was like that for the AAF squadrons: CCTF-EAC-ACSEA-SEAC.

The administrative chain of command for the American groups in CCTF was directly to AAF IBT. Administration of the RAF units was much more difficult. By way of explanation, it should be noted here that the RAF group was a command of much greater importance than the AAF organization of the same name, organizationally it corresponded with an AAF numbered air force, and in strength it compared with an AAF wing of World War II vintage. When

¹⁷ Wing RAF passed out of the air supply picture soon after the activation of CCTF.

CCTF came into existence, three RAF groups became involved in the administrative control of its British components. Since all RAF transport squadrons were assigned to RAF Transport Command, which had its headquarters in London, control of promotions, records, etc. for the RAF squadrons in CCTF was exercised by 229 Group, the highest Transport Command headquarters in India. This headquarters was 2,000 miles away from CCTF bases. Many reports had to be made directly to London, and this led to much extra work, because EAC and ACSEA also required reports, but in different form. This duplication of clerical effort and the time consumed in correspondence between India and England put a great burden on RAF squadron commanders, their staffs, and, especially, their clerks.

The complications of RAF administration did not end with 229 Group and Transport Command. RAF tactical squadrons on the Burma front operated either under 221 Group, which controlled operations over central Burma, or 224 Group, which had the same function in the Arakan, after the disbandment of Third TAF. These groups were responsible for services (mainly supply) for all RAF units within their respective geographic areas. Since British transport squadrons were based in both group areas, they depended upon one or another of these groups for supply services. Thus the RAF components of CCTF were responsible to CCTF-EAC-ACSEA-SEAC, 229 Group-Transport Command, and 221/224 Group for various phases of their activities.

This was an almost intolerable state of affairs. Separation of administrative and operational control was probably unavoidable in an Allied theater, but the division of administrative control led to endless complications, misunderstandings, frustrations, and recriminations. After much correspondence back and forth with London and ACSEA, and after 221 and 224 Group Headquarters had moved into Burma, the British component of CCTF Headquarters finally succeeded in having itself constituted as 232 Group, Transport Command, RAF,

in April 1945 Thus it was enabled to exercise full administrative control over the British transport squadrons in CCTF. At the same time, however, it became responsible for supply services to tactical organizations within its assigned geographical area. Since 232 Group was no better prepared to provide these services to tactical squadrons than 221 and 224 Groups had been to provide them for transport squadrons, the change was not altogether for the better. This solution of the problem did remain in effect, however, until after the end of the war.¹⁸

Japanese Defeat in Central Burma

The Allied advance. As noted earlier in this chapter, Fourteenth Army had reached and crossed the Chindwin in a number of places by 1 December 1944, and other crossings were soon to follow. The next step was to clear the area north of the big bend of the Irrawaddy and west of Mandalay. Allied commanders hoped, and at one time expected, that the Japanese would make their stand in this area and thus permit an early decision in the Burma campaign. Each corps of Fourteenth Army had a part. IV Corps, having crossed the Chindwin in the Sittaung vicinity, reached Oil Indaw on 11 December, made contact with 36 British Division as that unit advanced south from the NCAC area, and by 20 December had taken Wuntho and Kawlin. XXXIII Corps, after crossing the Chindwin at Kalewa, moved eastward through Pyingang and Kabo; Ye-U fell on 3 January 1945, Shwebo on the 10th. On 14 and 15 January XXXIII Corps' 19 Division established bridgeheads across the Irrawaddy at Thabeikkyin and Kyaukmyaung, north of Mandalay; other elements moved against Monywa, which fell on 22 January. During the last week of the month the Japanese launched strong but unsuccessful counterattacks against 19 Division's bridgeheads.

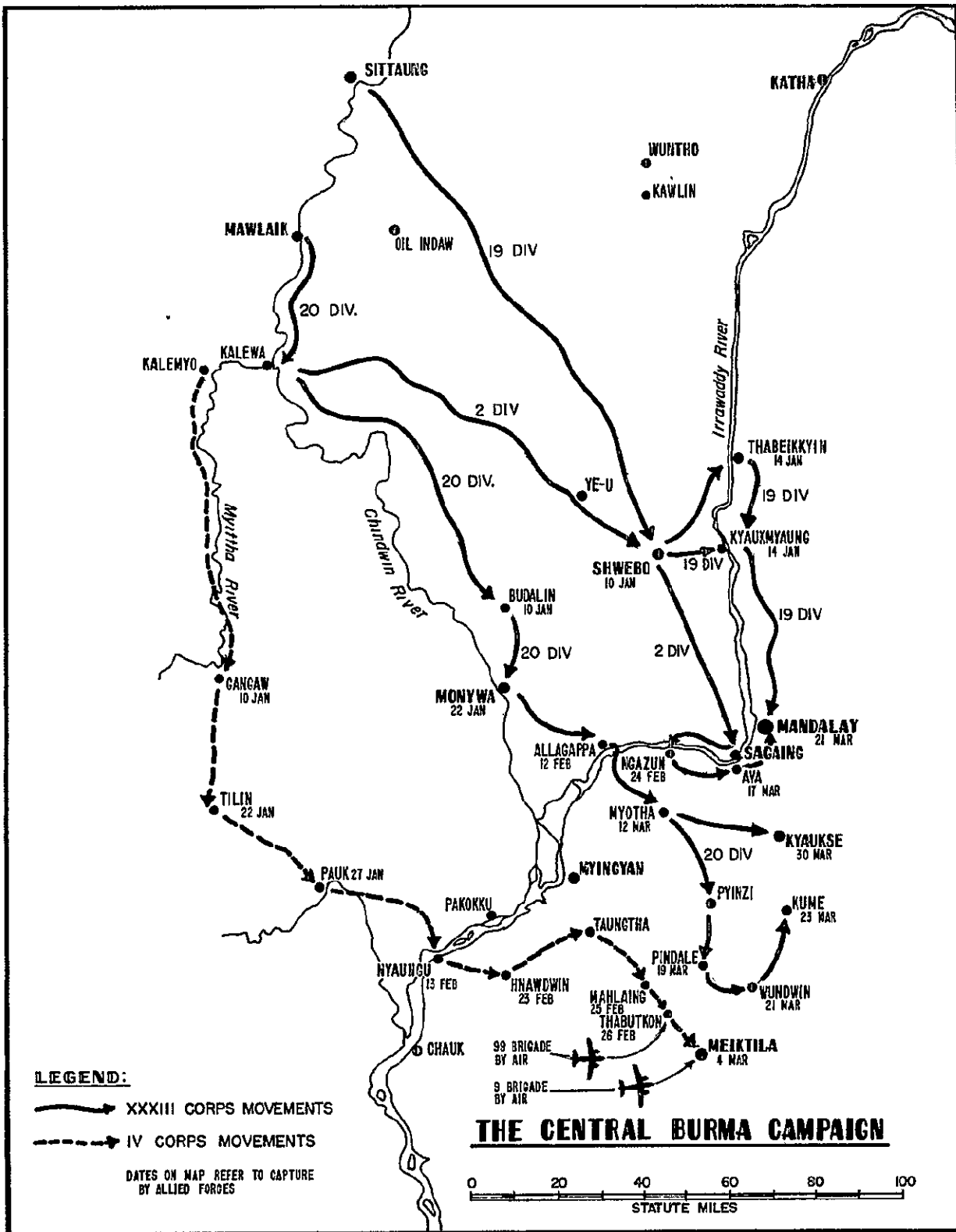
Before the end of December it was evident that the Japanese defense of the territory west and north of the Irrawaddy was merely a delaying action. Lt. Gen. Sir William Slim, Fourteenth Army commander, determined

upon a maneuver designed to bring the Japanese to bay and force a decisive battle. The IV Corps units across the Chindwin were assigned to XXXIII Corps, IV Corps, using divisions that had marched down from Imphal, moved southward from Kalemyo through the Myittha Valley toward Pakokku and Chauk. Before Gangaw the Japanese offered strong resistance to this drive but, not realizing that the force they faced was a major part of Fourteenth Army, during the first weeks of February they continued to throw their main strength into the counterattacks north of Mandalay.

While the battle north of Mandalay continued, 20 Indian Division on 12 February effected a crossing of the Irrawaddy west of Mandalay at Allagappa, 2 British Division, under heavy fire, crossed at nearby Ngazun 12 days later. The Japanese, who believed that the crossings north of Mandalay were the work of IV Corps, now decided that the XXXIII Corps crossings west of Mandalay were the main Fourteenth Army effort. Ordering nine and one-half divisions into the Mandalay-Meiktila area, the Japanese commander attempted to wipe out the Allied bridgeheads south of the Irrawaddy. The fighting here, which went on from 16 through 27 February, was as heavy as anywhere in Burma during the war.

In the meantime the veteran 7 Indian Division of IV Corps made its crossing of the Irrawaddy at Nyaungu, between Pakokku and Chauk, with feints at these two points to divide the Japanese defenders. The feints did not prevent stiff Japanese opposition to the crossing, but within a week 7 Division's bridgehead was secure. Then 255 Indian Tank Brigade and two mechanized brigades of 17 Indian Division crossed at Nyaungu. In terrain that permitted maneuver, these units broke out to the east, took Taungtha on 24 February, Thabutkon airstrip (where reinforcements were received)* on the 26th, reached Meiktila on the 28th, and occupied the last-named city and its airfield by 4 March, after killing more than 2,000 Japanese.

*See below, pp. 105-6.



Map 13

The Allied capture of Meiktila cut the communications of the Japanese divisions in the Mandalay area and made it imperative that the Japanese commander of the Burma Area Army, Lt. Gen. Kimura, use troops from Mandalay in an effort to eliminate the IV Corps threat to his rear. Unfortunately for Kimura, his forces about Mandalay had been seriously weakened by their unsuccessful counterattack against XXXIII Corps' beachheads, and Allied troops were taking the offensive against Mandalay. Nineteen Division moved south down the Irrawaddy on the east bank while 2 Division moved upriver from its beachhead near Ngazun. The Japanese trapped in Mandalay offered fierce resistance but, caught between the Allied divisions, they were destroyed and the city cleared by 20 March. While 2 and 19 Divisions were taking Mandalay, 20 Division marched southeast from Allagappa and by 30 March had taken Wundwin, Kume, and Kyaukse on the railroad between Mandalay and Meiktila.

During the last stages of the battle for Mandalay, the Japanese were making a desperate attempt to retake Meiktila. Their first effort in this battle was successful, Taungtha fell to an attack from the north, severing ground communications between 17 Division at Meiktila and the corps bridgehead at Nyaungu. Because 17 Division and 255 Tank Brigade were supplied by air, loss of land communications was not overly serious, but it did prevent the movement of reinforcements overland. However, 9 Brigade of 5 Indian Division was flown into Meiktila, though the transports had to land amidst artillery and small arms fire. After the reinforcing brigade had arrived, the Japanese pressure mounted until it was necessary to close Meiktila Airfield for the last ten days of March, but airdrops of supplies kept the Allied forces in action. By the end of March the counterattack at Meiktila had failed, Taungtha was again in Allied hands, and the main strength of the Japanese armies in Burma had been broken.¹⁹

Air supply of the central Burma campaign As of 1 January 1945, CCTF had ten squadrons of transport aircraft available for supporting the Allied advance, and the arrival of 436 Squadron RCAF during the month brought the total up to eleven. Four of these squadrons, AAF 3d Combat Cargo, RCAF 435 and 436 Transport, and RAF 194 Transport were based on the Imphal Plain at Imphal Main, Tuliha, and Kangla. At Hathazari, near Chittagong, was RAF 117 Squadron, which devoted most of its efforts to supplying XV Corps in the Arakan. Two RAF squadrons, 31 and 62, were at Comilla, and the C-46-equipped 4th Combat Cargo Group was at Agartala, from whence it was soon to move to Chittagong. Three squadrons of the 1st Combat Cargo Group were on detached service in China and therefore not available; one of these, the 1st, would remain in China for the rest of the war, but the 2d and 4th Squadrons would return to India in time to take part in February operations. The 319th Troop Carrier Squadron was on detached service with Tenth Air Force,* but it would soon return to CCTF control.²⁰

CCTF transports dropped supplies to leading or isolated elements of Fourteenth Army throughout the central Burma campaign, but the great bulk of material was delivered to forward airfields. Some of these were former Japanese fields hastily repaired; others were as hastily constructed on suitably level sites. As of the first days of 1945, a few supplies were still being landed at Tamu, at the head of the Kabaw Valley, and large-scale stockpiling continued at Yazagyo and Indainggale. Also in operation by 1 January were fields at Taukyuan, south of Kalemmyo, and at Kawlin, southwest of Katha in north central Burma. Other forward fields were opened to transport aircraft as the ground advance moved on, Ye-U and Indaw on 10 January, Tabin-gaung on the 13th, and Onbawk on the 14th. On 20 January the former Japanese field at Shwebo became available in the north, and Budalin was opened near Monywa.

*See above, pp 49-50

Fourteenth Army policy was to locate airfields approximately 50 miles apart along the line of advance of each corps. Corps were instructed to select sites and immediately to inform army headquarters of the location. Decision as to whether or not to prepare an airfield at the proposed site was made jointly by the supply plans section of army headquarters, which decided whether the strip was needed for supply purposes, and air plans section of 221 Group, which based its decision on whether or not the proposed strip could be adequately protected by fighters. Advice was sought from the army's engineering section and from forward representatives of CCTF. If the decision was to proceed with construction, the appropriate corps was so informed. In consultation with CCTF representatives, 221 Group decided when the new strip could be opened to transport landings, arranged for air cover beginning that date, and so advised CCTF and the Commander Army Air Transport Organization (CAATO).^{*} CCTF inspected the new field and made test landings before regular supply loads were scheduled.

Forward airfields in Burma were, generally, of two types. A single strip, usually cut from dry rice paddies, could be made ready in as little as 42 hours if the site was favorable. These single strips ordinarily had an unloading bay at one end and could accommodate up to 25 or 30 transports an hour for a short time. If it was anticipated that a forward airfield would be in use for a considerable length of time and for the reception of large quantities of supplies, two parallel strips were prepared. Each of these ended in an unloading bay, and some 30-40 transports could be accommodated on the ground at the same time. Fields captured from the Japanese were usually made into this type of landing ground. With two runways and greater unloading space available, these strips under ideal conditions could accommodate up to 350 landings per day. Usually it was the unloading facilities rather than

the runways that determined the capacity of forward landing grounds.

On the larger fields, one runway was used for takeoffs, the other for landings; transports landed in one direction and took off in another. Such fields had towers that controlled traffic by R/T, with Very Pistols and Aldis Lamps available in case of radio failure. Telephone lines connected the control tower, dispersal areas, and the headquarters of the unloading unit, making possible efficient control of the flow of traffic. For night landings, electric runway lights were installed.

On the single runway fields, transports landed toward the unloading bay and took off in the opposite direction in order to avoid unnecessary taxiing. The same type of control facilities (when available) were used on these strips as were used on the larger ones. Being hastily constructed, the strips and bays had many obstructions, and it was imperative that these be adequately marked.

The major problem, on all forward fields, was dust. During busy periods, suffocating dust clouds rose 300 feet into the air. This pillar of dust was of some help to pilots in identifying their destination, but it added greatly to the hazards of landing. Some pilots declared, no doubt facetiously, that they taxied to the unloading bays on instruments. Used engine oil and calcium chloride were both tried as dust suppressors, but on a much-used strip they accomplished little. When a body of water was conveniently near, it was sometimes possible to set up an effective sprinkling system, but at most strips dust was an ever-present and unavoidable nuisance until the coming of the wet monsoon.

Ram settled the dust, but heavy downpours left the ground too muddy for landings and takeoffs. Rains were infrequent before April—the first three months of the year are part of the dry season in Burma—but a heavy downfall on 6 January closed all the Allied landing grounds in central Burma for four days, making it necessary to drop all the supplies delivered. This was

^{*}See below, p 124

a grim warning of what could be expected at the beginning of the wet monsoon.

The AAF provided seven Army Airways Communications System (AACS) teams for flight control at forward airfields in central Burma. These teams earned praise from all who commented on their work. Additional control personnel, however, were needed because after January there were always more than seven forward airfields in operation. CCTF formed impromptu teams out of the communications personnel of its American squadrons and overcame the shortage of airfield control personnel until June. The RAF had very few control personnel in India, and no suitable portable communications equipment. This led to hardships in June, when American personnel withdrew from central Burma.²¹

As noted above, supply dropping was the normal means of supply of the forward elements of Fourteenth Army as they raced across central Burma or fought their way down the Myittha Valley. The techniques used were those which had been proved by long practice, and when bad weather in January closed down all forward fields for four days, dropping kept the ground forces adequately supplied. Some difficulty was encountered in dropping to 19 Division, which moved eastward so much faster than had been expected that predesignated DZ's were often passed by and new ones opened farther forward. In most cases pilots were able to find the new DZ's by following the direction of the advance from the last known supply target.²²

Enemy action did not seriously interfere with air supply operations during January 1945. RAF fighters had moved forward into Burma, and patrols protected most landing fields. The only success the Japanese Air Force enjoyed came on 12 January when a fighter sweep destroyed one transport on the ground and another in the air at Onbauk, then shot down two gasoline-laden RCAF C-47's and damaged another at Shwebo. For a short time after this attack, all fields in north central Burma except Ye-U were closed to daylight transport landings, and fighter defense of Ye-U was

increased. Night landings delivered the supplies needed at other fields. The Japanese made no more successful transport interceptions, and other forward landing fields were reopened for daylight operations before the end of the month.

Transports dropping in the Gangaw area were occasionally fired upon by Japanese troops, but during January ground fire was a serious problem only over the bridgeheads north of Mandalay. Small arms and automatic weapons fire on supply transports was countered by the cooperation of all arms. The transports assigned to drop to the bridgeheads landed at Tabingaung for briefing on danger zones and coordination with fighter escort. When dropping began, Allied ground troops opened machine-gun fire on Japanese strong points and the fighters that accompanied the transports strafed automatic weapons positions. These measures were successful in protecting the transports from ground fire.²³

During January, with fewer than 230 transports assigned, CCTF delivered more than 39,000 tons of supplies to Allied troops in Burma. In total weight of cargo and personnel carried, the transports lifted an average of 1,421 tons per day. Most of the supplies delivered went to the Fourteenth Army area, where XXXIII Corps received the lion's share. Gasoline delivered to forward bases of RAF 221 Group amounted to more than 3,000 tons.²⁴

During February, three new forward airfields were opened in the IV Corps area, five in the XXXIII Corps area. Supplies poured into these fields as the bridgeheads across the Irrawaddy were consolidated and stocks built up for the drives on Mandalay and Meiktila. As of 1 February, CCTF had six British and eight American squadrons to deliver these supplies. The four C-46 squadrons of the 4th Combat Cargo Group had moved to Chittagong, where they were nearer their supply targets in central Burma. The 3d Combat Cargo Squadron, 435 and 436 Transport Squadrons RCAF, and 194 Squadron RAF remained on the

²⁴See Chart I

CHART I

Combat Cargo Task Force Operations, October 1944 - May 1945*

| Month | Average aircraft assigned | Average aircraft in commission | Percent of aircraft in commission | Total flying hours | Average hours per aircraft assigned | Average hours per aircraft in commission | Short tons of supplies delivered | Passengers carried | Casualties evacuated |
|----------|---------------------------|--------------------------------|-----------------------------------|--------------------|-------------------------------------|--|----------------------------------|--------------------|----------------------|
| October | 131.5 | 122.5 | 93.1 | 6,849 | 52:06 | 55:48 | 8,214 | 8,052 | 4,475 |
| November | 163.4 | 137.1 | 83.8 | 11,095 | 67:42 | 80.54 | 12,954 | 14,396 | 5,624 |
| December | 209.7 | 167.1 | 79.7 | 19,196 | 91:04 | 114:54 | 23,661 | 33,617 | 8,970 |
| January | 228.5 | 187.8 | 82.1 | 32,235 | 141:04 | 171:36 | 39,472 | 33,939 | 7,698 |
| February | 306.4 | 250.2 | 81.7 | 48,538 | 158:24 | 193:54 | 54,085 | 36,990 | 7,189 |
| March | 353.6 | 293.2 | 82.1 | 63,692 | 180 06 | 217:12 | 65,774 | 48,899 | 11,579 |
| April | 393.6 | 325.3 | 82.7 | 68,164 | 173:12 | 209 30 | 65,963 | 69,655 | 11,916 |
| May | 437.4 | 354.0 | 80.9 | 72,441 | 165:36 | 204.36 | 58,992 | 57,019 | 9,149 |

*These statistics are the best available. No claim to exact accuracy is made, but the errors are slight. As a whole, these figures do give an accurate analysis of the command's operations for the period.

Imphal Plain, 31 and 62 Squadrons remained at Comilla, and 117 Squadron was still at Hathazari. The 2d and 4th Combat Cargo Squadrons, back from China, were stationed at Dohazari, but their operations were handicapped for some time because they had been required to leave their maintenance equipment in China. The 319th Troop Carrier Squadron of the 1st Air Commando Group was based at Asansol, but was not taking part in operations as the month began. There were few changes of station during February, 31 Squadron moved from Comilla to Hathazari, and detachments of the 319th and newly-arrived 317th Troop Carrier Squadrons, formed into the 1st Provisional Troop Carrier Group, moved to Palel to fly reinforcements to the Meiktila area.

CCTF strength in February had grown to an average of 306 transports assigned. In delivering more than 54,000 tons of supplies, the command averaged more than five and one-half hours per day per transport assigned. The two corps of Fourteenth Army received 1,500 tons more than commitments obligated the transport command to deliver. In achieving this performance, some of the CCTF squadrons averaged more than 200 flying hours per month per assigned aircraft, and the command as a whole averaged more than 200 hours per month per transport in commission.²⁵

The most significant event of February was the beginning of the drive on Meiktila,* in which air transport played an important part. CCTF established an advance headquarters that accompanied the ground forces and directed Air Commando close support as well as air supply operations. Two bulldozers accompanied the troop column so that work on captured airfields would not be delayed. In preparation for the move, gliders loaded with construction equipment had been towed over the Chin Hills to the forward landing ground at Sinthe, so that possible bad weather over the mountains would not hinder their delivery in case they were needed. At Palel the aircraft and crews of the 1st Provi-

sional Troop Carrier Group were prepared to deliver reinforcements when they were called for.

When 17 Indian Division and 255 Indian Tank Brigade reached Thabutkon on 26 February, they found an airstrip in fair condition; with the bulldozers available it was made ready for transport landings by the morning of the 27th. The strip had drawbacks, it was not fit for night operations, the runway was short, and the area available for unloading was very limited. However, there was no plan for long-term use, and speed was necessary if enough troops were to be available for the assault on Meiktila. The troop carrier group received orders on the night of 26 February to begin flying 99 Brigade of 17 Division into Thabutkon on the morning of the 27th.

A glider loaded with flight control personnel and equipment was released over Thabutkon at 0940 of 27 February, a radio control tower was in operation by 1030. The first transport touched down at 1107, and by 1815 the field had accommodated 63 landings and 62 takeoffs. Enemy mortar fire that struck within 100 yards of the strip did no damage, but one of the Air Commando C-47's was destroyed, without injury to crew or passengers, when it overshoot the runway on a downwind landing. On 28 February, which was enlivened by the capture of a Japanese sniper on the field, the two squadrons of the 1st Provisional Group put 108 flights into Thabutkon with 99 Brigade personnel and equipment, and seven RAF transports landed supplies. Flights into Thabutkon reached their greatest intensity on 1 March. On that date the first landing was made at 0645, by 1015 no less than 116 C-47's had landed, and 107 had taken off. Before the approach of darkness halted operations for the day, 208 planes made use of the field. On 2 March the Air Commandos delivered the last men of 99 Brigade, but supply-landing flights by other CCTF units continued through 3 March, on which date the field was closed.

*See above, p 99

In five days of operations, 672 sorties landed on Thabutkon and 671 took off, all during daylight hours. The 1st Provisional Group, reinforced by 10 C-47's of the 1st Combat Cargo Group, delivered 99 Brigade and its equipment with 358 trips; the remaining 314 trips brought in supplies for 99 Brigade and other Allied units. The efficiency of the troop carrier crews and of the ground personnel engaged in unloading cargo at Thabutkon was outstanding. The aircrews averaged 12 hours a day flying time during the four days of the troop movement; the transports averaged only 12 minutes on the ground between landings and takeoffs. Transports loaded only with troops and their normal weapons turned around at Thabutkon in four minutes; some of the transports carried two jeeps, and 20 minutes were required to unload these. One aircraft, with loads consisting only of troops, was on the ground only 45 minutes in the course of three round trips to Thabutkon.

A British army report on the fly-in of 99 Brigade applauded the CCTF performance, but it also voiced some criticisms. Army planners complained that CCTF Headquarters had refused to forecast the number of flights available for the fly-in (presumably because Fourteenth Army had the responsibility for determining whether priority would go to troop movement or supply) until army requirements had been stated, and then rejected the army statement as excessive. There was also complaint that the ground forces were not given adequate and accurate information on the payload of transports; it was even suggested that CCTF gave the ground force planners a figure lower than the reality in order to compensate for anticipated army cheating. The ground force report also took note of the poor scheduling that put more than 100 sorties into Thabutkon in less than four hours on 1 March; only herculean labors had prevented complete saturation of the field, and at one time 22 transports were awaiting their turn to land while others on the ground were seeking an opportunity to take off. The report suggested

that racing and jockeying for position on the part of eager but undisciplined pilots may have been a factor in upsetting schedules and congesting the air over the field.²⁶

Meiktila Main Airfield was captured on 3 March; this event made it possible to close the temporary strip at Thabutkon and fly troops and supplies to an all-weather field (by Japanese standards) much nearer the fighting. In fact, before the fighting about Meiktila had ended, the airfield was literally a part of the front lines; CCTF crews found themselves in far more danger from Japanese artillery, mortar, and small arms fire than from fighters or antiaircraft guns.

Two transports, one loaded with ammunition, the other with rations, landed at Meiktila on the afternoon of 3 March; the surprised Japanese had had no time in which to carry out the ditching and demolitions that had denied immediate use of airfields captured north of the Irrawaddy. Supply landing began in earnest on the morning of 4 March, and for the next ten days supply aircraft landed and took off regularly despite increased Japanese pressure. By nightfall of 14 March, 923 sorties had landed at Meiktila; the transports brought 242 loads of rations, 191 loads of ammunition, 259 loads of POL, 44 loads of reinforcements (about 1,100 men), and 187 loads of other materials, including barbed wire, piping, bridging, beer, and mail.

Allied troops in the Meiktila area soon had their hands full holding off the frequent and increasingly strong Japanese counterattacks. Each night infiltrating snipers took up positions on the airfield, and no landings could be made the following morning until the RAF regiment in charge of the field had flushed the snipers out. One AACCS man killed a Japanese with a carbine shot from the airfield control tower. By 14 March eleven transports had been damaged, most of them lightly, by Japanese small arms and artillery fire. Since Japanese strength in the Meiktila area was increasing as more troops moved south from Mandalay, IV Corps Headquarters asked CCTF to fly in another brigade; 9

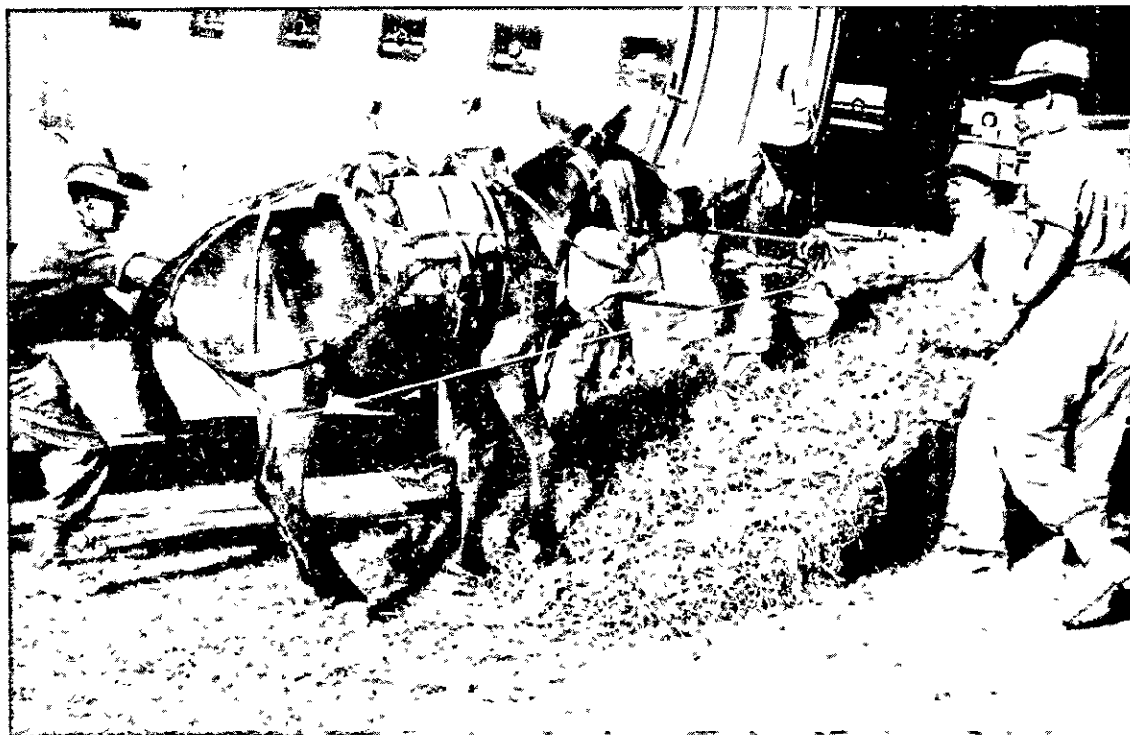


Figure 10 Loading Mule aboard C-47



Figure 11. Mules aboard C-47 Ready for Flight to Burma

Brigade of 5 Indian Division was on hand at Palel, and 1st Provisional Troop Carrier Group was instructed to deliver it to Meiktila.

The fly-in of 9 Brigade began at 0715 on the morning of 15 March; the first six troop-carrying C-47's to reach Meiktila had to circle for 10 minutes until supply aircraft took off and cleared a space for troop disembarkation, but all 27 transports in the first wave were able to land. Japanese artillery fire encountered on the ground damaged one C-47 that after hurried repairs was able to take off at 1435. In the meantime the rest of the first wave had returned to Palel, and at 1330 a second serial of 26 C-47's left there for Meiktila. While in flight, pilots of this serial received orders to land at the forward landing field at Nyaungu and wait there until Japanese infiltrators had been cleared off the field at Meiktila. Four pilots who did not receive the message went on into Meiktila and landed under fire without damage. The other 22 transports waited at Nyaungu for an hour and a half, then were cleared to proceed with their mission.

The first wave on the morning of 16 March was also diverted to Nyaungu; when it became evident that Meiktila could not be used before afternoon, the troops were disembarked at Nyaungu so the transports could return to Palel. A second wave left Palel at 1400 and went into Meiktila under fire, one C-47, fortunately loaded with jeeps rather than troops, was destroyed by two direct artillery hits. Counting those which unloaded at Nyaungu, 54 flights were completed on 16 March.

On the morning of 17 March takeoff from Palel was again delayed until infiltrators could be cleared from Meiktila Airfield, but when the transports did arrive they encountered only scattered and inaccurate artillery fire. The afternoon mission landings were accomplished without serious difficulty, and 10 transports flew from Meiktila to Nyaungu and back to retrieve some of the troops left at Nyaungu the previous day. The day's effort resulted in the delivery at Meiktila of 49 loads from

Palel, 10 from Nyaungu. The fly-in of 9 Brigade was completed on 18 March with 54 sorties from Palel to Meiktila, and 15 round trips between Meiktila and Nyaungu.

With 27 C-47's, 317 and 319 Troop Carrier Squadrons had in four days delivered more than 4,000 men and their equipment (including jeeps) to Meiktila. This was accomplished by 210 sorties from Palel plus 25 round trips between Meiktila and Nyaungu. The average distance flown per round trip from Palel to Meiktila was 500 miles, and the average time consumed was four hours. One transport was completely destroyed by Japanese action; five others were damaged, but rapid repairs kept them in operation. This troop movement was a vital part of the central Burma campaign, because the arrival of 9 Brigade gave the Allied troops in the Meiktila area the added strength they needed to withstand the desperate Japanese counterattacks.

Regular air supply flights into Meiktila continued during and for several days after the fly-in of 9 Brigade. In addition to the flights of the 1st Provisional Troop Carrier Group, 339 flights by other CCTF units landed rations, ammunition, barbed wire, and other equipment at Meiktila between 15 and 21 March. During the same time, an additional 72 flights dropped supplies to patrols and larger formations isolated from the airfield. Throughout these six days, the runway and unloading bays were coming under heavier and heavier Japanese fire. A sizable number of transports were damaged by this fire; the exact number cannot be determined because the sources disagree. It is certain that two C-47's and one RAF C-45 (not attached to CCTF) were destroyed on the ground during the battle, and that at least 19 C-46's and C-47's were damaged. Seven C-47's were damaged in a few minutes on 20 March when concentrated artillery fire swept the unloading area; heroism on the part of the British-Indian unloading crews, who suffered many casualties, made it possible for the transports to get off the ground quickly and escape heavier damage. One of the significant features of the air supply operations at

Meiktila was the fact that C-46's and C-47's, though damaged, were repaired and restored to action so quickly that the damage had little effect on operations.

By 21 March enemy fire on Meiktila had become so constant, and the indications of a full-scale Japanese counterattack were so strong, that it was necessary to close the field until conditions should improve. The major attack on the airfield took place on the night of 22/23 March; the Japanese failed to drive the Allied troops away, but small groups dug themselves in on the field and held their ground in typical Japanese fashion. As a result, there were no transport landings at Meiktila for the period 22-30 March, inclusive. A light plane strip had been prepared some distance from the main airfield, and from there Air Commando liaison aircraft carried casualties back across the Irrawaddy.

Air supply could not halt because the airfield was closed. Airdropping was not as efficient as airlanding, and reinforcements could not be delivered by drop, but the move of 9 Brigade to Meiktila had supplied the added manpower needed to defend the Allied positions, and airdropped supplies were sufficient to keep the British-Indian forces in action. From 22 March through the remainder of the month, CCTF transports completed 549 supply-dropping trips to Meiktila, delivering more than 600 tons of rations, more than 500 tons of ammunition, more than 400 tons of POL, and nearly 100 tons of other material, mainly barbed wire and mail. On 31 March a single RAF transport landed at Meiktila on a runway littered with dead Japanese; regular supply landings were resumed on 1 April Meiktila, the crucial Allied objective in central Burma, was finally secured; now it was to become the main base for the Allied drive on Rangoon.²⁷

Although the operations about Meiktila were the most dramatic of the air supply accomplishments of March 1945, they were only a part of CCTF's total effort. During the month CCTF controlled 17 transport squadrons (not including the 12th Combat Cargo Squadron, which was temporarily as-

signed to CCTF for the supply of 36 Division) with an average assigned strength of 353.6 aircraft. The chief movement of squadrons during the month was to Akyab. By 31 March 62 Squadron had moved there from Comilla, 194 Squadron from Tulihal, 436 Squadron from Kangla, and 267 Squadron (which had gone into operation on 1 March) from Tulihal. RAF 238 Squadron began operations from Comilla on 14 March and continued there for the remainder of the month. As March ended, two squadrons were based at Dohazari, two at Tulihal, two at Hathazari, one at Comilla, four at Chit-tagong, two (air echelons of 317 and 319 Troop Carrier Squadrons) at Palel, and four at Akyab. Fourteen new forward fields were opened in Burma during the month.²⁸

The central Burma campaign decided the outcome of the war in Burma. Fourteenth Army had destroyed the main strength of the Japanese in the battles around Meiktila and Mandalay and had so disorganized the remaining enemy that rapid pursuit was almost sure to bring final success. The victory had been attained as a result of massive and dependable air supply, and exploitation of the victory depended upon a continuation of air supply on a similar scale. There were, however, two obstacles in the way. First, as Fourteenth Army plunged farther south into Burma, the distance from CCTF bases increased inevitably, as the transports had to fly greater distances, they had to carry more fuel, and the weight of the supplies they could carry was correspondingly reduced. Secondly, the wet monsoon was due in a few weeks. Clouds were beginning to build up over the Chin Hills during the Meiktila fighting; the weather would worsen steadily until the rains came in all their fury. The problem of distance was overcome by the third Arakan campaign, which made airbases available at Akyab and on Ramree Island. The wet monsoon came early in 1945, but a rapid Fourteenth Army advance, a subsidiary airborne-amphibious assault on Rangoon, and, above all, the skill and courage of transport crews made it possible to achieve the objectives of the offensive

before weather reduced air supply below the minimum needs of the ground forces.

The Third Arakan Campaign

Surface movements. At Mandalay, Fourteenth Army was so far from Imphal and from the Comilla-Chittagong area that transports from those bases were at the limits of their efficient range (roughly 250 miles) when they carried supplies there. Meiktila was just as far from Chittagong and farther from Imphal. It was essential that CCTF have bases nearer the scene of operations as Allied ground forces moved south, and Akyab and Ramree Islands off the Arakan Coast offered the best possibilities. Thus necessity for developing airfields within efficient range of south-central Burma made the third Arakan campaign necessary.

SEAC Headquarters issued orders for the new Arakan campaign on 8 November 1944. A combined headquarters of XV Corps, RAF 224 Group, and 64 Force, Royal Navy, was established for planning and directing the operation. At the beginning of the campaign, XV Corps had 25 Indian Division on the Mayu Peninsula, 81 West African Division in the Kaladan Valley, and 82 West African Division in the Kalapanzin Valley, all in contact with the Japanese. In reserve were 26 Indian Division, 50 Indian Tank Brigade, 22 East African Brigade, and 3 Commando Brigade. For air support 224 Group deployed four RAF fighter wings and exercised operational control of the AAF B-25's of the 12th Bombardment Group. Additional air support could be obtained from Strategic Air Force Liberators if needed. Force 64 consisted of two destroyers and a motley collection of minesweepers, gunboats, Landing Ships Medium (LSM), and Landing Ships Tank (LST). The LSM's and LST's were available only because they were in such poor condition that it had been impossible to send them to the Mediterranean when other amphibious resources of SEAC had been withdrawn. For bombardment purposes, other units of the British Far Eastern Fleet, including battleships, could be called upon.

Supply of XV Corps, insofar as possible, was to be by land and sea. Troops on the Mayu Peninsula could be supplied by road from Chittagong or by water, and water supply was possible anywhere along the coast south of Akyab. Supplies for forces in the Kalapanzin Valley could move by land. Air supply was necessary, however, for the troops in the Kaladan Valley until they made contact with naval forces along the coast, and emergency supply drops were required whenever any sizable body of troops moved any distance away from navigable waters. From Hathazari 117 Squadron was to devote most of its strength to supply of XV Corps, and other units of CCTF could be called upon in an emergency. XV Corps' initial allocation of air supplies was 130 tons per day.

The Japanese headquarters primarily concerned with defense of the Arakan was that of Twenty-eighth Army, which was also responsible for defense of the Irrawaddy oil fields. In the Arakan, the Japanese had the overstrength 54th Division. Because there were so many points to defend along the coast, Japanese units were strung out from Taungup to above Akyab; rapid concentration was impossible in the Arakan terrain. The Japanese had fairly good roads back of their positions, but a shortage of motor vehicles largely neutralized this advantage. The Japanese 54th Division could expect no help from the Japanese Air Force; it faced an enemy who enjoyed complete command of the air and the sea.²⁹

With such advantages, the Allied offensive, which began on 12 December 1944, made rapid progress, although the Japanese resisted at some points with great skill and greater bravery. Control of the Maungdaw-Buthidaung Road was secured almost immediately as 82 West African Division overran Buthidaung on 15 December. By the day after Christmas the Kalapanzin Valley had been cleared and 25 Division had reached Foul Point at the tip of the Mayu Peninsula. The advance of 81 Division had forced the Japanese to strip the defenses of Akyab, and the port was undefended when 3 Commando Brigade went ashore in

an amphibious assault on 10 January 1945. Having met no opposition, the commando brigade was quickly ready for another assault, and it landed on the Myebon Peninsula on 12 January. There resistance was heavy, but Kantha was taken and the Peninsula secured by the 21st of the month. On the same day, 26 Indian Division captured Kyaukpyu, an important airfield site on Ramree Island, by late February the island was cleared of organized Japanese forces.

After the occupation of these points, XV Corps' chief remaining task was to cut off the retreat of the Japanese in the Kaladan Valley. The commando brigade landed near Kangaw on 22 January and there encountered the bitterest opposition of the campaign. Determined Japanese counter-attacks continued for nine days, however, the Allied troops maintained their positions and on 30 January captured the village. In the meantime 81 Division had taken Myohaung, finally clearing the Kaladan Valley, but many of the Japanese had already escaped.

The main objectives of the third Arakan campaign, capturing and making secure airfield sites on Akyab and Ramree Islands, had been accomplished by the end of January. At that time 81 Division and 50 Indian Tank Brigade were withdrawn to India. XV Corps still hoped, however, to trap and destroy the Japanese 54th Division in its remaining positions in the An and Taungup areas. The first stage of this plan was executed on 16 February when 25 Division landed at Ru-ywa against heavy opposition; further steps had to be suspended, however, when the needs of Fourteenth Army in central Burma made it necessary to reduce XV Corps' air supply to only 30 tons per day.

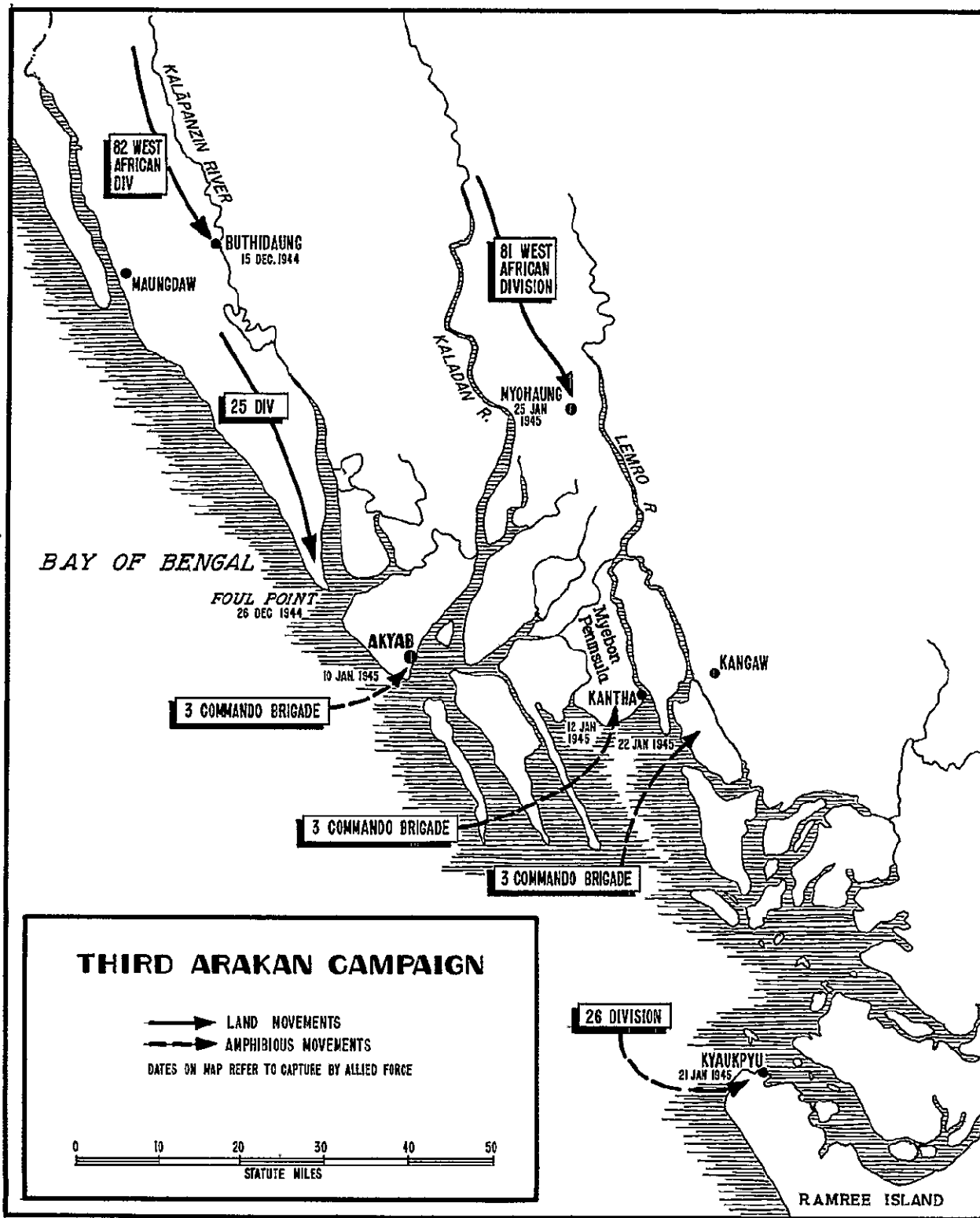
For the remainder of the war, Allied operations in the Arakan were largely harassment. Thrusts from the sea had some value in reducing resistance to Fourteenth Army forces in the Irrawaddy Valley, so landings were made at various points in the spring of 1945, extending to Gwa on 15 May. Sometimes these landings met resistance, but often they were in the nature of fol-

lowing up Japanese withdrawals. After the loss of central Burma and Rangoon, the Arakan was of no value to the Japanese; their problem was not defense, but rather the extrication of their remaining troops.³⁰

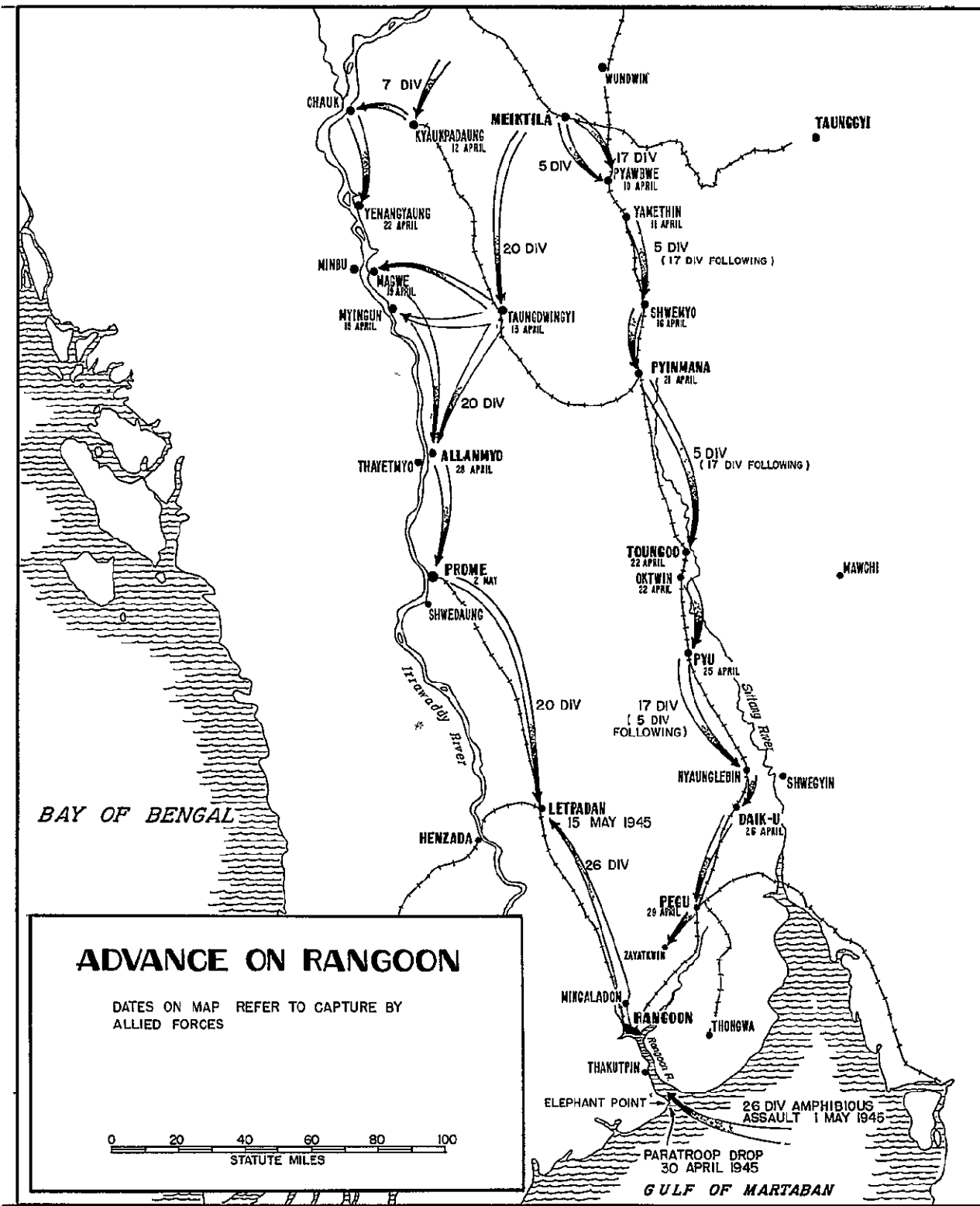
Air supply in the Arakan Air supply in the Arakan was very definitely a small-scale operation as compared to support of Fourteenth Army in central Burma. The troops along the coast below Akyab were largely supplied by sea; even when ground units were some distance inland it was often possible for small craft to reach them by means of one of the many chaungs that made the Arakan a maze of swamps and waterways. It was necessary, however, to supply troops in the Kaladan Valley by air, and air supply of 81 Division was the chief task of 117 Squadron from the autumn of 1944 until after the fall of Myohaung. Air supplies went to other points during emergencies or when troop movement inland had made supply by water impossible.

CCTF commitments to XV Corps ranged from about 2,000 tons per month in October and November 1944 to a high of more than 4,000 tons in January 1945. Through February, however, deliveries were always below commitments to a greater or lesser degree, never amounting to as much as 3,000 tons in one month. In March 1945 the XV Corps commitment was drastically reduced to 1,344 tons, but actual deliveries for the month amounted to more than 1,500 tons. Commitments were cut again in April, and deliveries amounted to 532 tons then and to 790 tons in May. May deliveries were this high only because an unexpected emergency arose in the Sandoway area. Total tonnage delivered to XV Corps by air from 1 October 1944 through 31 May 1945 amounted to only 13,920 tons.

Almost all air supplies for XV Corps were dropped. Airfields were opened during the campaign at a number of points other than Akyab and Ramree Islands, but these strips were intended for casualty evacuation rather than supply landing. Some were suitable for C-47's, but with a very few exceptions transports landed only to take casualties on board.



Map 14



Work on all-weather airfields on Akyab and Ramree Islands was begun as soon as the sites had been secured, but all-weather fields could not be completed in time for use in supporting the drive on Rangoon. For this reason temporary fair-weather strips were established at Mawnubyin on Akyab Island and at Kyaukpyu, on Ramree. CCTF transports made scores of supply landings on these fields, but the great majority of these flights carried men and supplies for the RAF squadrons based there. Even so, CCTF did not deliver more than a fraction of the air force supplies that went into Akyab and Ramree, since one of the great advantages of the new bases was that they could be supplied by sea. It must be emphasized that the airfields on Akyab and Ramree Islands were not forward landing grounds; on the contrary, they were highly important CCTF rear bases for the supply of the advance on Rangoon.

As noted above, four RAF and RCAF squadrons moved to Akyab as soon as the fair-weather field at Mawnubyin was opened; there they came under the control of RAF 341 Wing. All were in operation by 1 April. The fair-weather field at Kyaukpyu was ready in early April, and detachments of 31, 62, and 436 Squadrons commenced operations from there on the 16th of the month. The all-weather Akyab Main Airfield was opened on 16 May, and from it 341 Wing directed 62, 194, and 267 Squadrons until the end of the war. When the all-weather field on Ramree (near Kyaukpyu) was completed about the same time, 342 Wing moved there and took over control of 31, 117, and 436 Squadrons. Ramree Airfield was poorly constructed, and it was all-weather more in name than in fact; it was so subject to flooding that in June the transports based there were frequently unable to take off.¹¹

The Capture of Rangoon

Introduction. The victories at Mandalay and Meiktila had made it militarily possible for Fourteenth Army to move against Rangoon, Burma's chief seaport. The establishment of transport squadrons on Akyab and

Ramree Islands made possible the supplying of large forces south of Meiktila. It was necessary, however, that the advance be made with all possible speed; the wet monsoon was imminent, and the rains would slow movement on the ground and seriously hamper air supply operations. Thus the drive toward Rangoon in April 1945 was essentially a race with the weather; such Japanese resistance as was encountered (and it was strong in some places) was an added handicap to the Allied forces. The outcome of the race was practically a tie, but it put Rangoon in Allied hands and marked the successful conclusion of the Burma campaign. There remained one battle to be fought; however, the Battle of the Sittang Bend* was a desperate Japanese attempt to escape rather than an attempt to reverse the decision already reached.

Ground movements. In the advance on Rangoon, General Slim sent his IV Corps (5 and 17 Indian Divisions) down the railroad from Meiktila. XXXIII Corps (2 British and 7 and 20 Indian Divisions) was ordered to move down the Irrawaddy, clearing both banks of that stream. Basically, IV Corps made the decisive advance, but XXXIII Corps faced the hardest fighting and had a vital role in preventing reinforcements of the railroad corridor from the Irrawaddy area.

XXXIII Corps, after moving from Mandalay across the rear of IV Corps, absorbed 7 Indian Division, which captured Kyauk-padaung on 12 April. Taungdwingyi fell to 20 Division the next day. In the meantime 2 Division had come up against strong enemy defenses at Mount Popa, and these were not reduced until 20 April. Worn out at the conclusion of this battle, 2 Division was flown back to India. While the battle at Mount Popa was fought, 20 Division captured the onetime RAF base at Magwe (19 April), and on 22 April 7 Division overran the oil center at Yenangaung. The life of the Allied soldier became miserable with the beginning of the rains in late April, but growing Japanese disorganization made it

¹¹See below, p. 122.

possible for the advance to continue. Al-anmyo fell on 28 April, Prome on 2 May, and on 15 May XXXIII Corps troops met Allied troops from Rangoon on the Rangoon-Prome Road.

The IV Corps drive began on 30 March with 17 Division in the lead. Pyawbwe was taken on 10 April after hard fighting, and 5 Division leapfrogged ahead to Yamethin, which fell the next day. A strongly-held obstacle was encountered at Shwemyo Bluff, but 5 Division flanked this potential point of delay and continued on to Pyinmana, which was captured on 19 April. Here the airfield was quickly repaired and 5 Division, resupplied, rushed on to Toungoo. Tennant Airfield at Toungoo was taken without a fight (because the Japanese had misplaced their prepared positions), and the town proper was secured by 24 April. At this point 17 Division took the lead, captured Daik-U on 26 April, and plunged on to Pegu where, on 29 April, the wet monsoon broke. Pegu was cleared by 2 May, but movement on the ground had become very difficult. The IV Corps' drive was no longer a dash by mechanized forces; it was reduced to the pace of infantrymen in the mud and water of the rice paddies.

The Fourteenth Army offensive had nonetheless accomplished its purpose, because the Japanese had evacuated Rangoon. To insure the occupation of the city, a parachute battalion was dropped at Elephant Point on 30 April, and an amphibious force landed below Rangoon the next day, but few Japanese were to be found.*³²

Surface LOC to central Burma. During the April advance, every effort was made to use surface lines of communication for supply of the Allied forces in Burma. The route from the railhead at Dimapur through Imphal and Kalewa had been improved; the roadbed had been leveled to some extent and drained, and a four-inch pipeline had been completed from Dimapur to Imphal. The pipeline delivered 3,500,000 gallons of POL (approximately 14,000 tons) to Imphal each month and was being extended to Tamu. The pipeline relieved con-

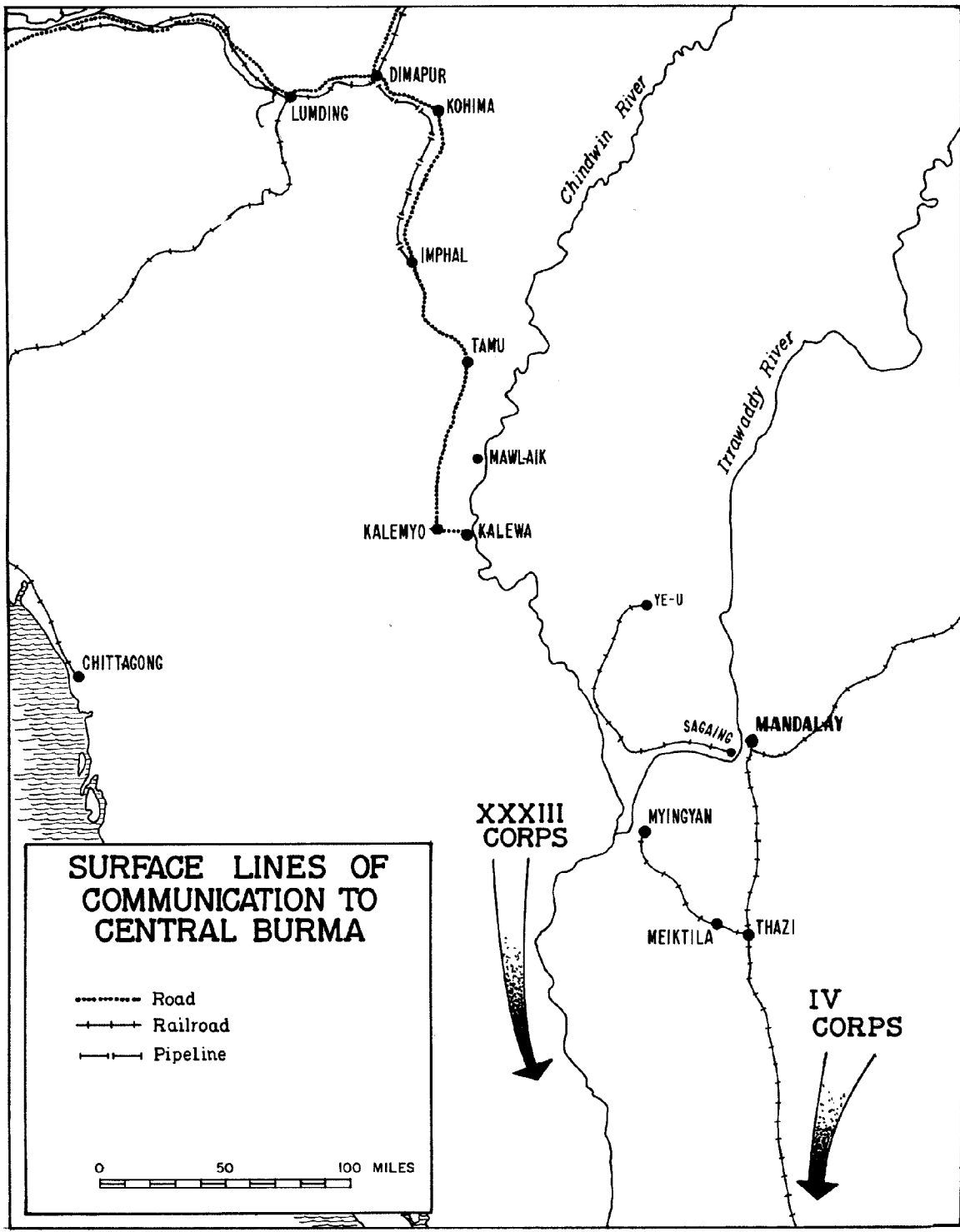
*See below, p. 120.

siderably traffic pressure on the Dimapur-Imphal Road, the busiest section of the long route to central Burma. By April the road down the Kabaw Valley from Imphal to Kalewa was good enough for all-weather operation.

From Kalewa supplies could move across the Chindwin and overland to Mandalay in dry weather, but the capacity of this section of the route would be much reduced when the rains came. By April, moreover, the bulk of Fourteenth Army troops were south of Mandalay, along the lower Irrawaddy or in the Mandalay-Rangoon Railroad corridor. Supplies could reach XXXIII Corps from Kalewa via the Chindwin and Irrawaddy Rivers, but the movement of material to IV Corps was more complicated. The surface LOC to IV Corps, as it finally developed, went from Kalewa to Myingan (at the junction of the Chindwin and Irrawaddy Rivers) via the Chindwin. At Myingan IV Corps' supplies were put aboard cars on the Meiktila-Myingan Railroad (a branch of the Rangoon-Mandalay line) and moved by rail to Meiktila, thence to Thazi, and from there as far south toward Rangoon as possible.

In order to put the railroad from Myingan to Meiktila into operation, it was necessary to provide locomotives and to repair track damage resulting from three years of Japanese neglect and Allied air attack. Three 70-ton and six 21-ton locomotives were moved down from Dimapur to Kalewa by road, then floated down to Myingan. Six 5-ton locomotives were broken down and flown into Myingan. For repair and operation of the Myingan-Meiktila Railroad, more than 2,500 tons of all sorts of material, including coal, were moved into Burma by road, river, and air. Enough freight cars remained in operation or repairable to make it unnecessary to transport these from India.

These improvements in the surface LOC made it possible for an increasing proportion of supplies for Allied forces in Burma to be delivered by this means during April. A committee appointed by Mountbatten to



Map 16

study the Fourteenth Army supply situation reported that during the period 30 March through 5 April, 2,250 tons of supplies per day were being dispatched from Dimapur. Out of this, 770 tons remained at Imphal, and 877 tons were delivered to points between Imphal and Kalewa. About 500 tons a day reached Kalewa, of which 44 tons per day reached troops north of the Irrawaddy in central Burma.

Through the first 15 days of April, the water route down the Chindwin River from Kalewa was moving only 350 tons per day. This water section of the route was the bottleneck in the surface supply line, because by mid-April the theoretical capacity of the Myingan-Meiktila Railroad was 500 tons per day. Since this much tonnage was not available by surface LOC, capacity of more than 200-300 tons per day was not immediately useful. From Meiktila and Thazi not more than 70 tons per day could be sent forward on the ground (by jeep-drawn train), and little if any of this 70 tons reached 5 and 17 Divisions as they drove on toward Rangoon.

These figures indicate that, at the best, not more than 400 tons of supplies per day reached IV and XXXIII Corps by surface means during April. Indeed, it is doubtful that any significant amount reached IV Corps by such means, because much of the tonnage dispatched from Myingan was construction material for use on the railroad, and most of the remainder must have been consumed along the way. XXXIII Corps along the Irrawaddy probably benefitted more from surface LOC, but not to such an extent as to alter the corps' basic dependence upon air supply.

Indeed, as of April, the land-river LOC did little more than support itself. This was not a state of affairs that would endure indefinitely, because in April much of the supply consumption between Imphal and Kalewa was by road-construction personnel who would soon complete their task and withdraw. The necessities of construction, moreover, often interrupted traffic. The completion of the major construction would lower consumption of supplies along the

road, decrease turnaround time for trucks, permit the use of heavier vehicles, and thus increase the tonnage emerging at Kalewa. On the other hand, construction was to be completed just as the wet monsoon began, and the resulting floods, mud, and landslides would cut down the efficiency of the route. SEAC experts predicted delivery of 800-900 tons a day to Kalewa during June.

The efficiency of the water route from Kalewa to Myingan was expected to increase slowly as more boats were put into operation and better traffic control established. The beginning of the rains would help rather than hinder river transportation, because the higher water level would reduce groundings, one major cause of delays. It was anticipated that by the end of May it would be possible to deliver 700 tons a day to Myingan. From Myingan this tonnage could easily be moved to Meiktila or down the Irrawaddy.

The development of the land-water LOC into Burma was a tremendous accomplishment. By April the route was self-supporting and was able to contribute slightly to Fourteenth Army supply. Before the end of May it might have made a substantial (though still minor) contribution to the upkeep of the fighting front. During April, however, the surface LOC was still unable to relieve CCTF of any of its commitments. By the time the Dimapur-Myingan LOC reached a stage of development that would have permitted it to play a vital part, IV and XXXIII Corps had defeated the Japanese and opened the port of Rangoon. No commander could have been so certain of quick victory as not to provide insurance in the form of this land-river supply route. No criticism of the decision to provide it is intended. It served, as in the case of pontoons and locomotives, to move some material that could not have been moved by air. But the fact remains that Fourteenth Army defeated the Japanese and won the Burma phase of World War II while dependent upon air supply for all but an insignificant fraction of the supplies it consumed.³³

Air supply of the drive on Rangoon. CCTF commitments for the month of April 1945

in its final form it consisted of a small headquarters (six British officers, four British noncommissioned officers, and thirty Indian enlisted men), one or more air supply companies (ASC's), a labor company, and transportation and military police detachments. Ordnance, medical, and postal personnel were attached as required. The total number of personnel assigned and attached to a RAMO varied greatly with the tasks being carried out, but no RAMO had fewer than 1,000 men after 1 January 1945.

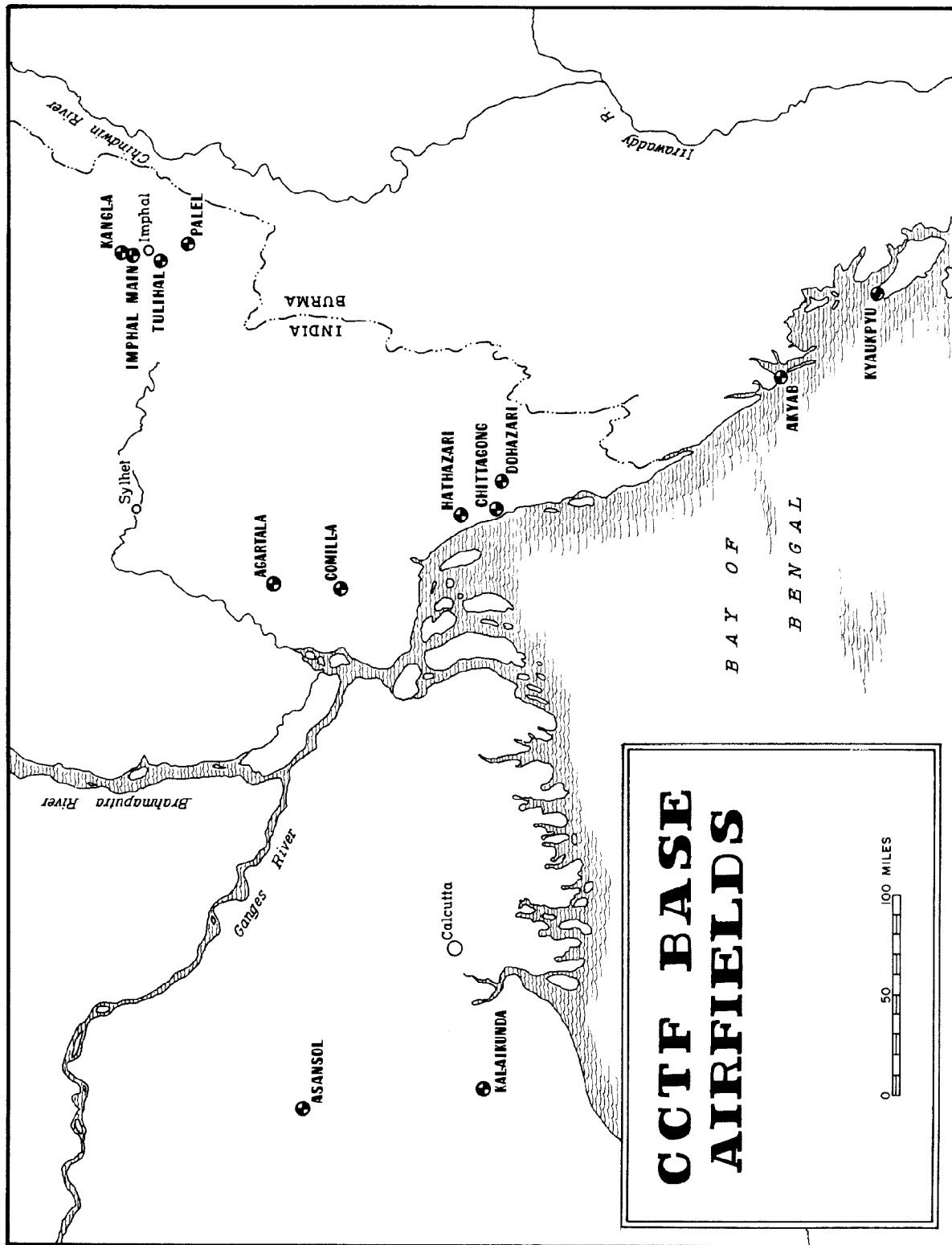
The RAMO's always maintained supply warehouses on the airfields from which supplies were lifted, and they maintained an air supply depot when no regular supply depot was nearby. In their warehouses they packed supplies for dropping and loaded trucks with supplies for dropping or landing. The RAMO trucks moved the goods to the loading bays, and RAMO laborers put the goods aboard the transports. The RAMO made manifests to accompany each load and kept records of its activities so that CAATO could always be kept up-to-date regarding stocks on hand at any supply base. One other duty, belonging to the RAMO Headquarters in particular, was liaison with the air transport units with which it worked. This liaison was essential if supplies were to be on hand for loading as soon as aircraft were available.

At Chittagong, where Number 7 RAMO worked with the 4th Combat Cargo Group, a conference was held daily at 1630 with representatives of the RAMO, group headquarters, and each squadron in attendance. Each squadron announced which individual aircraft (by serial number) would be available for the next day's operations, and the RAMO made known the number of loads to be delivered. The task was then divided between the squadrons on the basis of assigned (not operational) aircraft; at the same time an effort was made to divide delivery points equally among the squadrons so that arrivals at forward airfields would be staggered.

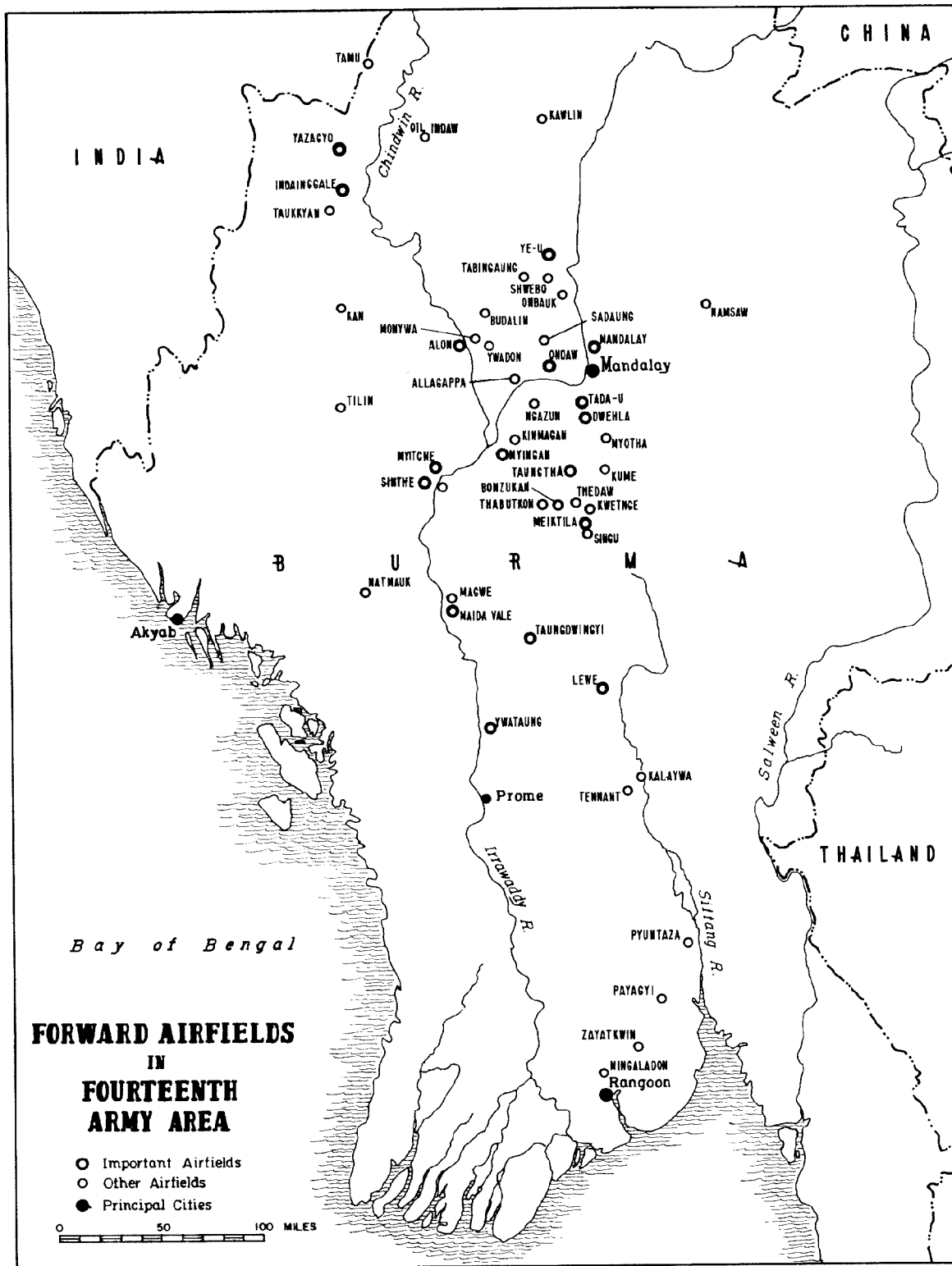
RAMO laborers put loads for the first mission of the morning aboard the trans-

ports at night. Whenever possible, heavy and cumbersome items, such as bridge parts, were loaded for early-morning delivery in order that the extra time required for loading such cargo would not increase turnaround time at base during the operational day. After the first mission of the morning departed, a central operations tent housing a RAMO representative, the airfield controller, and the base ground radio station became the operational nerve center. This tent was connected by voice intercommunication system (squawk box) with group and squadron operations rooms and the control tower, and by telephone with RAMO Headquarters and the air supply depot. Returning from a mission pilots called in 15 minutes before landing, stated whether or not their aircraft were available for another load, and gave warning if they brought troops or other return cargo to be unloaded. This information enabled the RAMO to have trucks waiting with new cargo to be loaded as soon as the aircraft entered its parking bay and to take the return cargo (if any). Before taking off on each mission, pilots notified the control tent of the aircraft number, destination, and load manifest number, enabling the RAMO to keep its records up-to-the-minute.

For handling the ground force side of air supply at forward airfields, three Forward Airfield Maintenance Organizations (FAMO's) were established, one to work directly under Fourteenth Army, the others with the army's two corps. Each FAMO consisted of two British officers, nine British noncommissioned officers, and 44 enlisted men, plus two or more Control Centers, Forward Maintenance Area (CCFMA's). These CCFMA's consisted of a small nucleus of personnel from the FAMO plus attachments from the ground units being supplied. The duties of the FAMO were control of aircraft on the ground, unloading of supplies and deplaning of troops, routing supplies and troops to their various destinations, emplaning leave personnel, and loading cargo (mainly salvage) for return to India. By means of its CCFMA's, each FAMO was able to organize and con-



Map 17



Map 18

trol the movement of supplies on as many as three forward airfields.

In contrast to the RAMO's and FAMO's, which were ground force units, staging posts (SP's) belonged to the RAF. SP's were located at both base and forward airfields, eleven being in operation by May 1945. The RAF establishment for staging posts called for 5 officers and 56 enlisted men per unit, or a total of 55 officers and 616 men, but by late March only 19 officers and 240 men had been assigned. As a result, all SP's were critically short of personnel.

On base airfields, SP's served as an air force agency to check on the loading of cargo, making certain that transports were not overloaded, that volatile and inflammable materials were correctly packed, and that all cargo was safely lashed in place. The SP's were also supposed to prevent damage to transports by supervising the parking of trucks that brought cargo. Finally, they were responsible for the reception and despatch of individual passengers and mail, and of any freight that was not part of the normal supply delivery. At forward airfields the SP's carried out very similar duties with the added responsibility of insuring quick turnaround of transports.

These duties of the staging posts were to some extent a duplication of the functions of RAMO's and FAMO's. Many observers thought that the SP's were an unnecessary cog in the air supply machine, and there were several recommendations that they be disbanded. Eventually those posts on forward airfields were abolished, though small RAF detachments remained to check the weight and lashing of return cargo. Staging posts at RAF air supply bases in India and the Arakan continued in existence until after the war ended.⁴⁴

Casualty evacuation. Through the summer of 1944, casualty evacuation in India-Burma was carried out more or less extemporaneously. A transport that delivered supplies to Imphal during the fighting in Manipur took out a load of casualties if the sick and wounded men were at the airfield ready for loading. Army medical personnel brought the patients to the airfield and put

them aboard the transports. Other army personnel took care of the unloading when the plane reached Comilla, where most casualties were delivered. The procedure in Burma during the second Wingate expedition was much the same, except that the presence of liaison aircraft made it possible to move casualties from the front lines to the transport landing grounds with great speed.

Anticipating casualty evacuation of a greater magnitude than had yet been necessary, the RAF set up Casualty Air Evacuation Units (CAEU's) when CCTF was established. Each CAEU was under an RAF medical officer and consisted of about 40 British enlisted men and a varying number of Indian personnel. CAEU's were sent to the main forward airfields serving particular areas of operations, and each unit was able to stage as many as 100 casualties for as long a time as necessary. The CAEU's maintained liaison with army medical units in the field so as to always have an idea of the approximate number of casualties to expect. When the sick and wounded men arrived at the forward airfield, whether by liaison aircraft or ambulance, CAEU personnel gave them necessary medical attention, provided food, and placed the patients, most serious cases first, aboard transports as space became available. Most casualties were still delivered to Comilla, but a few were flown on to Calcutta.

Since seriously wounded men often required attention during the flight back to India, a pool of air ambulance orderlies was established, and one of these nursing orderlies accompanied each planeload of casualties. The orderlies carried first aid equipment and portable oxygen bottles; oxygen was vitally necessary for seriously wounded men crossing the mountains between India and Burma. The orderly who had accompanied a load of wounded to Comilla went back to Burma in the first available seat; it was not unusual for one to accumulate more than 200 hours flying time per month.

Both C-46's and C-47's were used for casualty evacuation during the campaign, but the smaller C-47, which had room for

30 walking wounded or 18 stretcher cases, was generally preferred. Ideally, ambulance planes would have been used for no other purpose, but the supply of transport aircraft in India-Burma was never great enough for any C-47's to be relieved from supply runs. Delivery of casualties to India in the same transport that had carried supplies to Burma proved completely practical. The only fault found with the C-47 was that the metal stretcher brackets on some of the older models tended to warp and break after repeated use. Later models of the transport had webbing fittings for suspending stretchers, and these gave no trouble.

From October 1944 through May 1945, CCTF transports evacuated more than 68,500 casualties from the fighting fronts to hospitals in India. Only one patient died in the air on these flights, but in June 24 wounded men were killed when a C-47 crashed in bad weather. A total loss of 25 casualties out of about 75,000 (through the end of the war) was small indeed when compared with the deaths that would have resulted had air evacuation not been possible. The CCTF casualty air evacuation system functioned admirably, and it contributed much to the morale of the Allied ground forces.⁴⁷

Air supply communications. Inside Burma, normal ground force communications channels were used for air supply messages between subordinate units and division headquarters. Divisions carried on their air supply communications with corps by radio, and corps used the same means for communicating with Fourteenth Army and CAATO. Army headquarters also had a radio link with CAATO. This radio net did not give complete satisfaction, because its use for other purposes overloaded it. Messages were sometimes 36 hours in transit between the ground unit being supplied and the squadron that delivered the supplies. This delay made little difference when messages referred to bulk supplies for delivery at forward airfields, because the requests were normally made a week in advance. It did make considerable difference, however,

when airdrops were to be made to advancing ground units, because the supplies could not be dropped until the location of the DZ was known. It was recommended that divisions be equipped for direct radio communication with CAATO and RAMO's for emergency requests, in order to avoid the delays incurred in going through corps, but the shortage of communications personnel and equipment in India-Burma made it impossible to carry out this recommendation.

Forward airfields within Burma were provided with radio equipment for communication with aircraft and with CCTF and CAATO. At many fields, AACS teams provided these communications; the RAF had only three control teams, and these poorly equipped, as compared to seven from AACS. Since some of the teams were usually in transit, and because CCTF was often using more than ten fields at one time, provision of these forward communications was always a serious problem. Creation of extemporaneous teams from the communications personnel of American squadrons in CCTF improved the situation, but it was still not uncommon for forward airfields to be without communications. When this was the case, a measure of flight control was achieved from a transport on the ground, but since aircrews had little or no experience in flight control, and since control shifted rapidly from one pilot to another as transports were unloaded and took off, this was a very unsatisfactory substitute. In June, after the departure of American personnel from CCTF, the RAF was unprepared for the communications task it had to assume; few trained men and very little satisfactory equipment were available. Indeed, the departure of American communications personnel literally cut communications between forward airfields and India early in June 1945, and in no case had these communications been restored by the middle of the month. Restoration of a sort was eventually accomplished, but the situation remained unsatisfactory to the end of the war.

In the forward areas it was also necessary to have communications between ground

forces at the DZ's and supply dropping aircraft. Most of the time this communication was visual; panels laid out by the ground forces identified the DZ and pointed out the desired direction of flight for the drop. By early 1945, ground force units were usually equipped to communicate with supply-dropping aircraft by radio, but such communications were undertaken only in emergencies. Use of air-ground radio during supply drops had a number of advantages, since the troops on the ground could warn pilots of the location of enemy positions and also could help the pilots drop more accurately. In view of these advantages, air-ground radio communication at DZ's was authorized as a normal procedure in March 1945. When all DZ's began using air-ground radio, they tended to interfere with one another's broadcasts to some extent.

In October 1944, when CCTF operations commenced, communications between CCTF/CAATO Headquarters at Comilla and the various CCTF bases was by telephone, supplemented by radio in emergencies. Comilla was a junction point of telephone trunk lines leading north to Imphal, south to Cox's Bazaar, and west to Calcutta, and thus afforded all needed connections. The chief trouble was that the telephone lines were overburdened, but CCTF surmounted this difficulty by judicious use of radio and by confining use of the telephone to night as much as possible. CCTF/CAATO communications with subordinate units were greatly improved in early 1945 by the installation of a teletype net between Comilla and all base airfields. The teletype net was a great convenience, but it was not an unmixed blessing, because maintenance was a heavy burden.

Air supply communications within CCTF were a vital and somewhat neglected part of successful operations. These communications were never wholly satisfactory, and most of the time they were barely adequate. The difficulties encountered may have reduced the efficiency of air supply operations somewhat, but not significantly. Slow improvement, improvisation, and making the best use of the personnel and equip-

ment available enabled communications to keep pace with operations.⁴⁶

Summary

Between 1 October 1944 and 31 May 1945, transports under CCTF control flew more than 322,200 hours and delivered more than 333,000 tons of supplies. In addition to supplies, the transports evacuated more than 66,500 casualties from Burma, and lifted more than 300,000 personnel other than casualties into or out of Burma. The total weight of cargo and personnel lifted by CCTF transports was almost 370,000 tons. Unfortunately, statistics are not available for the performance of 232 Group from 1 June 1945 to the end of the war, but the total weight lifted by the end of the war was certainly more than 400,000 tons. This task was accomplished through June with the loss of only 11 transports to enemy action, 62 to other causes. Only about 120 aircrew personnel were reported killed or missing during the same period.

This air supply effort made it possible to drive the Japanese out of Burma. Air supply was important to XV Corps in the Arakan campaign, but it was vital to Fourteenth Army in central Burma. Fourteenth Army constructed a surface LOC behind its line of advance, but this LOC had barely become self-supporting by April, and by that time the success of the Allied offensive was assured. Likewise, the opening of the port of Rangoon, which was a great help to the troops in Burma, came after air-supplied troops had accomplished their objectives and won the campaign.

Perhaps, though it certainly might be debated, an efficient surface LOC might have been more convenient for the ground forces in Burma. The ground commanders had some difficult moments when they were uncertain whether their supplies would be adequate for the tasks to be accomplished. Troops sometimes had to subsist on reduced rations. Such thoughts and such conditions were not unusual, however, in campaigns supported by good surface supply lines, as the history of almost any war will attest. It

is most significant that despite distance, terrain, and weather, lack of food on the Allied side did not influence the outcome of a single battle in the central Burma cam-

paign, and Allied troops never lacked the ammunition and POL needed to carry out their tasks against a brave and determined enemy.

CHAPTER VI

Reflections Concerning Air Supply in Burma**Air Superiority**

THE JAPANESE established air superiority over Burma during the 1942 campaign, but they never extended their control of the air across the Chin Hills to eastern India. Their superiority over that part of northern Burma within range of Allied bases in Assam and Yunnan was soon challenged, and by mid-1943 Allied airpower was making itself felt all over Burma. No definite date can be pointed out as the time when Allied control of the air over Burma was established, but it had come to pass by early 1944. The Japanese Air Force tried, and failed, to reverse this trend in the Arakan and over Imphal; from mid-1944 to the end of the war, Allied air superiority over Burma was unchallenged.

Had the Allies failed to win the air battle over Burma, the air supply achievements recounted in the previous chapters would not have been possible. Even after Allied superiority was established, the few Japanese Air Force planes in Burma were a serious threat to air supply operations. Had they been employed effectively, large-scale air supply might have been impossible. 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.

The conclusion that working air superiority is an essential condition for successful air supply operations is axiomatic. Contemplation of what the Japanese Air Force might have accomplished against Allied transports in Burma, even after having lost control of the air, suggests that superiority in the area of air supply operations must be of an extreme degree. Otherwise a well-husbanded and well-directed inferior force may inflict losses out of all proportion to its strength, and it may be able to reduce air supply to a fraction of what could be accomplished unopposed.

Command

Command in an Allied theater such as Southeast Asia was necessarily complicated. Integration of headquarters, which was the alternative to separate national forces, each going its own way, necessitated a separation of operational and administrative control. This was true of Troop Carrier Command and of Combat Cargo Task Force (CCTF) as well as other air units. Only the transport units that remained under Tenth Air Force after the dissolution of TCC avoided this divided responsibility. The Royal Air Force units in CCTF suffered even more disability, since administrative responsibility was fragmented. This command system added much to the burden of unit commanders, but it is not possible to show that the efficiency of transport operations was reduced thereby. Divided command was no doubt an obstacle to efficient operations, but this obstacle, like others, was overcome.

Operational command of air supply operations was simplified when the air trans-

port headquarters could deal with a single ground force headquarters. Since a truly unified ground command was impossible in India-Burma, the eventual solution to the air supply problem was to divide air transport resources between the Northern Combat Area Command (NCAC) area and the Fourteenth Army/XV Corps area. It was possible to switch transport units back and forth between the two areas, and this was sometimes done, but such moves were likely to upset air supply plans that were of necessity made well in advance of operations. 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 transport headquarters coordinated with a single ground force headquarters would have permitted more flexible and more efficient air supply.

The achievement of an effective command for air supply operations in India-Burma was a most difficult task. It was never achieved in any manner that could be clearly demonstrated on a command chart. Nonetheless, through unselfish effort on the part of commanders, through untiring work on the part of aircrews, maintenance men, and loading and packing units, and through close coordination between the supporting air units and the supported ground units, efficient and effective air supply operations became the rule rather than the exception.

Air-Ground Coordination

No command system for air supply operations could have succeeded without close coordination between the air transport organization and the ground forces. By and large, such coordination was not a result of any committee work or prescribed procedures; it derived from mutual trust. Liaison between air and ground units, both at command and subordinate unit level, did much to develop mutual trust, but had the air transport units lacked the capacity or the will to deliver the supplies needed by the ground forces, no amount of liaison could have maintained confidence. Nor could confidence have been maintained if the ground

forces had obviously failed to make good use of the supplies that the transports delivered. However, so long as each arm was carrying out its tasks, the more each knew of the other, the more effective air supply operations could be. It follows, then, that close liaison between air transport units and ground units was highly desirable, and that it contributed to the success of air and ground operations in Burma.

Air Force Functions in Air Supply

Certain functions of air supply in the Burma campaigns devolved upon the air forces, others upon the ground forces. The air forces were responsible for providing aircraft and aircrews. In Burma, as in other theaters, this function was largely beyond the control of air headquarters within the theater and depended upon decisions made in Washington and London. It was the responsibility of the air forces within the theater, however, to make the most efficient use of the aircraft and crews allocated to them. In India-Burma, transport aircraft were more critical items than the crews to fly them, so maintenance of aircraft did much to determine capacity. This too was an air force responsibility.

Determination of capacity for the delivery of supplies, an air force function, might be accomplished indirectly by acceptance or rejection of a ground force bid (the procedure followed in CCTF operations), or the capacity of the air transport units might be announced to the ground force planners so that army operations could be tailored to fit the supplies available. In either case, if the ground forces justified a demand for more supplies than the transport units could provide, it was up to the theater commander, if it lay within his power, to provide additional aircraft and aircrews. In India-Burma, this was accomplished twice by diverting transports from the Air Transport Command (ATC) operations between India and China, once by borrowing aircraft from another theater. On the other hand, India-Burma air transport capacity was several times reduced by the permanent or temporary diversion of

units to China. At any rate, the final decision as to what quantity of supplies could be delivered with the aircraft, crews, and bases available was made by the air forces.

The main air force responsibility, of course, was delivery of the supplies. Basically, this involved lifting the goods from a base airfield, flying them to the forward zone, and either landing them at a forward airfield or dropping them on a dropping zone (DZ). In the case of dropped supplies, "kickers" to eject the packages from the transports were provided by the ground forces.

A number of air force responsibilities grew out of the flight of loaded transports from base airfields to forward areas. It was necessary to provide and maintain base radio communications for flight control and for communication with aircraft in flight. On forward airfields it was necessary to provide flight control and radio communication with base airfields and the transport headquarters. If the forward airfields were to be used at night, runway lighting was needed.

It was necessary for the air forces to carry out certain additional tasks in connection with air supply. On base airfields facilities for rapid briefing of pilots had to be located near the runways. When crews were flying several missions a day (which was normal), they had to be fed near the runway, and good hot food was a definite aid to efficient operations. At the other end of the air supply line, it was the duty of the air force to inspect forward landing grounds to make certain that they were suitable for transport landings. Indeed, it was essential that the air forces at least advise the ground forces concerning the suitability of suggested forward airfield sites. Finally, it was an air force responsibility to supervise and/or inspect the loading and unloading of transports to prevent damage from overloading, from insecure lashing of cargo, or from careless handling of the trucks used in loading and unloading.

Supplies delivered by air to air force units in the forward area were a special case. From the point of view of the transport

units that delivered the material, the procedure was no different from the handling of ground force supplies, but the air forces in general were responsible for the delivery of air force supplies to the air supply bases from which they were to be flown forward. Responsibility for packing and loading varied with circumstances, but generally, to avoid duplication of functions, the ground units that packed and loaded ground force material did the same for items going to air units. Unloading of these supplies was almost always carried out by the consuming unit, since the transports made delivery to the forward airfield on which the consuming unit was based.

Ground Force Functions in Air Supply

The ground forces had many responsibilities in the India-Burma air supply system. None of these responsibilities were as vital as that of the air forces for transporting the rations, ammunition, gasoline, and other materials from rear to forward areas, but they represented functions that had to be carried out if air supply was to succeed.

The ground force supply services—Services of Supply (SOS) in north Burma and the Royal Indian Army Supply Corps (RIASC) in the southern area—were responsible for moving goods over the surface lines of supply from Calcutta or other points within India to the air bases from which the supplies were lifted. The ground forces maintained control of the depots in which supplies were stored at air supply bases, and ground units maintained the warehouses in which goods were sorted and packed before being loaded aboard aircraft.

Packing and loading was another ground force function. In the NCAC area some United States Army Air Forces packing and loading units were available (air cargo resupply squadrons) but they were under SOS operational control. In the south the RIASC air supply companies were responsible for all packing and loading. Unloading at forward airfields was also a ground force function, carried out by the consuming units in the north and by Forward Airfield Maintenance Organizations (FAMO's) in the

south. The ground forces even had a part in airdropping, since the personnel who did the actual work of ejecting supplies from aircraft came under SOS in the north, RIASC in the south.

The ground forces were responsible for providing forward landing grounds. This was done after coordination with the tactical air commander to assure protection against the Japanese Air Force, and with the transport headquarters to assure the suitability of the site, but within these limitations the need of the ground forces for supplies determined the location of forward airfields, and engineers under ground force command undertook the construction. After the engineers had completed the strip, air force officers inspected it to make sure it was in condition for transport operations. In a similar manner, ground force units were responsible for the selection and preparation of DZ's for airdropped supplies. Here too the advice of an air officer was usually available, but the final decision as to the location of a DZ rested with the ground force commander concerned. Transport pilots could (and did) refuse to drop on DZ's when the terrain or enemy fire exposed their aircraft to unacceptable danger.

Distribution of air-transported supplies to consuming units was also a ground force function. Ordinarily this was accomplished in accordance with plans made well before delivery, but the system had to be sufficiently flexible to deal with emergencies. In the case of airdropped supplies, DZ's had to be carefully guarded against pilfering and cleared as rapidly as possible lest there be no supplies to distribute.

Finally, the ground forces were responsible for protecting DZ's and forward landing grounds against enemy ground action. Tactical air could help in this task, but the basic responsibility lay with the ground commander. Generally speaking, forward landing grounds were far enough away from enemy forces that no serious problems was imposed, but there were startling exceptions to this rule, particularly at Myitkyina and Meiktila. Protection of DZ's, which were often close to enemy positions,

was a more difficult task. There were instances of Japanese troops' pilfering from DZ's, and it was frequently necessary for the ground troops to take steps to hold down enemy fire directed at the transports dropping supplies. On the other hand, the ground commander had to take care lest his forces become so committed to the protection of the DZ that no strength was left for his offensive mission.

The Question of Priorities

Priorities were a thorny question throughout air supply operations in India-Burma. Since ground force desires for air supply were, in sum, nearly always greater than the capacity of the air transport units to deliver, a system of priorities was essential if the most vital needs of the ground forces were to be met. The air forces were in no position to determine which cargo should have priority, because they lacked detailed information on the ground force situation as well as understanding of ground force problems, methods, and procedures. It was equally impractical for ground force commanders in the field to assign priorities to their requests, because each commander naturally believed that his request represented a vital need. In the north, the solution was for G-4 NCAC to establish priorities; in the south Headquarters Allied Land Forces Southeast Asia (ALFSEA) determined priorities between Fourteenth Army and XV Corps. Fourteenth Army, in turn, assigned priorities for supplies to be delivered to its subordinate units.

As noted earlier in this narrative,* the function of assigning priorities in the NCAC area grew until it amounted to direction of day to day air transport operations. In the context of the NCAC campaign, it cannot be demonstrated that this near-usurpation of air force functions reduced the efficiency of air supply operations; the establishment of the system increased efficiency over what had gone before. Since, however, a ground force headquarters must determine the priority to be accorded conflicting ground force requests for air sup-

*See above, pp. 38-39.

plies, air headquarters must be aware of the tendency of priority control to become operational control.

Air Supply Communications

Communications were an extremely important aspect of air supply operations in India-Burma. Between rear and forward areas, wire communications were not possible. Mail and couriers were too slow for operational exchanges of information, so chief reliance was perforce placed upon radio. Ideally, a radio net used for air supply messages should carry no other traffic, but this was seldom possible in equipment-starved Southeast Asia. Communications with forward landing grounds and base air-ground communications were an air force function. The ground forces, however, carried on the communications between requesting units and G-4 NCAC in the north, Commander Army Air Transport Organization (CAATO) in the south. As could be predicted, the greater the number of headquarters air supply messages had to pass through, the later was their delivery to the addressee; communications could be speeded up by eliminating headquarters along the channel. This process could not be carried too far, however; some higher ground force headquarters had to be responsible for preventing unauthorized messages or inflated requests from choking communications channels and wasting air supply resources.

Communications between rear air supply headquarters and the bases from which supplies were flown were as vital to efficient operations as were communications with forward areas. These rear communications not only provided for exchange of information between the air transport headquarters and subordinate operating units, but also between the headquarters directing the ground side of air supply and the packing and loading units. These communications had to be rapid if operations were not to be delayed, but it was also essential that they be accurate.

Radio and telephone both had serious disadvantages as means of carrying on these

rear area communications. Radio required the use of cryptography to prevent giving information to the enemy, and coding and decoding of messages consumed much time. Furthermore, errors crept in in transmission, in coding and decoding, and in paraphrasing such messages. In India, telephone communications lacked security, and the opportunities for misunderstanding were great. Normally, telephonic communications might have been speedy, but in India the lines were so overburdened that radio was often faster than telephone.

Wire teletype proved the most satisfactory means of rear area air supply communications in India-Burma during World War II. Presumably, had it been available, radio teletype would have been just as satisfactory. The transmission of teletype messages over wires connecting the air supply bases was secure, rapid, and accurate. In addition, the written messages as they came from the teletype could be used as a work order, and served as an accurate permanent record.

Experience proved that it was desirable to simplify air supply messages to the greatest possible degree. This was accomplished, first, by establishing an arbitrary but simple commodity code that was used in all messages originating from the consuming units and transmitted to the rear bases. This code greatly reduced the length of air supply messages and thus reduced the volume of communications. In north Burma, further simplification was achieved by abandoning the conventional message form and substituting a form that made the daily priorities sheet, for example, resemble a letter of instructions.

Communications difficulties were an aggravation to ground and air headquarters concerned with air supply in India-Burma, but it cannot be said that poor communications ever caused the air supply units to fail. The communications were poor to begin with, and improvement was slow, but supplies continued to move to their proper destination.

Obstacles to Air Supply in Burma

Introduction. There were many obstacles in the way of accomplishing efficient air supply in Burma. None of these problems were necessarily unique to transport operations in that theater, but in India-Burma they were to some extent magnified. Weather, for example, was at times an obstacle to air operations everywhere, but only in the Aleutians was the weather so consistently bad as in Southeast Asia during the wet monsoon. Aircraft and spare parts were short everywhere—at least in the opinion of local air commanders—but only China was farther away than India from the sources of supply. Ground fire was a problem wherever it was encountered, but over Burma transports made drops day after day under fire from Japanese small arms. Such examples could be extended, but these few should be enough to indicate that some of the more or less normal obstacles encountered in air transport operations assumed added importance in India-Burma.

Weather. The most impressive fact concerning the wet monsoon weather encountered in Burma is that it had surprisingly little effect in reducing the overall effectiveness of air supply. Monsoon weather did sometimes get bad enough to halt all flying, but such days were few in number. More frequent were days when weather reduced the missions flown to some degree, but generally, throughout the wet monsoon, the mission rate was kept high enough to deliver the supplies required by the ground forces. Air supply during the rains did make careful planning necessary, and slightly larger numbers of transports and crews were required than were needed for delivery of a similar amount of supplies in good weather. This was true because flying had to be concentrated in the periods when the weather was relatively good. Weather was responsible for the loss of some aircraft, but very few in proportion to the number of missions flown. The number of abortive flights during the rains was almost double that recorded in good weather, but abortive flights remained a minute fraction of the total.

Indeed, the chief effect of the monsoon in reducing air supply deliveries came not through its effect on the amount of flying, but through the effect of continuous rain on airfields. Even rear area fields suffered, especially during the rains of 1944. Air bases in India had been much improved by the beginning of the 1945 wet monsoon, but the new and supposedly all-weather bases in the Arakan were flooded in the spring of that year.

Forward airfields were more vulnerable to the rains; most of them had a packed earth surface that quickly became a quagmire. When this happened, supplies that could not be delivered to all-weather fields had to be dropped. Transports could carry a heavier load for dropping than for landing, but parachutes and packing weighed more than enough to offset the increase in gross load. More significant in holding down the volume that could be delivered by dropping was the burden of packing. Over a period of more than a few days airdrop delivery could not be maintained at the same rate as delivery by landing. It was by knocking out forward airfields and making dropping necessary that weather exerted its chief limiting effect on air supply operations in Burma.

Maintenance. Maintenance of transport aircraft in India-Burma was accomplished with an efficiency that must have given satisfaction to the commanders concerned. The most stubborn obstacle to good maintenance was the chronic shortage of spare parts. This shortage, which affected all units but was more severe in RAF squadrons, often kept out of commission planes that could have been in the air in a few hours had the needed parts been available. Pooling and cannibalization had some effect in reducing the number of transports out of commission due to missing parts, and the supply of parts was improved as the war went on, but this remained the most serious maintenance problem for India-Burma transports throughout the war.

With the shortage of parts went a shortage of maintenance equipment. This included items as large as the hoists needed

for engine changes and as small as common wrenches. Some simple tools were manufactured in India, but their quality was so poor that they were almost useless. Equipment shortages were intensified by the fact that squadrons that went to China from India-Burma for temporary duty were required to leave their maintenance equipment behind when they returned to their home bases. Knowledge that the equipment shortage was worse in China than in India was cold comfort to crew chiefs who had to maintain aircraft without needed tools.

Maintenance personnel were never surplus in India-Burma, but American units were normally adequately staffed. There were periods of intense overwork for AAF maintenance men when combat cargo squadrons arrived in the theater without their supporting airdrome squadrons, but these continued only until the supporting units arrived. The RAF transport squadrons depended more heavily than their AAF counterparts on depot maintenance and had fewer maintenance personnel assigned to squadrons. Within the RAF squadrons maintenance tasks were divided among specialized personnel, with no crew chief responsible for the upkeep of individual aircraft. This British system was probably economical in the use of personnel, but shortages of some critical specialists and leisurely depot procedures kept aircraft out of commission longer than would have been the case had the American system been followed.

Discussion of the difficulties encountered in maintenance must not be allowed to obscure the fact that between 80 and 90 percent of the transport aircraft engaged in air supply operations in India-Burma were kept in commission. The percentage of planes in commission was higher in Tenth Air Force than in CCTF, but Tenth Air Force transport squadrons were all American units. CCTF was almost half British, and the American component included four C-46 squadrons, which had a substantially lower in-commission rate than America or British C-47 squadrons.

Aircraft damage. Most damage inflicted on transport aircraft by the Japanese resulted from small arms and automatic weapons fire around DZ's or from the same types of fire plus artillery at planes on the ground at Myitkyina or Meiktila. Scores of transports received such damage, but there was surprisingly little interference with operations. The C-47 was apparently able to take hit after hit from small arms or nonexplosive automatic weapons fire without fatal or even crippling damage. Perhaps this can be explained by the small area of engines and cockpit as compared to the total surface of the aircraft. At any rate, small arms and automatic weapons fire did not, to any significant degree, put transports out of commission or drive them from their air supply targets in Burma.

Ground fire could be accepted as a normal hazard of war, but damage to transports from two other causes was considered a gratuitous nuisance. The air over India abounded in kites, vultures, and other unattractive forms of feathered life, and there were numbers of collisions between transports and birds. Fortunately such damage was not so frequent or severe as to constitute a threat to successful operations, but it was annoying. Even more aggravating was the fact that trucks loading or unloading cargo all too often backed into and damaged transports. The fault lay with poorly-trained Indian drivers, and it was apparently impossible to do much to correct the situation.

Shortage of aircraft. The commanders responsible for air supply in Burma always felt that they needed more aircraft in order to carry out their tasks. Certainly they did lack the quantity of transports needed for the supply of Imphal in the spring of 1944, and the addition of planes from ATC and the Mediterranean Theater to the force on hand barely provided enough airlift for the supply of the isolated garrison. During other phases of the war in Burma, the planes available were enough to carry out the supply lift essential to victory. The ground forces undoubtedly could have used more supplies from the air, but they achieved

their objectives without it. Since this was true, it is difficult to state positively that more transports could have led to a quicker or easier victory. Of course there were too few transports available in the first two years of the war to permit large-scale supply of Allied ground forces, but it is equally true that the ground forces available during those years were not in any sense prepared for a large-scale campaign. Except during the Imphal fighting, the much-discussed shortage was a threat rather than an immediate problem. If more transports had been available, the drive against the Japanese in 1944-1945 would have been easier, but it would not have been more decisive.

Shortage of bases. For most of the war in Burma air supply operations during the wet monsoon were hampered by a shortage of bases. As related earlier, this resulted from the prewar assumption that air operations during the rains would be slight, and from the fact that tactical units were based in the same area. This difficulty, like others, was overcome, but it did bring some loss of airlift (particularly during the siege of Imphal) and made necessary more flying hours per ton of supplies delivered than would have been required had adequate and conveniently located bases been available. The capacity of the air supply bases was, until the fall of 1944, as much a limitation on the air supply effort as was the number of transports on hand.

The shortage of bases ceased to exist after the end of the 1944 rains. Fair weather bases could be used during the dry season. When the wet monsoon of 1945 arrived, new all-weather airfields had been constructed on Akyab and Ramree Islands, and older bases in India had been improved. The American squadrons in the southern area were being withdrawn. Finally, tactical units moved forward in the wake of the ground advance, relieving crowded conditions in the air supply base area.

Demands of the China Theater. Air supply operations in India-Burma were conditioned by the fact that United States

strategy in the area was primarily devoted to the support of China. This was the reason for the reluctance of the Joint Chiefs of Staff (JCS) to divert aircraft from the ATC Hump route for emergency air supply operations. More serious, from the point of view of air commanders in India-Burma, was the fact that their air supply resources were subject to emergency calls from the China Theater. An entire troop carrier squadron was permanently transferred to China in the spring of 1944. For the first five months after its arrival in India-Burma in September 1945, the 1st Combat Cargo Group spent almost as much time in China as in India, and one squadron remained in China from December 1944 through the end of the war. No criticism of the decision to take advantage of the mobility of air transport units in order to meet emergencies in China is intended, but the fact remains that diversion of air supply capability to China upset plans made in India-Burma and added to the burdens of commanders and crews.

Air Transport Capacity

The capacity of air transport units to deliver supplies was determined by the number of aircraft available, their speed, the distance to be flown, the load that could be carried over that distance, and the number of hours the aircraft available could fly during the period of time under consideration. The airlift capability thus determined was the logistic base on which ground force plans for Burma were erected. The maximum number of hours a transport could fly a month was an arbitrary figure, designed to prevent such wear and tear as would exhaust the force available. Eastern Air Command (EAC) exerted considerable effort in order to restrict flying time to the allowable figure, but it was expected that emergencies would make it necessary for operating units to exceed this figure. Indeed, there was an evasion of this restriction in original estimates of capability, since the estimates were based on the number of aircraft authorized rather

than the smaller number actually assigned to units.*

In practice, once the offensive in Burma had reached its height, flying hours for transports consistently exceeded the normal maximum by a considerable margin. The normal rate for C-47's was set at 120 hours per month. As noted in the preceding narrative, units sometimes flew more than 200 hours per assigned aircraft per month. The fact that transports exceeded the normal rate for months without creating an intolerable maintenance burden suggests that the rates were too low. The record of air supply in the India-Burma Theater makes it plain that with good maintenance the C-47 transport could fly in the neighborhood of 200 hours per month consistently for as long as six months. It seems probable that this rate of flying could have been maintained even longer.

Air Base Capacity

The capacity of air bases to support air supply operations proved an important factor in the India-Burma war. The number of aircraft available to lift supplies from the base was one determining factor. This included not only the aircraft based on the field in question, but also those that could stage through it from other bases. However great the number of aircraft, they had to be serviced. In India-Burma a scarcity of gasoline trucks, the small size of those available, and the accessibility of fuel supplies limited the number of aircraft that could be serviced and at times made it impossible to make use of all the aircraft available.

Equally important in determining the capacity of an air base to support air supply operations was the capacity of the packing and loading units. This depended in turn upon the number of personnel available, their level of training, the number of trucks on hand, and the warehouse and workspace the base afforded. No matter how many aircraft were available, and no matter how well they were serviced, they

could deliver no more supplies than were packed and loaded. More time was required for packing and loading a given amount of supplies for dropping than for landing on a forward airfield. As late as mid-1944 the packing and loading units at several bases failed to keep up with airlift capacity and were thus a factor in reducing the amount of supplies delivered to the front. Increased numbers of personnel and trucks, and a higher level of skill, made the packing and loading units adequate for the period of the final Allied offensive in Burma.

A final determinant of the capacity of an air supply base was the capacity of the surface lines of supply leading to the base. Packing units could not process supplies that were not on hand, nor could transport aircraft deliver such supplies to the front. In India-Burma the supplies were usually on hand in base depots when they were needed, but this was not always true. When the Japanese attack on Imphal made it necessary to reorient IV Corps' supply lines, packing units and aircraft were sometimes forced to remain idle or to prepare and deliver low priority goods because most-needed items were delayed on their way to the air base. This shortcoming had been corrected by the beginning of the final offensive.

The capacity of an air base could not be estimated and adjusted accurately on a day to day basis. This was especially true during the wet monsoon, when several days of idleness or near-idleness might be followed by several days of intense activity. Recurrent peaks and valleys in operations made it necessary to provide aircraft, servicing facilities, loading equipment and personnel, and, to a lesser degree, packing and surface line of communication facilities sufficient to cope with the peak operations periods. Packing procedure and operation of the surface lines of supply were less vulnerable to dislocation in periods of peak activity because prepacking and stockpiling during slack periods could be carried out in anticipation of operational peaks.

The capacity of an air base in terms of tonnage alone was enhanced if it dealt

*The squadrons of the 3d Combat Cargo Group were usually overstrength.

with only one supply commodity. This was true because the tasks of the packing and loading units and the functioning of the surface lines of supply were simplified. Fourteenth Army and ALFSEA Headquarters, which controlled those two phases of the air supply operation in the southern area, advocated single-commodity air supply bases. This idea was opposed by CCTF Headquarters and its predecessors on the ground that multiple-commodity bases avoided excessive staging of aircraft from one base through another and thus increased efficiency. A few bases did at times handle a single commodity during the war in Burma, but most continued throughout the war to handle several or all items of air supply.

Effects of Air Supply on the Ground Forces

The Allied ground campaign in Burma from mid-1943 to the end of the war was made possible by air supply. Without goods delivered by air the Wingate expeditions could not have been launched, the second Arakan campaign would have been an Allied disaster, Imphal would have fallen to the Japanese, Stilwell would not have taken Myitkyina, and the final Allied conquest of Burma would not have taken place until amphibious resources had been provided for a major amphibious assault in the south.

It is evident, of course, that air supply contributed tremendously to the mobility of Allied ground forces. When surface supply lines to the rear became a nonexistent or secondary consideration, infantry units could move in any direction they chose and depend upon an airdrop for supply. The dash of Merrill's Marauders to Myitkyina and the British drive from the Irrawaddy to Meiktila are the best examples of the mobility made possible by air supply, but the Wingate expeditions could also be cited. The striking fact about these campaigns, and it was also true of the second Arakan campaign, the Battle of Imphal, and the advance of 5 Indian Division through the Chin Hills, was that there was no Allied surface supply line whatsoever during

the critical phases. Transports sometimes landed and all too often made supply drops under enemy fire, but wherever Allied troops went in Burma, the supply aircraft followed.

Divisions and smaller units that operated independently and depended upon air transport for supply and reinforcement were practically unanimous in reporting that provision of normal reserves of food, ammunition, and gasoline was unnecessary when supplies came by air. Such reserves, in fact, proved to be a burden, reducing the mobility that air supply made possible. This conclusion concerning reserves demonstrated the confidence ground units in Burma had in the dependability of air supply. It should be noted that the conclusion that reserves should be kept to a minimum applied to supplies carried with the unit; reserve dumps still existed, but they were far in the rear at the air supply base rather than in the forward area with the division concerned.

Generally speaking, air supply contributed to the morale of the troops supplied. Probably air evacuation of casualties, which was in large measure a byproduct of air supply, was the most important factor in promoting good morale. There were breakdowns of morale in some units, such as Merrill's Marauders and a few of the Chindit brigades, when they were fought past the point of exhaustion, but under the circumstances their morale would have suffered as much had they been supplied by means other than air. Unit histories and commanders' memoirs make much of the fact that the regular appearance of supply aircraft overhead was a great encouragement to troops in Burma. Some of this inspirational quality of air supply was lost when in large-scale operations food and ammunition reached front-line units from forward airfields in the same way they might have come from a railhead. Even in the later stages of the war, however, those troops in conflict with the enemy were often supplied by airdrop, so they still saw the transports making their patterns about the DZ's.

It is more difficult to evaluate the effect of air supply on the fighting strength of ground units. The divisions that subsisted on air supply in Burma were "stripped down," with about one-third of the normal personnel strength withdrawn. The missing men were mainly those who in normal operations maintained surface lines of supply. Since that part of the division normally concerned with supply was to a large extent dependent upon the remainder for its defense, its removal may have contributed positively, in balance, to the fighting strength of the organization. There was some reduction in heavy weapons, but this was not a great loss in the context of the fighting in Burma; in another theater, of course, the lack of these weapons might have been a serious handicap. All things considered, a ground unit organized for operations on air supply was at least as effective in Burma as it would have been with normal surface supply lines; it may have been more effective.

Meaning for the Future

Burma air operations reaffirmed the axiom that effective control of the air is a prerequisite of successful air supply operations. The remnants of the Japanese Air Force in Burma, had they been used effectively, could have made air supply operations in that area much more costly, and they might have made large-scale air supply impossible. There is no evidence leading to the conclusion that control of the air will be of any less importance as a condition for air supply in future hostilities. Whatever future developments in transport aircraft may be, it is inconceivable that they could consistently deliver large quantities of cargo in an area dominated or strongly contested by hostile aircraft.

On the other hand, the Burma experience proved that large-scale air supply is practical. It made possible ground and tactical air dispositions that would have been impossible without it. No future campaign can be planned without taking into consideration the capabilities of air supply, friendly and enemy.

The experience in Burma does not justify a general conclusion that air supply is universally superior to normal surface supply. The most important consideration leading to preference of surface to air supply, other things being equal, is cost. Under normal conditions, supply by surface means is far less costly in national resources than supply by air. It is reasonable to assume that in the future, as in World War II, air supply will be used when normal lines of communication are impossible.

Geography made normal supply lines impossible in the Burma operations of World War II. Such a situation could develop again. Perhaps the experience gained in Burma will be most valuable when applied to the "brush fire" type of war. Air transport had an important role in the Indochina conflict, and in the modern world similar outbreaks are quite possible. Southeast Asia is a likely area for this type of hostilities. It is conceivable that Burma, the scene of the events described in these chapters, might again be a battleground in which air supply could play a decisive role.

Conditions other than geography could inhibit the development or use of conventional lines of communication. If a general war of the future reaches the stage of ground action, it is doubtful that surface lines of communication with their depots, railroad yards, and harbor facilities can be relied upon. Such installations will provide lucrative targets for any tactical atomic potential that an enemy might possess, and it is probable that an enemy would devote aircraft or missile attacks to such targets. Under such conditions, surface lines of supply would be as impractical in Western Europe or the Middle East as they were in the mountains and jungles of Burma. Air supply once more would be the only means by which ground combat units could be fed and provided with munitions.

The results of enforced dependence upon air supply would not be entirely negative. The ground forces supplied could, as ground units did in Burma, dispense with the reserve supplies that are necessary in operations supplied by surface means.

Likewise, the ground units could operate without a major part of the men and equipment normally devoted to housekeeping duties for the combat troops. So long as air supply functioned, the lack of supply reserves and supply train would not reduce the combat potential of the ground organization. Furthermore, significant increases in mobility would be attained. This increased mobility would contribute to the unit's striking power and at the same time reduce its vulnerability to enemy tactical atomic weapons.

Air supply bases and forward landing fields would also be lucrative targets for enemy missiles and hit-and-run air attacks. The increased range of modern transports as compared to the C-47 and the C-46 will afford some protection to the air supply bases, since they can be located at a greater distance from the enemy's airfields and missile launching sites. If airdropping

techniques are used, there need be no forward airfields. The carrying capacity of newer tactical transports is such, however, that tremendous amounts of supplies, by Burma standards, can be delivered to forward airfields by comparatively few transport flights. Thus the number of transport aircraft on the ground on a forward airfield at a given time would be far less than was the case in air supply operations during World War II. Furthermore, the newer transports, in addition to range and load capacity many times that of the supply aircraft used in the Burma campaigns, have landing and takeoff characteristics superior to the C-46 and comparable to the C-47. By taking advantage of these characteristics so as to locate air supply bases in comparatively safe areas and to disperse forward landing grounds, it should be possible, under conditions of air superiority, to carry out large-scale air supply operations in a major war of the future.

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CHAPTER V

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General orders of the various headquarters which functioned in India have been consulted intensively. They are the best means of determining the dates of activation, reassignment, and deactivation of units. General orders have additional value in that they frequently state the missions of the units concerned; this is fortunate, since very few operational directives for air transport units in the China-Burma-India Theater (CBI) are available.

Plans are another source of information, but those developed in the CBI must be used with caution. During the early years of the war, abortive plans were prepared in great profusion; those developed by Headquarters Southeast Asia Command (SEAC) are more useful in revealing what was considered desirable than in showing what was believed to be possible.

Daily journals extant are few in number, but nonetheless useful. Tenth Air Force maintained such a journal during the last half of 1942, and this is one of the best sources for the beginnings of air supply operations in India-Burma. The daily journal of Combat Cargo Task Force (CCTF) Headquarters, and a daily narrative (summary of operations) issued by the same headquarters contain valuable information. While commanding Troop Carrier Command (TCC), Brig. Gen. William D. Old kept a diary which amounts to a daily journal for TCC with the added advantage that it reveals General Old's thoughts concerning the events recorded. This diary is the best single source available dealing with air supply activities during the crucial first half of 1944.

Voluminous message files for most Army Air Force (AAF) and integrated headquarters in India-Burma have been preserved. The messages are not merely a source in themselves, however; they serve as a means of checking tentative conclusions reached from other sources, and as a lead to additional sources.

Statistical analyses may have the effect of making history dull, but frequently they provide the only means of arriving at an overall appreciation of an air effort. It is unfortunate that there was no complete statistical analysis of air supply operations in India-Burma before mid-1944. From October 1944 through May 1945, CCTF Headquarters prepared an excellent analysis of each month's operations, and Air Cargo Headquarters, Tenth Air Force, did the same for operations under its control from December 1944 through March 1945.

Letters are among the most revealing records on hand. Each headquarters file in the Historical Divi-

sion Archives has a section for correspondence, but many letters are attached to other documents filed elsewhere. The "Operations Letters," a collection of correspondence between AAF commanders in the field and AAF Headquarters has several items dealing with air supply in India-Burma. Likewise, several useful items of correspondence are found in plans files from AAF Headquarters. The most valuable letters of all are found in Eastern Air Command (EAC) files ("General Stratmeyer's Personal Correspondence") and in the AAF India-Burma Theater (IBT) collection ("Stratmeyer's Personal File"). Other letters worthy of special note were found in miscellaneous collections entitled "TCC Documents" and "Air Supply, EAC."

Reports of various kinds are one of the most fruitful sources of information concerning air supply operations in India-Burma. Some of these reports were prepared by air headquarters, some by ground headquarters, and so to some extent they reflect different points of view. Reports by air commanders, "despatches" in British parlance, contain much useful information and also give an overall view of air supply operations. Note should be taken of Maj. Gen. George E. Stratmeyer's report covering EAC operations, and of Air Marshal Sir John Baldwin's report on Third Tactical Air Force Operations. The Tenth Air Force issued a report on "Air [Supply] Dropping in Northern Burma" in February 1945. The CBI Air Evaluation Board Report No. 2, 15 October 1944, was entitled "Effectiveness of Supply of Ground Units by Air in the CBI Theater." Air Command Southeast Asia (ACSEA) was responsible for an excellent report, "The Siege of Imphal," and for a critical analysis of air supply operations at their height, "Air Supply Operations, Burma." Reports on the troop carrier and air supply phases of the IV Corps' drives against Meiktila and Rangoon are found in CCTF files entitled, respectively, "Operation Multivite" and "Freeborn and Gumption Operations." A report by India-China Wing, Air Transport Command (ICW ATC), "Story of Spring Diversions, February-June 1944," deals with the emergency diversion of ATC transports to air supply activities.

Reports by ground force agencies also give much information concerning air supply operations. Among the best of these is a report by the Military Observers Group, Headquarters United States Army Forces, IBT, entitled "Growth, Development and Operating Procedures for Air Supply and Evacuation System Northern Combat Area Command Front, Burma Campaign," which goes into great detail in regard to air supply operations in north Burma. Maj. Gen. Orde C. Wingate's report on the initial phase of his second expedition into Burma (JICA/CBI Rpt No. 1833) must be used with care,

but contains much useful information. Reports by 36 British Division and by 5 Indian Division concerning air supply were very useful. Other useful material on both surface and air supply of the central Burma campaign may be found in the "Report of the Air and Ground Supply Committee," Headquarters Supreme Allied Commander, SEAC, 7 May 1945.

Many reports were collected and reproduced by the Joint Intelligence Collecting Agency, CBI Theater (JICA/CBI). Some of the best of these dealt with the reinforcement of Myitkyina and the fly-in and air supply of the second Wingate expedition. Unfortunately, these JICA reports are not filed together in the Historical Division Archives, but are scattered through the files of various headquarters.

On the border between historical material and reports are three items prepared after the war by men who participated in the operations. Col. Samuel T. Moore in a study entitled "Tactical Employment in the U.S. Army of Transport Aircraft and Gliders in World War II" devoted a long chapter to India-Burma. The Air War College thesis of Col. John A. McCann dealt with India-Burma in considering "Allocation and Priority Control of Intra-Theater Air Transportation." Finally, Air Vice Marshal J.D.I. Hardman's "A Review of RAF Transport Operations in the Burma Campaign, December 1944-August 1945" gives good coverage to supply of the final Allied offensive.

Unit histories are available for almost all the AAF units that participated in SEAC air supply operations, and for some of the integrated headquarters. These histories are of varying quality, but collectively they contain much information unavailable elsewhere. The histories of CCTF, TCC, Air Cargo Headquarters, and the squadrons of the 443d Troop Carrier Group and the 1st Combat Cargo Group are the most useful of these. Unfortunately, unit histories of Royal Air Force (RAF) transport squadrons are not available, but some compensation for this lack exists in a monograph produced by the Air Historical Branch, Air Ministry, "Air Supply Operations in Burma, 1942-1945 (The Campaigns in the Far East, V)" and in Hardman's "Review of RAF Transport Operations in the Burma Campaign" mentioned in the preceding paragraph. Finally, Grace P. Hayes, "The History of the Joint Chiefs of Staff in World War II, The War Against Japan" contains much information on American strategy.

Three monographs on the Burma war were produced by Japanese officers following the end of World War II, translated into English, reproduced, and distributed by the Office of the Chief of Military History, United States Army. These monographs deal with the operations of each of the three Japanese armies that took part in the fighting in Burma; they are concerned almost entirely with

fighting on the ground, but contain information of use in studying air supply of the opposing Allied forces.

A surprisingly large number of published works deal with the war in Burma. The air phase is covered in Wesley Frank Craven and James Lea Cate, eds., *The Army Air Forces in World War II*, Vols. I (Chicago, 1948), IV (Chicago, 1950), and V (Chicago, 1953). Even these volumes devote little attention to air supply operations.

Most other published works deal primarily with the war on the ground. The most comprehensive of these, Vice Admiral the Earl Mountbatten of Burma's *Report to the Combined Chiefs of Staff by the Supreme Allied Commander, South-East Asia* (London, 1951), does devote considerable attention to air supply matters. Roy McKelvie's *The War in Burma* (London, 1948) is a competent popular history. Field Marshal Sir William Slim's, *Defeat into Victory* (London, 1956) is an excellent memoir, accurate in detail, and has considerable literary quality. John Erhman, *Grand Strategy, Volume V, August 1943-September 1944*. History of the Second World War, United Kingdom Series (London, 1956), contains an excellent account of the strategic side of the Burma campaign from the British point of view.

Published material available on the north Burma campaign includes two volumes of the United States Army in World War II series. Charles F. Romanus and Riley Sunderland, *Stilwell's Mission to China* (Washington, 1953) and *Stilwell's Command Problems* (Washington, 1956) deal with American strategy in the CBI and cover the fighting in Burma down to Stilwell's recall. The first of these volumes has a tendency to see only Stilwell's side of any question, but collectively these books give a more complete coverage of the first three years of the war in north Burma than any other published sources. *Merrill's Marauders*, Armed Forces in Action Series (Washington, 1945), is a simple but fairly complete account of Marauder operations down to the capture of Myitkyina South Airfield. Fred Eldredge, *Wrath in Burma: the Uncensored Story of General Stilwell and International Maneuvers in the Far East* (New York, 1946) is so biased that it must be used with extreme care.

The surface campaigns in the Arakan are covered in great detail in Lt. Col. N.N. Madan, *The Arakan Operations, 1942-1945*, Official History of the Indian Armed Forces in the Second World War, 1939-1945: Campaigns in the Eastern Theater: Combined Inter-Services Historical Section, India and Pakistan (Calcutta, 1954). Other volumes in this series, when they appear, should provide a complete account of the war on the ground in central Burma. Antony Brett-James, *Ball of Fire: the Fifth Indian Division in the Second World War* (Aldershot, 1951) carries 5 Indian Division through the Arakan,

Imphal, central Burma, and the drive toward Rangoon.

Wingate's two expeditions have inspired a number of works. Leonard Mosley's biography of Wingate, *Gideon Goes to War* (London, 1954), attempts to depict the raider's personality. As a source of information on the Burma campaign, this biography is practically useless; it contains some errors which are almost ludicrous. Charles J. Rolo, *Wingate's Raiders: an Account of the Fabulous Adventure That Raised the Curtain on the Battle for Burma* (New York, 1944) contains more exclamation points than information.

A much better work is Bernard Fergusson's *Beyond the Chindwin: Being an Account of the Adventures of Number Five Column of the Wingate Expedition into Burma, 1943* (London, 1951). Fergusson commanded Number Five Column in the first expedition as a major; when Wingate returned to Burma the next year, Fergusson was brigadier of 16 Brigade. An even better memoir is Michael Calvert's *Prisoners of Hope* (London, 1952). Calvert commanded 77 Brigade, which held the block at Mawlu and then captured Mogaung in 1944. These two books are noteworthy for their high literary quality as well as for the information they contain.

G l o s s a r y

| | |
|---------|---|
| AACS | Army Airways Communications System |
| AAF | Army Air Forces |
| AATO | Army Air Transport Organization (British) |
| AC | Air Command, or Air Commander (British) |
| ACR | Air Cargo Resupply |
| ACSEA | Air Command, Southeast Asia |
| ALFSEA | Allied Land Forces Southeast Asia |
| ARCADIA | Washington Conference, December 1941-January 1942 |
| ASC | Air Supply Company (British) |
| ATC | Air Transport Command |
| AVG | American Volunteer Group |
| BAB | British Army Base |
| BCS | British Chiefs of Staff |
| CAATO | Commander Army Air Transport Organization (British) |
| CAEU | Casualty Air Evacuation Unit (British) |
| CATF | China Air Task Force |
| CBI | China-Burma-India |
| CC FMA | Control Center, Forward Maintenance Area (British) |
| CCS | Combined Chiefs of Staff |
| CCTF | Combat Cargo Task Force |
| CNAC | Chinese National Air Corporation |
| DRACULA | Airborne-amphibious assault on Rangoon |
| DZ | Drop zone |
| EAC | Eastern Air Command |
| FAMO | Forward Airfield Maintenance Organization (British) |
| IBS | India-Burma Sector |
| IBT | India-Burma Theater |
| ICW | India-China Wing |

| | |
|----------|---|
| JCS | Joint Chiefs of Staff |
| LOC | Line (or lines) of communication |
| LSM | Landing Ship Medium |
| LST | Landing Ship Tank |
| MP | Military Police |
| MTO | Mediterranean Theater of Operations |
| NBATF | North Burma Air Task Force |
| NCAC | Northern Combat Area Command |
| OSS | Office of Strategic Services |
| POL | Petroleum-Oil-Lubricants |
| PRF | Photographic Reconnaissance Force |
| QM | Quartermaster |
| QUADRANT | Quebec Conference, August 1943 |
| RAF | Royal Air Force |
| RAMO | Rear Airfield Maintenance Organization (British) |
| RCAF | Royal Canadian Air Force |
| RIASC | Royal Indian Army Supply Corps (British) |
| R/T | Radio Telephone |
| SAF | Strategic Air Force |
| SEA | Southeast Asia |
| SEAC | Southeast Asia Command |
| SEXTANT | Cairo Conference, November 1943 |
| SOS | Services of Supply |
| SP | Staging Post (British) |
| TAF | Tactical Air Force |
| TCC | Troop Carrier Command |
| T/E | Table of Equipment |
| TO&E | Table of Organization and Equipment |
| TRIDENT | Washington Conference, May 1943 |
| USAAF | United States Army Air Forces |

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