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**AIR OPERATIONS IN SOUTH EAST ASIA FROM 1st JUNE, 1944,
 TO THE OCCUPATION OF RANGOON, 2nd MAY, 1945**

NOTE.—A set of maps for this despatch is on separate sale at 1s. net. This set of maps also covers the operations described in the other Air and Army despatches of the Burma Campaign from the 16th November, 1943 to 12th September, 1945.

The following despatch was submitted to the Secretary of State for Air on 16th November, 1945, by AIR CHIEF MARSHAL SIR KEITH PARK, K.C.B., K.B.E., M.C., D.F.C., Allied Air Commander-in-Chief, Air Command, South East Asia.

PART ONE.

FOREWORD.

1. This Despatch is a review primarily of air operations in Burma during the last year beginning in June, 1944. During this period a fanatical and over-confident enemy has been driven back from his foothold in India at Imphal over 800 miles, which included the complete rout of the enemy's field army in the open plains of Burma and culminated in the occupation of Rangoon by our forces on 3rd May, 1945.

2. The primary cause was the defeat of the Japanese Army. This achievement has been made possible by air power, which not merely took an intimate share in the ground attack, but also isolated the enemy's forces in the field. Confronted by overwhelming air power, the enemy's air forces withered away, and this same air power helped to undermine the stability of his land forces, so that after their decisive defeat at Imphal, although they made a tenacious stand on a number of occasions, they were no match for our well-equipped field army—well equipped in large measure by the unstinted effort of air supply to provide their daily needs. Though air supply did not and could not supplant all other means which

themselves involved a great effort to maintain, without it the campaign could not have been successfully fought. Regardless of weather, climate, and distance, the air supply line was maintained unhindered by enemy air opposition, which had been driven from the skies.

3. The Burma campaign should make its mark in the annals of history as a triumph of air power and air supply and as a feat of endurance of Allied land forces.

COMMAND.

4. In June, 1944, the Allied Air Forces in South East Asia were under the command of Air Chief Marshal Sir Richard Peirse, K.C.B., D.S.O., A.F.C. Upon his relinquishment of the appointment on 26th November, temporary command was assumed by Air Marshal Sir Guy Garrod, K.C.B., O.B.E., M.C., D.F.C., until my arrival on 23rd February, 1945.

The Position in June, 1944.

5. Two events mark the beginning of the period. The major Japanese offensive against Imphal had been blunted and was in process of being broken by means of air supply on a hitherto unprecedented scale to the forces cut off from land communications with their base; and second, the south-west monsoon was reaching its full intensity over the operational areas. It remained to be seen whether air forces could materially influence the land battle in weather which had in preceding years prohibited their effective employment, and whether the enemy defeat in Manipur was to prove the turning-point in South East Asia strategy which would

enable the primary tasks of the Command, the re-opening of the land route to China and the clearance of Burma, to be accomplished.

6. The dry-weather campaign which was drawing to a close had brought few positive results. Only in the north-east had any territorial gains been made, and here General Stilwell's forces had cleared the Hukawng Valley and were in possession of Myitkyina airfield. In the Fourteenth Army sector, Imphal was still invested, though 33 Corps was driving the Japanese from the Kohima-Imphal road, and 4 Corps was attacking the Japanese in the Imphal plain. In Arakan, although one enemy offensive had been frustrated, the Japanese still held the Mayu peninsula and the rice port of Akyab. The other British forces operating on the offensive were the long-range penetration groups of Special Force.

7. The Air Forces, having just completed a period of intensive operations, were envisaging some retrenchment, a "reculer pour mieux sauter". An extensive programme of re-equipment was in train which would convert nine squadrons of Hurricanes to Thunderbolts, the two Wellington squadrons to Liberators, and four squadrons of Vengeances to Mosquitos. The relative sparsity of all-weather airfields in the forward areas entailed a withdrawal of these squadrons to bases in India for their conversion, and the monsoon campaign was undertaken with a total of 17 squadrons out of the line, re-equipping, resting or training. Having regard to the nature of monsoon conditions and of the fighting in progress, the forces remaining in the line were ample, nor indeed could any more be deployed. The net result was that the air component conducting tactical operations that culminated on all three sectors in the capture of springboards for a dry-weather assault, was a moderate, well-balanced force of experienced squadrons, versed in the ready identification of jungle targets and trained in close co-operation with the formations whom they were supporting.

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Plans for 1944-5 Operations.

8. The broad mission of S.E.A.C. was formulated at the Octagon conferences as . . . "the destruction or expulsion of all Japanese forces in Burma at the earliest date. Operations to achieve this object must not however prejudice the security of the existing air supply to China, including the air staging post at Myitkyina and the opening of overland communications with China".

9. The plans that were prepared to this end during the monsoon of 1944 envisaged an elaborate series of airborne assaults that did not appreciate the reliability and self-sufficiency of an army supplied unstintingly from the air. Indeed, had it then been suggested that Rangoon could be reached by an army travelling overland and supplied largely by air, the proposal would not have received serious consideration. The overall strategy can best be judged from the four main plans which were formulated during the 1944 monsoon:—

(i) *Plan "X"* involved an overland advance from the Mogaung-Myitkyina area to Katha and Bhamo, co-ordinated with

another advance from Imphal to the Chindwin and an airborne operation in the vicinity of Wuntho. The furthest penetration that was envisaged was the occupation of territory north of a line stretching between Kalewa and Lashio.

(ii) *Plan "Y"* intended to employ airborne troops in the seizure of Kalewa, and a second air landing at the point of debouchment into the Mandalay plain to exploit the confusion that would be caused.

(iii) *Plan "Z"* entailed an airborne assault in strength with all transport aircraft in the theatre immediately north of Rangoon, to capture the city.

(iv) *General Stilwell's plan* was for British forces to press forward towards Shwebo-Mandalay, while N.C.A.C.* profited by the diversion to occupy Bhamo, whence they could mount an airborne operation to capture Lashio.

10. The part that the Air Forces were to play in these operations was given in an Operational Directive in which the order of priorities was interesting, putting as it did close support and transport operations very low in the scale. In the event, a reorientation of tasks took place which gave greater emphasis to the work of close support and air supply. The results of such a shift in the centre of gravity to a machine geared to the classical form of air warfare involved changes in organisation, control, supply and maintenance which are discussed at more length in the appropriate context.

11. Plans "Y" and "Z" were approved in principle by the Chiefs of Staff in July and August, and called "Capital" and "Dracula" respectively. In point of fact, however, operations in Central Burma progressed more quickly than anticipated. Continually out-flanked by Allied forces, to whom the manna of air supply gave an unprecedented degree of mobility, and continually harried by our close support aircraft, the enemy was never allowed to consolidate the new positions that he occupied along the line of his retreat. Thus by January, the airborne aspect of "Capital" had been rendered unnecessary, a fact which caused great relief to the Allied Commanders, for it was increasingly evident that the transport aircraft to train for and launch the operation, scheduled for mid-February, would be difficult to find from existing resources.

12. Operation "Dracula" was to be the greatest airborne operation yet conceived, involving a fly-in over a distance of 480 miles by some 900 transport aircraft and 650 gliders. The necessity for retaining these forces in Europe, and their high attrition rate in operations there, precluded their re-deployment in this theatre as planned, and in October "Dracula" was postponed with the prospect of not being mounted until the winter of 1945-46.

13. The emphasis now lay on Central Burma operations. An advance to the Monywa-Mandalay area was considered to be the furthest point that could be reached before the 1945 monsoon. Exploitation further south was not thought to be practicable in view of the difficulties of supply. In the event, the

* Northern Combat Area Command.

advances made exceeded all planned expectations. This can be attributed to the following main causes:—

(i) The magnitude of the Japanese defeat at Imphal, which was not realised until much later.

(ii) The virtual elimination of enemy air opposition resulting in complete predominance and liberty of action of our offensive and air transport forces.

(iii) The steady growth of air supply resources and improvements in their organisation.

(iv) The occupation of Akyab and Ramree, which had been decided upon to provide advanced air supply bases. This enabled us to reorient and shorten the supply lines in relation to the advance southward of Fourteenth Army.

14. By February, 1945, the possibilities of a more ambitious plan were becoming evident, and Fourteenth Army and 221 Group submitted a plan for vigorous exploitation of the favourable set of circumstances then obtaining. G.O.C. Fourteenth Army considered that if the enemy elected to stand and fight around Mandalay, there was every hope of destroying the Japanese Army in the open plains of Central Burma, thereby opening the route for a swift advance upon Rangoon by highly mobile columns. The plan aimed at encirclement of the enemy forces on the Mandalay Plain to be completed by air attack on such lines of communication as remained open to him. In conjunction with a direct thrust by 33 Corps towards Mandalay, 4 Corps were to carry out a wide encircling movement directed towards Meiktila which would cut the main line of communication southwards. Meiktila itself was to be secured by a small air transported force who would consolidate our position athwart this vital route.

15. This bold plan was highly successful, and as a result the Japanese Army in Burma suffered heavy casualties in a costly and bloody killing match to which the Air Forces contributed in large measure. Notwithstanding its success, the battle of extermination took longer than had been contemplated, and the time-table for the dash to Rangoon by 4 Corps was in jeopardy. The prospect of a race against a reduced time limit caused considerable anxiety in the mind of C.-in-C. Allied Land Forces, South East Asia (A.L.F.S.E.A.). In his opinion the overland advance by highly mobile forces might not have the necessary impetus to overcome opposition en route, together with the final opposition estimated from the defenders of Rangoon, reinforced by the remnants of field formations extricated from Central Burma. Upon his urgent recommendations, the capture of Rangoon before the monsoon was made more certain by the mounting of a modified "Dracula" by sea and air.

16. To carry out this operation, it would be necessary to utilise forces which were earmarked to seize concurrently with the capture of Rangoon a springboard on the Malay Peninsula. In the event, this modified "Dracula" proved to have been unnecessary, as the following pages will show. Nevertheless the capture of Rangoon entailed such a large expenditure of effort and resources that planning has had to be conducted since then on

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the premise that large-scale refitting, re-deployment and marshalling of forces is necessary before the next step is undertaken. The occupation of Rangoon therefore constitutes a milestone in the history of South East Asia, marking the end of a well-defined period.

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PART TWO.

THE OPERATIONAL BACKGROUND, JUNE, 1944—MAY, 1945.

17. When, on 22nd June, 1944, an overland junction was effected on the Imphal-Kohima road between the garrison of the Imphal plain and the relieving ground forces which had advanced from the north, a major crisis had been resolved, and our land forces, despite the monsoon, were able gradually to turn more and more both tactically and strategically to the offensive.

18. The Fourteenth Army, with its headquarters beside those of the Third Tactical Air Force at Comilla, controlled the Allied units on the southern two-thirds of the front. On its coastal section, 15 Corps held the port of Maungdaw and a monsoon line along the Maungdaw-Buthidaung road; its left flank was thinly covered by the Lushai Brigade which operated in guerilla fashion over the desolate hill country as far north as Haka and the valley of the Manipur River. In the Imphal Valley, although 4 Corps had linked up with 33 Corps advancing from Assam, the Japanese were still holding tenaciously to their positions among the hills east of Palel overlooking the plain; further to the north-east, however, the position was more favourable, and elements of 33 Corps were pressing forward towards Ukhrul.

19. Beyond the operational area of the Fourteenth Army, Special Force, which had been boldly launched into the heart of enemy held territory in March, was fighting both the weather and the enemy in the general area of the railway corridor east and south-east of Lake Indawgyi. It was controlled by the Northern Combat Area Command under General Stilwell, and had effected a junction with the Chinese and American forces now investing the Japanese garrison of Myitkyina, where the main airfield had passed into their hands. Further still to the north-east, a Chinese army based on Yunnan was fighting in the upper Salween valley.

20. The front remained static, during the period of the monsoon, only in the coastal area. On the Imphal sector, 33 Corps—which took over from 4 Corps when the latter was withdrawn from the line for four months—remained on the offensive. In the course of July the enemy was finally driven by combined air and ground bombardment from his tenaciously held positions, on the perimeter of the Imphal plain, and with the capture of Tamu in early August the Allied forces had re-established a foothold in the Kabaw Valley and were ready to push southwards towards Yazagyo and Kalemyo and eastwards to the Chindwin.

21. On the right flank, a series of Japanese delaying positions on what was euphemistically called the Tiddim Road, was overcome during

August and September, the "Hurribomber" again proving itself a most effective weapon for close support in jungle country, as the wreckage along the Tiddim Road testified. Tiddim itself fell on 18th October, and the way was now open for a double thrust towards Kalemyo from the west and north. Japanese resistance in the Kennedy Peak area, albeit grim, proved no match for the experienced Allied troops and the accompanying air bombardment, and Kalemyo fell on 15th November. With the capture of Kalewa on 2nd December the chapter of mountain warfare was closed and the Fourteenth Army was ready to debouch upon the plains of Central Burma.

22. Comparable progress had also been made in the Northern Combat Area Command sector, where the enemy garrison at Myitkyina had been reduced early in August. In the railway corridor, 36 Division, which had replaced Special Force, made steady progress; it captured Hopin on 7th September and by 10th December had reached the junction at Indaw. A drive southwards from Myitkyina carried Chinese units to Bhamo at approximately the same time. Thus by the end of the monsoon period the forces of the Northern Combat Area Command were in a position seriously to threaten the right flank of the enemy elements facing the Fourteenth Army.

23. Before the opening of the campaigning season proper, a certain number of changes had been made in the organisation of the ground forces facing the Japanese in Burma. Since with the converging advances of both the Fourteenth Army and the Northern Combat Area Command the opening of a continuous front in Central Burma seemed probable in the near future, Lieut.-General Sir Oliver Leese, Bart., K.C.B., C.B.E., D.S.O., was allotted command of all the Allied Land Forces in Burma. This Headquarters absorbed that of 11 Army Corps, and was set up at Barrackpore outside Calcutta, while an off-shoot was maintained at Kandy. 15 Corps, operating in Arakan, was removed from the control of Fourteenth Army and placed directly under his command—a step which enabled Headquarters, Fourteenth Army, to move forward and establish itself beside 221 Group on the Imphal plain. With the return of 4 Corps to the field in early November it thus retained command of two army corps, for 33 Corps remained in control of the operations developing against Kalemyo. Such was the general organisation of the ground forces when the new campaign fairly opened in November, 1944.

24. In the coastal sector, 15 Corps had begun the preliminaries to its offensive at an early hour and before the end of October, 81 (West African) Division, supplied entirely by air, had crossed into the Kaladan valley from its monsoon quarters at Chiringa and was beginning to advance southwards against some opposition. The main offensive was opened west of the Mayu Hills in mid-December; its purpose was to secure air bases on Akyab and Ramree Islands, from which support could be mounted for future operations in southern Burma, and also by driving the Japanese from the coastal strip west of the Arakan Yomas to liberate the considerable Allied forces they had contained there. It met with even less

resistance than had been anticipated. Forward units of 15 Corps reached Foul Point before Christmas, and an Allied landing on Akyab Island on 3rd January was unopposed. A further landing on Ramree Island on the 21st met with only slight opposition. The core of Japanese resistance was, however, met along the coastal road from Myohaung to Taungup, and a number of amphibious landings which were effected in January and February at various points along the coast provoked fierce fighting (whose issue was beyond doubt due to the heavy and accurate air support that was given), and gradually the enemy was driven towards the two routes leading eastwards from An and Taungup towards the Irrawaddy valley. With the capture of Taungup in the middle of April the coastal campaign was virtually over.

25. The climax of the main battle in central Burma was meanwhile not long delayed. During December the Fourteenth Army struck eastwards, and with the occupation of Wuntho by 4 Corps on the 20th, secured its left flank by laying the basis for a continuous front with the Northern Combat Area Command. The railhead at Ye-U was occupied by 33 Corps on New Year's Day, and the Japanese stronghold at Monywa was finally reduced on the 21st, by when 33 Corps had reached the general line of the Irrawaddy, on which it was evident that the enemy had resolved to make a stand. Bridgeheads had however been secured by 20 Division on the left bank of the river at Thabeikkyin and Singu, and in the great bend of the Irrawaddy the Japanese stoutly defended the approaches to Sagaing on the right bank. In these two sectors, where the contending forces were not separated by the river, bitter fighting continued throughout the second half of January and the first half of February. To the north-east, the Northern Combat Area Command forces were moving southwards across the Shweli valley and towards Lashio; Hsenwi was taken on 19th February, and Namtu on the 23rd.

26. While these events were taking place in the Irrawaddy valley and to the north-east, the main strategy of the campaign was beginning to take shape. 4 Corps was removed from the left flank of the Fourteenth Army as soon as the junction with the Northern Combat Area Command was assured, and with two divisions was given the task of pushing southwards from Kalemyo along the Gangaw valley towards Tilin and Pauk. The natural obstacles on this wild route were every bit as great as those prepared by the enemy, who did not appreciate the threat to his left flank that was thus being unfolded. His ignorance of the situation was due to the fact that his reconnaissance aircraft dared not cover the area, and to his tardy realisation of the new mobility of the Allied armies with which air supply endowed them. His defences at Gangaw were overwhelmed on 10th January after an air bombardment to which the Army paid full tribute, and by the 27th the forward units of 4 Corps had reached Pauk. Early in February they established themselves on the right bank of the Irrawaddy below Pakokku. The stage was now set for the crowning blow of the campaign.

27. After a few days' pause, a series of concerted crossings at various points of the Irrawaddy below Mandalay began on the night of 12th-13th February. A new bridgehead was established by 33 Corps opposite Myinmu, in the teeth of determined opposition on the part of the Japanese, who took it to be part of a major encircling movement against Mandalay in conjunction with the forces in the Singu bridgehead to the north. They accordingly threw in most of their available reserves to combat it. A feint crossing was made far to the south, opposite Seikpyu, while the main thrust was made a little upstream, opposite Myitche, where 4 Corps was able to establish a foothold against comparatively light opposition from the enemy, who still underestimated the threat to his left flank. When this bridgehead had been consolidated, a motorised brigade was concentrated behind its lines.

28. On the 23rd, this Brigade moved swiftly eastwards, reaching the railway at Taungtha the next day. It then turned south-east along the line towards the junction of Meiktila, a nodal centre in the communications of central Burma, in the neighbourhood of which there were also several good airfields. The enemy was completely taken aback by this thrust into his rear areas, and although his line of communication troops fought hard, they were unable to do more than delay slightly our advance. By the afternoon of 3rd March, the garrison of Meiktila had been annihilated and 4 Corps had thus placed a brigade, which our air transport speedily built up into a division, squarely athwart the main enemy line of communication from his base at Rangoon to the fighting zone.

29. It was in March that the battle which was to decide the fate of most of Burma north of the Gulf of Martaban was fought. The Japanese reacted speedily to the major strategic thrust whose significance they had grasped too late, and hastily moved southwards all their available forces, in an effort, first, to break our stranglehold on their communications, and, when this failed, to withdraw to safety as many as they could of their troops in the Mandalay-Meiktila noose. Mandalay itself fell to our troops advancing from the north by the middle of the month.

30. Meanwhile the whole area Mandalay-Myingyan-Meiktila had been transformed into a vast battlefield, in which the Fourteenth Army and No. 221 Group attacked from three directions the disorganized forces of the enemy, whose casualties were heavy. A number of scattered units made their escape, but by the beginning of April it might fairly be estimated that Japanese military power in Burma had been shattered. In the Northern Combat Area Command sector, the course of events in central Burma had helped to quicken the pace of the Japanese withdrawal; Lashio was captured by a Chinese division on 8th March, and the enemy soon broke contact, retreating southwards into the Shan States.

31. The Fourteenth Army resumed its large-scale offensive on 12th April, after a short period for regrouping its forces. 4 Corps, supplied by air, struck along the main Mandalay-Rangoon axis; by the end of the month it had covered some 250 miles and had reached the outskirts of Pegu, less than 50 miles from Rangoon, which the Japanese were

known to have evacuated two or three days earlier. 33 Corps had moved south-west to Magwe, which was captured on the 18th, and thence advanced down the Irrawaddy valley; its forward elements reached the railhead at Prome on 1st May. Nowhere was the enemy able to bar the advance by a frontal stand. Such were the circumstances when the combined operation for the capture of Rangoon from the south was put into execution at the express wish of C.-in-C. A.L.F.S.E.A.

32. As already explained, Operation "Dracula" met with little or no opposition. It was a copy-book operation, and the troops advancing into the city from the south partook more of the nature of a triumphal procession than an assault force. They were met by the commanding officer of No. 110 Squadron R.A.F., Wing Commander Saunders, who on the previous day, perceiving no signs of the enemy at Mingaladon airfield, had decided to land and reconnoitre the city. He took formal possession of Rangoon on behalf of the Allied forces. It was fitting that the vital part the Air Forces had played in the campaign should be symbolically rounded off by the occupation of Rangoon by the Royal Air Force.

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PART THREE.

ALLIED AIR DOMINANCE.

33. Until October, 1944, when the enemy began to withdraw aircraft from this theatre to reinforce his garrison in the Philippines, the overall strength of the Japanese Air Force in this theatre remained at some 450 aircraft in operational units. Normally about 150 aircraft, 70 per cent. of which were fighters, were disposed in Burma and Thailand for immediate use. The majority of the remainder were retained in Malaya and Sumatra, and comprised bombers and floatplanes for shipping escorts and anti-submarine duties, fighters for the defence of the Sumatra oilfields, and operational echelons refitting or training. With General MacArthur's invasion of the Philippines, when up to 100 aircraft left S.E.A.C., a steady decline in strength set in, aggravated by the constant attrition caused by our fighters, for which full replacement was not forthcoming, until in May, 1945, the enemy could muster but 250 aircraft in the S.E.A.C. area, of which over 100, stationed in Malaya and Sumatra, were for most purposes ineffective by reason of their distance from the battle areas.

34. Following the sharp lessons he received between March and May, 1944, the enemy's warning system became somewhat less embryonic, so that it was difficult to achieve complete surprise in any part of the theatre. By listening to Allied W/T and R/T, and by supplementing a skimpy radar system with observation posts and sound locators, a comprehensive albeit somewhat thin warning-system had been established around the whole of the Western Perimeter, and it was only a question of time before growing technical proficiency rendered the task of Allied aircraft in search of all too rare targets, even more difficult.

35. By comparison, the strength and composition of the Allied fighter force was most satisfactory. Spitfires, Lightnings, and latterly Thunderbolts and Mustangs, completely transformed the situation which had obtained until November, 1943, when our Hurricanes were outclassed and out-manoeuvred by the enemy. Backed by a warning and control system of high standard, Allied fighters had without fail rendered the enemy's incursions into our defended areas costly and ineffectual. During the eleven months covered by this despatch 165 enemy aircraft were destroyed on the ground or in the air, together with 47 probables and 152 damaged. This destruction was achieved against a total enemy effort, offensive and defensive, of 1,845 sorties. One enemy aircraft was destroyed for every eleven sighted; that the air superiority established before the period of this narrative was well maintained over the year, needs no further proof.

36. This virtual dominance of the air over Burma was the result of hard work with small dividends upon the part of our fighter organisation. Freed from the necessity of establishing superiority, the major problems remaining to Allied fighters by the time this despatch opens were the interception of sneak raids, usually undertaken by the Japanese Air Force under the protection of cloud-cover, and the searching-out and destruction of a meagre enemy air force dispersed upon a generous network of rear airfields. Initially, the greatest danger was to the stream of transports hauling supplies to the Imphal Plain, which offered the best prey ever presented to any air force. Some one hundred unarmed aircraft flew daily in and out of the area, and fighter patrols laboured under the handicaps of extensive cloud conditions and a shortage of P.O.L.* at their bases.

37. Moreover, the mountainous terrain to the east precluded efficient early air raid warning, and the enemy could at will come unannounced through the valleys. To minimise the danger, traffic was routed along a corridor from the Khopum Valley to Palel under a fighter umbrella. Ground signs were displayed en route to indicate the presence of enemy aircraft which was also broadcast by R/T. The sight of a stream of transports flying into the Imphal Valley with a screen of Spitfires circling overhead was a most heartening sight to the garrison, who thereby received constant assurance that their aerial life-line was unbroken. The precautions taken and the impotence of the enemy resulted in only two transports being destroyed by enemy action during the whole of the siege, a remarkable achievement.

38. The danger to transport aircraft persisted during the whole of the advance, since they were continually operating in front of the warning screen, and fighter bases were not always established as far forward as was tactically desirable. For this there were two main reasons; in the early stages of the advance through hilly jungle no airstrips could be constructed near the front, and second, having debouched on to the plains, the Army were not willing to devote supplies and resources to

establish fighter bases in the area of dropping operations.

39. On two occasions, therefore, our transport aircraft were victims of enemy sneak raids; on one day in November while dropping along the Tiddim Road, five aircraft were destroyed by the enemy, and on the 12th January four were shot down while supply dropping near Onbauk, an airfield recently recaptured from the enemy which, however, had not by that time been prepared for defensive fighters. Even when during the temporary halt around Mandalay, and Spitfires were able to occupy the Shwebo and Monywa airfield groups, air supply was proceeding over a hundred and thirty mile front which the four available squadrons of Spitfires were hard pressed to cover in conjunction with their other defensive commitments. It is a lesson of the campaign that the air supply of ground forces depends on the immediate deployment as far forward as possible of fighter squadrons to patrol the Lines of Communication. Had the enemy used his fighters effectively instead of frittering away their effort on infrequent low-level attacks against forward troops, he would have been able to do great execution among our Dakotas and Commandos, thus seriously impeding the advance.

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40. Since it was not always possible to engage the enemy in the air, it was necessary to search out his aircraft on the ground. To this end, intruder raids were undertaken at frequent intervals, and paid a dividend of 80 destroyed, 25 probably destroyed and 78 damaged aircraft on enemy airfields. In October, a series of raids were undertaken against the Rangoon airfields with the additional motive of hindering the transfer of units to the Philippines. In this operation, many types of aircraft were employed, including Beaufighters, but, as aircraft resources became more suited to operational requirements, intrusion was progressively left to the Mustang squadrons of the Air Commandos, who on more than one occasion in the spring of 1945, made the 1,500 mile round trip to the Japanese base airfields in Siam with good results totalling 38 destroyed, 10 probably destroyed and 21 damaged aircraft.

41. The problem of destroying an enemy intent on conserving his forces and possessing a wide choice of airfields containing many revetments (Meiktila airfield disposes of over a hundred) is not an easy one. In addition, the enemy's skill with light anti-aircraft and machine-gun fire is well-known, and low-level "strafing" runs are apt to be costly. It was found uneconomical to make a preliminary reconnaissance run to discover which revetments were occupied, and often only a quick snap-shot at a target seen late in the "strafe" was possible. In view of these factors it will be seen that the result achieved is more than creditable.

42. Early attempts to ground or destroy the enemy by bombing his airfields were ineffective and were discontinued in favour of more worthwhile targets.

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43. The enemy's offensive effort was so ineffectual as to be hardly worth mentioning except to recount the losses he sustained. In

* Petrol, Oil, Lubricants.

late September the Japanese Air Force began a series of reconnaissances with disastrous results. Cover was attempted of the Manipur Road, Silchar, Chittagong and battle areas. Four Dinahs were destroyed during this brief spell and since then no reconnaissance over the India border has been attempted. On Christmas night three bombers attempted to penetrate to the Calcutta area; of these, two were destroyed by Beaufighters and the third returned in a damaged condition. Enemy attempts to interfere with shipping off Akyab in January were decisively dealt with by the Spitfire squadrons who moved in five days after its occupation, No. 67 Squadron destroying five out of six attacking Oscars in one day.

44. Thereafter, the enemy effort degenerated into a series of sporadic and infrequent attempts to disrupt our forward columns. The ineffectual nature of these attacks was evident to all who flew over the battlefield and noted, on the enemy side no signs of activity, but, behind the British lines, long lines of transport moving in uncamouflaged safety, supply-dropping parachutes in use as tents, and all the apparatus of war left in full view by troops whose immunity from air attack was scarcely ever violated even by fast-flying fighters, for the enemy dared not send a bomber over the Allied lines by daylight.

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45. It is unnecessary to recount in detail the enormous advantages accruing to both ground and air forces when the enemy air arm is small and misemployed, and when our own squadrons are superior in performance, training and control. It is, however, worth pausing to consider the results had enemy aircraft been allowed unrestricted use of the sky. The air supply on which the whole land campaign hinged would have been impossible, the attrition rate of our close support squadrons, which worked with accuracy and effect, would have been prohibitive, and the disruption caused by our strategic bombers to the enemy's communications far to the rear could not have been such as to have materially influenced the battle.

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PART FOUR.

TRANSPORT SUPPORT OPERATIONS AND DEVELOPMENT.

46. The Burma campaign has proved beyond all doubt that once air superiority has been achieved, the air maintenance and supply of forces in the field is governed primarily by the availability of airfields and of transport aircraft. The supply and maintenance of the Army, in the field and engaged in intensive operations together with a tactical air force in support, is a major problem under most favourable conditions. It should be borne in mind, however, that supply bases were some 250 miles distant, and that the intervening country comprised vast stretches of impenetrable jungle and a formidable mountain barrier rising up to 10,000 feet. In addition, weather conditions were by no means favourable, and experience has shown that monsoon cloud develops a

degree of turbulence which has been the cause of a number of fatal accidents.

47. Despite these many difficulties, the success of the air supply operations in the Burma campaign has been fully testified. It is fair to say that without air supply the Burma campaign could never have been fought on its present lines. It was in fact a decisive factor of the land campaign. Admittedly mistakes occurred, sometimes due to miscalculation but more often due to unforeseen contingencies. Even so the air supply operations in Burma will probably rank as one of the greatest, if not the greatest, of air supply achievements in this war.

48. The organisation and operation of air supply is a problem which calls for mutual understanding of each other's difficulties by the respective Services. In this respect it cannot be too strongly emphasised that it is the operators and not the consumers who determine the most efficient method of delivering the goods. Moreover, it is up to the consumers to state precisely what is required, in a given order of priority. It is their responsibility also to deliver these goods in the required quantities and at the right time to the air supply heads. The swift and unco-ordinated growth of the air transport organization did not allow of a full appreciation, by either the Army or the Air Force, of the importance of the ancillary services necessary to promote the full effectiveness of the machine. As the campaign advanced, this tendency has been progressively eliminated, and the situation is now that only a lack of resources prevents the air transport organization from incorporating all the lessons that have been learnt, and giving it the full effectiveness with which experience can endow it. From this observation, the air supply organization that has developed within the area of Northern Combat Area Command and Tenth Air Force is excepted. There, a realisation of the importance of firm backing to the supply system was evident from the outset, and resulted in a very high standard of operating efficiency.

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49. In June, 1944, there were in Air Command eleven transport squadrons engaged on air supply, four British and seven American. By May, 1945, these figures had risen to nine and sixteen respectively, an increase which still left the air supply force with little or no margin of reserve. The growth of air supply during the period can well be imagined.

50. At the beginning of the period, attention was still centred upon the critical position of 4 Corps besieged in and around the ancient capital of Manipur. There were still twenty-three days of June to go before the road to Imphal was to be re-opened. Working to supply the garrison and to build a stockpile to exploit the anticipated Japanese retreat, as much as 700 tons were being flown in on a single day under monsoon conditions. When the road was re-opened, effort was not allowed to drop and for the remaining days of June the squadrons flew at maximum effort in order to build up stocks and ascertain the peak air lift that could be achieved. The wisdom of this was doubtful; all concerned were already exhausted, and experience has illustrated the value of retaining a margin of effort in reserve, and of not over-straining a complicated machine without urgent necessity.

51. However, by the end of the month, the enemy was in retreat, and food and munitions were available to speed his withdrawal. The threat to India and to the China life-line had been removed, and a grim defence, sustained solely by air supply, was becoming a vigorous offensive, whose progress was also fed from the air. From July until November, 33 Corps fought its way eastwards to the Chindwin, southwards along the Kabaw valley and down the Tiddim Road, provided entirely with munitions and food by our transport squadrons. Until the end of the monsoon, supply was carried out under conditions of unbelievable difficulty. In July the commander of 33 Corps sent the following signal to No. 194 Squadron: "Your unflinching efforts and determination to complete your task in spite of appalling flying conditions are worthy of the highest praise." In August, another squadron summarised its efforts as follows:—"It has taken on occasion six to seven days of battling through torrential rain, strong winds and 10/10ths cloud down to 200 feet to achieve one mission, but it has been done."

52. In August and September it was becoming clear that the planning and day-to-day control of air supply operations required an organisation separate from Third Tactical Air Force, whose responsibility air supply operations had been since the dissolution of Troop Carrier Command. This was rendered all the more necessary by the large part that it was proposed airborne operations should play in the coming dry season. Thus, in October, Combat Cargo Task Force (C.C.T.F.), an integrated U.S.A./British Headquarters, was formed and became responsible for the day-to-day control and the planning of air transport operations in support of Fourteenth Army and 15 Corps.

53. One of the first measures undertaken by H.Q.C.C.T.F. was the reorganisation of the allocation of tasks, whose importance when demand is always outrunning supply cannot be stressed too strongly. The original procedure had been that, prior to the beginning of each month, Fourteenth Army submitted to Third Tactical Air Force its planned air supply requirements, which were based on the assumption that the Army's advance in the various sectors would invariably be strongly opposed. Consequently, demands were always high and supplies were occasionally fifty per cent. below the planned figure but withal more than sufficient for current requirements. The Rear Airfield Maintenance Organisation (R.A.M.O.) received its day's tasks direct from the headquarters of the Corps which it was supplying, and at the same time asked the Air Forces for the requisite number of aircraft. If, as often happened, the Army's daily requirements exceeded the air resources available, considerable confusion resulted, since no proper system of allocating priorities had been evolved.

54. This problem was solved by forming, alongside C.C.T.F., the Combined Army-Air Transport Organisation (C.A.A.T.O.) which received and collated daily requests, assessed their urgency and, having a full knowledge of aircraft states, allotted the tasks accordingly. The organisation was thus more in line with current European practice, with two notable exceptions, the lack of signals and telephone communications

was such as to clog any air supply machinery no matter how well-planned, and second, there were crippling deficiencies of personnel in such ancillary bodies as Staging Posts and Casualty Air Evacuation Units.

55. On December 20th, the first strip for landing-on of supplies was opened at Indaing-gale. Others followed in quick succession, Taukkyan near Kalembo, Kawlin and Indaw trans-Chindwin as soon as the river had been crossed, and Kan in the Myittha Valley where 4 Corps had returned to the line, replacing the Lushai Brigade and representing another and growing commitment to our transport forces.

56. Thus, by January, the increasing demands of mobile warfare, which did not accord with the plans on which resources had been allotted and organisation developed, and the engagement of larger forces, witnessed a gradual and sustained rise in the demands of Fourteenth Army for air supply. Many unforeseen difficulties were now coming to light, and when the Supreme Commander visited the forward areas he was informed that the Air Forces were not carrying enough supplies. C.-in-C. A.L.F.S.E.A. circulated a memorandum calling for more resources in transport aircraft, without which, he stated, not only would the advance to Mandalay and beyond be arrested, but due to the impossibility of supplying forces in front of the roadhead he might be forced to withdraw beyond the Chindwin for the monsoon. This view of the situation (which in my opinion was unduly pessimistic) caused an urgent request to the Chiefs of Staff for additional transport squadrons, and as a result Nos. 238 and 267 Squadrons arrived in March. Actually a better organisation of existing ground transport resources would have met every commitment, and for this reason Air Marshal Garrod undertook a tour to investigate the working of the system.

57. It is as well here to outline, for the sake of comparison, the working of air supply in the N.C.A.C. area, to which but little reference has so far been made.

Air Supply in the Northern Combat Area Command.

58. The most striking feature of this organisation was the high standard of co-operation achieved by all agencies concerned—N.C.A.C., Service of Supply, Tenth Air Force, Air Service Command and all ancillary formations. Collective responsibility for the task of aid supply was rated higher than service allegiance; each body trusted the ability of the others to carry out their part of the work and did not attempt to dictate on matters outside its own sphere. The second great advantage was the abundance of good signal communications; every link in the chain, organisational, supply, squadrons, co-ordinators, being linked by a teletype and telephone network which allowed of a quick dissemination of the next day's tasks and priorities as allotted by the collating agency in N.C.A.C., and of speedy re-adjustment if necessary. A last-minute change in location of a Dropping Zone could be signalled back by a Division and retransmitted to an aircraft already airborne for another objective. Moreover, the packing and loading processes were organised on a moving-belt principle whose

efficiency eliminated a multitude of small delays; these ancillary organisations worked with the industrial efficiency of a large commercial factory.

59. A comparison between the American packing loading agencies at Dinjan and the R.I.A.S.C. Air Supply Companies at Hathazari reflected no credit on the British ground organisation. Here it should be emphasised that no reflection is intended on the personnel involved; British Officers and Indian Other Ranks were strained to breaking-point, and often had to work seventy-two hours at a stretch to complete their tasks; the fault lay in the fact that the importance and nature of the work demanded a much more generous scale of personnel, facilities, and organising ability than could be allotted by the Army.

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60. An examination of the data gathered on Air Marshal Garrod's tour brought to light the differences of organisation and procedure between the two air supply systems, and revealed a crying need for improvement in the organisation operated by C.A.A.T.O. and C.C.T.F. Too numerous to recount here, these points did have the effect of initiating action to improve the operating procedure. Meanwhile, Air Command was pressing for the speedy development of the recaptured bases along the Arakan Coast at Akyab and Ramree whose employment would shorten the haul into Central Burma. Journeys from the established bases at Chittagong, Comilla and Tulihal were now becoming so long that in order to complete three trips in a day, aircraft had to take off at first light and perhaps not finish until after dark. The strain on technical maintenance, flying and loading personnel can well be imagined.

61. It was in February that an overland advance to Rangoon supplied entirely by air was first put forward as a serious proposal. Fourteenth Army prepared a plan which envisaged two parallel drives southwards along the axes of the River Irrawaddy and of the Mandalay-Rangoon railway, while a large force from 33 Corps, of up to three and a half divisions, struck east to Takaw with the object of containing and destroying all enemy forces cut off north of Meiktila.

62. Air Command reactions to the plan were

(i) a re-orientation of supply lines, using Akyab and Ramree as advanced air supply heads which would result in substantial reduction in length of the air supply line as the force advanced south of Mandalay.

(ii) We doubted the soundness of the plan which aimed at a total destruction of the enemy in addition to the capture of Rangoon if the former necessitated a drive eastwards to cut off and destroy the enemy in the hills. This would inevitably involve a supply problem in that direction in addition to sustaining a main advance southwards.

63. A study of the situation after the fall of Rangoon shows that these reactions were fully justified. Apart from this, the plan had many advantages, and at a major conference in Calcutta on 23rd February which heralded my arrival as Allied Air Commander-in-Chief, it was approved in principle and the target for

tonnage to be hauled in its execution decided. The maximum lift was assessed at 1,887 tons per day between 20th March and 1st April and 2,075 tons per day between 1st May and 15th May. I emphasised that these figures would entail a very high rate of effort from the squadrons involved, and would entail considerable retrenchment during the monsoon to pay off the mortgage in maintenance and overstrain we would have contracted in its achievement.

64. Meanwhile, the air lift was still increasing. In February, C.C.T.F. hauled 51,210 short tons of supplies into the operational area. In addition, at the end of the month, a small though vital airborne operation took place to consolidate the capture of Meiktila, which had been seized following an armoured dash from their bridgehead on the Irrawaddy by 17 Division.

65. Troops were landed to reinforce the flying column which had seized the airfield and was now being fiercely attacked on all sides by the enemy. Transport aircraft landed and discharged their loads under fire, many suffering damage while so doing. One aircraft taking on wounded for its return journey had a shell explode inside it, causing further injuries to the casualties who were already emplaned. Thus, within very few days, landing became impossible, and it was necessary to resort to the less economical practice of dropping, which still further increased the load on our transport squadrons.

66. The Meiktila operation was a success, and a captured Japanese Staff officer assessed it as the turning point in the battle for Burma. It was not accomplished without mistakes, however, which rendered it far more hazardous than it might otherwise have been. It should be established that aircraft will not land until the possibility of the airfield being subjected to heavy fire is ruled out. Planning should be carried out on this premise. Secondly, the R.A.M.O. that was established on the airfield was pitifully inadequate, the officer in charge having to guide aircraft to unloading points instead of being free to organise their quick turn-around under fire. In a critical operation, such points might make all the difference between success and dismal failure. They merit much greater consideration in combined planning than has hitherto been accorded them.

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67. By the beginning of April, Meiktila was again safe for landing, although shells were still bursting less than 200 yards from the strips. Preparations were immediately commenced to build up stocks to maintain Fourteenth Army in the final dash which was to carry them 250 miles southward in the second half of the month. On the 20th, the main airfield at Lewe was captured and speedily prepared for light aircraft and gliders, which began landing on the morning of the 21st. Toungoo, 50 miles further south, was occupied on the 22nd and, in spite of bad weather, over 100 Dakotas and Commandos landed on the 24th. Within five days, Pyuntaza, another airstrip 70 miles further south, was also receiving supplies, and a battalion group was flown in to cut the enemy escape route eastwards from Pegu. The enemy was still active on both sides of the narrow strip along the Mandalay-Pegu railway which had formed our

corridor, and while the capture of Rangoon was left to an assault from the south, transport squadrons continued with unabated activity the supply of Fourteenth Army, who but for these outstanding efforts would not have been able to hold the ground they had won.

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Casualty Evacuation.

68. Throughout the period, the saving of lives, the morale of the fighting troops and the mobility of our ground forces has been materially assisted by the work of light aircraft and Dakotas flying out sick and wounded from the battle areas. The total of men thus saved from avoidable pain and suffering, from many days' journey by sampan, mule and ambulance, and from dying for lack of hospital facilities was formidable.

69. The flexibility of air power, by no means lessened when used in the interests of humanity, was well illustrated by a unique operation carried out by Sunderlands of No. 230 Squadron, which landed on Lake Indawgyi behind the enemy lines and flew out 537 wounded men of Special Force, whom General Wingate's columns would otherwise have been forced to abandon to the mercy of the Japanese.

70. This operation was, however, exceptional. The normal procedure was for light aircraft of the R.A.F. Communication squadrons and the U.S.A.A.F. Liaison squadrons to bring in the sick and wounded from extemporised landing strips to grounds where Dakotas and Commandos were discharging their cargo, and whence they would take them to base hospitals on return journeys. It was proposed at one time to attach light aircraft to the transport squadrons, and form one co-ordinated flying unit to undertake the whole process of casualty evacuation, but such a scheme would either have impaired the mobility of the light aircraft components or would have left them continually detached from their parent squadrons with no administrative or domestic backing for the difficult conditions under which they live and operate. Accordingly, as the American light aircraft are withdrawn from this theatre and the R.A.F. take on the whole of the work, it is proposed to form independent self-sufficient flying units to reinforce the Group Communication Squadrons in casualty evacuation. The resultant organisation will be sufficiently elastic to cover the whole front and yet be capable of concentration where casualties are heavy.

71. Casualty evacuation has been a regular part of the Air Forces' work in this theatre since the middle of 1943. It is unfortunate that with the increase in traffic which intensified operations have caused, there has been insufficient parallel growth of resources. Nursing Orderlies are 11 per cent. below establishment, and the buildings and accommodation for the reception of wounded at base airfields are not of the standard which good hygiene and humanity demand. If the Royal Air Force is to maintain the high reputation it has built in this sphere, far more generous scales of equipment and personnel must be authorised.

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Conclusions on Air Transport.

72. The first essential for air supply is good ground organisation. One weak link in the chain can vitiate the work of the aircrews and maintenance personnel, the estimates of the planners and the efforts of the fighting troops. It is worth outlining some of the faults that have occurred in order that they may be avoided in the future.

(i) Dropping Zones should always be located where a drop is feasible. This might sound a platitude to anyone who has not flown on supply-dropping operations in Burma and found dropping areas continually located in narrow valleys whose negotiation after each run is a major hazard.

(ii) The system of communicating information on dropping areas, on the composition of loads, on changes of location, on enemy interference and all other aspects of air supply must be such that the one small and vital item of knowledge which might make the difference between a successful or an abortive sortie is available at all links in the chain.

(iii) The British Army-Air supply system in South-East Asia has been continually marred by the failure to provide for meticulous organisation in a sphere where great efforts can be rendered nugatory by inaccuracy in minor details.

The following are some of the lessons learnt:—

(a) Adequate distributing facilities must be made available by the land forces at landing grounds to ensure that perishable goods are quickly distributed when unloaded from aircraft.

(b) Aircraft should not be detailed to convey food to areas in which the same commodities can easily be obtained by local purchase.

(c) Packing of goods must be strong enough to ensure that containers do not burst in transit.

(d) Adequate facilities must be provided for feeding and resting aircrews engaged on this arduous flying, as they are often absent from their bases for as long as ten hours at a time.

(e) An efficient supply of re-fuellers and facilities for night maintenance must be arranged, otherwise aircraft which could otherwise be making an effective contribution to the battle will be grounded.

(iv) Forward airfield commanders and flying control personnel took a long time to realise that air supply traffic is as vital as any other. Cargo aircraft should not be kept circling an airfield while tactical aircraft take off on a routine operation whose delay by half an hour is immaterial.

(v) Each part of the planning and assessment of air lift must be carried out by the Service in whose province it lies. Much confusion has been caused here by the Army attempting to quote and work on flying hours per aircraft with no knowledge of the implications of U.E. and I.E.*, aircraft serviceable

* U.E. = Unit Equipment.
I.E. = Initial Equipment.

or aircraft on strength. Moreover it was consistent practice for the Army to require full data on the performance of our aircraft and explanations for any short-fall that might occur, while never giving equivalent information upon their own short-fall in overland or inland water transport.

73. Air supply depends on so many agencies, and is affected by so many imponderables, that the allocation of resources and good brains to ensure efficiency, speed and good liaison can never be too generous. The campaign in Burma would have been rendered easier had the engineering resources that were poured into less profitable projects been directed towards timely building of forward airfields, more efficient supply depots and stronger lines of communication to the air haulage centres. The Ledo Road, for example, is surely the longest white elephant in the world. Had the wealth of ability and material that went to its building been employed in strengthening the air supply system, the recapture of Burma could probably have been advanced by an appreciable period.

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PART FIVE.

TACTICAL SUPPORT OF THE GROUND FORCES.

The Organisation of Tactical Support.

74. Air forces operating in tactical support of the Allied Land Forces in Burma comprised Nos. 221 and 224 Groups R.A.F. and 10th U.S.A.A.F. all under the command of Headquarters, Eastern Air Command. Each worked in close association with a corresponding army headquarters—the Tenth U.S.A.A.F. with the Northern Combat Area Command, 224 Group with 15 Corps and 221 Group with 33 Corps and 4 Corps, and finally from the beginning of December onwards with the Fourteenth Army. 221 Group and Fourteenth Army remained together at Imphal only until the end of December, when the latter moved forward to Kalemio, being accompanied by the A.O.C. and his air staff. The two headquarters were again united fully at Monywa from 9th February until the middle of April, when they moved to Meiktila, their final staging post before Rangoon. The mobility of 221 Group headquarters had a less active counterpart in that of 224 Group, which remained with the headquarters of 15 Corps first at Cox's Bazar and later at Akyab. In both cases the close relationship of the headquarters of the two Services was an essential element in their successful co-operation.

75. In the campaign in central Burma, just as all the ground forces came under the Fourteenth Army, so all the aircraft engaged in close, as distinct from tactical, support of the former were controlled by Headquarters, 221 Group. There were however two exceptions. The two Air Commando Groups operated directly under Eastern Air Command, and the Mustangs of the Second Air Commando Group, which played so important a role in the operations of 4 Corps which led to the seizure of Meiktila, were for the crucial period of these operations controlled by an advanced headquarters of the Combat Cargo Task Force located with 4 Corps headquarters.

The second exception was provided by the Thunderbolt squadrons of 905 Wing, for which, owing to administrative reasons, there was no room east of the Lushai Hills and which were therefore located in Arakan under 224 Group.

76. In this connection the very difficult problems of administration confronting 221 Group must be recalled. Its wings and squadrons operated from bases covering a front of some two hundred miles, and a depth which at the beginning of the campaigning season in November was no less, and which by the end of April had expanded to some six hundred miles, from the Mosquito wing at Khumbigram to the fighter squadrons on forward strips near Toungoo. Most were on a highly mobile basis, with personnel reduced to the minimum; the separation of squadrons from servicing echelons which was generally effected towards the end of 1944 contributed materially to the mobility of units in the group. Fighter squadrons moved forward in pace with the advancing front as quickly as the army were able to prepare landing grounds and forego air transport for them; the squadrons of 906 Wing, for instance, were operating from airfields near Ye-U by the middle of January, a fortnight after the occupation of the district by 33 Corps, and before the end of April no less than nine fighter squadrons were located at Toungoo, which had not been captured until the 22nd, and another four at Magwe, which fell on the 18th, in preparation for the assault upon Rangoon. These moves were effected with the aid of transport aircraft, overland communications being almost non-existent. There was, however, some feeling among the squadrons that in the matter of motor transport and indeed of supplies generally the army was at a distinct advantage.

77. The enormous area over which the squadrons of 221 Group were scattered, together with the meagreness of communications by land and telephone, also precluded the wholesale adoption, for the operational control of fighter aircraft in close support, of the organization which had been evolved in the European theatre of war for army-air co-operation. The former system of Army Air Support Units was replaced in the closing months of 1944 by the establishment of Air Support Signals Units with Visual Control Posts (V.C.Ps.), Air Advisers being also provided for both corps and divisional headquarters. A Combined Army/Air School for training V.C.P personnel was set up at Ranchi, and it was soon found that the greatest difficulty in the establishment of Visual Control Posts was the provision of personnel, particularly of Controllers, who it was agreed must be chosen from experienced junior officers of the General Duties branch. Ten teams were however operating by the end of 1944 and by the beginning of May, 1945, their number had risen to thirty-four. The special value of the V.C.Ps lay in the extra flexibility and accuracy which they lent to air operations planned in conjunction with the ground situation; the former device of indicating targets by smoke shells, always liable to inaccuracies in both place and time as well as to counterfeiting by the enemy, was now needed only when the target lay in flat jungle country, invisible from the air and not determinable in relation to any obvious feature of the landscape.

78. Of the general success of the V.C.P. system there can be no doubt, from both air and ground points of view. It contributed materially to that close and efficient co-operation of ground and air forces which was so marked a feature of the campaign of 1944-45. It led however to a tactic of less unquestionable value in the employment of the "cabrank" method, by which aircraft patrolled continuously over selected areas, maintaining touch all the time with the V.C.P., who as opportunity offered would call them down to attack any fresh target revealed by the progress of the battle. This tactic was very popular with our own troops, as the continued presence overhead of our own air support had excellent morale effect. Furthermore, air support was available to engage any target at a moment's notice. It was however wasteful of flying hours and reduced petrol stocks, in that the aircraft were liable to be kept waiting and targets could not always be provided, while it diminished the weight of air attack, since in order to maintain a continuous patrol the aircraft could seldom operate in more than pairs. If the army requires direct air support to be available at such short notice, it is considered that their desires could more economically be satisfied by providing the air forces with airfields as close behind the front line as the reasonable security of the ground installations will warrant.

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Close support of the Fourteenth Army.

79. The aircraft employed in close support operations were of various types. In June, 1944, there were still four squadrons of Vengeances operating, two on the Imphal and two on the Arakan front; they had done excellent work in the 1943-44 campaign, but had soon to be withdrawn. In September, the first R.A.F. Thunderbolts began operations; Thunderbolts had already been in use for some time with the Tenth U.S.A.A.F. which had also occasionally employed its Lightnings (P.38) in close support work. As the new campaign developed, and it became clear that the enemy was in no position seriously to challenge the Allied air superiority, Spitfires were increasingly diverted to the ground-attack role, particularly in the Arakan sector.

80. But the backbone of direct air support was always provided by the Hurricane, with or without bombs. The "Hurribomber" had well proved its worth in the 1943-4 campaign, and some in particular of the "Hurribomber" squadrons enjoyed an immense reputation for their accurate pin-pointing of targets within a comparatively few yards of our own positions. Their value in this was particularly evident during the period of mountain warfare that ended at the beginning of December, 1944, and subsequently in the interval of semi-static fighting that was marked by the battle of the bridgeheads in late January and February, 1945. In conjunction with fighter-bombers as well as independently, ground-attack fighters also frequently operated in close support, doing particularly effective work in attacks upon gun sites and patrols over areas in which enemy artillery was suspected to be located.

81. Heavier aircraft were also taken into service in support of ground attacks. Mitchells

(B.25) had already been employed for this purpose in the 1943-4 campaign, but the four squadrons of the Twelfth Bombardment Group were now withdrawn from the Strategic Air Force and placed under the operational control of first 224 Group and later 221 Group, so that their work might more simply be dovetailed into the general tactical pattern. They operated sometimes independently, but in close support more frequently in conjunction with fighter-bombers, and added greatly to the weight and effectiveness of large-scale close support operations; the term "Earthquake" which was ultimately taken into official use to describe these concerted attacks upon Japanese bunker positions originated among these Mitchell squadrons, who earned for themselves the name of "the Earthquakers."

82. An outstanding "earthquake" operation, for instance, was the air contribution to the combined army and air attack directed on 10th January against the enemy stronghold at Gangaw in the Kabaw Valley, where an extensive and well-defended system of bunkers and gun emplacements was holding up the advance of 4 Corps southwards in its vital thrust against the Japanese left flank. Four Mitchell squadrons participated in this operation, as did some thirty-four "Hurribombers," defensive cover being supplied by Spitfires and Thunderbolts. It turned out to be a highly successful day; the bombs were dropped at approximately 1430 hours and within ninety minutes five out of the six main Japanese positions were in Allied hands. The subsequent withdrawal of the enemy from the whole neighbourhood during the next few days was attributed by 4 Corps to be due in great measure to a lowering of his morale as a result of this air attack. But the participation of so large a number of aircraft in a single operation was not usual, and as the campaign wore on it was realised that Mitchells operating in numbers as low as two or three could do effective work in accurately winking out small enemy parties from their lairs.

83. Heavy bombers of the Strategic Air Force were also employed on "earthquake" operations from time to time, mainly in support of the Fourteenth Army during the battle for the bridgeheads in January and February, 1944, though they also intervened effectively in support of 15 Corps during the struggle for the possession of the coastal road at Kangaw at the end of January. But well-marked targets suitable for their employment in direct co-operation with the ground forces were of necessity few, owing to the Japanese skill in camouflage, and the heavy bombers were therefore of most assistance to land operations in their attacks upon targets not in the immediate battle-zone.

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Indirect Support of the Fourteenth Army.

84. On numerous occasions the ground forces requested the help of the Strategic Air Force, and nominated targets some distance behind the battle area though still in the tactical zone of land operations. These targets were, in the main, supply centres or nodal communication points or built-up areas in which the enemy was believed to be living. A notable attack of this type was mounted on

13th January against Mandalay, the keystone of the whole Japanese defensive system in central Burma and directly threatened in two directions by the advance of the Fourteenth Army. Fifty-four aircraft attacked the Japanese-occupied district and a further 12 the suburb of Sagaing on the opposite side of the river, the operation being preceded by attacks by Thunderbolts upon anti-aircraft gun sites in the neighbourhood, and accompanied by fighter sweeps over the airfields at Aungban and Meiktila. Photographic evidence confirmed the destruction of some 70 major buildings in the Japanese quarters, while intelligence reports variously estimated Japanese casualties alone at 600 and a 1,000, in addition to those inflicted upon Burmese puppet troops.

85. Such operations undertaken at the request of the Allied land forces reached their zenith in February, during which month nearly two thirds of the total number of sorties flown by Liberators of the Strategic Air Force were directed against targets in or near the battlefront as requested by the Fourteenth Army. These included, for instance, the stores dumps near the railhead at Madaya, from which the enemy forces fighting to contain the Singu bridgehead were supplied, which was attacked by forty-five heavy bomber aircraft, and the garrison districts at Yenangyaung, which were attacked by 50. Later in the month, heavy bomber targets included objectives designated by the Army at Myittha, Mahlaing and Myingyan—all towns lying on or close to the path being followed by the armoured columns of 4 Corps in their thrust towards Meiktila. To take a final example, the climax of the air attacks upon the potential stronghold of Toungoo, where the enemy was expected to make a serious effort to stop the drive of 4 Corps southwards towards Rangoon in the second half of April, was supplied by over 40 Liberators, which bombed the garrison area there on the 21st, when the nearest Allied troops were already within striking distance, and indeed entered the town the following day.

86. Very effective operations against targets in the immediate rear of the enemy were carried out by ground-attack fighters throughout the period; their most vulnerable objectives were to be found along the lines of communication, where animal and motor transport units were carrying to his troops in the field, and also along the waterways where miscellaneous rivercraft served the same purpose. In these operations varied aircraft were employed, from Hurricanes and Spitfires to Beaufighters, Lightnings, Thunderbolts and Mosquitos, while Mitchells also participated, particularly by night. Armament included rocket projectiles and bombs, as well as 40 mm. cannon, also guns of lesser calibre.

87. Some small foretaste of the weight and pattern of this tactical support of the army was given in July, when the enemy was endeavouring to withdraw from the perimeter of the Imphal plain, and good toll was taken of his transport forced to brave the open road to Tiddim and the other routes eastward to the Chindwin. Direct attacks upon vehicles, mainly by Hurricanes, were varied by successful efforts to block the Tiddim road by causing landslides, and to break the bridges both along it and in the Kabaw Valley—achievements for

which Lightnings and Vengeances were responsible. In all, over 75 motor transport units were successfully attacked in this area during the month. These operations, though invisible to the army, were controlled with the military situation always in view, and evidence was subsequently forthcoming in plenty from captured diaries of enemy officers and men of their effectiveness in hindering the passage of supplies and the movement of personnel, and in aggravating the conditions of disease and undernourishment under which the Japanese ground forces laboured.

88. In August the tactical picture on the Fourteenth Army front came to centre round the Chindwin river, which for two or three weeks became of considerably enhanced importance as a supply route. It had long been in use by the Japanese as a line of communication, and the riverine ports, particularly Monywa and Kalewa, were active points of supply. The still worsening military situation continued to impose upon the enemy the necessity for emergency movements of men and supplies behind the Manipur sector of the front. Since the capacity of the Sagaing—Ye-U railway had been greatly reduced by air action, and the other overland routes were more or less unusable owing to the monsoon, they were forced to have increased resort to the Chindwin as a line of communication.

89. Early in the month the toll of rivercraft successfully attacked began to increase and it became apparent that something was afoot. The Spitfires and Hurricanes which had hitherto been covering the river were reinforced by a detachment of Beaufighters from 224 Group. "Hurribombers" were joined by Wellingtons, and later by Mitchells, in a series of attacks upon riverside targets. In addition, mines, both magnetic and ordinary, were laid in the Chindwin by Mitchells so as to catch traffic attempting to move under cover either of cloud or darkness. The total number of rivercraft successfully attacked on the Chindwin during the month was not far short of five hundred, and included seven launches; of this total the Beaufighters accounted for slightly over half, together with five of the launches.

90. Attacks upon road transport vehicles continued throughout the campaign, their effectiveness being increased with the advent of better weather at the close of the monsoon. In particular, the periods during which a major Allied advance was in progress and the battlefront was therefore fluid, were marked by the presence of transport targets in otherwise unusual quantity. This was so during the advance to the Irrawaddy in December, the thrust towards Meiktila during late February and early in March, and above all during the final advance of 4 Corps towards Rangoon in the second half of April. Ox-carts belonging to the local population had long been habitually pressed into service by the Japanese, and were attacked at all times. But lorries moved mainly under cover of darkness, and the Beaufighters which lit upon a convoy of forty to fifty vehicles travelling westwards along the road from Meiktila to Kyaukpadaung on the afternoon of February 5th and successfully strafed them made an exceptional discovery. But it was probably no coincidence that on the night of February 15th/16th, just after the Fourteenth Army had

made its decisive crossing of the Irrawaddy below Mandalay, another Beaufighter located some fifty vehicles all moving eastwards along the Chauk—Meiktila highway.

91. A little later, on the night of the 27th/28th, a Mitchell on intruder patrol discovered a convoy of over a hundred vehicles, together with some armoured cars and six tanks, travelling northwards along the road from Taungdwingyi to Myothit, doubtless to be thrown into the attempt to stem the advance of the Fourteenth Army. The aircraft delivered attacks by both bombing and strafing for the space of an hour. It then attacked another smaller group of vehicles some distance to the south-east, after which it returned to the large convoy and was able to observe that some forty units had been knocked out by its previous attacks; finally it delivered one more strafing attack, setting three more vehicles on fire.

92. In the second half of April, with the final stages of the advance southwards in progress, such targets became unprecedentedly plentiful. A Hurricane squadron, for instance, caught over forty vehicles on the 19th standing nose to tail, heavily loaded and camouflaged, off the road a little south of Pyinmana, and was subsequently able to count seventeen in flames and many more severely damaged. The same squadron located an even larger number near the site of the bridge over the Sittang at Mokpalin on the 30th, when a total of forty-three lorries finally was counted in flames. Both Mustangs of the Second Air Commando Group and Beaufighters of 224 Group had each already made a haul similar in size and nature in this escape corridor on the 26th. In all, during this second half of the month, approximately three hundred and fifty motor vehicles were successfully attacked behind the enemy's lines throughout Burma. The analogous figures for the whole period covered by this despatch may conservatively be assessed, on the basis of visible evidence, at 3846 M.T. vehicles.

93. One operation in tactical support of the Fourteenth Army is worthy of special mention, namely the achievement of a Hurricane IID squadron, firing rocket projectiles, which on February 19th—in the course of a single day—put out of action twelve tanks which the Japanese were about to throw into the battle for the bridgehead opposite Myinmu. These belonged to the single tank regiment of which the Japanese forces in Burma were known to dispose, and it was a measure of the importance attached by the enemy to the outcome of the struggle in the Myinmu bridgehead that he now sought to commit them in the field for the first time since they had been withdrawn from the Imphal front in the previous June. They were, however, destroyed before they came within range of infantry weapons, their destruction being shortly afterwards verified by advancing Allied troops who inspected their remains.

94. Somewhat different in character from the harassing of Japanese road communication was the interdiction of the railways used by the enemy in supplying his troops in Burma. Already, before the opening of the period covered by this despatch, the operation of ground-attack fighter aircraft over these lines had become a difficult and expensive undertaking. Trains had practically ceased to run by day,

their component parts generally being camouflaged and dispersed until sunset with the locomotives hidden in specially constructed shelters, often at the end of long sidings deep in the jungle. All obvious railway targets were guarded by efficient anti-aircraft defences, dummy or derelict locomotives being placed to decoy the aircraft into traps or at least to draw their fire. Nevertheless, some three hundred and ten locomotives were successfully attacked by day, Beaufighters accounting for one hundred and eighty-seven. Most of the remainder were claimed by Mosquitos, Mustangs, Lightnings and Thunderbolts.

95. Of the number of rolling stock destroyed it would be unsafe to give any estimate, but in any case there were always more than enough waggons available in Burma to satisfy Japanese military needs—in contrast to the position in regard to locomotives, which, as a result of past Allied air attacks were always in short supply, the Japanese going so far as to import them from Siam and to use petrol-driven cars to haul railway waggons. Water-towers always presented a vulnerable target, difficult to hide, and thirty-nine were holed during the period. It should be noted that these day attacks by ground-attack fighters reached as far as the northern extremities of both the Burma-Siam and the Bangkok-Chiangmai railways.

96. A further one hundred and twenty-two locomotives were put out of commission as a result of night attacks, thirty-seven being contributed by Mosquitos and thirty-seven by Mitchells. These attacks were of course delivered upon trains in full employment, and were not infrequently accompanied by spectacular results, with engine boilers exploding, trucks aflame and a series of secondary explosions. They may be reckoned as having inflicted greater material injury upon the enemy than a numerical comparison between the numbers of locomotives damaged by day and by night would suggest.

97. Concurrently with attacks upon locomotives, key points in the Burmese railway system, such as the junctions at Thazi and Pyinmana, were bombed, mainly by Mitchells and Lightnings. But the main weight of attack continued to be directed upon bridges, which were so numerous that it was impossible to provide anti-aircraft defences for more than the most important. The enemy pursued his established policy of erecting by-pass trestle bridges to serve as temporary substitutes for the permanent structures wrecked or menaced by air attack.

98. In all, about three hundred bridges were put out of commission by medium, light and fighter bombers; of this total, one hundred and twelve were railway bridges. So great, however, was the success of the bridge destruction policy, that in connection with the unexpectedly rapid advance of the Fourteenth Army it provoked the query whether we were not destroying our own future land line of communication in advance, and agreement was reached by which, from February onwards, the indiscriminate destruction of bridges was abandoned in favour of a policy of keeping specified major bridges unserviceable. When, in course of time, the sites were occupied by Allied

troops, Bailey bridge sections flown in by transport aircraft were available to mend the broken thoroughfare.

99. Attacks on watercraft in Burma were pressed home by ground-attack fighters of all types throughout the campaign, particularly along the Irrawaddy, always an important Japanese line of communication, and also on the Arakan coast and the waterways of south-west Burma, though, as along the land routes so on the waterways, the enemy moved mainly by night. A rough estimate of the total number of inland or coastal watercraft in enemy use successfully attacked is 11,822 of which 302 were power-driven units. Towards the end of the campaign, the Irrawaddy tended to become less a line of communication for the Japanese than a hindrance to their lateral mobility, so that boats collected for ferrying rather than supply craft provided the main targets. At the same time, air reconnaissance and attack was maintained at a high rate over the Bassein-Henzada district in order to discourage the enemy division located there from moving eastwards to reinforce the main battle-front in central Burma. In the course of April, the motor launches supplying this garrison formation were successfully attacked on a number of occasions, notably on the 25th, when their hiding-place south-west of Rangoon was located and bombed and strafed with rocket projectiles by a mixed force of twenty-seven Beaufighters and Mosquitos.

100. A word must be added in connexion with the patrols flown by Beaufighters to intercept enemy shipping in the Gulf of Martaban. Owing to the reduction through air attack of the carrying capacity of the overland routes of entry into Burma, the Japanese had increasing resort during 1944 to the shipment of goods northwards along the Tenasserim coast and thence westwards across the Gulf of Martaban to Rangoon, employing for this a number of coasters of wooden construction eighty to one hundred and twenty feet in length. A daily patrol was maintained by Beaufighters, whose base at Chiringa lay not far short of five hundred miles distant from the Gulf at its nearest point, and resulted in the sinking of twenty-eight coasters, many of which were destroyed at dawn or dusk soon before ships reached or after they had left the nooks in which they hid during the day.

101. Attacks by all types of aircraft likewise continued, throughout the campaign, to be directed against enemy bivouac and barrack areas and against storage points from small stacks of petrol drums near the front line to the great dumps north of Rangoon mentioned elsewhere in this despatch. Despite the undoubted accuracy of operations against this type of target, more particularly by Lightnings, Mosquitos and Mitchells, difficulties of terrain often forbade the assessment of results, even with the aid of photographs, and in default of the subsequent occupation of the target area by our own troops it has often only been a reference in a Japanese diary or an intelligence report which has arrived weeks or even months later which served to clinch the evidence of success. To take one instance out of many, it was not until several weeks after the event that the full success of the heavy raids of 8th February on targets at Yenangyaung was

confirmed, when two prisoners of war agreed that they had been most terrifying, and stated that one bomb had destroyed thirty-four motor vehicles parked under shelter, and that another had landed in a trench in which some thirty Japanese were sheltering, killing all the occupants.

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Tactical Support of 15 Corps.

102. Tactical support of 15 Corps followed lines closely parallel to those on which air support was furnished to the Fourteenth Army. There were, however, certain special characteristics which deserve mention. After the initial advance down the Kaladan Valley, the major forward moves of the ground forces were marked not by overland offensives leading to a break-through by mechanised formations, but by a series of amphibious landings at half-a-dozen points on the coast. Of the three island landings, those on Akyab and Cheduba were completely unopposed, while that on Ramree met only with slight opposition; few or no targets presented themselves and the air support on these occasions was therefore akin to a peace-time exercise. The mainland landings each achieved tactical surprise, but were all followed shortly by bitter fighting when the enemy entrenched himself in characteristic fashion and attempted to prevent the exploitation of the initial landing. Fierce battles then developed on the same general pattern as those for the Irrawaddy bridgeheads.

103. Two developments confined to operations by 224 Group deserve mention. The first was the use of Spitfires in the fighter-bomber role. The second was the employment, from February onwards, of airborne Visual Control Posts, whose success was undoubted. From a light aircraft they were able to discern targets in the coastal jungle that were well concealed from ground observation, and so to pass directions to the aircraft waiting to attack. Two of these teams were operating by the end of the campaign.

104. Indirect support of 15 Corps centred largely around the maintenance of air attacks upon the long supply line on which the Japanese depended for the existence of their troops in Arakan. Its forward end among the coastal waterways and along the parallel road southwards to Taungup was covered by ground-attack fighters of all types, while the eastward track from An to Minbu—whose existence had been established by Beaufighters on reconnaissance—and the mountain road from Taungup to the railhead at Prome, also yielded valuable targets. Stress was laid by the army in March and April, 1945, upon the need for maintaining a continuous interdiction of the latter road by cratering its surface or precipitating landslides by bombing, even at the cost of denying ourselves the future use of a much needed supplementary land line of communication to the Irrawaddy valley, and fighter-bombers and also heavy bombers of the Strategic Air Force were accordingly diverted to this purpose. Targets along the Prome-Rangoon railway were attacked as elsewhere in central Burma; in this, the destruction of its bridges by Lightnings of the 459th Squadron in February was especially

notable. The stores areas at Taungup and Prome were watched and bombed from time to time.

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Tactical Support of the Northern Combat Area Command.

105. On the north-eastern sector of the front, direct air support to Special Force and later to Thirty-six Division together with the Chinese divisions and the American Mars Task Force further to the east, was provided by the P.47s., P.38s. and also by the B.25s. of the Tenth U.S.A.A.F. The general principles of army/air force co-operation were as on other sectors of the front, the Visual Control Post being known as the "air party". There were, however, two directions in which the technique of close air support as practised by the Tenth U.S.A.A.F. was more advanced than on the 221 and 224 Group sectors. The first was in the more highly developed signals methods used in R/T communications between the "air party" on the one hand and the attacking aircraft and also the light aircraft—L.5s.—used for observation on the other.

106. The second lay in the special use made in the N.C.A.C. area of photography for tactical operations. Photographs of all sorts were used—low level verticals, reconnaissance strips, obliques and pin point shots. A simple method was worked out by which a common photograph grid was accepted by both ground and air forces for marking photographs; this was all the more necessary in that the country through which the N.C.A.C. forces were advancing consisted of an expanse of jungle-clad hills with few natural features by reference to which a target could be simply identified. The effectiveness of close air support was acknowledged by the ground forces in this sector no less than elsewhere, despite the considerable obstacles offered by the wild terrain to an exact collaboration.

107. It was no doubt in part the very success of air support operations in the N.C.A.C. area that led to their comparatively early cessation. The country through which the land forces advanced with a continually growing momentum offered few or no sites for the construction of forward landing-grounds, and the leading army units tended more and more to draw away from the available air bases as a consequence. Enemy opposition also dwindled, and, from the end of March onwards, contact was lost with the Japanese. Thenceforward, the air effort was thus inevitably restricted to long-range attacks upon the transport routes, supply centres and bivouac points along the enemy line of retreat through the Shan States southwards into Siam.

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(PART SIX.

STRATEGIC AIR FORCE.

108. Operations by heavy bombers in this theatre were conditioned by the restricted nature of the targets available and by the vulnerability of the all-important Japanese lines of communication. To understand the pattern of attack, and to assess its results, demands some knowledge of these circumstances, which are discussed in some detail hereunder.

109. The factors of climate, topography and the occupation of large areas of China combined to make the Japanese grip on Burma one which, it was early realised, the Allies would have great difficulty in prising loose. Notwithstanding his seemingly inviolable front, the enemy possessed an Achilles' heel in his poverty of natural resources and his consequent dependence on seas that he has never actually controlled. A high percentage of everything upon which his industry thrives must cross the sea in crude form to be processed in the homeland; thence it must recross the seas to arrive at the fighting line. From Japan to Burma the sea lanes stretch for some 4,000 miles, of which more and more were open to attack by Allied bombers as strength, experience and air bases developed. The railways which carried his supplies thence to the front were at the mercy of Allied bombers to an even greater degree.

110. Communications by sea were not disputed during 1942 and much of 1943. It was simple to follow the normal channels of commerce to the ports of Siam and Malaya in the east, Singapore in the south, and Mergui, Tavoy, Ye, Moulmein and Rangoon in the west. But Japan herself had proved by the sinking of the "Prince of Wales" and "Repulse" that control of the sea demands control of the air above the sea. In her early victory lay the seeds of her own defeat, for Allied aircraft disputed with her, and won, control of the air over all her lines of communication in Burma and Siam.

111. From the nodal ports, the railways of Burma and Siam constitute a system of strategically connected lines with a total length of approximately 5,000 miles. From Phnom Penh, north-west of Saigon, the railway goes west and north-west through Bangkok, Pegu and Mandalay, where it forks into two lines terminating at Lashio and Myitkyina with branches to Rangoon, Bassein, Kyaukpadaung, Myingyan and Ye-U. The tactical importance of all these railheads was reinforced by their strategic positioning on the lines of supply. Their function was not only to feed forward material from Japan, but to shuttle within the occupied territories the natural resources whose employment would ease the load on Japanese shipping—rice, tungsten, oil, tin and rubber. It has been estimated that at least 50 per cent. of the Japanese Army's requirements in Burma were produced locally.

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112. In June, 1944, the Strategic Air Force underwent changes in organisation and composition that materially reduced its strength and effectiveness during the monsoon months. The Twelfth Bombardment Group, comprising four squadrons of Mitchells, was transferred to Third Tactical Air Force, a step for which Air Marshal Baldwin had long pressed, and the Seventh Bombardment Group of four squadrons of Liberators was diverted to haul petrol to China. This was considered more remunerative employment for them than the conduct of bomber operations under active monsoon conditions. Strategic Air Force therefore retained only its British component, totalling three Liberator and two Wellington squadrons, excluding the Special Duty and Air Sea Rescue element. In consequence of the

reduction in strength, and with the monsoon at its height, a change in policy was necessary, and a new Operational Directive (No. 10) declared that objectives would be tactical targets best calculated to assist Fourteenth Army; communications, shipping and railways, with particular attention to the Martaban—Pegu, Pegu—Mandalay and Bangkok—Nampang sections.

113. In October, the Seventh Bombardment Group returned to Strategic Air Force, and in the following month, Nos. 99 and 215 Squadrons returned to the line having been re-equipped from Wellingtons to Liberators. With one more accession to its strength (No. 358 Squadron formed within the Command and operating by January), Strategic Air Force reached its full power for the vital six months to follow. Its operational function was accordingly expanded from October onwards to include all the duties of strategic bombers, including mining, and the Force was ready for the decisive campaign which lay ahead.

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114. Operations fell into well-defined categories, the first of which was the effort against shipping and harbour installations; the second, and most important, was the interdiction of the overland supply routes into Southern Burma; and the third the destruction of the enemy's powers of resistance in Burma by disorganising his internal communications, razing his dumps, and denying him the use of his airfields and military installations.

(I) Attacks against Shipping and Harbours.

115. Although the main weight of attack fell upon railways, some effort was directed towards the furtive and well-camouflaged shipping which plied the coasts, seldom moving by day and never venturing far within the radius of action of strike aircraft. Such operations were carried out with the purpose of deterring the enemy from committing his supplies to the perils of the sea rather than of sinking the ships en route. It was a policy of denial rather than of destruction. This choice was necessary since shipping was never frequent enough to justify intensive search for it, and the most remunerative targets were therefore harbours, docks and port facilities. Of these Mergui, Martaban, the new port of Khao Huagang, and Bangkok were most often attacked, and considerable destruction achieved. A typical intelligence report on a raid against Bangkok in March, for example, was—"Concentrated and successful attack causing destruction of forty per cent. of the storage units; sixty Japs killed".

116. Accepting that enemy shipping was hard to search out, Strategic Air Force had resort to the policy of hindering what it could not destroy. Mining was already proved by photographic reconnaissance as being a profitable method of delaying the passage of supplies, for in harbours already mined there had been a serious curtailment of Japanese shipping, and such craft as continued to approach the harbours anchored outside so that cargoes had to be lightered ashore.

117. Thus from August onwards plans and technique for very long-range mining were developed and soon bore fruit. In September

the Pakchan river, housing the newly constructed port of Khao Huagang, was heavily mined and the flow of coastal traffic seriously disrupted. Similar operations against Bangkok, Goh Sichang and Tavoy followed. In October a remarkably successful flight was carried out to the inner approaches of Penang harbour. Fifteen Liberators each laid four 1,000 lb. mines "precisely in the positions ordered", with no mishap or failure although the round trip was over three thousand miles. Such operations continued throughout the campaign against all ports and anchorages along the Tenasserim Coast and from March onwards against those in the Gulf of Siam. Mining was the special and exclusive province of No. 159 Squadron R.A.F. who throughout the period laid the impressive total of 1,953 mines at ranges which a year before would have been considered impossible. The following results were observed from reconnaissance:

(i) Jap launch and passenger steamer sunk near Victoria Point (February).

(ii) 3,000 ton tanker Kuisho Maru sunk at Bangkok (January).

(iii) 200 ft. M.V. sunk at Bangkok (March).

(II) The Interdiction of the Southern Burma Supply Routes.

118. If the anti-shipping effort was intangible in effect, that against railways was spectacular, and its results immediately apparent. By far the greatest attention was paid to the Bangkok-Moulmein railway on which an overall total of 2,700 tons of bombs were dropped. With the interdiction of nearly all alternative routes, this railway was of paramount importance to the Japanese to supply and maintain their forces in Burma. Approximately two-thirds of the railway pursues a winding course in jungle hill-covered country, and it is not suitable for low-level attack, in addition to providing first-rate concealment. But as the strength and efficacy of the bomber force grew and the Burma—Siam railway became more vital, techniques were developed for its neutralisation. No precise date can be given for the introduction of these methods. A *modus operandi* was hammered out and in use before it became a doctrine, but its broad principles were as follows:—

(i) Bridges were the best targets because they were the most vulnerable and the most difficult to repair.

(ii) The underlying motive was to isolate segments of the line, and then to destroy at greater leisure the rolling stock and locomotives stranded thereon.

(iii) Diversity of attack was necessary to confuse the enemy.

(iv) Close photographic reconnaissance was maintained to detect any abnormal build-up at sidings or stations which would repay attack.

119. These principles were followed to such good effect that between January and April the average number of bridges unserviceable at one time was 9.2 over the stretch of railway from Pegu to Bangkok. It has been estimated that this reduced the traffic from 700-800 tons to 100-200 tons a day. The value of the attacks needs no further emphasis.

120. Operations similar in concept but less in intensity were maintained against the Bangkok—Chiengmai line, the Kra Isthmus railway, and the Bangkok—Singapore line. In all cases, the enemy reacted by placing the strongest A.A. defences he could muster along such a dispersed network of lines, by rebuilding and repairing bridges with beaver-like zeal, and by constructing as many as four by-pass structures at one crossing to counter or anticipate our attack.

(III) *Destruction of the Enemy's Powers of Resistance within Burma.*

121. To sever the external supply routes was not enough, for the enemy held at least six months' reserves of supplies that were contained in vast dumps, mainly dispersed in the Rangoon area. Therefore, during March and April, systematic destruction was initiated on the Rangoon Dumps in conjunction with XXth Bomber Command. Their destruction was vital, since with the stores contained therein the enemy might have been able to delay our advance and even halt it above Toungoo. The Dumps contained about 1,700 storage units well dispersed in revetments, and of these, photographic evidence alone showed 524 destroyed, and ground observers reported that well over 50 per cent. destruction was achieved.

122. The attacks on Japanese Headquarters and concentration areas can be illustrated by a strike on 29th March against the Japanese Burma Area Army Headquarters located in Rangoon. Reports indicate that four hundred Japanese, with a high proportion of officers, were killed. News of the attack spread to the Allied prisoners in Rangoon, and was the cause of considerable encouragement to them. The enemy's evacuation of the city a month later is much more understandable in the light of these attacks, which made Rangoon such a dangerous area even before ground forces were within striking distance. Mandalay had already suffered such attacks, notably one in January when it was reported by agents that six hundred Japanese were killed. The part played by such air blows in persuading the enemy to abandon his strategic positions earlier than anticipated must surely have been great.

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"Special Operations."

123. Air operations in connection with intelligence and guerilla raising activities in this theatre have increased greatly during the past year. From a strength of two squadrons totalling 15 U.E. aircraft in June, 1944, resources were increased by the end of April, 1945, to three squadrons and one flight totalling 61 U.E. aircraft. The dividend that has been paid definitely justified the effort involved. From a handful of informants supplying skimpy information at great risk, the organisations grew, by the end of the campaign, into a powerful force capable of exerting a considerable influence on the course of the battle, and the air effort to support them reached a total of 372 sorties in the lunar month 18th April to 17th May. Between November, 1944, and May, 1945, over 1,350 sorties were flown, in which 2,100 tons of stores and 1,000 liaison officers were dropped behind the enemy

lines. The effort for the preceding comparable period resulted in 34 tons of stores and 35 bodies being parachuted in.

124. One of the major results of the great effort involved was the prevention of the Japanese Fifteenth Army from taking any part in the defence of Toungoo during our advance, and rendering unnecessary the major battle which Fourteenth Army anticipated in front of the town. Other guerillas killed up to seven hundred Japanese, including a General, in the Toungoo-Rangoon area alone.

125. From the Air Force point of view, the great value of the Special Duty effort flown by Strategic Air Force was the provision of targets for the tactical Groups. During the final fortnight of April almost the whole of the long-range Fighter-Bomber resources of No. 224 Group were employed on Force 136 targets. Troop trains were caught at rest and a pagoda reported as a petrol/ammunition dump blew up with a huge explosion.

126. Special Duty operations in this theatre are of vital interest to the Air Forces in view of the difficulty of locating targets without the help of informants. Thus the diversion of effort to secret work has not been grudged, and current developments, foreshadowed in the R.A.F. Airborne Commando, will make the information supplied by operators behind the lines of even greater value. It is emphasised that parties should be thoroughly briefed in the limitations and potentialities of air strikes and that they should develop a speedy and accurate method of reporting if a full harvest is to be reaped from the information whose garnering depends so much upon the operations of our S.D. squadrons.

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PART SEVEN.

PHOTOGRAPHIC RECONNAISSANCE.

127. At the opening of the period, photographic reconnaissance was carried out mainly by the aircraft of the Photographic Reconnaissance Force commanded by Group Captain S. G. Wise, D.F.C. These included the Spitfires, Mosquitos and Mitchells of 681 and 684 Squadrons, R.A.F., operating from Alipore, and the Mustangs, Mitchells and Liberators of three U.S.A.A.F. squadrons, the last of which specialised in mapping. A fourth U.S.A.A.F. squadron flying Lightnings, began to operate in September.

128. The dense cloud banks habitually shrouding the operational area of South East Asia during the period of the monsoon interfered greatly with photographic reconnaissance, but advantage was taken of the northward passage of the monsoon in August to procure the first large-scale and survey cover of northern Sumatra by Mosquitos detached to operate from Ceylon. Other detachments were later sent eastwards to operate with the forward tactical air force headquarters from Tingawk Sakan (where at the beginning of September an American tactical reconnaissance squadron was placed under the P.R. Force), Imphal, Comilla and Chittagong in preparation for the forthcoming campaign, and these were later reinforced and moved forward in step

with the ground forces. From the beginning of September onwards, a considerable measure of decentralisation in the planning and conduct of operations was introduced, with the purpose of giving squadron commanders more latitude in the allotment of sorties.

129. With the return of fair-weather conditions in October, the effort of the photographic reconnaissance squadrons rose to its former level, and during this month the daily average of sorties represented over a third of the total aircraft available in the whole force. The methodical cover of enemy airfields, communications and other targets was resumed, survey photographs being supplied as required by Headquarters Air Command, and Headquarters Allied Land Forces, South East Asia. In proportion with the increased flying, the photographic work of the photo sections of the P.R. Force was expanded, nearly 354,000 prints being produced during January, 1945, the peak month. Technical photographic developments included the introduction of the moving film camera on operational sorties, and the fitting into Mosquito aircraft of forward facing oblique cameras. The latter were first used on 14th February, when a set of stereoscopic pairs covering the Burma-Siam railway was thereby secured.

130. An exceptionally valuable photographic reconnaissance of the Burma rice areas was carried out by Squadron Leader C. Fox during 1944. The results shown by an analysis of the pictures were subsequently checked up on the ground, and were found to be correct within 5 per cent.

131. The main hindrances to the operations of the P.R. Force continued, even in the campaigning season, to be factors inseparable from flying in the tropics rather than the opposition of the enemy, which remained slighter than was usual in other theatres of war. Successful cover of the waterfront at Akyab, for instance, was secured in November, 1944, by two Spitfires flying at from 50 to 200 feet, at neither of which a shot was fired. But the lengthening range of Mosquito sorties month by month bore witness to the mastery of climate and terrain. It was in December, 1944, that the first cover of Puket Island was obtained, in the course of a flight involving a round trip of 2,100 miles, which marked the furthest penetration to be made in this area. This record was, however, eclipsed by another aircraft which in January flew 2,431 air miles in eight hours and 20 minutes to cover Moulmein and the railway from Bangkok to Phnom Penh. Finally on 22nd March a Mosquito XVI broke the long distance record for this type of aircraft in any theatre of war with a flight of 2,493 air miles in eight hours forty-five minutes, covering the Bangkok-Singapore railway to a point south of the Malayan frontier. It was thus that the Mosquito made amends for the structural defect which had seriously curtailed its use during November and December, 1944.

132. The work of the P.R. Force was co-ordinated at one end with the short-range photography of the tactical reconnaissance squadrons, while at the other end, long distance survey work over Malaya was undertaken by the Superfortresses of XXth Bomber Command, U.S.A.A.F. The P.R. Force was

responsible, for instance, for all the workaday survey and mapping required by the Fourteenth Army. As the Officer Commanding, No. 11 Indian Air Survey Liaison Section, R.E., reported in February, 1945, 684 Squadron, R.A.F. alone had achieved, in twelve months, three-quarters of the basic cover for the whole campaign and 1/30,000 cover for maps, photo-maps and artillery block plots over the battle lines from Dimapur nearly to Rangoon and Moulmein. The work of photographic reconnaissance in general in this theatre has, of course, been of all the greater importance owing to the comparatively meagre intelligence available from ground sources; for air force purposes alone it provided an indispensable factor in the maintenance of Allied air superiority by providing speedy evidence of the location of enemy aircraft, while the work of the Strategic Air Force would have been unprofitable without the coverage of targets it furnished.

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PART EIGHT.

GENERAL RECONNAISSANCE.

133. As the period under review opened, a deal of uncertainty existed as to whether the Indian Ocean U-boat warfare would be intensified by the arrival of long-range German U-boats. Such a possibility was not improbable, and had the contemplated threat materialised then, all General Reconnaissance air power in this theatre would have been harnessed under the co-ordinating and supervising control of IOGROPS.*

134. The period from June to August witnessed a decided increase in enemy U-boat warfare, although at no time can it be said that the threat reached alarming proportions. During these three months the enemy (operating with considerable wariness) sank thirteen ships of the medium-sized merchant vessel class, and, in turn, suffered the loss of one submarine as a result of a combined attack by aircraft and Naval Force 66.

135. In July, a concentration of enemy units in and around the shipping lanes to the east of the Maldives—resulting in the loss of five ships—portended a possible menace. In this connection it is worthy of comment that Catalina aircraft employed on rescue searches co-operated in the location and eventual rescue of 244 survivors.

136. Having regard to the amount of shipping in the Indian Ocean, and the fact that during August there were possibly five German units operating in these waters, the enemy's achievements might be considered singularly paltry. This is a tribute to the constant vigilance of General Reconnaissance aircraft in the flying of anti-U-boat sweeps and patrols. Such a policy might not have produced many sightings and kills—a consideration of the immense expanses of ocean to be guarded will clearly show the difficulty of locating enemy units—but it kept U-boats submerged and out of range of our shipping.

137. With September came a falling-off in U-boat operations, and this was continued during October and November. A slight in-

* Indian Ocean G.R. Operations.

crease during November was considered as a parting shot of little weight and trifling importance. As an explanation of this it is reasonable to assume that American aggressiveness in the China Seas and the Pacific was absorbing the attention of Japan, as was the European war the attention of Germany. Thus the expected threat did not develop but rather declined, and as a consequence the need for an over-all centralised control as vested in the organisation of IOGROPS diminished with the declining U-boat threat.

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Offensive General Reconnaissance.

138. The second half of the twelve months under review opened with No. 222 Group still being primarily concerned in supplementing the hunting and striking powers of the East Indies Fleet in anti-U-boat warfare. But it was becoming apparent that the U-boat threat no longer existed. Therefore, in the due consideration of alternative employment was conceived the undertaking of an offensive role. The mining of enemy waters in the Malacca Straits and the Chumphorn, Singora, Padang, Singapore areas; anti-shipping operations to deny the waters of the Andaman Sea to enemy shipping—this was to be the future employment of General Reconnaissance aircraft.

139. Mining operations were the first to commence, on the 21st January. From that date until 3rd May, 1945, 833 mines have been carried to enemy waters by No. 160 Squadron, the high percentage of 86.9 being successfully laid. The success of these operations, although not immediately apparent, will be revealed with the broadening of the operational scene in this theatre.

140. Only a short period of training was necessary to prepare No. 354 Squadron for its new assignment of low-level anti-shipping strikes, which were commenced early in February. A second Liberator squadron—No. 203—began to augment the anti-shipping effort in March. A statistical summary of the material damage inflicted as a result of these operations proves that these two squadrons played no small part in complicating the enemy's acute problem of shipping shortage.

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The Development and Control of Offensive General Reconnaissance.

141. The last four months had seen General Reconnaissance changing the nature of its operational function with deftness and adaptability. The reinforcement and development of this new offensive role was envisaged during March, when No. 346 Wing was formed at Akyab, to provide escort for "forward area" convoys and to make easily available a striking force against enemy shipping off the Arakan and Burmese Coasts.

142. One squadron of Sunderland aircraft based on the depot ship S.S. "Manela" constituted a significant part of 346 Wing. This vessel ultimately proceeded from Colombo to Rangoon via Akyab, and her advent to these waters was an important milestone in offensive General Reconnaissance. Should a situation develop wherein it was necessary to conduct anti-shipping and similar operations in a

theatre where the scene of operations might be constantly and rapidly changing (with a consequent paucity of adequate land-bases) then a mobile flying boat base would be an invaluable asset. If this situation did not develop, then the inherent mobility of such a unit could be usefully adapted to the requirements of Air Sea Rescue and Transport operations, where, as always, the lack of immediate land-bases establishes a major problem.

143. The period closed on an encouraging note. General Reconnaissance had already struck a worthwhile blow at enemy shipping, and plans were in hand for an intensifying of these operations in the months to come. In considering the strategic plan of anti-shipping sorties, mention should be made of the invaluable contribution of those General Reconnaissance Liberator and Mosquito aircraft based on Ceylon, in their day and night photographic reconnaissance over the Andamans, Nicobar Islands, Northern Sumatra and parts of Malaya. Meteorological flights were also flown regularly, and materially assisted weather forecasts for aircraft flying over vast expanses of water.

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PART NINE

ADMINISTRATIVE AND OTHER ASPECTS

(I) *Administration.*

144. Administrative development of Air Command, South East Asia, during the year was dictated by the following factors:—

(i) The move of Command Headquarters to Kandy.

(ii) The need for identifying group administrative areas inside India with the geographical boundaries of the Indian Army Command.

(iii) The traditional problem of administering units spread over vast areas with insufficient resources.

(iv) The desirability of removing from operational formations extraneous administrative burdens.

(v) The necessity for providing operational units with greater mobility.

(vi) The planning of the administrative network to sustain and control units advancing into Burma.

(vii) The formation of new units in anticipation of future operations, while hardly meeting present commitments with existing resources in manpower and material.

(viii) The development on an unprecedented scale of air supply for the Allied forces advancing into Burma.

145. The primary British interests in South East Asia were the re-conquest of Burma, the Federated Malay States and Singapore, the Netherland East Indies, Thailand and French Indo-China. British air responsibilities in South East Asia also included the air defence of India and of Allied shipping in the Indian Ocean, the Arabian Sea and the Bay of Bengal. With these somewhat diverse objectives

and geographical vagaries in mind it was essential to evolve an administration covering Royal Air Force commitments which would effectively meet the situation in South East Asia.

146. The extensive re-organizations which took place during 1944-45 were effected against a background of strict and cumbrous control of expenditure by the Government of India, and of dependence upon India through the organization known as the War Projects Co-ordination and Administrative Committee for the provision of resources. There was, too, a crippling shortage of manpower in precisely those trades which make for good administration—non-flying officers (notably signals and maintenance staffs), clerks G/D., equipment assistants, cooks and the like. Moreover, the growing body of Air Command continually bumped its head against the Command manpower ceiling. It is not intended to infer that the R.A.F. in South East Asia was badly served in relation to other commands, for it was well understood that the allocation of manpower had to be assessed in relation to theatre requirements. Nevertheless, it was considered that perhaps the incidence of and the remedies for the growing pains experienced were not fully recognised at home.

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The Move of Headquarters, Air Command, to Ceylon.

147. The move of the Command Headquarters to Kandy was compelled by the insistence of the Supreme Allied Commander that his Commanders-in-Chief should work beside him. It was, however, rendered the more acceptable to Air Command on account of the growing need for divorcing operational and higher administrative control from the extensive and complicated negotiations necessary with the Government of India and with G.H.Q., India, relative to administrative services, which had tended to hamper the primary tasks of the Allied Air Commander-in-Chief.

148. The institution of H.Q. Base Air Forces at New Delhi had, therefore, many advantages. It liberated the Air Commander-in-Chief and his staff from direct day to day responsibilities for developing India as a base, and thus enabled him to address his attention more closely to the general problems of planning and policy control.

149. Before Base Air Forces was established and re-organisation was under consideration, it was generally supposed that a vertical split between the Air Staff and Administrative Branches offered the best solution to a complex problem. This meant that operations sections of the staff would move with the Air Commander-in-Chief to Kandy while the administrative sections remained at New Delhi. It was intended that administrative representation at Kandy should be effected by the provision of small cells or projections of the administrative branches concerned, which would work in an advisory and liaison capacity. This at the time, was broadly the view of Air Chief Marshal Sir Richard Peirse.

150. Difficulties ahead if such an administrative set-up was adopted at New Delhi as suggested, were foreseen by Air Vice-Marshal Goddard. The reins of higher administrative

control and policy, he considered, must in the first instance, be held firmly at Air Command in order to effect perfect co-ordination with the Air Commander-in-Chief and the operational branches at Kandy. Beside, the geographic factor was an important consideration, for Delhi was fifteen hundred miles from Kandy.

151. A new scheme which would more effectively meet the situation once re-organisation was established and yet ensure the retention of higher administrative control at Air Command, was brought up for consideration during the visit of Air Vice-Marshal Goddard to London in July, 1944. This revised project was, in the main, largely adopted when, at the beginning of October, Headquarters Air Command moved to Kandy and Headquarters Base Air Forces was formed at New Delhi.

152. The essence of the new arrangement lay in the retention at New Delhi of an administrative staff competent to deal with all questions, save the important policy matters, direct with the analogous departments of General Headquarters, India, and the Government of India. This ensured adequate Air Force representation at the centre of political power in India and, at the same time, avoided the creation of a duplicate headquarters under Air Command for which neither the men nor the means were to hand. The administrative services, whose heads remained in Delhi were, nevertheless, represented at Kandy by responsible and independent skeleton staffs under a senior officer competent to inform and advise on his own specialist topic as required, so that broad policy might properly be formulated at the Headquarters of Air Command.

153. During October and November, 1944, there persisted a considerable amount of uncertainty as to the basis on which the administrative machinery would ultimately rest. For instance, as matters of high policy were decided at Kandy, it was decided by the Air Commander-in-Chief that he must have by his side the head of the service primarily concerned. This applied successively to the Principal Medical Officer, the Command Accountant, the Command Welfare Officer and the Command Catering Officer, and finally to the Air Officer in charge of Training.

154. The situation was finally crystallised and clarified in October, when a revised directive was issued to the Air Marshal Commanding Base Air Forces. For all day to day matters affecting administrative services, the heads of those services were solely responsible to the Air Marshal Commanding Base Air Forces. But when matters of administrative policy affecting the Command as a whole arose, then the heads of the administrative services were responsible to the Allied Air Commander-in-Chief through the Air Officer (Administration) (A.O.A.), Headquarters, Air Command. Similarly, when matters of new Command policy came under discussion and the agreement of the Government of India was required, the heads of the administrative services concerned were empowered by the Air Commander-in-Chief, through the A.O.A. Air Command, to deal with their opposite numbers in G.H.Q. India, on behalf of the Air C-in-C.

155. As a corollary to this arrangement, the staff officers under the A.O.A., Air Command at Kandy were not established as mere liaison

officers. Their allegiance and responsibility was towards the A.O.A. Air Command, who looked to them for staff work, for records and for facts. They were not, however, his advisers in the formulation of new policy—these continued to be the heads of the services in New Delhi, who might if they wished send their own staff officers from Delhi or come themselves to make representations to the A.O.A., Air Command, on matters of Command policy external to the responsibility of the Air Marshal Commanding, Base Air Forces. This was not a normal system. But the separation of the Supreme Allied Commander and the Headquarters of his Commanders-in-Chief from the seat of the Government of India and duality of channels to the United Kingdom Government—either through the Government of India or direct—constituted an abnormal situation.

156. The value and effectiveness of the base organisation thus created was endorsed by the Air Member for Supply and Organisation (A.M.S.O.) during his visit in February, 1945. Air Chief Marshal Sir Christopher Courtney was impressed by the extent of the negotiations which were necessary in New Delhi with the numerous organisations concerned with the conduct of the war from India. He counselled a progressive decentralisation of functions to Base Air Forces and its gradual endowment with a greater measure of autonomy; this was of course in keeping with the original scheme and was accordingly pursued.

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Disbandment of Third Tactical Air Force and Formation of H.Q., R.A.F., Bengal-Burma.

157. Eastern Air Command, from its formation in December, 1943, onwards, was an exclusively operational Headquarters with no administrative responsibilities. When its Headquarters moved to Calcutta in March, 1944, administrative services for the area of Eastern (Army) Command were being provided by Headquarters No. 231 Group, and this Headquarters also administered the R.A.F. element of Eastern Air Command. But it was clearly anomalous that a Bomber Group engaged in active operations should continue to be saddled with the wide responsibilities for administration which were of no concern to the Strategic Air Force.

158. This, and other considerations pointing towards a re-organisation of the groups in India, was discussed with the A.M.S.O. in August, 1944. The logical course would have been to confer administrative responsibilities upon the R.A.F. Element of Eastern Air Command and to form a new Group Headquarters under it to exercise them. But owing to the manpower shortage it was impossible to create a new headquarters altogether distinct from Headquarters, Eastern Air Command, and it was therefore agreed that H.Q. No. 231 Group should give up its extraneous administrative responsibilities, and that the administrative staff so released should be reconstituted as Air Headquarters, Bengal. At the same time, the Deputy Air Commander, Eastern Air Command, was to become Air Officer Commanding, Bengal, with administrative responsibilities extending eastwards as far as the Brahmaputra. They could not be further extended, since this

would have meant that the Air Marshal Commanding, Third Tactical Air Force, would have been administratively subordinated to the Air Vice-Marshal, A.O.C. Bengal.

159. It was therefore decided to propose the disbandment of Headquarters, Third Tactical Air Force. For such a course there were other good reasons outside the administrative sphere—operationally, the title was now a misnomer, since in June, 1944, the Tenth U.S.A.A.F. had been reconstituted as an independent formation under Eastern Air Command, and the Headquarters of the Fourteenth Army was due after the opening of the new campaign to move forward to Imphal, where Headquarters, No. 221 Group had long been established, leaving XV Corps in the Arakan to operate independently under the G.O.C.-in-C., Allied Land Forces. Authority for the disbandment of Headquarters, Third Tactical Air Force was given in October, 1944.

160. The disbandment of Third T.A.F. involved also the expansion of Headquarters, No. 221 Group and the allotment to Eastern Air Command of direct operational control of all its subordinate operational formations. The date of this further re-organisation was timed to synchronize with the move of Headquarters, Fourteenth Army to Imphal beside Headquarters, No. 221 Group, and the establishment of Advanced Headquarters, Allied Land Forces, alongside Eastern Air Command at Calcutta. This move took place on 4th December when the Air Marshal Commanding, Third Tactical Air Force, became Deputy Air Commander, Eastern Air Command and Air Marshal Commanding, R.A.F., Bengal-Burma.

161. Headquarters, R.A.F., Bengal-Burma was the name given to the administrative formation now brought into existence to combine the functions of R.A.F. Bengal and the administrative responsibilities previously wielded by Third T.A.F. Geographically, its responsibilities covered both the base area of Bengal and the more easterly marches, bit by bit being extended into Burma with the advance of the Fourteenth Army. The military suzerain of the former was G.H.Q., India, and of the latter, Headquarters Allied Land Forces. Headquarters, Bengal-Burma was accordingly built up on a dual basis commensurate with the existence of two sets of army authorities with which it would have to deal, and also with an eye to future development whenever the reconquest of Burma should compel it. This stage was reached in February, 1945, when it became possible to carry out the anticipated divorce between Bengal and Burma components of the Air Marshal Commanding's province. R.A.F. Bengal was then expanded into Headquarters, No. 228 Group and returned to Base Air Forces, though the filling of its establishments proved a slow process.

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Administrative and Training Groups.

162. In order to ensure better co-ordination of administrative services, to facilitate combined training, and to ensure close liaison on internal security measures, the groups in India underwent a rationalization of their areas to coincide with those of the army formations.

This measure was brought to its logical conclusion by the formation of No. 228 Group in February, 1945, to provide functional and/or administrative control of all units of Base Air Forces within the area of Eastern (Army) Command, and to provide R.A.F. administrative services within that area. As Eastern (Army) Command extends its boundaries to the Burma frontier, the area of responsibility of No. 228 Group will expand. R.A.F. India is thus split up between four administrative and training groups.

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Introduction of Wing H.Q. and Servicing Echelon Organisation.

163. In the Far East more than in the metropolitan air force, the administrative problems confronting junior operational commanders are such as to hinder them in the performance of their primary tasks. In recognition of this and to improve the mobility and flexibility of the wing organisation, it was decided to introduce the principle of wing headquarters and servicing echelons for single-engined and light twin-engined aircraft. The scheme came into effect by the end of September, 1944, with the wing headquarters based on certain major airfields, and the servicing echelons became responsible for the upkeep of the squadron aircraft. The squadrons were thereby relieved of the responsibility for their own administration and most of their first-line maintenance.

164. In anticipation of a more mobile kind of warfare, it became necessary in December, 1944, to remove the geographical restriction implied by naming the wing according to its current location. The wings were accordingly given numbers, and their attitude to mobility thus greatly enhanced, as evidenced by the advance of No. 906 Wing from Imphal to Rangoon in six months, in a series of well-organized moves. The scheme has been successful, and its principle has been extended to other squadrons in order to centralize control of resources and administration and to economise in overheads.

165. Perhaps one factor has marred full advantage being taken of the inherent mobility and flexibility which the organisation would afford. The provision of more servicing echelons than squadrons would allow of peak periods of operational effort at very short notice from advance airfields, for an additional servicing echelon could be flown in to supplement the existing maintenance personnel. This lesson was learned at Akyab where the providential presence of a servicing commando allowed of a much higher rate of effort from the island during the early days of the occupation than would otherwise have been possible.

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The Manpower Situation.

166. The Command has been continually hampered by an ill-balanced allotment of manpower, whereby shortages have been concentrated in certain vital trades, rendering the administrative machine extremely difficult to operate efficiently.

167. In June, 1944, the establishment and strength of the Command for ground British personnel were as follows:—

	<i>Establishment</i>	<i>Strength</i>	<i>Shortage</i>
Officers ...	6,277	5,170	1,107
Other ranks ...	88,636	80,967	7,669
	<hr/>	<hr/>	<hr/>
	94,913	86,137	8,776

The deficiency of 18 per cent. in ground officers was concentrated principally in such important branches as Admin. G., Tech. (E), Code and Cypher and the like. The airman deficiency of 9 per cent. more seriously affected the clerical trades.

168. By May, 1945, the position had changed, but not improved, as the following figures and illustrations will show:—

	<i>Establishment</i>	<i>Strength</i>	<i>Shortage or Surplus</i>
Officers ...	8,103	7,573	530
Other ranks ...	105,470	110,459	4,989
	<hr/>	<hr/>	<hr/>
Total ...	113,573	118,032	4,459
	<hr/>	<hr/>	<hr/>
			Surplus

169. The 6½ per cent. deficiency in ground officers affects principally the following branches, Admin., Code and Cyphers, Tech. (E), Catering, etc. The shortages in the Technical Branch have caused particular difficulty. The overall 5 per cent. surplus in airmen does not give a true picture of the situation, for there are very serious deficiencies in clerical and domestic personnel which are hampering the development of the Command. Clerks G/D are below establishment by no less than 36 per cent., Equipment Assistants by 29 per cent. and Cooks by 28 per cent. The surplus was concentrated in the technical trades and amounted to 7,100. Such a surplus was more of a liability than an asset, since it created additional work for the already overburdened administrative and domestic personnel and could not be used to offset the shortages elsewhere.

170. Since February, 1945, very strenuous efforts have been made to disband redundant units and prune such establishments as can conceivably be reduced. The diminishing air threat to the east coast of India and Ceylon has made it possible to thin out the early warning Radar system, and considerable economies have been effected. Much has been done to distribute the shortages where they could more easily be borne, and it was Command policy to make the strongest where it was most effective, that was nearest to the enemy.

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Conclusion.

171. The administrative network covering the vastness of India is now as complete and rational as present resources allow. It cannot be said, however, that the administrative problems of the Command are now solved. As the armies advance, the area to be controlled grows, and the net is in many places thin.

This is particularly so in those areas vacated by the advancing tactical groups, and extra provision must continually be made to administer those formations left in the backwash of the advance. It has even been necessary to graft additional administrative responsibilities on to the air supply group in the forward areas (No. 232), for lack of personnel to set up the requisite administrative framework. The conflicting factors of function and distance have called for an organization far more complex than would be the case in a more compact theatre. For this the only solution is a realization at home that additional personnel and transport facilities to maintain India as a base, and conduct an energetic campaign in Malaya and beyond, must be allotted on a more generous scale than previously.

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(II) *Maintenance.*

172. The maintenance organisation in South East Asia embraces supply, servicing, repair and salvage of all air force material in India, Ceylon and Burma; an area approximately the size of Europe. It was realised at an early stage that it was impossible to have the same maintenance system operating throughout the Command, since the extensive topographical diversities encountered necessitated that the ultimate systems adopted be dictated by the geography of the country. Broadly speaking, therefore, one system applies in Ceylon and India as far eastwards as the Brahmaputra, and an entirely different one was evolved to operate throughout Assam and Burma. In the former area conditions are more or less static, the ground communications, although greatly inferior to those of Europe, are reasonably good with no considerable land or water barriers. Here, a large and efficient base maintenance organisation has been built up which provides adequate backing for the air forces far beyond the Brahmaputra; it is in this base area that the Base Repair Depots, Equipment Depots and Aircraft Storage Units are to be found. In Assam and Burma, however, the situation bears a vastly different appearance, parsimonious communications from Calcutta to the railhead at Dimapur and thence by road over the Naga and Chin Hills to Central Burma prohibited the use of a maintenance organisation which was possible in England and which, to a limited degree, has also been found possible in India.

173. From the time of the siege of Imphal to the capture of Rangoon, air lift, the principal means of supply to our combat Army and Air Force formations, was restricted to essential needs and could not be provided to support avoidable maintenance at forward airfields. As a result, a policy was agreed of flying aircraft back to India for comparatively simple servicing requirements such as periodical inspections and engine changes. This obviated the necessity for flying spare engines and to some extent, equipment and spares, into the forward areas; at the same time it increased the mobility of squadrons and reduced their maintenance personnel requirements. Aircraft which crashed away from airfields had normally to be written off charge, while those which crashed on airfields, provided the damage was not too great, were repaired on

the site. Surface movement back to India was restricted to a minimum, since damage to an aircraft during transit in this part of the world is normally so great that it is beyond economical repair on arrival at its destination. On occasions, damaged fighter aircraft were dismantled and flown back to India, the servicing personnel becoming so expert that they were able to pack the whole of a fighter aircraft and its components into one Dakota fuselage.

174. Owing to the speed and intensity at which the campaign was being fought, and the vital need to capture the strategic base of Rangoon before the onset of the monsoon, I decided that all the normal rates of effort must be exceeded, and all our Air Force resources were thrown into the battle. During one month of 1945, no less than 700 aircraft passed through the Aircraft Storage Units and Reserve Aircraft Pools in order to provide replacements for the 75 squadrons operating east of Calcutta. During the early stages of the campaign, the small number of combat losses introduced a major maintenance complication, since low wastage rates, giving aircraft a long life, placed upon the repair organisation a storage commitment which had not been foreseen. A further strain was caused by severe deterioration owing to climatic conditions, such as to subject aircraft to monsoon rains accompanied by sudden bursts of sunshine. This had an adverse effect upon the timber, fabric, rubber and electrical parts of aircraft. In the autumn of 1944, for instance, Mosquito aircraft had to be grounded as a result of such defects, until extensive repairs had been effected.

175. The maintenance organisation in the forward areas consisted of the Repair and Salvage Units (R. and S.U.) supporting squadrons at their airfields, and taking on all work which the flying units could not complete within forty-eight hours. Air Stores Parks held sufficient stocks of spares and equipment for three months supply, and the Forward Repair Depots which were located far enough forward to undertake major inspections and repairs beyond R. & S.U. capacity. In addition Motor Transport Light Repair Depots were deployed in the forward areas, and the importance of their work can be measured by the fact that in traversing the tortuous line of communication from Calcutta through Dimapur and Imphal to central Burma, mechanical transport vehicles had expended the major part of their useful lives before reaching their destination. Thus a great deal of ingenuity and inventiveness on the part of M/T servicing personnel was necessary in order to keep vehicles running, vehicles which in base areas would have been scrapped.

176. The maintenance effort in Burma can best be summarized as a triumph of improvisation to overcome bad climate and worse terrain, the paucity of spares, tools and equipment which was designed for the European theatre of war and not designed to be flown over, driven through or manhandled in the cruel country of Assam and Burma. The overloading of home production, and the overriding need to finish off the western war first, were adequate reasons for this situation, and the maintenance effort during the period which culminated in the capture of Rangoon was very

largely dissipated in a desperate struggle to keep the units of the maintenance organisation abreast of the operational flying units. That this was achieved speaks volumes for the tenacity, skill and loyalty of the maintenance personnel.

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(III) *Internal Air Lines.*

177. The growth of air routes during the past year is best illustrated by the following figures:—

	<i>Passengers</i>	<i>Freight</i>	<i>Mail</i>
May, 1944	2,103	166,313 lbs.	99,435 lbs.
April, 1945	11,514	1,579,119 lbs.	777,944 lbs.

178. This rapid increase was attributable to a greater intensity of operations, and better planning followed somewhat tardily by a growth of resources. At the beginning of the campaign, one squadron (No. 353) shouldered the whole burden while still largely equipped with Hudsons. In July, 1944, No. 52 Squadron was formed, and by flying 19,000 hours without an accident, speedily gained an excellent reputation for its high standard of operating and freedom from accidents over routes that include the hazardous flight over the Hump to China. In April, 1945, a flight of No. 232 Squadron, equipped with Liberator C-87 aircraft, began to operate on the longer routes, forming the most recent addition to a force the strength of which has grown to two and a half squadrons.

179. Parallel action to build up a ground organisation to handle greater traffic and more complex problems was necessary. To this end, static transport wings have been established at Delhi, Karachi and Calcutta; that at Delhi was intended eventually to move to Rangoon. Located at nodal points on the trunk routes, these wings also gave advice on all matters affecting air transport and ferrying to the group in whose area they were located. When their establishments were fully implemented, 229 Group Headquarters was relieved of a great deal of day to day work in administering some sixty units spread over India.

180. Even now, internal air communications within the theatre are not adequate. This fact cannot be fully realised by anyone who has not appreciated the vastness of India from a railway carriage or travelled over roads on which the twentieth century has barely left its mark. Moreover, in a sub-continent whose urban centres are so distant from one another, it is often necessary to plan an operation eight hundred miles from its mounting base, while the allocation of resources may be effected from another centre which may be fifteen hundred miles from the controlling headquarters. Furthermore, the major base for the prosecution of a campaign in southern Burma, Malaya or Java, is still India, and the need for swift communication between base and combat area is another continually growing commitment for squadrons who serve an area ranging from Karachi to Kunming and from Peshawar to Ceylon.

181. At times, local operational tasks have made the diversion of aircraft from internal routes to air supply a tempting solution to a pressing problem. This temptation has always been resisted, and it is a first principle that the

vital arteries of South-East Asia Command shall remain open. The mobility of the staffs, the despatch of urgent freight, close contact with the battle areas, and the building up of India as a base, must always be a prime consideration when assessing priorities for air transport resources in this theatre. Not only is the work of all three services dependent upon speedy communication over long distances; it is on the air routes that the Air Force can reap a dividend from the transport aircraft which are so frequently operated for the benefit of others. The R.A.F. should also use the speed and flexibility of its transport squadrons to improve the efficiency of its own organisation.

182. Air Command has derived great benefit from the Transport Groups allotted to this theatre, which has made possible a closer study of transport problems and a more effective supervision of this specialised type of flying. The improvement in operating standards is well illustrated by the accident rate. In October, 1943, there were 49 accidents per 10,000 hours of transport and ferry flights. By April, 1945, the rate had been reduced to 9 per 10,000 hours. Such an improvement reflects the greatest credit on all concerned and demonstrates the close co-operation which has been achieved between South-East Asia and Transport Command.

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(IV) *The R.A.F. Regiment.*

183. Until mid-1944 the strength of the R.A.F. Regiment was deployed to the extent of rather more than two-thirds in machine gun anti-aircraft units, and the remainder in field squadrons designed for an infantry role. Events then forced a fundamental revision of the part for which the R.A.F. Regiment in South East Asia was cast. It had become apparent that advanced airfields, radar sites and other air force installations would not necessarily be guarded if their locations did not happen to fit into the tactical schemes adopted by the local army formations, and that unless the air forces were to withdraw everything to a safe distance behind the front lines they would themselves have to provide the necessary defence force. For this purpose the R.A.F. Regiment during the later months of 1944 was expanded and re-organised into ten wing headquarters, twenty field squadrons, three armoured (holding) squadrons and ten anti-aircraft squadrons, so as to provide tactical defence for air force units as required. The balance of functions in the Regiment as between air and ground defence was thus completely reversed.

184. The wisdom of this re-organisation was abundantly proved in the course of the 1944-45 campaign. As has already been explained, the essence of the tactics by which the re-conquest of Burma was achieved lay in the rapid advance of mechanised units thrusting through or around enemy positions, the strength of which had been weakened by air bombardment. The fighter bombers which provided the backbone of the latter, and also the fighters required for air defence, could only operate effectively from airfields close behind the advanced army units. The supplies on whose delivery the maintenance of the Army's advance depended were

likewise landed at airstrips as close as possible to troops in the line. Allied transport aircraft were often being unloaded on captured airfields within a few hours of their being seized. But as the army units advanced, it frequently proved impossible, despite the presence of enemy troops lurking in the neighbourhood, to leave garrisons behind to protect the airfields they had overrun. The defence of the latter thus fell to the squadrons of the R.A.F. Regiment. On their shoulders there thus rested the defence of the army lifeline and also of the air bases indispensable for air support and defence, and they were accordingly moved forward step by step with the progress of the campaign, sometimes by air.

185. The main airfield at Meiktila for instance, was occupied early in March, 1944, and was speedily transformed into a forward base for the supply of the Fourteenth Army, whose units had forged ahead both southwards and eastwards, leaving numerous organised parties of the enemy in their rear. The defence of the airfield thus fell mainly upon two field squadrons of the R.A.F. Regiment, which went into action on a number of occasions against Japanese parties attempting to dig themselves in within the airfield perimeter. For a short period indeed, the landing strip used to change hands twice daily, the enemy infiltrating by night only to be expelled the next morning when, as soon as all was clear, the transport aircraft would begin to land. The Regiment casualties in the course of these engagements included two officers and twelve other ranks killed.

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PART TEN.

CONCLUSIONS, RESULTS, AND LESSONS LEARNED.

I. Operations.

186. One of the major difficulties under which an Air Force works is the impracticability of ever drawing up a full balance-sheet which will give in detail the full results of air action. Unless a detailed examination of enemy records is made, air forces must rely upon the disjointed accounts of the ground forces, the reports of informants, and photographic reconnaissance, for an assessment of their results. This has been particularly the case in Burma, where so much of the effort has been expended upon fleeting targets, reported troop concentrations, or objectives obscured by thick jungle. Notwithstanding the vagueness of the information, it is certain that the number of casualties inflicted upon the enemy as a direct result of air action has undoubtedly been large, the isolation of the battlefield by the interdiction of the supply lines has been almost complete, and prevented the enemy from deploying his full strength in every major engagement that has taken place, while the new mobility given to armies by the unstinting use of air transport has undoubtedly been the major factor in the expulsion of the enemy from Burma.

187. There have at times been grounds for a belief that the effort of our close support squadrons has not been used to full advantage because of a lack of experience on the part of

Army commanders of the relative efficacy of certain types of air attack against the varied objectives. A more scientific application of the fire-power afforded by ground-attack aircraft might have led to an economy of effort thus made available to apply to other targets. Whether the attack by twelve fighter-bombers against a well-camouflaged single machine-gun is justifiable, must always be a moot point until machinery is devised to assess the debit and credit side of the picture. It is not difficult in a staff study to deduce that the effort is unprofitable, but the same point of view may not be held by the troops making the actual assault. The results of the air bombardment may be just what was needed to make the action successful. It is certain that the high standard of accuracy developed in our tactical squadrons during 1944-45 has had an enormous effect upon enemy resistance.

188. The low incidence of casualties during assaults by our own troops also bears this out, as do the unvarying tributes paid by battalions and divisions to the work of the squadrons who supported them. Recently, further evidence has come to light from informants on the efficacy of attacks. With the co-ordination of Visual Control Post teams and other sources, an even more efficient direction of fire-power on to targets and better observation of results will be possible. If analysed, the plans compiled from these sources would provide valuable proof of the decisive part that can be played by close support squadrons properly trained and handled.

II. Planning.

189. The amount of planning that has been necessary to bring the campaign to a close has been large, due in part to some misappreciation of Japanese intentions and to frustration imposed by non-arrival of resources. There was a tendency also on the part of ground forces to formulate a plan of operations without consulting the Air Commander in the early stages of planning. In consequence, much effort was expended in the recasting of operational plans to take advantage of the striking power of air forces.

190. Much of this could have been avoided had the Army Commander been able to remain alongside the Supreme Commander and the Allied Air Commander-in-Chief instead of having to base himself at an Advanced Headquarters in Calcutta. Not only was proper liaison at C.-in-C. level impossible, but the full flow of information and views between the staffs was rendered difficult. The Burma campaign proved that no plan of operations is complete unless it represents the views of the air as well as of the ground forces at all stages.

* * * *

III. Maintenance.

191. South East Asia Air Forces have a background of three years' development under trying conditions with insufficient resources. The organisation became vast and was spread over a wide area. The first phase for which this organisation was designed is now completed; the flow of supplies has become secure, and the necessity for tying down large numbers

of men and stocks of essential equipment in India has decreased. A more fluid and economical base organisation should be possible as the war progresses.

192. Energetic action has been taken, now that the pipe line is secure, to reduce the reserve holdings of aircraft and equipment which clog the machinery of supply and absorb so much of the Command resources in manpower and storage space in India. An extensive reorganisation to undertake more maintenance in the field is contemplated, and, it is hoped, will do much to avoid the bottlenecks to which centralised maintenance is prone. Such a reorganisation is only possible if the scales of ground equipment, hand tools and other servicing facilities are adequate and fully maintained. For an Air Force working in the field a generous scale of equipment is essential, and the lack of it was largely responsible for the uneconomical base maintenance organisation which events forced upon South East Asia in its early stages. The saving in man-hours that results from a generous scale of ground equipment is vast. This should always be taken into account in campaigns in tropical countries where sickness and lack of communications militate against units possessing their full establishment.

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IV. Administration.

193. The standard of unit administration in the operational areas was not high. With formations spread over wide areas, and deficiencies in ground officers also in the majority of vital trades, notably among clerical and signals personnel, much of this has been inevitable. Nevertheless a very real need exists for the indoctrination of service personnel in overseas theatres of war with the principles of self-reliance and better improvisation.

194. The principles of mobility and self-help have only resulted from the perception of those on the spot to train personnel in the

rudiments of active campaigning. In so doing they have made the best use of local resources to achieve that standard of morale and well-being which are the prerequisite of good discipline. The posting of a squadron commander from a well-established bomber base at home to an overseas appointment with no preliminary training in his changed circumstances cannot but have an adverse effect upon the well-being of the Unit. The setting-up of Junior Commanders' Courses within the theatre is the best immediate remedy, but the problems of accommodation, and the time absent from units, rendered it little more than a palliative in this theatre.

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V. Air Transport.

195. Finally, the Air Forces, having given a new-found mobility to land warfare, must also take advantage of it. When assessing bids for air transport and air supply, the highest priority should be given to the rapid movement of spares, personnel, and indeed whole R.A.F. units, in order to keep the force working at maximum efficiency. It is bad economy to keep the 15 serviceable out of 20 available aircraft supplying the ground forces when the diversion of one aeroplane to collect A.O.G.* spares would raise the serviceability rate to 18. If full advantage is taken of air transport, the striking radius of the Air Force can be still further extended, and the application of air power to any situation made more rapid and more decisive than hitherto.

K. R. PARK,

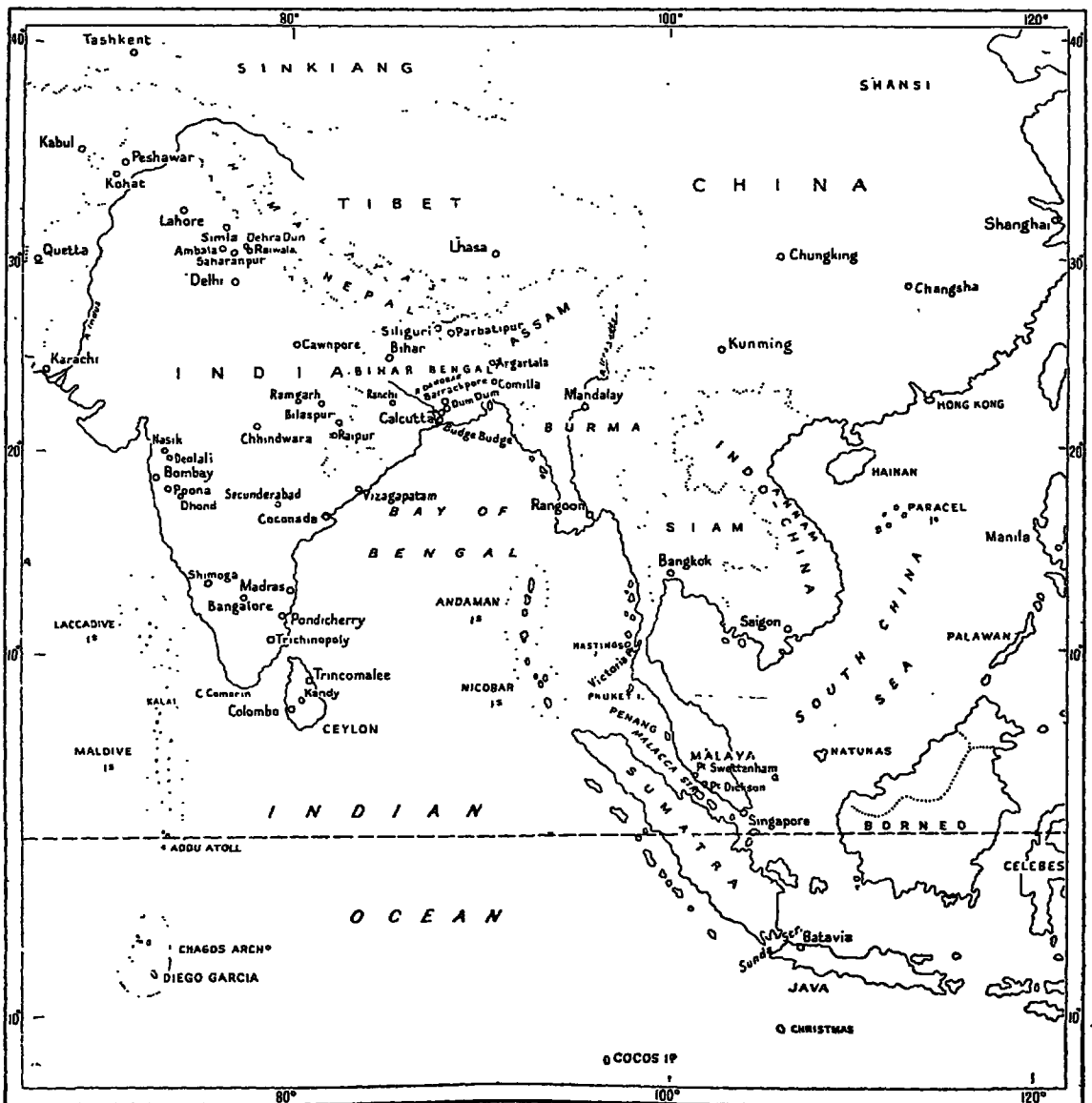
Air Chief Marshal.

*Allied Air Commander-in-Chief,
South East Asia.*

Kandy, Ceylon.

October, 1945.

* Aircraft on Ground.



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