## CHAPTER 5

# OWEN STANLEY CAMPAIGN: IMITA TO WAIROPI

THE second phase of the campaign on the Owen Stanley Range began after the withdrawal of the Australian forces to Ioribaiwa in the middle of September. The move to Imita Ridge was complete by the 17th and on the 23rd General Blamey arrived in Moresby. On this day the military dispositions were as follows. In the forward area Major-General A. S. Allen commanded the 7th Australian Division, with the 14th, 21st and 25th Brigades, the 14th Brigade being relieved by the 16th Brigade. In the rearward area was the headquarters of the 6th Australian Division, commanded by Major-General G. A. Vasey, with the 30th Australian Brigade and the 128th United States Infantry Regiment. The 126th United States Infantry Regiment was then arriving at Moresby.

A relative lull lasted from the withdrawal to Imita Ridge until 26th September. During this period active patrols probed the Japanese force, which, though depleted, was engaged in constructing strong defensive positions with reinforced earthworks at Ioribaiwa. It is important to realise that during this lull, significant events were happening elsewhere, notably the rapid and spectacular clash of arms at Milne Bay, where the expected attack by the Japanese had culminated in a trial of strength under conditions of extreme difficulty. Also in the Wau-Bulolo-Salamaua sector Kanga Force had been carrying out exploring and harassing tactics against the Japanese. Little was undertaken in the way of offensive operations in the Wau area, but buildings and equipment on the goldfields in the Bulolo Valley were burnt and abandoned as part of the tactical defence of Moresby.

From the medical point of view it should be clear that the Owen Stanley campaign, for all its fluctuations, was a continuous chain of actions, in which the effects of disease were all-important, that the conquest of the Japanese at Milne Bay was only the beginning of a long struggle against endemic and epidemic malaria, and that the expected Wau-Salamaua operations would also be bound up with the struggle against tropical disease. Therefore we take up again the story of the tasks demanded by preventive medicine all along the lines of communication over the relentless mountains and down on to the steaming malarious plains below.

### *ADVANCE FROM IMITA*

Full advantage was taken by the Australian force of its stabilisation on Imita Ridge. Fighting patrols explored the enemy positions, and these had been under fire from 25-pounder guns which had been brought up to Owers' Corner after great effort. On the 25th a patrol penetrated a little distance into the enemy's position on the main track to Ioribaiwa, and the next day a heavy attack was launched on the Japanese front and flanks by three battalions. Further advances on Ioribaiwa showed that

the enemy had withdrawn, and on the 28th, when the position came into Australian hands, the main body of the Japanese had retreated, and only a rearguard was left, retiring rapidly along the trail northward.

This altered the medical position, as with the expanding scope of work aid posts were now needed forward of Ilolo. The advancing Australians found that the retiring Japanese did not concentrate for a stand until they had reached Templeton's Crossing. Fortunately the weather had remained dry for sufficient time for 25,000 pounds of material to be shifted from Moresby to Owers' Corner. As the Australians advanced, however, there was a bout of bad weather which hindered air-dropping and made recovery of stores more difficult. In spite of this the Australian force captured Nauro on 30th September, took Menari on 2nd October, and finally on the 3rd, occupied Efogi with its high-pitched village huts and its cold wet nights, a foretaste of the chilly mist of the higher places. By the 6th the force had reached Kagi without encountering any Japanese except in isolated straggling parties.

In accordance with these advances the 2/6th Field Ambulance was moved from Ilolo to Uberi on 2nd October. The 2/4th Field Ambulance, which had been fostered at Ilolo by Chenhall's unit, and had taken opportunity to become familiar with the country, took over the M.D.S. at Ilolo a few days afterwards. This dressing station was then taken over in turn by the 14th Field Ambulance, so as to allow Lieut-Colonel A. F. Hobson, with his 2/4th Ambulance to be freed of work at the Subitana aid post, and to go forward to Nauro. The conformation of the country here was rather more favourable to air-dropping than some other places. The area was flat and lay in a wide valley, but after heavy rain it soon became a morass. Some supplies were sent by road in divided loads, and some were dropped from the air.

The 2/4th Ambulance began to prepare an M.D.S. at Nauro, off the track, and the 2/6th established an M.D.S. at Uberi. Owing to the speed of the Japanese retreat, neither of these posts functioned fully. A detachment under Captain A. V. Day was left at Nauro to look after some sick and wounded, and later rejoined the main body of the unit, which had meanwhile pushed on towards Myola. The 2/6th Ambulance followed the 2/4th a few days later. As these two ambulances went on to Myola, the intermediate posts were taken over by detachments of the 14th Field Ambulance.

By the 9th Joseph and his party of the 2/4th Ambulance were at Myola, Sergeant F. N. Smith and orderlies were at Kagi, and an N.C.O. and detachment at Efogi, while Day was at Nauro with a detachment. The work of the medical services was, of course, full of frustrations, particularly for the R.M.Os. for with supplies being carried from Owers' Corner, replenishment was barely possible.

Hobson, with Majors H. F. G. McDonald and G. C. Love pressed on to Myola, and on an area known as Myola 1, selected a site for an M.D.S. Sixteen tent flies from a local dump were erected before dark. This enabled Major G. V. Mutton, acting as R.M.O. of the 2/33rd Bat-

talion, to be relieved next day of the necessity of holding casualties. It may be remarked here that it was on this day, the 11th, that the first wounded were received at Ilolo since the advance from Ioribaiwa; these men arrived in good condition after a six-day journey.

Meanwhile, the Australian forces had moved on from Templeton's Crossing, where the great gorge, carrying the fast-running Eora Creek was entered after a severe climb over a very rough track. Templeton's Crossing was five days' march from Ioribaiwa. During the second week in October strong patrolling contained the enemy within his main defences, and during the period 13th to the 16th heavy frontal and encircling attacks by the 3rd, 2/25th and 2/33rd Battalions were successful in capturing the objectives with severe enemy losses.

Myola was the goal for settled medical work on the range until Kokoda was taken, and on the 13th the evacuation plan provided that no casualties should be moved back from Efogi, so that they could be held at Myola for direct air transport to Moresby, or, failing this, sent on foot to Kokoda and, when it fell, by air thence to Moresby. The 2/4th Ambulance was becoming more firmly established on the 13th, and Captain D. R. Leslie of the 2/9th A.G.H. and Captain A. O. Watson, the dental officer acting as anaesthetist, were expected there as a surgical team. More tents were dropped at Myola on the 15th and picked up at once; patients were received despite an acute shortage of gear for cooking, eating and drinking, which called for some extemporisation. Further ingenuity used biscuit tins as dixies and helmets as bed-pans. A steady stream of patients, both sick and wounded, arrived through the day, and by dusk 75 patients had been admitted, 34 being battle casualties. This number had been increased to 130 by the next day, and as the surgical team had then arrived, the first operation was performed soon afterwards. Towards evening Chenhall arrived with thirty-one O.Rs. from his unit. The most unsatisfactory feature of the day was the low percentage of recovery from air-dropping: this was chiefly due to the type of the country; most of the packages were lost in the forest, and no cooking gear was obtained.

On the 17th a 2/6th Ambulance party moved to the Myola 2 area, two hours' journey distant on foot, and began to establish an M.D.S. there, while Hobson's party with six officers worked on at Myola 1 in a primitive theatre made from a tent fly and blankets with some still more primitive equipment for sterilisation. When night fell there were 133 men in hospital; their only light was two hurricane lamps and two torches. More staff appeared the next day, and the Menari post was now ordered to close and the personnel to come on to Myola.

On 18th October the 25th Brigade followed up the successful attacks delivered some days earlier, and carried out an assault on the enemy position at the first crossing at Eora Creek, but failed to dislodge the Japanese. The 16th Brigade relieved the 25th in the forward area, and followed up the attack. Hobson moved with the 16th Brigade headquarters as medical liaison officer on the 19th, when this formation established a position half an hour's travel behind the ground south of the

stream held by the enemy, and began a series of attacks which lasted for several days.

More medical help was needed at Myola, and all the available staff at Uberi was summoned forward, while the 14th Field Ambulance supplied their replacement.

Both brigade headquarters and the aid post were on a slope exposed to mortar and mountain-gun fire. During the afternoon of the 22nd a mortar bomb hit the R.A.P. of the 2/3rd Battalion, killing two orderlies and the medical officer's batman, and wounding the medical officer Captain M. Goldman. The position was difficult; hot drinks could not be safely prepared for the men, as smoke attracted mortar and gun fire, and water had to be collected during the usual afternoon storm, as the Japanese held the ground near the creek. This situation was unchanged on the 24th, and Love set up a post at Templeton's Crossing, and Wilkinson was in relief at the 2/3rd Battalion aid post.

At Myola medical forces were strengthening; Joseph arrived there from Efogi, where he had run a staging post and looked after troops in transit. There was no definite news as yet of the chances of air evacuation from Myola, when the 2/6th M.D.S. began to take patients: Leslie took up duty at Myola 2 as surgeon, while Vickery and McDonald carried out surgical treatment at Myola 1. Arrangements were made for the fragile portion of the 2/6th's equipment, some 700 pounds, to be taken to Myola. The admissions back at Uberi had now dropped to small figures, and authority was given for all medical personnel at the staging posts to move forward to Myola.

On the 27th a patient was transferred by air from Myola to Moresby. It was evident that there would be increasing need for surgical treatment at the hospital centre at Myola, for the Japanese held strong positions facing the 16th Brigade. Joseph was brought up to the native camp south of Eora Creek, and set up a medical post. There was particular need for essential drugs and dressings, as Hobson found the brigade supply was almost depleted. Inevitable delays occurred in the sending and arrival of supplies, but some were sent forward from Myola. After days of heavy fighting, and finally hand-to-hand fighting, the 16th Brigade captured positions overlooking Eora Creek on the night of the 28th and the opposing Japanese force was almost entirely destroyed. The defence of these positions called for great tenacity, and inevitably produced many casualties. The Templeton's Crossing-Eora Creek series of actions lasting nearly two weeks were bitterly contested and the Australian advance marked a critical point in the operations.

As there was still no firm decision about air evacuation from Myola, some of the lightly sick and wounded were started back along the trail to the base areas, while other casualties were sent to the 2/6th M.D.S. at Myola. Great disappointment was felt at Myola at the repeated delays in establishing an air-shuttle between Myola and Moresby. Success in bringing in and out a small plane did not ensure the safety of landing a larger aircraft, and in particular, taking it off again. Perhaps the over-

worked and over-crowded medical centre at Myola did not always realise that delay did not mean infirmity of purpose.

The brigade now moved on and set up headquarters south of Alola: the Japanese were quiet, and there were for the time being no casualties. At Alola Hobson inspected the dropping-ground with Brigadier J. E. Lloyd, commanding the 16th Brigade, and found it unsuitable: there would surely be heavy losses from air-dropping, which was serious, as rations and supplies were scarce.

Diet of forward troops and patrols varied considerably. The standard emergency ration was satisfactory when it could be obtained, and was much better when cooked, but this was not often possible, especially when the troops were in close contact with the enemy. Most of the men wanted carbohydrates; dried fruits, milk powder, and chocolate were in demand during periods when rations had been scanty. The basic tinned beef and biscuits were sustaining but monotonous. Medical officers commented on the need for more salt as well as concentrated carbohydrate when there was a call for increased exertion.

Vasey relieved Allen in command of the 7th Division on the 29th: his headquarters were now in the Myola area, which was being used with success as a dropping ground for supplies. Air-dropping of medical equipment and supplies was found a great improvement in spite of losses, though the percentage of recovery at Myola was not satisfactory; a loss percentage of 80 was not uncommon. The 2/4th Ambulance detachments had found that when ground parties carrying full individual loads of material were divided, they tended to be strung out along the trail, and thus more difficult to keep under unified control.

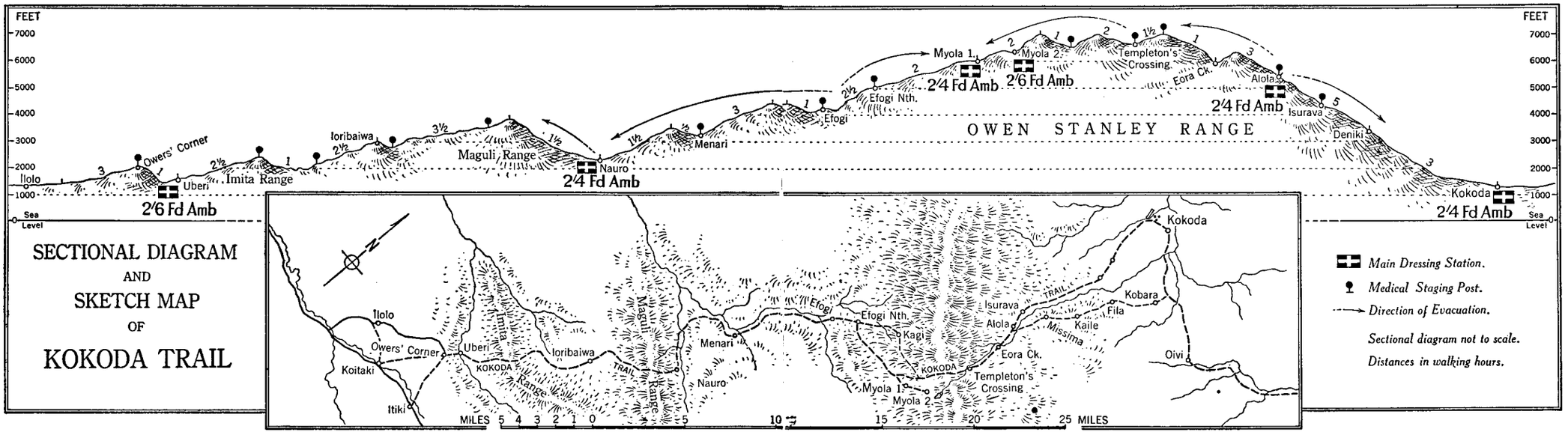


Before the end of October the 16th Brigade made successful assaults on the Japanese flanks, and on the 30th captured Alola, north of Eora Creek, and were pressing the straggling enemy.

On the afternoon of the 31st the 2/4th M.D.S. at Myola 1 was closed, thus freeing the staff for onward movement, and leaving the 2/6th Ambulance at Myola 2 to undertake the medical and surgical care of casualties from coming actions. McDonald and a party of twenty-one O.Rs. moved on to Alola.

Some medical supplies had now arrived at Myola, and the ambulance was able to send some to the forward posts. The number of patients at Myola 2 had increased rapidly, and as the single M.D.S. was responsible for holding them, with the exception of the men able to begin walking back, the task was great. On 1st November there were 438 men in hospital there, 212 were battle casualties and 226 sick. By midnight all necessary surgery had been performed at Myola 2 but, although this aspect of the immediate situation was under control, medical supplies were grossly inadequate, and there were no reserve stocks of most of the essential items. To relieve the strain the 2/4th Field Ambulance set up a small M.D.S. at Alola, to take sick left by the battalions as they moved through. Love was sent on with a small party to establish a medical post at Isurava rest house. The medical officers found it difficult to provide shelter for the sick. Tents were scarce, and were seldom used complete, usually tent flies only, with gas capes to keep off the fine spray of water; most of the patients were placed under their own ground-sheets.

The military position was changing rapidly. Two brigades, the 25th and the 16th, were at the point of parting. From Alola two tracks led on,



one through Isurava and Deniki to Kokoda, the other a rough track through Abuari, Missima, Fila and Kobara to meet the Kokoda-Oivi road halfway. The 25th Brigade took the track to Kokoda, and the 16th Brigade went towards Oivi. On 1st November Isurava and Deniki were occupied. The following day the 2/31st Battalion, thankful to leave the rain-soaked forest, entered Kokoda unopposed, and with due ceremony hoisted the Australian flag there on the 3rd.

The establishment of sure air contact with the headquarters of New Guinea Force completely altered the aspect of operations, and in particular the outlook of the medical services. Hobson's unit gave medical support to the 16th Brigade along the rough Abuari-Missima track to Oivi, and as many as could be spared set up the M.D.S. at Kokoda.

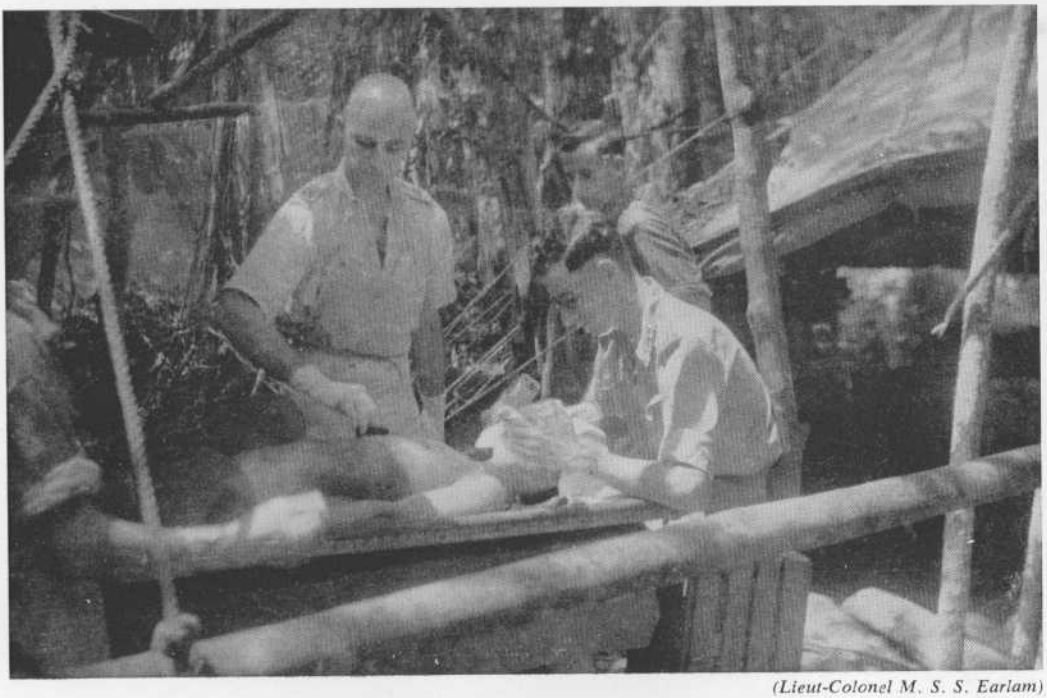
Captain H. B. Gatenby, a surgeon of the 2/2nd C.C.S. at Koitaki, had been flown in to Myola, and now came on foot with Vickery and party. The 2/4th Ambulance had six officers and forty-nine O.Rs. in the area, and on the 3rd, leaving a small aid post staff at Alola, all set out for Deniki, taking forty-four walking sick who were thus being sent forward to Kokoda. At Deniki the native gardens were helpful as a supply of fresh vegetables, and huts were available for accommodation.

The following midday this medical party with forty-five native carriers arrived at Kokoda, and were taken by Major M. S. Alexander, D.A.D.M.S., to the site selected for the M.D.S. The settlement and Government station at Kokoda had suffered from air attacks, and were largely burnt out, but the natural beauties of the position on the edge of the plantation were striking. Here there was little cover for the sick, who, owing to the shortage of staff, often had to make their own shelters from ground-sheets. Planes were landing on the Kokoda airstrip, promising relief from the stringency of medical supplies. At Kokoda fresh bread, margarine, butter and jam were flown in, an incredible luxury after biscuits and bully beef for some six weeks. It was evident that the establishment at Myola was committed to a long task, leaving only one field ambulance, the 2/4th, forward to serve the two infantry brigades. In view of this position the 14th Field Ambulance was called on again for assistance.

On 27th October Earlam had been asked to prepare a light section of his 14th Field Ambulance to fly to Kokoda after its capture, with the specific object of providing a surgical service during the operations forward of Kokoda. The size of the section was increased some days after to provide two detachments, the first to be of twenty-five, with equipment weighing 10,000 pounds. To the second and smaller detachment were then added dental personnel and full equipment. Delays occurred owing to difficulties in priority and changes in plan, and in the beginning of November the expected date of arrival of the detachment had not yet been fixed. There was no corps field ambulance to be brought forward, and the 3rd and 14th Ambulances were unable to do more; the 3rd was fully engaged in work in the base area, and the 14th still had some of its members on the ranges, and sufficient key personnel were retained in the base area in case the M.D.S. at Bomana should have to be re-opened. McLaren at Nauro was

*(Lent by Colonel A. F. Hobson)*

The 2/4th Field Ambulance M.D.S. after the bombing attack.



*(Lieut-Colonel M. S. S. Earlam)*

Major T. H. Ackland, surgeon, and Captain A. R. Wakefield, anaesthetist, doing surgery at Soputa.

Casualties leaving loading point south of Sananda for the M.D.S. at Soputa in a converted car. This car was captured by the Japanese at Singapore and recaptured by Australians at Gona.

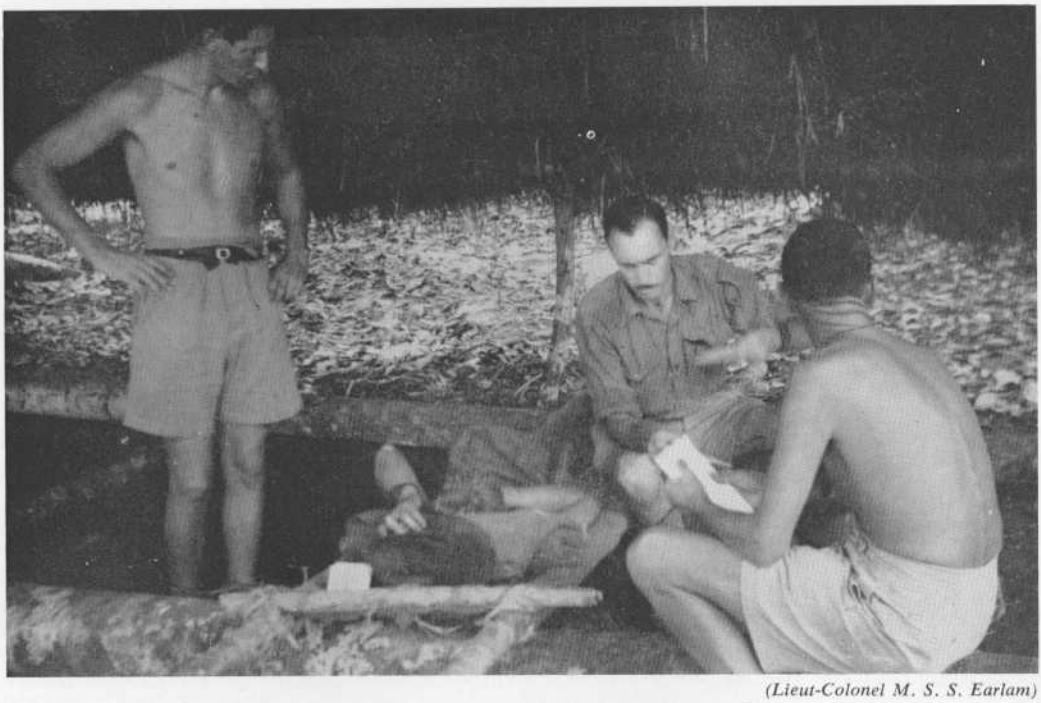
*(Australian War Memorial)*

*(Australian War Memorial)*

Casualties receiving treatment at Gona.

*(Australian War Memorial)*

Wounded at Gona receive treatment before being taken to the dressing station.



*(Lieut-Colonel M. S. S. Earlam)*

Captain W. W. McLaren at the staging post near Gona.

*(Australian War Memorial)*

An R.M.O. at Sanananda dresses an arm wound.

*(Australian War Memorial)*

Evacuation in the Sanananda area.

moved forward, and the 2/4th Field Ambulance with the aid of Gatenby's team was ready to take up the work onward from Kokoda.

Once the airstrip at Kokoda was in regular use the transport of patients to Moresby could be arranged, but as the force advanced, more medical help would be needed in the Oivi-Gorari section, where the Japanese were expected to put up a strong defence before the Kumusi River. The main road from Kokoda to the river was quite good, though there were numerous water crossings to be negotiated, and parts of the track through Oivi and Gorari were steep. The enemy brought up fresh troops from the coast, and were holding on to these areas tenaciously.

### *OIVI-GORARI ACTIONS*

The 2/1st Battalion was sent from Kobara, along the track from Kokoda, on the 3rd; the 2/2nd Battalion then took a parallel track to the south, and on high ground near Oivi heavy fighting developed. The 2/2nd and 2/3rd Battalions dug in facing a strong enemy position, and next day repulsed a heavy attack, though at the cost of fifty Australians killed or wounded. On the 5th, the 2/1st reached a junction on the south track leading north to Gorari, and two days later Vasey sent the whole 25th Brigade round the southern flank to cut the Japanese rear line at Ilimo while the 16th Brigade kept up pressure at Oivi. The 2/1st Battalion by cutting the track from Gorari to Ilimo trapped the Japanese, who, failing to break through, abandoned the positions at Oivi. This bold action dispersed the remainder of the enemy force, which suffered very heavy losses, and was pursued by the 25th Brigade. Their disbanded forces fled along the Kumusi River under air attack, thus giving Vasey's force control over the Wairopi River crossing, for further onward movement. The struggle for the Owen Stanley Range and for the Moresby base was over, but in the four months of action the four brigades engaged had lost 625 killed and 1,055 wounded.

### CASUALTIES AND SURGICAL WORK

The actions which forced the Japanese back over the Kumusi River were fierce and costly. For a fortnight the toll of Australian casualties was heavy, from the fighting at Templeton's Crossing and Eora Creek, and early in November from the attack on Oivi. The Japanese mortars at Templeton's Crossing caused a number of severe wounds, and on the high ground at Eora Creek the 2/3rd Battalion suffered heavily: there were seventeen stretcher cases from this action. Carries from the forward position to the rear R.A.P. were most arduous, some were even up to fourteen hours, and the bearers were often under fire. The patients also showed great fortitude; most of the stretcher patients were taken forward to Kokoda, and those able to walk returned along the trail to the roadhead. By the 11th November a total of 111 patients had been evacuated by air from Kokoda.

The patrolling and fighting at Oivi produced about fifty casualties in the 2/3rd Battalion. Joseph, relieving Wilkinson, who was ill, saw num-

bers of patients with wounds of the chest and abdomen and with compound fractures. Extemporised splints cut from bush timber were used, and the patients were carried to the R.A.P. in single-pole blanket stretchers, so narrow was the track.

### *ADVANCE TO WAIROPI*

During the night of the 12th-13th the fleeing Japanese troops crossed the Kumusi River; a small party pursued the course of the river north and later reached its mouth, and many lost their lives in trying to cross the wide swift-flowing river in boats and rafts. There was nothing now to hinder the dropping of bridge-building equipment from the air, and the work proceeded rapidly.

Three planes reached Kokoda on the 15th, with four medical officers and thirty-four O.Rs. and equipment; this was the detachment from the 14th Field Ambulance, a welcome reinforcement to the medical services, though no fresh solution of the problem of Myola had been reached.

On the 13th the engineers began to throw a wire rope across the river, and next day two flying-foxes were working, and by the 16th a footbridge had been placed across the flooded stream, and the 25th Brigade was on the eastern side of the river and was advancing towards Gona on the plains below. The next day the headquarters of the 7th Division and the 16th Brigade had also crossed the river, and were moving on another prong of the attack towards Sanananda. On this day also an 800-foot landing strip was ready for use on the eastern side of Wairopi.[1]

In September a battalion of the 126th United States Regiment began a difficult advance from Moresby along the Rigo track to Jaure and thence to Bofu on the foothills of the Owen Stanley Range. The main body of this battalion remained here for the time being, and a detachment went on, and on 16th November joined the 7th Australian Division near Wairopi. Remaining forces in Moresby were flown to Wanigela, and thence moved to Pongani.

### SUPPLIES DURING THE ADVANCE

Experience showed that some of the standard field ambulance equipment was not indispensable in an atypical action such as that on the Owen Stanley Range, but certain items such as the ordnance equipment were necessary at medical posts. Unless this could be dropped the problem of hand carriage over the trail was raised at once. Further, it was unreasonable to expect that native carriers could be used as a two-way type of transport, bearing patients and supplies on alternate trips. Norris in his outstanding work as A.D.M.S. in this campaign set himself as free as possible to move up and down the track, and Alexander, his D.A.D.M.S., likewise kept in close touch with those units and posts in particular whose work was daily affected by tactical changes and other local factors. This maintenance of contact kept the needs of the medical service up-to-date, even though they often could not be satisfied. The moral effect of this

[1] Australian casualties for Imita to Wairopi 26th Sept-13th Nov: killed in action 16 officers, 273 other ranks; wounded in action 29 officers, 521 other ranks.

practical interest was worth much more. In addition, it was found helpful to have a senior medical officer attached to the brigade staff during movement, so that advice could be obtained and the requirements of the forward areas be met. Men, equipment and medical supplies had to be pooled, and such a pool varied in size according to the troops involved, and the number of axes along which troops were moving. Distances were of necessity reckoned in terms not of miles but days. The recovery of material dropped from the air depended on many factors such as weather and the geographical features of the area. The native carriers performed the work of recovery with natural skill, but they were hampered if the parcels were not distinctively marked, as with colours, or streamers of bandages or hessian. At its best air-dropping achieved a remarkable speed and accuracy, but there were occasions when losses were heavy. Either parcels could not be located, or if located could not be retrieved, or when recovered were poorly packed so that loss from breakage or dispersal was excessive. The urgent need for review of the war equipment tables of field medical units merged from this campaign.

The average proportion of medical supplies recovered was not better than 50 per cent; therefore landing was a much more economical procedure than dropping, subject of course to the possibility of landing within reasonable distance of the forward post or area concerned. Fluids did not survive dropping well. Methylated spirit, which was both useful and scarce, suffered heavy losses, though containers only three-quarters full sometimes survived: other liquids, and oily substances did not drop well, though anaesthetics were successfully dropped on occasion. Tables were drawn up for the division to indicate the periodic maintenance requirements of R.M.Os., M.D.Ss., and surgical teams. Such tables were included in a report by Hobson on the New Guinea campaign from August to December 1942. The nature of the standard medical staging post may be clearly gathered from the following list, setting out the men and material required:

Details of minimum portable equipment and personnel to establish:

*A Standard Medical Staging Post.*

*Personnel*: 1 medical officer
6 O.Rs., to include one trained nursing orderly, and one N.C.O., the four others to be able to function as one cook, one clerk and two general duties.

*Ordnance Equipment*:

Tents complete, 1 (Poles not required in timbered country. Fly or tent used separately were found to be unsatisfactory in wet weather.)
Axes, felling, 1
Shovels, G.S., 1
Picks, 1
Sheets, ground, 12
Blankets, G.S., 24
Kettles, camp oval, 3 (or kerosene tins)
(It was found that kerosene tins were more portable and had larger holding capacity—cooks verify this.)
Ladles, cooks, 1 (can be improvised)

Plates or basins, soup, 12
(Basins, soup, are preferable—plates not suitable for liquids or mashes.)
Spoons, dessert, 12
Pannikins, tin, 12
(Knives and forks not used during campaign—were found to be unnecessary for type of food issued.)
Towels, hand, 6
Lamps, hurricane, 1
Stoves, oil, wickless (Primus), 1
Kerosene, gallons 4 per week
Buckets, water canvas, 3
Flags, directing pendants, 1
Razor, safety, 1 (spare blades as required)
Torch, hand electric, 1 (with spare batteries).
(12 natives are required to carry these stores.)

Many practical details relating to the exact form of medical supplies and the methods of packing were also given in this report. One point of importance was that unless natives were available for carrying water and supplies, such a post should be sited near a supply dump and near water. Six to ten native carriers could be usefully employed about the post. Other non-medical posts, purely for refreshment along the way, were established with advantage. Good liaison between the S.M.O. brigade group and the R.M.Os. was essential, so that their indent of requirements could be consolidated and signalled regularly to the M.D.S. The value of the work of the signal corps was outstanding in regard to the important matters of supply and evacuation.

### WORK OF R.M.OS.

Captain A. E. McGuinness, R.M.O. of the 2/2nd Australian Infantry Battalion, remarked on the difficulty in recovering and removing wounded in jungle country, and pointed out the need for adequate doses of morphine to be given at the company R.A.P., since the majority were recovered at night. Means for supplying cover, heat and light had to be provided; these requirements included two stretchers and a minimum reserve of twenty blankets. It will be seen that in the case of rapid movement, both native carriers and R.A.P. staff may be required to carry equipment. McGuinness felt that a transfusion set with enough plasma for one patient, with further plasma available should the need arise would be of great value, as the A.D.S. was often some distance away. The "medical companion" of the R.M.O. was found rather cumbersome in mountainous country; it was suggested that sub-division into two parts would be an advantage.

Several medical officers had by this time commented on the factor of age in soldiering in the difficult parts of New Guinea. The upper limit was generally placed at thirty-five, with the ideal age twenty to thirty years. Stability of temperament was of course important too: many men admitted that the knowledge of the possible proximity of an unseen enemy caused a constant feeling of strain. Though described in different terms by different men in various places, this sense of being hemmed in by some

degree of danger was a reality. The siting of an R.A.P. in a secure place added considerably to the men's feeling of safety if sick or injured. Nervous disorders were on the whole uncommon. This was a tribute to the spirit and discipline of the men and their leaders. Further, it is a special tribute to the R.M.Os., who used their battle experience with firmness and understanding. This remarkable campaign must be viewed in the light of all the relevant physical and mental factors. In describing these, Joseph spoke of:

> The intense jungle, inducing feelings of claustrophobia, its intolerable quietness rent by eerie sounds, the crashing of enormous rotting trees, the narrow tortuous tracks, the knee-deep mud with its vice-like grip, and the torrential tropical rains. Into this awe-inspiring scene with its oppressive heat by day and bitter cold by night place the infantryman clad in jungle greens, the only clothes he possesses, assail him with dysentery, malaria and mite bites which ceaselessly itch.

In addition there were the factors of dietary insufficiency, the fatigue of a rapid advance, and the fear of ambush, which could soon lower morale.

Rations were very monotonous on the whole: men tired of bully beef and biscuits, though these were convenient to handle. Milk and dried fruit with rice were found much more appetising, and dehydrated potatoes and vegetables were also a success when available. Most of the troops on the trail from Uberi to Wairopi felt the constant urge of hunger. Increased intake of salt was essential: many men were found to lose abdominal discomfort and cramps in their limbs after taking salt and resting. In the 2/1st Battalion the R.M.O., Captain J. F. Connell, instructed the men to suck at least two tablets per day.

The ability of wounded men to walk to medical posts was a feature of the campaign; even admitting that only the most seriously wounded could be carried, it was noted that men with wounds of the feet, arms, shoulders, and minor wounds of thigh and head were usually able to walk. Sucking wounds of the chest were relatively common in the experience of McGuinness. Other R.M.Os. saw few of these injuries, but it is admitted that numbers of these men must have failed to reach help. The same was true of abdominal wounds. The R.M.O. and his staff had to walk as his unit moved; while doing all they could to feed, rest and restore the less severely wounded, they still had to drive them on however weary, if able to walk, and each night had to hold such men as were unable to be sent on and care for them as best they could.

*Fatigue.* Connell pointed out a number of important factors in producing fatigue and strain on the men fighting on the Owen Stanley Range. During the first engagements the 16th Brigade had the help of a large body of native carriers, and some air transport, and could draw upon native gardens. When the force was pressed back to Ioribaiwa the troops arrived with little equipment, carrying no rations or ammunition, though they were able to use some reserve dumps during the retreat. The tracks progressively deteriorated, until they had become a sea of mud owing to the constant traffic of the opposing forces.

By the time the 16th Brigade began to advance conditions were still worse: the native carriers had "gone bush" and only twenty could be allocated to each battalion. This, combined with restrictions on air-dropping owing to bad weather, increased the personal load carried by each man to some 54 pounds. Connell has summed up the physical difficulties as follows:

> In the considered opinion of many experienced officers who have taken part in other campaigns in all theatres of the war—Middle East, Europe and New Guinea—there was no campaign in which the stamina and endurance of the troops was so overstrained as in the second advance across the Owen Stanley Range between Ioribaiwa and Kokoda. As a result of this, and because of it being essential to keep down the weight carried per man to the minimum, the limit allowed was half a blanket. This, together with a ground-sheet, allied to wet clothing, proved quite inadequate to enable soldiers to spend a comfortable night while campaigning in altitudes varying from 3,000 to 8,000 feet above sea level. In the light of this it is a tribute to the morale and general good condition of the troops.

### *DISEASE ON THE OWEN STANLEY RANGE*

Apart from the casualties of battle, infections were, as usual a significant waster of men. Some of these were endemic to the area, others were brought by the men themselves.

*Malaria.* The Kokoda Trail began and ended with malaria. The posts within short distances of Koitaki were highly malarious, and the sloping country stretching from Kokoda and Wairopi to the coast was also a breeder of anophelines. After the withdrawal to Ioribaiwa malaria was frequently seen at Ilolo, mostly of relapsing type; A.I.F. units returned from the Middle East then used the supplies of anti-malarials they had brought with them. Without atebrin chemo-prophylaxis was not possible. A survey of the track from Uberi to Deniki did not reveal any malarial vectors, and the high elevations where the climate was moist and cold did not lend themselves to malaria transmission. Therefore, once the lower levels of the trail were passed, the risk of malaria was negligible until Kokoda was reached. Attacks of fever on the higher levels, if due to malaria, were not of primary origin. It will be seen that the routines of malarial prevention, and even the taking of suppressive quinine could safely be allowed to remain in abeyance during this part of the campaign, but a real danger lay in the difficulty of re-establishing these routines when the need once more arose.

The A.D.M.S. of the 7th Division asked that anti-malarial equipment and stores, and an adequate supply of quinine should be sent by air to Kokoda, and advised that 10 grains of quinine daily should be taken by all troops from 10th November, a week after their arrival in the Kokoda area. Unfortunately these stores did not arrive, and by the middle of November the lack of quinine, nets and cream exacted its toll of primary malarial attacks, which became so prevalent that special measures were necessary to deal with these casualties. Exact knowledge was also lacking at the time. The medical units had no slides, stains or microscopes until they reached Soputa, nor the measures necessary for

protection, even had it been possible to apply them. The full price to be paid was not apparent until later, when the risks of malaria on the coastal plains were greatly intensified. Quinine was not only difficult to obtain but also hard to keep, as in ordinary packages it disintegrated in the moist climate. Johnston had queried the wisdom of suspending quinine even on the range, but its suspension had eased supply difficulties: 60,000 tablets per week were required. Actually, supplies were sent to Kokoda on 9th November, and further quantities at frequent intervals: 400,000 tablets were sent in two weeks. The missing consignment was found later on the edge of the Kokoda airstrip: it seems that there was some confusion whether quinine was landed or dropped.

*Dysentery.* Further experience indicated that not all the clinical diarrhoea encountered on the range was due to dysenteric infection. The monotonous diet, at first chiefly hard biscuit and tinned beef with a high fat content, did not seem always to be digested and absorbed, and some of the diarrhoeal disturbances may have been dietetic. But there were hundreds of men afflicted with true clinical dysentery with passage of blood and mucus, and accompanied by colic and urgent liquid discharges. During three weeks of September some 1,200 casualties passed through the A.D.S. at Ilolo; the majority had dysentery. In the period 9th to 14th September, when the retreat to Ioribaiwa was in progress, over 40 per cent of the sick were suffering from diarrhoea, and as the military population grew the position became worse. Chenhall proposed at this time that deep fly-proof latrines be constructed every 400 yards from Owers' Corner to Uberi, a suggestion which indicates the position as it then existed. Whatever degree of hygiene was attained at the posts, with the construction and policing of fly-proof latrines, there was little or no sanitation practised along the track. Major K. Brennan reported to Fairley, the Director of Medicine, that the "sick men through weakness and exhaustion were unusually careless, and water supplies became a danger to the whole area". Both sanitation and water sterilisation were improved, but the factor of human fallibility remained, until the sending of supplies of sulphaguanidine to forward areas promptly and effectively controlled the disease, and rendered the dejecta relatively harmless. A combination of these preventive factors resulted in a fall of the incidence of diarrhoea to 4 per cent, in spite of incessant traffic along the trail. Further improvement in the general condition of the men was effected in the Ilolo area by setting men in the convalescent camp a hardening exercise, which included carrying medical stores up to Imita Ridge, and cleaning up the track.

The importance or otherwise of infection by flies on the Owen Stanley track cannot readily be estimated in a brief statement, since the prevalence of flies varied with the locality. In the steamy jungle and rain forests of the lower levels fly-breeding was profuse where there was a high concentration of troops. Another possible factor in fly-breeding was the use of transport animals in base areas. In the cold wet high level areas there was probably little risk from insect vectors, and in any case their capacity to carry infection was not worked out. There seems no doubt, however,

that transmission took place by direct hand to hand infection or from food, and by water. Ford reported in October that the organisms causing the disease on the range were mostly of the Flexner type, and the remainder, in a ratio of 1 to 15 only, were Schmitz. Patients reaching the dysentery hospital in the Moresby area arrived in fair condition, even after walking for six to seven days, and cultures seldom revealed dysentery bacilli. The Japanese on their retirement left evidence of dysenteric infection, in their fouling of the ground, for their hygiene was primitive, but fears of an outbreak of Shiga dysentery or still worse, of cholera, proved groundless. There seems no doubt that the timely use of sulphaguanidine, administered at once in the early days or hours of the clinical malady, stopped a damaging and serious epidemic.

*Typhus Fever.* As was expected, patchy outbreaks of typhus occurred on the trail. As all men with evidence of a possibly serious febrile illness were sent to the base by carrier as soon as possible, the problem was not one of diagnosis or treatment as much as of evacuation. The numbers of typhus infections increased during the latter part of 1942, but these were drawn from a number of areas other than the Owen Stanley Range.

*Malnutrition.* Ford pointed out that although a frank clinical state of beriberi is not easily produced in less than eighty days, this period may be shortened by exhaustion and infectious disease. Only a few cases of beriberi were observed among men cut off from other groups and on low and poor rations for periods of weeks.

*Respiratory infections.* It is of interest to note that on the whole very little respiratory disease was observed on the trail. The men were often exposed to fatigue and cold, and were constantly wet through at some of the higher levels but, though often forced to rest or even to try to sleep on wet ground, exposed to mist and rain, they remained free from infections of the respiratory system except in localised outbreaks.

### *MEDICAL WORK AT KOKODA AND WAIROPI*

Three days after the occupation of Kokoda five stretcher patients and eleven others were flown to Moresby, and an encouraging amount of supplies was received. Six battle casualties arrived at the M.D.S. and 93 sick. More tentage was required, as there were torrential falls of rain which hindered air transport on the following day. The climatic conditions were then humid and trying, especially by contrast with the cool of the mountains. On 7th November there were a number of seriously wounded men among the 46 battle casualties admitted, and 173 sick. Weather again prevented inward or outward air traffic.

Next day conditions were better, and more fresh food was available for the 52 battle casualties and 205 sick. Most of the latter were suffering from diarrhoea (probably dysentery) and pyrexia, due either to malaria or scrub typhus. On 12th November Captain M. G. F. Donnan, R.M.O. 2/25th Battalion, was admitted with a gunshot wound of the elbow.

By the time the M.D.S. had been working for a week the staff was accustomed to the alternation of being able to send away patients one day,

but none the next, and to similar fluctuation of stores. There was sometimes actual hardship to the patients, who had to be moved to the airstrip in spite of uncertainty of plane movements. If patients who were only slightly ill appeared likely to recover within ten days or less, they were returned if possible through a reception camp to their own units. The staff of the Kokoda M.D.S. found later that many of these men were not really able to rejoin their units as active members, and the nature of the camp was changed from a transit or reception camp to a convalescent camp under daily medical supervision. A good ward system was now in use, and the surgical and other routines were running smoothly. The A.D.M.S. arranged that the 2/4th Ambulance would follow the divisional headquarters to Oivi when New Guinea Force could arrange relief.

Improvement in the weather made it possible to reduce the bed state of the M.D.S. to a comfortable low level, and when Major L. P. Hiatt arrived with the 14th Field Ambulance detachment from Moresby by air, the numbers had fallen to four battle casualties and 160 sick. Five officers and some sixty-three O.Rs. and thirty-six native carriers of the 2/4th Field Ambulance left Kokoda. Although some 800 pounds of stores were sent on in advance by jeep, the members of the party were very fatigued by the journey over a muddy track in hot humid weather, for all had to carry some unit equipment as well as personal gear.

The 14th Ambulance detachment found that the moving forward of the fighting force made Kokoda a backwater, but it was still an important evacuation centre, for stretcher cases could only be transported by air to Moresby by carrying them to Kokoda along the trail. Fresh admissions were few, and came from neighbouring units, which were rapidly dwindling in size. One perhaps unexpected difficulty was experienced after the force reached Kokoda, the necessity of helping to feed numbers of natives who returned there after the Japanese left. For a time there were 300 whites and 1,300 natives needing food. Some of the transport pilots helped to ease this situation, especially those of the Wirraways, who brought in bread and cigarettes. Later air evacuation, which had been very irregular, was sufficient, and supplies were good. The M.D.S. at Kokoda was kept open until all the patients from Myola had either walked back to Ilolo or been transported via Kokoda to Moresby, and on 20th December this need no longer existed and the dressing station was closed.

On 17th November the 2/4th Field Ambulance party left Gorari, and went on to Wairopi. The medical conditions here verged on the impossible, as the numbers of sick were beyond the powers of the limited staff on hand to cope with them. On the 13th McDonald and Love and accompanying parties had been sent along the Ilimo track to set up posts at sites selected by Norris. The next day McDonald arrived at Wairopi and when Day also arrived they set up a small post just off the track; McDonald and party then moved on. Day was confronted with the danger of his men being injured by stores dropping from planes and had to move to a safer site, and on the 16th had only six O.Rs. to look after over 100

patients while they erected tents. The main party of the ambulance found him on the 17th trying to cope with 120 patients, and before moving on to forward posts this party was able to help with the difficult situation. Norris summoned the main body of the unit to Sangara Mission with all available staff, and leaving Day and Wilkinson with seventeen O.Rs. to care for 200 patients, they set out on a long and arduous march, with their entourage of native carriers straggling out along the track. The ambulance unit reached Sangara on the 19th.

During this journey Hobson's staff found many sick men in the villages along the track, needing care, but there were no carriers to spare, and the best that could be done was to leave quinine and rations with the men and tell them to come on as soon as they were able. The only rations were those remaining from the issue at Wairopi, which were pooled and divided among patients. The staff lived on the products of native gardens until they reached Popondetta. McDonald's party pressed on to Popondetta in advance of the rest of the unit, some of whom remained at Sangara to look after forty men who had collected there. Major S. Elliott-Smith of Angau arranged to send natives back to Wairopi to collect 400 rations, and to provide fruit and vegetables from the gardens for the use of those at the post.

Meanwhile the numbers had risen at Wairopi, where there were 265 sick men, including six battle casualties on the 19th. Most of these men had fever, due to some cause which could not well be determined at once under the existing conditions; many also suffered from dysentery or mild diarrhoea. Day and Wilkinson with seventeen O.Rs. and eight Rabaul natives attached for general duties were able to give reasonable care to the sick. The 20th found the majority of the 2/4th Field Ambulance down on the coastal plains at Popondetta; McDonald's party was sent still farther on, to Soputa, to form a medical post there. The next day the main body of the unit followed to Soputa, and there we may leave them at present while we follow the doings of the 2/6th Field Ambulance left at Myola, and the other posts at Kokoda and Wairopi.

Myola was an important focal point in the ebb and flow of the series of actions on the Owen Stanley Range, and highly significant in the provision of surgical facilities for a force involved in several heavy engagements. Further, it raised the problem of air evacuation so acutely that in this respect it is historically important. Therefore we may briefly recapitulate the history of the medical community shut up in a plateau on a mountain top, and the efforts made to lighten their unique responsibility.

### *MYOLA*

During the first phase of the campaign when the Australian forces began to retire in the face of heavy Japanese pressure the plan of using Myola as a medical and surgical centre and as a convenient dropping place for supplies, led naturally to the exploration of the possibility of a landing ground being developed there. These plans were rapidly dissipated when the Japanese, after a temporary check by the 2/16th Battalion,

threatened to by-pass Myola along the track from Kagi to Efogi. On 2nd September there was then no alternative; Myola was abandoned at least until the tide of battle ebbed back again to Kokoda, but the hope of constructing a landing strip there persisted. When the Australian force pressed on again from Imita, and went through from Efogi and Kagi without opposition, the way was clear once more to Myola. Norris described in his account of this movement how the M.D.S. at Nauro "became out of date, and with the assurance of air evacuation from Myola, further rearward evacuation beyond Efogi north ceased". In earnest of this hope the 2/4th Field Ambulance reduced its forward posts and the M.D.S. at Nauro as far as was safe, and on 16th October established an M.D.S. with a surgeon, Captain Leslie, at Myola 1 until the 2/6th Ambulance should have overcome the difficulties of securing relief and enough carriers for onward transport.

Myola was a flattened area thought to be an old crater or dry lake; it was over 6,000 feet above sea level. There were two good sites for main dressing stations, known as Myola 1 and Myola 2, which were separated by some two hours' travel on foot. A stream flowing from the watershed of the Owen Stanley Range, about 1,000 feet above, skirted Myola 1, and rushed on to feed Eora Creek at Efogi. The climate was reasonably good; the mornings were usually fresh and clear, but later the characteristic banks of cloud appeared, and rain would fall in the afternoon. The nights were cold. Myola 2, some four square miles in extent, lay beyond a spur of the range, and was higher and more level.

The greater part of these two flattened areas was swampy, but around their perimeter were areas of level ground which promised to be suitable for airstrips. From the point of view of planning Myola seemed ideal. Casualties could be transported forward from the posts immediately to the rear, and until Kokoda was taken they could be flown back to the base. An airstrip was quickly completed by the engineers, but a serious difficulty had still to be surmounted, that of securing suitable aircraft for ambulance work in this mountainous area.

On 16th October the 2/33rd Battalion had captured the objectives at Templeton's Crossing and was advancing to Eora Creek. The next day all the 2/4th Ambulance men who were at Uberi moved on with those of the 2/4th and the 2/6th Ambulances who were the division's composite unit at Uberi, and arranging for A.A.S.C. details to carry medical stores, went forward to Myola, where there were over forty battle casualties. The 14th Field Ambulance sent up men to help fill vacancies at Uberi. The advanced divisional headquarters was also at Myola, and Chenhall with five officers and sixty-eight O.Rs. was moving up there to staff an M.D.S. It was then doubtful if evacuation from Myola could be arranged or not. The 2/6th M.D.S. was established at Myola 2 on the 24th. A few days later arrangements were made to send up 700 pounds of fragile items of equipment to Myola, and in response to a request from Alexander more men were also sent. The admissions to the M.D.S. at Uberi were now dwindling, though staging posts were still necessary.

On 1st November Hobson was instructed not to take more battle casualties in the 2/4th M.D.S. and to move on to Alola, which had been captured without opposition two days earlier. Three days later the 2/4th M.D.S. was at Kokoda. This rapid advance caused considerable congestion and difficulty in the 2/6th M.D.S. whose staff had to cope with all the patients which had been held by the 2/4th as well as their own. They had worked very hard; by now all major primary operations had been completed, and they were holding 438 patients, 212 of whom were battle casualties. The unit was desperately short of medical supplies, and had no wool, bandages, or catgut, and was without sulphanilamide and other essential drugs. A small party of walking patients was sent back to Uberi. In this anxious plight Chenhall sent a signal to the consulting surgeon at Land Headquarters and repeated this to the A.D.M.S., 7th Division, and the D.D.M.S., New Guinea Force. This message conveyed strong complaints of non-filling of indents, lack of air evacuation, and the hazards of the surgical situation, which was certainly a worrying one, for at Myola were some 140 patients who would need transport in order to reach hospitals at base. The air evacuation on which so much had been built had not taken place, and even air-dropping of supplies had not been adequate for the great needs of the little medical community marooned at Myola. Chenhall sent calls for help and criticisms which were not couched in terms as temperate as they might have been; unfortunately he was in an isolated position in which he could know little of the difficulties experienced in keeping the forces supplied with necessities. However, the situation, whose urgency was already well known to the responsible administrators, was promptly relieved by the arrival of a plane with stores, and later by the dropping of further material.

Even before Myola came into use as a medical and surgical centre the difficulties attending air transport of sick and wounded were apparent. The elevation of 6,500 feet above sea level was a hazard in itself, and undue risks could not be taken. Under certain weather conditions it was difficult and sometimes impossible to land, and often difficult to take off, for a hill near the take-off point necessitated a rapid gaining of height in a climbing turn. Very few planes were available in Australia suitable for air ambulances, and there were not enough air transports; even fewer aircraft were in any way suited for coming in and out of Myola. A few pilots were optimistic, but the senior air force officers, including the commander of the United States Air Force in New Guinea, would not permit planes in the area to be used for this purpose. Efforts were made to obtain a few suitable planes; three single-engined Stinsons, a tri-motor Ford and a DH-50 were available. A three-engined Stinson commercial aircraft was adapted for ambulance work, but, after reconnaissance, attempts to land were considered unwise. Lieutenant R. E. Notestine, U.S.A.A.F., took in a single-engined plane with stores and took out two patients successfully on each of a number of trips, and after this plane was grounded for repair, made two trips with another Stinson.

On 9th November Brigadier Johnston flew into Myola; as the weather was bad he remained till the next day, and inspected the area. He discussed the position with Chenhall and pointed out that it was expected that some natives would be available for taking stretcher patients as well as supplies to Kokoda. On the previous day a fighter-type aircraft had come down in the neighbouring trees; the pilot, who was not seriously hurt, was later flown back to Moresby for interrogation.

After an interval Mr T. O'Dea, an experienced civilian pilot, was flown into Myola to examine the possibility of bringing in the Ford tri-motor plane, which could lift ten patients. He was delayed by weather, but after walking to Kokoda he flew the Ford in on the 22nd; unfortunately the aircraft was damaged in landing on muddy ground at the extreme end of the runway, and he sustained injuries. The second Stinson also crashed in another area, and it was then hoped that the remaining Stinson and a DH-50 could continue the service to and from Myola. But the next morning the third Stinson crashed on the Myola strip, and all practical attempts to transport patients regularly by air vanished. However, up to 24th November forty-three patients were safely taken by air to the Moresby base, not more than two at a time, and instruments, other essential supplies, and Red Cross comforts were brought in.

Thereafter the situation gradually eased. Medical requirements at Myola lessened, and when it was learned on the 24th that no patients were awaiting air transport at Kokoda, there seemed reasonable hope that those still at Myola would be soon moved on. Groups of walking patients both medical and surgical were sent on to Ilolo; from the 25th to the end of the month forty-two patients were able to make the journey under their own power.

The last of the sick and wounded, together with the remainder of the unit, arrived at Port Moresby just after Christmas. The Myola episode was tense and anxious for all concerned, and in some ways was dogged by misfortune. Nevertheless the 2/6th Field Ambulance did excellent work and showed great tenacity of purpose, so too did Notestine, who made many flights with success, and did much personally as well as technically to help the men isolated on the mountain range. Fortunately, in spite of accidents no one was seriously hurt, and all patients flown out made the journey in safety.