

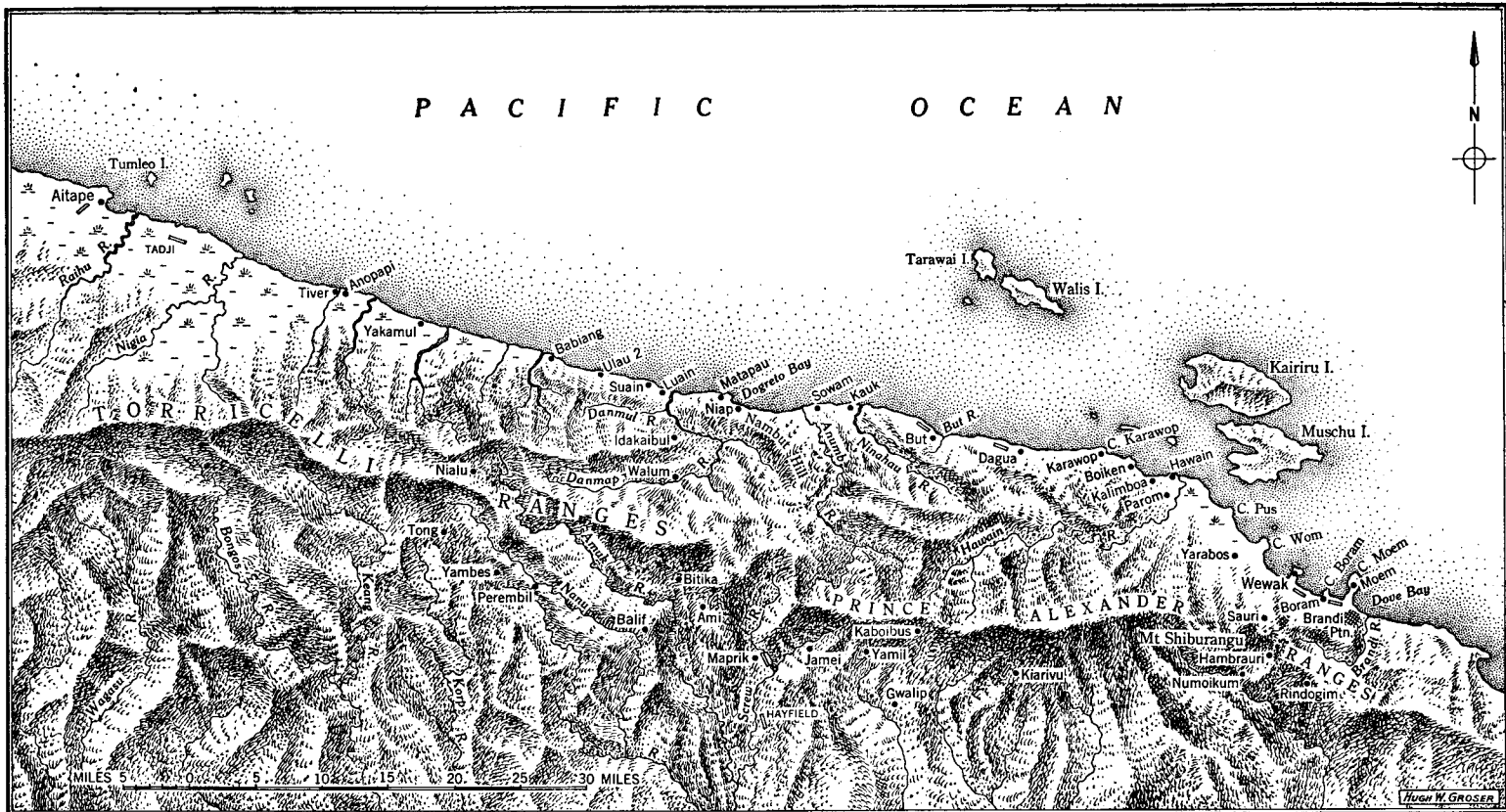
CHAPTER 15

AITAPE-WEWAK

THE previous campaigns of the Australian divisions in New Guinea ended in the clearing of the Japanese from the Huon Peninsula and the inland valleys of the Markham and Ramu Rivers, and the concentration of the 5th Division in the Madang-Alexishafen area. Further exploration along the coast past Hansa Bay failed to disclose any Japanese, and reconnaissance from the air showed that the widespread swamps at the mouth of the large Sepik River imposed a formidable obstacle to the movement of large forces south from Wewak. Consequently the enemy could be by-passed beyond this area, as was proved when in April 1944 the Americans made simultaneous landings at Aitape and at the Japanese air base at Hollandia.

At Aitape the immediate object was to hold the airfield and to secure a light naval base. The American troops established a strong defensive position, and after being reinforced to meet an expected strong attack, finally pushed the enemy back during August. By the middle of September the Australian force had established a base at Bogia, and had withdrawn the balance of troops to Madang. Arrangements were made for the Australian 6th Division to take over the Aitape area, and the necessary movement and exchange began in October. Since the determined but ultimately unsuccessful assaults of the Japanese in July, the American force had limited its land operations to defensive measures, and latterly to patrolling. The Japanese remaining in the area from Aitape to the Sepik River were chiefly in the coastal area between the Danmap and Sepik Rivers, and south of the divide in the Maprik and Sepik Valley areas. Their strength was estimated at some 24,000 troops, but there was reason to believe that disease and malnutrition had reduced their military potential. At the time when the Australians took over practically no contact was being made with the enemy.

The country over which the 6th Division was to assume a role far from passive, or even purely defensive, was distinguished by two chief features, a high coastal dividing range and a constant succession of coastal rivers intersecting the flattening plain which stretched from the divide to the sea. This divide ran within a short distance from the coast, ranging from a few miles near Wewak to twelve miles closer to Aitape. Two mountain ranges formed the watershed, the steep and rugged Torricelli Range, with ridges of nearly 5,000 feet in height, and steep gorges, all heavily wooded, and the less precipitous Prince Alexander Range. On the south, these fell sharply into the valley of the Sepik River, and fed the countless coastal streams on the north coast. These streams imposed a serious obstacle to advance, and after heavy rain flooded readily, becoming wide, deep and dangerous in places, and often changing their course. The rainfall on this section of the New Guinea coast varied from



Aitape-Wewak.

90 to 100 inches a year. Heavy rain south of the divide flooded the extensive swamp systems of the Sepik River, which could only be crossed on foot at a few places.

The most important settlements were Aitape and Wewak, both of which had good anchorages, especially the more sheltered Wewak, and satisfactory sites for airfields. Only a few miles of road existed in the coastal area near Aitape and Wewak, and between Maprik and Marui inland; other land communications were restricted to primitive native tracks. Most of the native population lived in villages inland from the coastal divide, where there were considerable natural resources of food in cultivations established on the rising ground south of the Torricelli Range. The coastal plains were similar to many others on this coast of New Guinea, narrow and flat, with occasional low spurs running down to the foot tracks. Inland the native settlements and gardens stood in clearings, usually on high ground, which gave them some tactical importance, but otherwise these areas were covered with dense forest. Most of the coastal flats were covered with kunai grass, and the neglected coconut plantations were generally thick with undergrowth. Mangroves grew densely and freely in the swamps. All water supplies had to be carried by hand.

AUSTRALIAN BASE AT AITAPE

An advance party arrived at Aitape on 15th September 1944, and chose sites for the various installations on a narrow strip of land between Aitape and the Raihu River. There was only one road in the area, running one and a half miles from the Raihu River along the coast. A month later some base troops arrived with supplies, and during October the 3rd Base Sub-area was sufficiently stabilised to provide for the Australian troops there. The Headquarters of First Australian Army instructed the 2/6th Cavalry (Commando) Regiment, subject to the 43rd United States Division, to begin the relief of the American outposts and patrol the tracks leading to the Torricelli Mountains, and part of the coastal area. These patrols were very active, and emerged from a number of sharp clashes with the enemy without loss.

During this early period the 43rd Division retained command of the area, with an agreement that tactical control of the troops rested with the Australian divisional command. The headquarters of the 6th Division, commanded by Major-General J. E. S. Stevens, moved in during October, and opened at Aitape on 8th November. On the 12th the 3/14th Field Ambulance, under command of Lieut-Colonel R. F. K. West, arrived in the *Katoomba*; its immediate role was to open an M.D.S. of fifty beds, to take over several R.A.Ps. in the base area, and to establish a beach medical post. The 104th C.C.S., commanded by Lieut-Colonel K. C. T. Rawle, travelled by the same ship, and landed on 13th November with its eight nurses. The 19th Brigade, under command of Brigadier J. E. G. Martin, arrived from 1st to 19th November with an armoured squadron, and artillery. Their medical care was provided at first by the 118th United States Medical Battalion, and the 30th United States

Evacuation Hospital, until the Australian units were established. On the 26th the 2/7th Field Ambulance disembarked. During December the 17th Brigade under Brigadier M. J. Moten and the 16th under Brigadier R. King arrived. The command passed to the 6th Division on 26th November, though it was the beginning of January before the division was at full strength. The medical holding units, under command of the 3rd Base Sub-area at Aitape, had arrived early; the 2/11th General Hospital and the 104th C.C.S. were in the area by the third week in November. The C.C.S. was able to take patients by 30th November and on 3rd December to receive Australian battle casualties hitherto admitted to the 30th United States Evacuation Hospital. The remaining field medical units arrived a little later, the 2/2nd Field Ambulance on 11th December and the 2/1st Field Ambulance on 3rd January. The 8th Malaria Control Unit, one of three allotted to the division, early began its work in the neighbourhood of the base area. At first the operational activity of the force was restricted to the objective of destroying the enemy forces west of the Danmap River, employing squadrons of the 2/6th Commando Regiment, which went forward of Babiang, towards the river.

At the end of November, the 2/7th Field Ambulance, commanded by Lieut-Colonel C. H. Selby, sent a detachment to Babiang at the mouth of one of the numerous coastal rivers. First clashes with the enemy forward of Babiang produced a few casualties; these were sent back by road, at first to the American hospital, but on 1st December the 2/7th Ambulance opened an A.D.S. at Tiver, and a light section at Babiang. The M.D.S. was established in the Aitape area, on a pleasant site on the Nigia River facing the sea. On a visit to Babiang through heavy rain Selby and his quartermaster found the rivers a foot over the bridges, and were forced to leave their bogged jeep and walk home. These conditions were features of the coastal area, though transport was simplified by the energy of the engineers, who built thirty-five bridges in a few weeks. A dressing station was established at Nusite with a theatre and a 40-bed ward; here a surgical team was set up and, with necessary additions, the A.D.S. became the headquarters and M.D.S. An intermediate car post was established at Yakamul.

Already the difficulties of evacuation of casualties in this coastal terrain were apparent. The road trip back to the M.D.S. took only two hours at low tide, but up to seventeen hours at high tide. Between Babiang and the Nigia River on the way back to Aitape there were fifty river crossings. The danger of flooding of the coastal rivers was soon realised too. Some of the surfing beaches were dangerous, especially at the mouths of flooded streams; on 4th December three men were carried out to sea during an organised surfing parade, and in spite of full life-saving facilities one was drowned.

A more active and important question had arisen during the month, that of endemic illness. In Aitape, in the 3rd Base Sub-area the 3/14th Field Ambulance had to expand to 172 beds, and on 22nd December held 128 patients, who had to suffer the inconvenience of leaky tents.

The 104th C.C.S. on 16th December had 300 beds equipped and 250 occupied. In this unit the heavy rain caused difficulties of drainage, but a more unhappy state of affairs had arisen in connection with the evacuation of mental patients. Rawle was most dissatisfied with the existing organisation, though arrangements had already been made for several ill patients to be flown to Lae. He insisted on being paraded to General Stevens, and the divisional commander initiated enquiries which helped greatly to rectify administrative defects and heighten the priority of these urgent cases.

THREAT OF MALARIA¹

Of greater menace was the threat of an epidemic of overt malaria. Early in December this was recognised, and with lively memories of similar difficulties in the Huon-Ramu campaigns, prompt measures were taken to insist on firm discipline and adherence to the set procedures of prevention. All febrile illness was taken seriously, and the significance of dengue fever was perceived, for its appearance in the area, though in no way related to malaria, indicated that the campaign against adult mosquitoes was failing in performance. Stevens called a conference, at which the subject was thoroughly discussed, and three boards of investigation were appointed, each including a medical officer and a combatant officer. The number of cases was not serious of itself, though at the end of the first week in December the C.C.S. held 180 patients, nearly all suffering from endemic illness, and the 3/14th Field Ambulance held thirty. The whole question was given close attention by the Commander-in-Chief, who enquired into the position on the spot: he and the divisional commander and his advisers recognised the great importance of remedying at once, if possible, any weaknesses in malaria prevention. Colonel H. M. Fisher, the A.D.M.S., in his war diary used stronger expressions, stating that "cases of malaria within the division were coming in at an alarming rate".

On 9th December the A.D.M.S. noted that the wastage rate for the division for the preceding week was 1.3 per 1,000 per day: more significant was the current disturbing rate of proven malaria within the division. On the 15th, the rate had risen to 1.9 per 1,000 per day. The 8th Malaria Control Unit was in the area and local control was proceeding. There were, however, some weak points. A month earlier the A.D.M.S. had pointed out that facilities for the diagnosis of malaria were not sufficient. By the beginning of January the strength of army and air force formations and units was expected to reach 23,000, but there was only one laboratory with one trained pathologist at the 2/11th A.G.H. The commander had ordered that every case of malaria was to be strictly investigated, and if necessary disciplinary action taken. This made accurate diagnosis all the more important.

¹ The malarial epidemic among troops in the Aitape-Wewak area has been dealt with in detail in Volume I of this series, *Clinical Problems of War* in Chapter 7, pp. 133-145. The scientific and epidemiological aspects are described in this section, but are abbreviated in the present chapter, which deals with the epidemic as it affected operations, the work of medical units and administration.

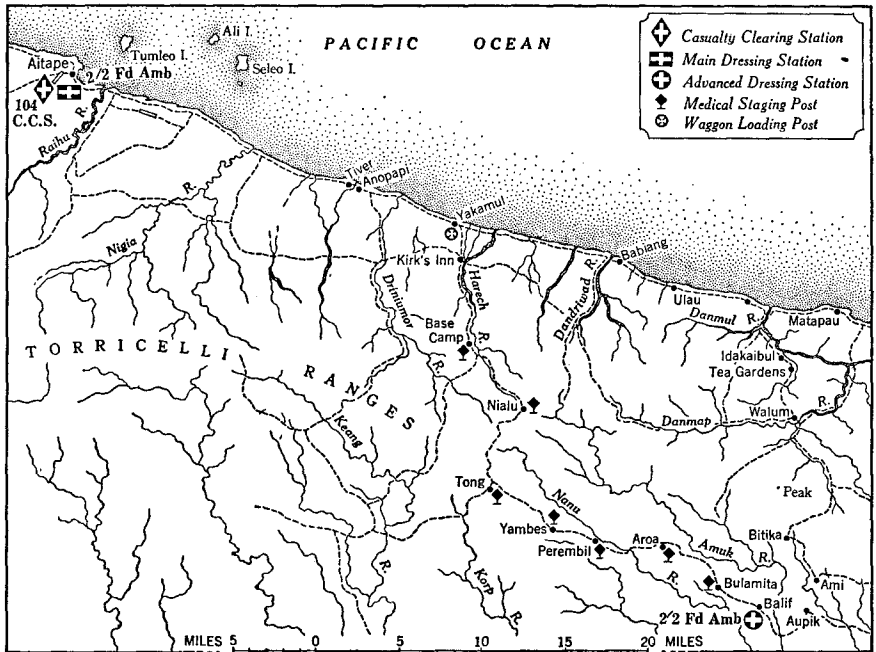
Major G. Read, D.A.D.H. 6th Division, made a special investigation. This did not show any unusual features in the mosquito types or in transmission, and a reasonable infectivity rate, not greater than 1 per cent in dissected mosquitoes. Organised control of the adult and larval mosquitoes was satisfactory in the area so far treated, Aitape-Nigia, but the whole coastal strip from Aitape to Wewak was without doubt highly malarious. Ground control of adult and larval mosquitoes was carried out by the 2/4th and 8th Malaria Control Units under command of Captains L. C. Milliner and J. E. C. Aberdeen, who was later transferred to command an entomological section and was relieved by Captain F. W. Berrill. Lieut-Colonel J. C. English, malariologist to First Australian Army, initiated some trials of aerial spraying with D.D.T.; these were fully successful and the possibility of further regular use of this method was examined.

Once the force was established at Wewak air spraying with 5 per cent solution of D.D.T. in oil was put on a regular basis along the coast, and carried out by an R.A.A.F. air crew in a specially equipped Beaufort made available to the division. It was believed that this made a material contribution, but, despite all efforts to maintain air and ground control, the mosquito population, though reduced, was always dense: Read found this was consistently high by comparison with other areas. Though the sporozoite rate was not high, 1 per cent, this was offset by the numbers of adult mosquitoes. Since investigation disclosed some defections of malarial discipline in two units of the 19th Brigade, and so that the trouble would not spread to other units or formations, the G.O.C. ordered troops east of the Nigia River to be given two tablets of atebirin daily from 13th December. This was continued until 29th December, when the daily dose reverted to 0.1 gramme, that is, one tablet. Read advised that this increase be maintained until the current rates of incidence in the brigade subsided.

MEDICAL PROBLEMS OF WEATHER AND DISEASE

The 2/2nd Ambulance under Lieut-Colonel Smibert, arrived at Aitape and on 26th December sent a detachment inland under Major P. J. Parsons to set up an A.D.S. at Tong, with a staging post at Nialu and an A.D.S. at Anopapi on the coast, with other staging posts at appropriate intervals along the evacuation route. This was by jeep to Anopapi and onwards to the 104th C.C.S., and, after the capture of Walum by the 2/7th Commando Squadron, with an alternative route through Walum and Idakaibul to the 2/4th Battalion R.A.P. east of the Danmap River. The A.D.M.S. arranged at this time that all evacuations should proceed through the C.C.S., whose commander could select patients for transfer to the general hospital. The 2/2nd Ambulance thus serviced the 17th Brigade, whose assignment was the inland sector, and in the present instance was in support of the 2/5th Battalion. The A.D.S. moved with the battalion, leaving behind enough men to serve a medical staging post. This was necessary, as evacuation either had to be made on foot or by

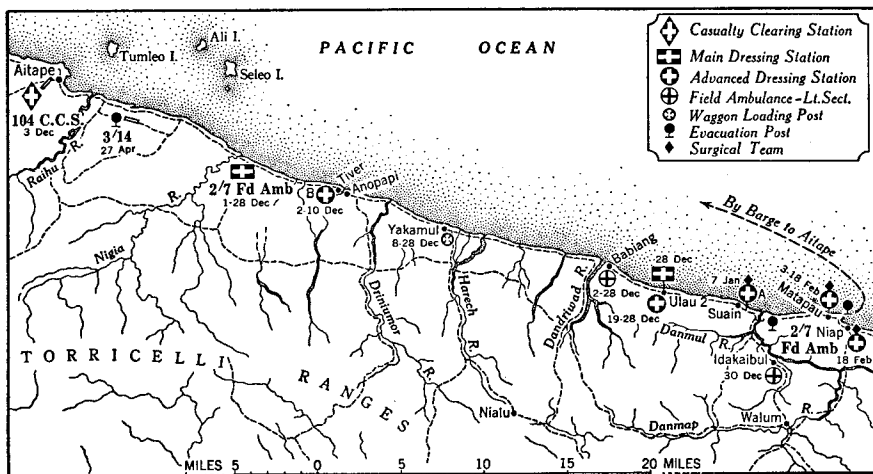
native bearer teams. The routines were now so well established in these experienced units that a building team sent on ahead to a new site, could do the necessary construction in two days, and the A.D.S. could be set up within an hour of the arrival of the staff. With these moves began the second phase of the operations in the inland sector.



On 1st January the 2/11th A.G.H. began work under command of Colonel J. S. Crakanthorp: the next day Lieut-Colonel D. A. Cameron arrived with his unit, the 2/1st Field Ambulance. This unit was to relieve the 2/7th Ambulance at Aitape when the 16th Brigade relieved the 19th on the coastal sector, but these plans were set back by flooding caused by torrential rain. Towards the end of the month heavy rain again caused great inconvenience and hindrance. Wards in the C.C.S. were flooded, necessitating special arrangements for drainage. The A.G.H. suffered likewise, and it soon appeared that drainage of the site was a major problem. Some tented wards leaked, others had water under foot, as the nurses had in their quarters. A bridge over the Raihu River was carried away, temporarily holding up evacuation of patients. Selby arranged for a jeep ambulance to be towed to a point where it could ply from the river under its own power, and a squad of bearers was posted to carry patients across the Danmap River. New rivers appeared in two places between the M.D.S. and the Danmap, but a jeep ambulance was stationed on each side, and a special squad was employed to carry patients

across the stream. If the current became too fast, arrangements were made to instal a flying fox. In this way wounded could be brought to a surgeon in six to eight hours. There was now an A.D.S. at Suain and a surgical team was working there.

By the 17th the continual rain had washed away the bridge between Aitape and the M.D.S., blocking the road for motor ambulances, but access was gained by towing the ambulances to the M.D.S. until the bridge was made practicable for jeeps. The next day traffic to the C.C.S. was barred



by a damaged bridge, and two wards of thirty beds were erected, one at the A.D.S. and one at the M.D.S. at Ulau. On the 19th more difficulties appeared. The flying fox over the Danmap broke down, and a landslide blocked the road and cut off a jeep. Hand transport was possible over this awful track, and across the river, and wounded men were still within seven hours' reach of the surgical team at the A.D.S. On the 22nd, bridges were washed away on the line of evacuation of the A.D.S. of the 2/2nd Field Ambulance within twenty miles of Aitape. Stretcher bearers carried two loads of sick from the 2/7th Ambulance across the rivers, and trucks and jeeps completed the journey to the C.C.S. By nightfall all were safely housed in the A.D.S., and the bridges were repaired. Next day the sick completed the journey in safety. Further heavy storms increased the flooding of the coastal streams, which became raging torrents near the sea. In these series of coastal floods three men were drowned and nine were missing. An emergency sick bay was set up by Captain A. F. McSweeney at the Danmap River, in case crossing became impossible, and arrangements were made for any urgent surgery to be carried out at the 2/3rd Field Regiment R.A.P. On the 30th the 2/2nd Field Regiment provided space for a sick bay for six men with a surgical team, under protection of the 2/8th Battalion. At the 2/7th Ambulance M.D.S. at

Ulau the surgical work was proceeding smoothly under the direction of Major J. J. Ryan. This dressing station grew to a capacity of 300 beds during this month owing to difficulties of evacuation, and in addition had to establish a small hospital of thirty beds at Suain to cope with an outbreak of cerebro-spinal meningitis among the natives.

MALARIA CAUSES ANXIETY

Back at the base area at Aitape conditions were superficially tranquil, but the 2/4th Battalion had returned with many sick: fifty patients a day were entering the M.D.S., half of them with malaria. These were transferred to the C.C.S. During the third week in January malaria was rising in incidence in the 19th Brigade, and on 29th January the divisional commander ordered the dose of suppressive atabrin to be increased to two tablets a day for the whole of the division. Smibert, by request of Martin, made a report on malaria in the 2/7th Battalion at this time, and concluded that the figures for malaria then compared not unfavourably with those in other formations in New Guinea. He drew attention to the importance of securing and using in the correct manner, supplies of mosquito spray as soon as a unit arrived in an infected area. The report emphasised the necessity for much more thorough application of mosquito repellent, detailed instructions in the use of mosquito sprays, attention to the siting of unit lines in relation to native compounds, and the desirability of pointing out to troops that the measures laid down were, when properly carried out, having a telling effect in combating malaria. Blamey directed that a conference be held at divisional headquarters at the end of January to discuss the whole position.

The anti-malarial routine procedures were already laid down and were being well followed on the whole, but additional measures were taken to ensure strict adherence to these by all ranks. It was certainly curious that the 19th Brigade on its relief by the 16th Brigade early in the campaign, though freed from the initial pressure under which they had been working, showed at first not a fall, but a substantial rise in malaria. Stevens in addressing the members of the conference on 31st January said:

We have investigated 150 cases of malaria. In each case there has been evidence that atabrin has been taken, except in one instance. . . . From these investigations we have found precisely nothing, except a certain amount of carelessness on the part of some officers in not attending to several minute details of the orders.

After traversing certain disciplinary actions taken in units with poor figures, he remarked that improvements had followed such actions in several units, but "disciplinary action is the wrong way to get results". He further stressed the importance of a more vigorous campaign against the adult mosquito, and the more faithful use of repellent lotion, and urged that general attendance at atabrin parades in every unit, except those in actual contact with the enemy, should be an obligation. To this should be added the comment that the performance of the division rested on a long history of achievement and high tradition, which could hardly



Wards of the 104th C.C.S., Cape Wom.

(Australian War Memorial)



Sisters coming on duty at the 104th C.C.S., Cape Wom.

(Australian War Memorial)



An Auster air ambulance arrives at Aitape with a wounded soldier from the Torricelli Mountains.

(R.A.A.F.)



Aitape beachhead and the 2/11th A.G.H.

(Major E. H. Hipsley)



(Australian War Memorial)

Blood transfusion being administered to a wounded soldier within 100 yards from the enemy in the Aitape sector.



Transferring a casualty from the Auster to road ambulance for transport to hospital at Aitape.

(R.A.A.F.)

fail to be impressed on reinforcements. The exact drill laid down for atebtrin administration was as follows:

- (a) Men will parade carrying a container, other than a water-bottle, filled with water.
- (b) The daily atebtrin parade will always be held by an officer.
- (c) The officer will follow and never vary from the following procedure:—
 - (i) He will place the atebtrin tablets one at a time into each man's mouth, either by hand or by some utensil.
 - (ii) Each man will take a mouth full of water and swallow it with the first atebtrin tablet. The procedure will be repeated with the second tablet, but this time the man will drink the full remaining contents of his water container, and will turn the container upside down.
 - (iii) He will then call his name.
 - (iv) This man will then open his mouth so that the inspecting officer can ensure that the tablets have been swallowed and are not in the mouth.
- (d) A roll book, not loose sheets of papers, will be kept in which the officer will record the taking of the daily dosage. This book, which must be signed by the officer, must be available for a period of two months following any entry.

Smibert expressed what he believed was representative of the view of the medical commanders of the division, that the lack of trust thus implied in the men would have a bad effect on morale, especially as the official instruction stated clearly that one tablet of atebtrin taken daily was enough to suppress all forms of malaria. These objections were not technical, but based on views of discipline and administration, and were voiced also by Lieut-Colonel Cameron of the 2/1st Ambulance, Lieut-Colonel P. K. Parbury of the 2/7th Battalion, and Major J. R. Nosworthy, the divisional legal officer. Stevens replied that unfortunately he did not agree with this view, and that no further action could be taken other than the obeying of the order. Smibert placed his objections in writing in the unit war diary for record, but of course the order was implicitly obeyed by all responsible officers. He considered that the important question to solve was not the degree of adequacy of the official atebtrin dosage or whether this was being taken by the men, but whether the handling of the situation was the best in the circumstances.

In spite of the first period of increased atebtrin dosage, the malarial rate reached 44.8 per 1,000 per week in the 19th Brigade. This peak was attained during the week ending 2nd February, when the brigade was virtually in reserve. Examination of 388 men with fever in the 2/7th Field Ambulance from 1st December to 19th January, showed that 94 (24 per cent) had demonstrable parasites in their blood. After the dose of atebtrin had been increased to two tablets a day the percentage dropped to 9, but during two periods when only one tablet was given it rose to over 35.

There was good reason for securing a higher concentration of atebtrin in the blood plasma of men of the 16th and 19th Brigades in view of the important commitments of these formations. It was hoped that this would

ensure that the atebirin in the blood would not fall below the concentration shown by the Cairns experiments to be sufficient to suppress overt malaria.

The 17th Brigade and the 3rd Base Sub-area were included in this order, but this brigade was placed differently from the 16th and 19th, for its initial malarial incidence rate for its battalions singly or together did not exceed 5 per 1,000 per week until 26th January, when it began to rise in one unit. This unit was the 2/7th Commando Squadron, which had been placed under direction of the brigade commander, and to it was added within the month, two other squadrons of the 2/6th Cavalry Commando Regiment.

THE INLAND SECTOR

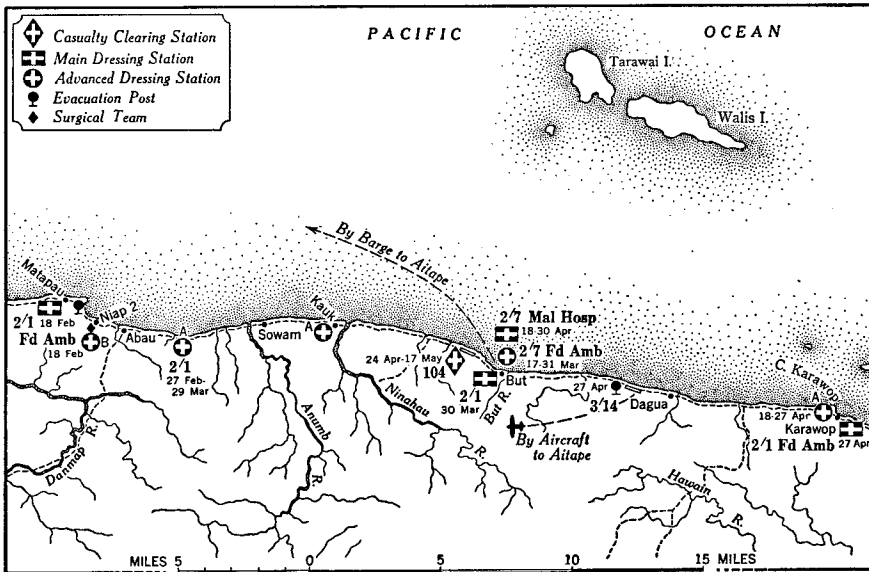
Meanwhile the 17th Brigade had begun its task of locating the enemy and was expelling them from successive villages on its line of advance. The 2/7th Commando Squadron, relieved from routine patrols by some of the brigade troops, was able to press on; it displaced the Japanese from the Bitika-Ami line by vigorous patrolling and on the 22nd occupied Bulamita. This advance had allowed the 2/2nd Field Ambulance to set up A.D.Ss. at Tong and Anopapi, late in December; early in January after the capture of Walum, surgical facilities were immediately made available. Captain D. B. Wightman, a surgeon detached from the C.C.S., went at once to the Tong A.D.S. with Major Parsons. Later, Major D. R. Reid went to Ami to help the A.D.S. there.

During February important advances were made on the inland sector, particularly with regard to the much needed control of the airfields. No serious incidence of malaria occurred sufficient to hamper the 17th Brigade, as the rate did not exceed 7 to 8 per 1,000 per week. Pressure was maintained on Balif, which was occupied on the 5th February, and the more important operations on Maprik were set in train with a wide sweep to the west and south. This was strongly resisted by the Japanese, who depended largely on the food produced in the extensive gardens of this area, and were aware of its strategic importance. The 17th Brigade in the early part of February was held up, and its advance temporarily checked by the non-arrival of essential supplies by air. Maprik, as well as having a good airfield, had been the centre of a district which supported large numbers of natives before the war, and its possession was highly desirable. The taking of Balif had already borne fruit in permitting air communication. Auster planes could land near the A.D.S., and a few days' work on the airstrip enabled patients to be flown out singly. For some months previously, the good work of Angau had helped greatly in preparing the natives for full cooperation with the forces. Movement of sick from this sector varied in difficulty; the evacuation route from Ami A.D.S. by track was very arduous for all but convalescents.

An advance on Maprik was planned by the 17th Brigade for early in March. This began on the 8th, and although the enemy resisted strongly, progress was made. On the 11th it was possible to close the A.D.S. at Tong, and less than a week later the brigade headquarters was established at Balif.

ON THE COAST

It was important for the forces on the coast to secure Dogreto Bay, as a safe landing point was necessary for maintenance of supplies by sea-borne craft, and also for establishing a centre for transport of casualties. On 3rd February the 2/7th Field Ambulance was able to set up an A.D.S. at Matapau, north of Dogreto Bay, and evacuations began at once from the point. On the same day six patients lying and fourteen sitting went back by L.C.T. with three others who were sent direct from the



surgical team at Niap. This was a relief to the 2/7th Ambulance, since there had been no recent evacuation at Aitape, and therefore patients sent by the coastal route for surgical attention had to be held in forward areas. It was not until 6th February that the Danmap River could be crossed by jeep. According to plan, the 2/1st Ambulance should have relieved the 2/7th, but was again prevented by the heavy continuous rain. The 2/1st had arrived on 2nd January at Aitape, and after opening east of the Danmap River on 14th February, sent a company to Niap to set up an A.D.S. This was equipped for surgical work, carried out by a team under Major F. W. Connaughton. Both lying and sitting patients sent from the M.D.S. at Matapau moved forward to Dogreto Bay where they embarked on L.C.T. at night. The 1st Australian Water Ambulance Convoy helped in these coastal evacuations. Once the 2/1st M.D.S. was running, the 2/7th Ambulance handed over the medical responsibility east of Danmap to the 2/1st, and withdrawing all their personnel west of the river, entered on a brief period of rest. During this time the unit looked

after 400 troops west of Danmap, and any others who came up over the inland route *via* Idakaibul. These patients were brought from the 2/3rd Battalion at Mina Creek by native carrier teams.

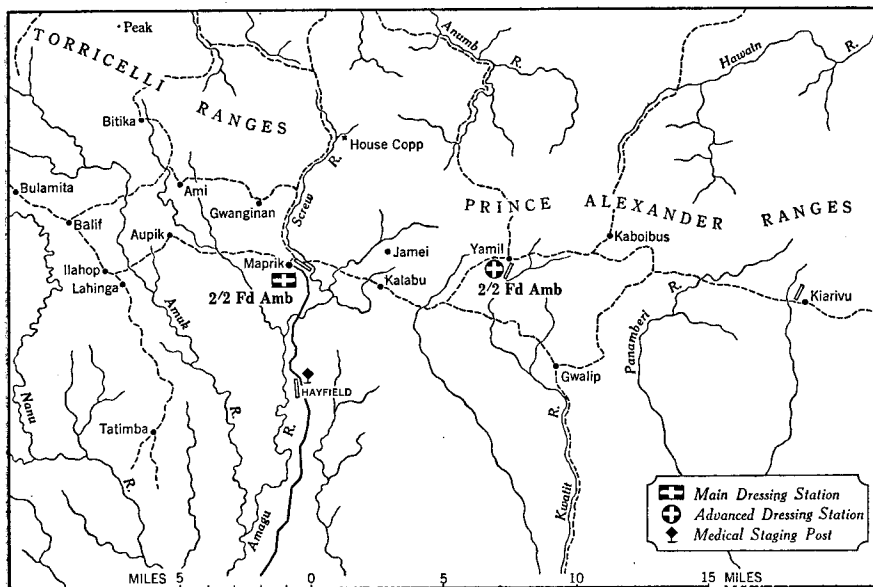
On the coastal sector there had been some heavy fighting at Nambut Hill since 7th February, the casualties from which had contributed to the crowding of the 2/7th M.D.S. during a period of bad weather. The area was not cleared of enemy until the 19th, when the 2/1st Ambulance had been able to relieve the 2/7th. Some further help was promised by the 3/14th Ambulance, which moved a company to Tumleo Island off the coast near Aitape to set up a convalescent depot. This was not opened till a little later, but was much needed, in particular for the numbers of men recovering from bouts of malaria.

During this period Colonel Fisher was returned to the mainland through illness, and pending the arrival of his successor, Colonel R. H. Russell, Lieut-Colonel Cameron of the 2/1st Ambulance acted as A.D.M.S. of the 6th Division. Unhappily Colonel Russell was killed in the crash of a plane which was also carrying Major-General Vasey, who was to have assumed command of the division, and Major-General R. M. Downes, who had been appointed as historian of the Medical Services.

Early in March the 16th Brigade, which still sustained the leading role in the coastal advance, continued to advance along the coast, and on 17th March captured But. Here the 2/7th Field Ambulance established an A.D.S., and was assisted by the 2/1st Ambulance in the medical work in the area. Major I. W. MacNaught and twenty-nine O.Rs. ran a small A.D.S. for the 2/3rd Battalion and the 2/6th Cavalry Commando Regiment, making available surgical treatment for cases of the urgent type, but bad weather still imposed obstacles to transport. In fact the heavy rain which fell in the middle of March made roads impassable: the road from the M.D.S. to Dogreto was so deep in mud that patients could not be sent through to the bargehead. The 2/7th Ambulance then had an M.D.S. at Ulau, and the only practicable road was through this by road to Aitape. Difficulties still persisted in moving patients over the wet muddy tracks, with their seemingly countless river crossings. Smibert's unit, the 2/2nd Ambulance, cooperated well in providing stretcher bearers to carry sick and wounded over the rivers. On the 21st Selby's ambulance returned to Aitape to rest, with the exception of those members working the A.D.S. at But. The maintenance of this A.D.S. was asked for by the brigade, in addition to that provided by a company of Cameron's unit at Kauk.

On 23rd March the 16th Brigade took over the responsibility of the coastal country west of But River, and then attacked Dagua, a settlement east of But with useful sea and air facilities. Dagua was captured, but the enemy resisted strongly for a time in the surrounding area, and was only subdued after hard fighting, which continued until 2nd April, when this coastal advance was consolidated. At Dagua the 3/14th Field Ambulance set up a staging post where walking patients would be held if necessary when awaiting transport.

At the end of March the 2/7th Ambulance ceased to administer the A.D.S. at But, which was then taken over by the M.D.S. of the 2/1st. In the preceding week 250 patients had been treated there, thirty of these requiring surgical care by the team; they were evacuated direct to Aitape by L.C.M. The strain of what was undoubtedly an exacting campaign, fought in highly malarious country, was recognised by the Commander-in-Chief when planning Australian participation in the landing on Tarakan, part of the operations on Borneo. It had been intended that one brigade



of the 6th Division should move from Aitape for this purpose, but as it was inadvisable to call on unrested troops of the 6th Division for another possibly prolonged operation, the 9th Division undertook this action.

OPERATIONS ON MAPRIK

During this phase of the coastal operations, the 17th Brigade was still active in the inland sector. Operations on Maprik successfully begun early in March, were strongly continued, and by the latter part of March Balif was cleared, as we have seen, and the brigade headquarters were established there. This facilitated further actions, in particular an out-flanking sweep from the south, the aim of which was the complete subjugation of the Japanese in the area surrounding Maprik.

Evacuations from the 17th Brigade area were the responsibility of the 2/2nd Field Ambulance; a carrier route was in use from Lahinga and Ami through Walum and Suain, but seriously ill men could not be moved past Lahinga, where there was some banking up of patients. Further movement was by motor ambulance from Suain to the 104th C.C.S.,

which was still at Aitape, but arrangements were made to extend the airstrip at Balif so that Auster aircraft could be used with improvised fittings to take one stretcher patient. As the brigade penetrated farther to the south, it reached some of the higher ground of the foothills of the Torricelli Range past the swampy valley of the winding Sepik River. This was difficult and mountainous country. Only aircraft could give practicable and comfortable transport to sick and wounded men, for whom the only alternative was a long carry lasting a number of days. The first week in April marked the progress of evacuation from the varied terrain of the inland sector; from 5th April Auster planes took patients from Balif to But, where the 2/1st Ambulance took charge and sent them on by barge to Aitape. Seriously ill men likely to be adversely affected by this double handling were flown to Aitape direct.

April was a month of favourable endeavour in other ways in the inland sector. Strong resistance of the enemy in the Maprik actions was overcome, and on the 12th Gwanginan was occupied after the enemy had withdrawn, and by the 21st the twofold sweep of the brigade finally cleared Maprik. A few days later elevated ground east of the Screw River was taken, with access to an emergency landing strip. The enemy then began to withdraw farther to the north, and work promptly began on an airstrip, five miles to the south of Maprik, and hereafter known as Hayfield.

THE COASTAL SECTOR DURING APRIL

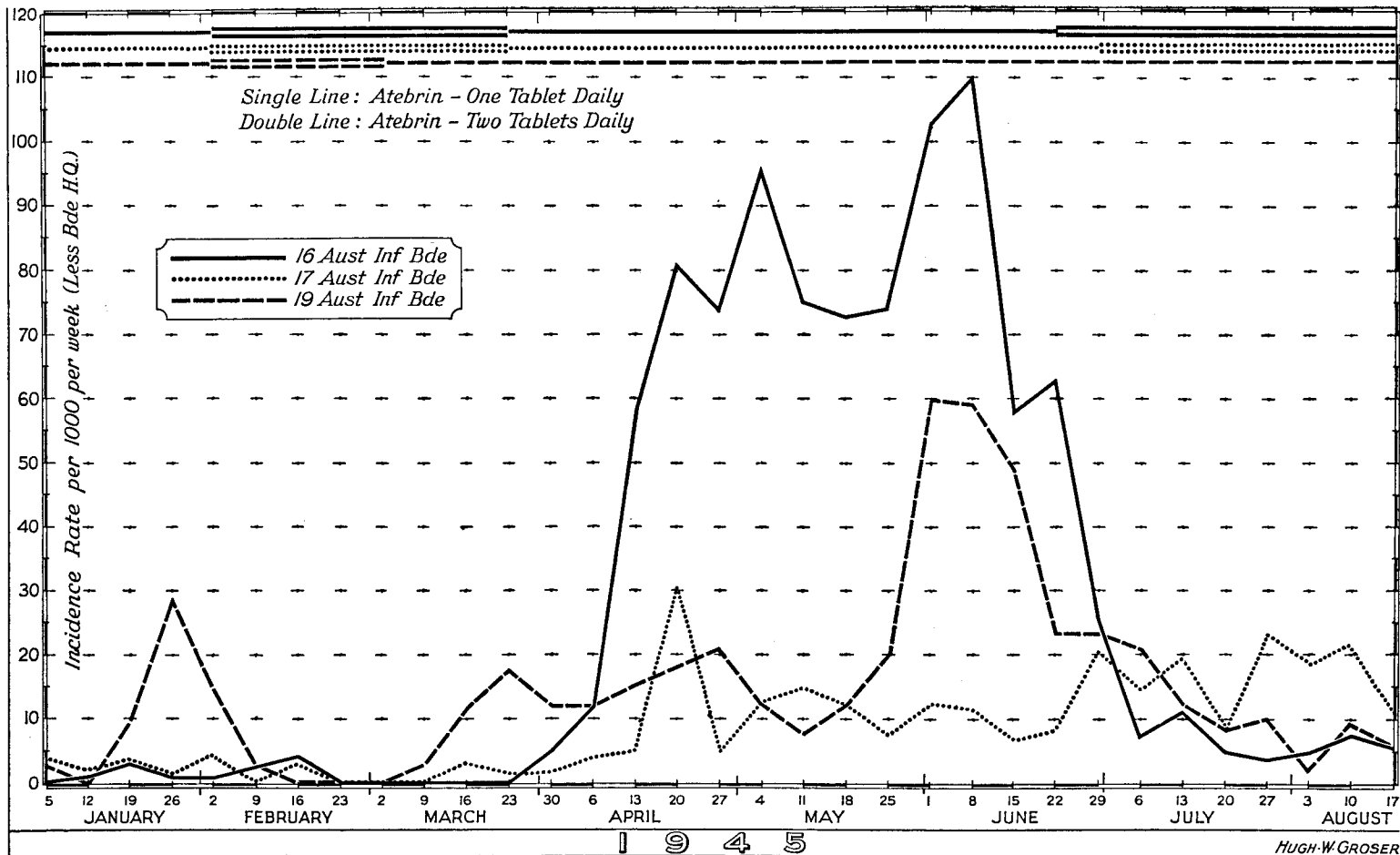
Early in April the staff of the 3/14th Ambulance began work at their convalescent depot on Tumleo Island. On the 9th the 2/7th Ambulance was sent to But where the 104th C.C.S. was preparing to occupy a site. Both ambulances were supplying different phases of a growing need, looking after the victims of malaria.

The advance along the coast was being energetically pursued by the 16th Brigade, which took Karawop on the 16th. Three days later, the 2/1st Field Ambulance established an A.D.S. at Karawop, and the C.C.S. moved to But, where the nurses were greatly missed, as they were detached to the A.G.H. The 3/14th Ambulance by this time had organised an air evacuation post at Dagua.

Brigade troops advanced on Boiken and Hawain River, and after heavy fighting reached Kalimboa. Further fighting was likely to be heavy in the later stages of advance on Hawain, and this continued till 29th April. The 2/3rd Battalion had moved through the 2/1st Battalion to capture Boiken and Kalimboa, and the 2/2nd Battalion repeated this manoeuvre with the 2/3rd, and went on to establish a bridgehead on the Hawain River, and to take Parom.

MALARIA EPIDEMIC

When the 19th Brigade took a double suppressive dose of atabrin (two tablets daily) for several weeks, the malarial outbreak affecting this formation in mid-December seemed at first to be coming under control.



Epidemic of malaria in Aitape-Wewak.

However, as we have seen, a sharp rise of epidemic type induced Stevens to place the whole division on a double dose on 29th January. The 19th Brigade reverted to the routine dose of one tablet daily at the end of February, but the 16th and 17th Brigades continued the double dose till the 22nd March. The result can only be described as greatly disappointing. The early days of April soon revealed that the rising rates shown in March were the harbingers of a true epidemic of malignant malaria. It appeared that, released from the assumed control bestowed by a daily dose of two tablets of atabrin, the 16th and 17th Brigades showed the classic phenomenon of the steep and high rise in the epidemic incidence of the disease. There was this difference: the 17th Brigade showed only a moderate rise, the herald of a mild outbreak; the 16th Brigade showed that a large-scale epidemic might be expected, with its swift steep rise and its cumulative nature. There was no reason to doubt that the cause of this difference lay in the greater abundance of adult vectors and the high transmission rate on the coast with its lower elevation and its heat and humidity.

The 19th Brigade showed a steep rise in its incidence rate also, but less marked and more irregular. This brigade had shared with the 16th the heavy tasks of the coastal campaign fought out on a difficult terrain full of physical obstacles, even greater in number and more difficult to overcome than those of the inland sector. Moreover the 19th Brigade had received its increased dosage of the suppressive drug over two divided periods. A controversial issue at once arose, whose reverberations shook the 6th Division, and are even yet potent to evoke discussion. Whether this epidemic was due to insufficient intake of atabrin, or to some other unexplained factor was not then determined, but it might well have been regarded as an ironic gesture of fate that after an initial threat which it was hoped could be countered, and immediately after the adoption of the most rigid precautionary anti-malarial measures as yet imposed on an army, an epidemic of swift onset and very serious dimensions should strike the division. Certain features were evident even at the onset. All brigades and the base sub-area were affected, though not to an equal extent; the predominant type was, as expected, malignant tertian; the nature of the attacks was mild and complications were rare; the anti-malarial discipline of the division was not flawless, in particular with regard to the destruction of adult vectors, but on the whole it had been satisfactory, since the search for and discovery of slips in the routines; the varied incidence in different formations was not inconsistent with differences in conditions of climate and terrain, and in all areas where troops were fighting the disease was hyperendemic, though the sporozoite rates were not unduly high.

When this epidemic first struck the force, Brigadier Fairley was overseas and was not able to begin investigations at once, but there was no dearth of authorities of high degrees of experience and capacity. Brigadier J. A. Sinton, a distinguished British malariologist, was in Australia and attended a conference on this problem. Both he and Lieut-Colonel Mackerras, the

entomological adviser of the Australian Army, as well as other experienced medical officers considered that there was a possibility that an "X" factor, not found in other areas, might exist which might prevent atebtrin from suppressing malaria; in other words there might be a local strain of plasmodium resistant to atebtrin.

As we have already seen, the routines adopted for the administration of suppressive atebtrin were exceedingly strict; it was concerning these routines that sharp controversy arose. Many officers in the 6th Division, particularly medical officers, believed that it was possible in certain hyper-endemic areas to take one tablet of atebtrin with complete regularity and yet to contract malignant tertian malaria. They pointed to distinguished victims whose care and honesty were unassailed. On the other hand, exponents of the official point of view maintained that the most careful and rigorous experiments in Australia had proved the power of one tablet of atebtrin taken daily to prevent the development of overt malaria. There was evident conflict between the two points of view: this gave support to the hypothesis of the existence of a relatively atebtrin-resistant parasite in the Aitape-Wewak area, the so-called "X" factor. In order to clarify the narrative we may here anticipate history, and state that a strain relatively resistant to atebtrin was later proved beyond doubt by Fairley and a special research team to be present in the area.

On 19th February 1945 a Special Technical Instruction No. 120 had been issued from the Australian Medical Headquarters on the *Efficacy of Suppressive Atebtrin*. The concluding paragraph ran as follows:

Review of the experimental data and careful analyses of A.M.F. malarial statistics make it possible to state with certainty that malarial rates consistently in excess of the minimum must be attributed to some break-down in administration of suppressive atebtrin.

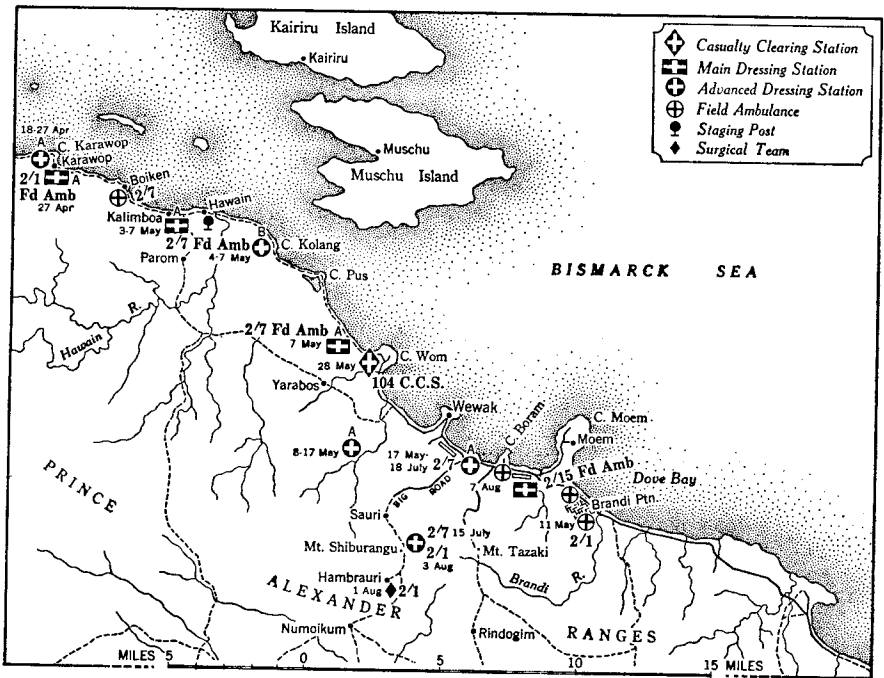
FURTHER EVENTS IN THE COASTAL SECTOR

On 3rd May the 19th Brigade passed through the 16th Brigade at Hawain River, and advanced to Cape Pus, and to Cape Wom on the following day. The 2/7th Field Ambulance established an A.D.S. at Kalimboa, and attached thereto a surgical team from the C.C.S., with Major A. Daly Smith as surgeon. A few days later Yarabos was captured, and the 2/1st Field Ambulance came forward and took over the Kalimboa A.D.S. These moves were all preliminary to the chief objective of the force, the taking of Wewak, and to this end, the 2/7th Ambulance moved up to Wewak west with its surgical team. This team began within a few hours to treat casualties from an accidental bombing of the 2/1st Field Regiment. The 2/7th Ambulance set up its M.D.S. at Cape Wom, one of four established during the campaign, illustrating the principle exemplified in New Guinea, that the role of field ambulances in holding patients need not be sacrificed to mobility, though its prime function is evacuation.

The 2/7th Commando Squadron captured Sauri Hill and then cut the main southward outlet of Wewak, known as Big Road. Fighting continued on Wewak Point but on 11th May the peninsula was cleared of

the enemy. A force known as Farida Force landed at Dove Bay with an A.D.S. from the 2/1st Field Ambulance.

The 19th Brigade pressed on. Boram was attacked on the 17th and Cape Moem taken five days later. Farida Force consolidated its position by capturing Brandi plantation and joining forces with the 2/8th Battalion south of Cape Moem. By the end of May the 19th Brigade had progressed far enough towards the foothills of the Prince Alexander Range to ensure a stable situation.



PROGRESS ON BOTH FRONTS

During May the 17th Brigade completed the work on Hayfield airstrip near Maprik, so that a month after the opening of the strip for Auster aircraft, Anson and Douglas transports were also landing. This advance accelerated and improved the medical service, as well as providing another avenue for supplies, and made possible safe and comfortable evacuation of casualties. During the remainder of May the 17th Brigade was engaged in active patrolling between the brigades inland and on the coast and made some advance towards Yamil.

Some sharp actions in the southern part of the inland sector took place in June, and these, combined with continued patrolling towards Yamil, led to the capture of this centre, and the southward villages were then cleared of Japanese. Jamei, a strong enemy centre, was captured earlier, but it was early in July before the Japanese were finally expelled from

the ridges. Constant patrolling ensured the safety of the flank of the steadily advancing force. Since the taking of Maprik and its surrounding areas, there had been a constant nearing of the two long prongs of advance, the 19th and 16th Brigades on the north coast, and the 17th Brigade in the Torricelli-Sepik areas to the south.

On 8th July the 2/2nd Field Ambulance moved its headquarters at Aitape to Wewak, though it still maintained an A.D.S. at Maprik. Further advances were made east of Yamil; several ridges strongly held by the enemy were cleared, such as Kaboibus Ridge, and still the advance proceeded. By a flank movement based on the Gwalip area Kiarivu was captured on 8th-9th August.

After the deeply regretted loss of Colonel Russell in March, Colonel D. M. Salter was appointed A.D.M.S. and arrived on 13th April. On 8th July Colonel Saxby arrived and took over from Salter, who became D.D.M.S. II Corps with the rank of brigadier. During the period of interregnum Major R. S. Day acted ably as D.A.D.M.S.

Meanwhile on the coast vigorous patrols of the 19th Brigade captured several Japanese strongholds, and three high positions in the foothills were taken within the last few weeks of June. These were Mount Kawakubo, Mount Tazaki and Mount Shiburangu. The last of these was captured on 3rd July, after an outflanking movement in very difficult country: during the action Captain Owen Williams, an outstanding R.M.O., was killed. These movements were successful, in spite of the continuation of the malaria epidemic.

FURTHER MALARIAL INVESTIGATIONS

At the very height of the epidemic, on 13th June, two experienced officers, Lieut-Colonel Jaboor, commanding the 2/2nd Field Regiment, and Lieut-Colonel Selby, commanding the 2/7th Field Ambulance, were instructed by the divisional commander to visit II Corps and 3rd Division on Bougainville, and 5th Division on New Britain, in order to find out details of the measures of malaria prevention adopted in these areas, and if possible, to discover any additional precautions which could be applied with advantage in the Aitape-Wewak sector. All possible assistance was given them in their enquiry.

Their most useful findings were in the Solomons. Here they visited fifteen units and headquarters on Bougainville, and found that increased doses of atebirin, even up to twelve to fourteen tablets a week were being taken on occasion. They found that the temporary increases were sanctioned by the D.D.M.S. II Corps, the A.D.M.S. of the 3rd Division, commanding officers and regimental medical officers, each within his own jurisdiction, and without effecting any permanent change in general policy. Men on patrols complaining of headaches or similar disorders, or those reporting at R.A.Ps. were given additional atebirin with good effect. Jaboor and Selby considered that the malarial discipline in the Solomons area was little different from that in the Aitape-Wewak area; in fact, special precautions adopted in the 6th Division, such as the use of night

mosquito picquets, or insect repellent routines at cinemas were not practised in the 3rd Division area. During the tour breaches of dress regulations were observed not infrequently.

The delegation reached the conclusion that on Bougainville, by using an increased dose of atebrin when a higher incidence of malaria was observed in a unit, the immediate rise could be controlled. Colonel Wallace, the A.D.M.S. of the 3rd Division believed that "the best weapon placed in medical hands is the optional use of two atebrin tablets when considered necessary by the S.M.O. of a formation". This opinion, shared by the delegation from the 6th Division, squared with the findings in this division with regard to the incidence of malaria in officers: it was found to be proportionately only half that of non-commissioned officers and men. Surely it was not unnatural that, official rules notwithstanding, officers threatened with an overt attack, which might initiate disciplinary action, should take increased quantities of the suppressive drug to avoid obvious infection. Jaboor and Selby found that the same practice existed in other areas also, and that comparisons based on the standard daily dose of 0.1 gramme were illusory.

They observed too, that their own conditions in New Guinea were not comparable with those existing in other parts. The Bougainville campaign was a corps operation, with an opportunity to "call the tune" with the enemy, and with better provision for supplies and transport, until the continued bad weather prevented further active operations on any large scale before the Japanese capitulated.

In New Britain the nature of the campaign was again different; it was largely a problem of containing the enemy within fixed defences, without sustained fighting.

The Borneo campaigns were again different. They were part of the grand plan, with problems of logistics solved, and full sea and air cover. In fact, the medical operations were an excellent demonstration of preventive medicine made possible on a large scale.

The delegation returned to the 6th Division with a conviction that, notwithstanding faithfulness in all methods of personal protection, an efficient dose of atebrin must be taken, and that, to be effective, this dose under certain conditions might have to be increased beyond the amount prescribed as adequate for suppression. What those conditions were could not be determined with certainty, but Jaboor and Selby were impressed with the practical methods adopted on Bougainville, which aimed at increasing the blood-atebrin levels when circumstances dictated the need for more active suppression. It was of interest that legalised increases in the daily atebrin dosage did not cause any defections in discipline or fall in morale.

EXPERIMENTS AT CAIRNS

When Fairley returned from overseas he was instructed by Blamey to proceed to the Aitape area and investigate the outbreak of malaria. He took immediate steps, and organised the formation of a field section

of the Land Headquarters Medical Research Unit under Major I. C. MacDonald, with Major J. I. Tonge as pathologist and a technical staff. Lieut-Colonel Mackerras was appointed malariologist to First Army and studied the problem from the epidemiological point of view.

Fairley and his team, in June, set about the solution of a number of technical problems relating to the suppression of malarial infection in the 6th Division. These included tests of the atebtrin used in the field, to determine the exact quantity in each tablet, and its physical and chemical composition, and the average levels of atebtrin in the blood plasma in men reputedly taking standard dosage. This enquiry showed that the atebtrin as supplied complied with all standards, and produced the concentration in the plasma theoretically needed for adequate suppression of malaria.

Examination of the blood of men of the 6th Division under treatment for M.T. infections, particularly those suffering from recrudescant attacks, revealed that standard concentrations of atebtrin in a certain proportion of cases failed to suppress M.T. malaria regularly, or to cure it satisfactorily, when compared with the usual experience while maintenance atebtrin was being taken after a standard course. Fairley's experiments afforded definite evidence of the presence of an M.T. strain relatively resistant to atebtrin. No proof was discovered of a similar strain of B.T. parasite. The proportion of M.T. parasites with this biological character was not exactly determined. The patients used for these tests were those who had had several recurrent attacks of M.T. in spite of standard treatment. The phenomenon was irregular in nature, and it seemed that varying grades of atebtrin-resistance existed. Some strains failed to be controlled by a dose double the usual amount. The suggestion was made that a certain instability in behaviour of this relatively resistant strain might be associated with the recent acquirement of the property of resistance.

Fairley concluded that at least 90 per cent of the force were infected with malarial parasites, but that only 23.3 per cent contracted overt malaria. He pointed out that the selective nature of the patients investigated, marked them out as exceptional experimental material, and not typical of malaria as seen in Aitape-Wewak. The results of investigation of a large series of men selected at random, sufficient in size to be more statistically representative, perhaps would have been interesting and significant, but prompt answers had to be supplied to the important questions posed in the area, and time was pressing. The cessation of hostilities during August somewhat curtailed the enquiry from the research point of view.

Braithwaite had also carried out some work on experiences with blood transfusion, and found some evidence in favour of the presence of a resistant type of *P. falciparum* in the Wewak area, but was not able to publish this till the war was over. *P. vivax* might have been investigated further had there been time and opportunity, in view of the much higher incidence of this type in Aitape-Wewak than in other areas and the

greater readiness with which it can be suppressed. Work was done later on four volunteers, but only one *vivax* strain could be tested experimentally.

The origin of the resistant M.T. strain could not be determined, but later work of Mackerras and Aberdeen suggested that if the quality of atebirin-resistance was acquired and not inherent, it seemed on epidemiological grounds unlikely that this strain was produced among the troops but rather among the Japanese. Mackerras after his appointment as malariologist to First Army pointed out the very real danger of stationing troops near native villages where children congregate.

An important feature of the outbreak of M.T. was the clinically mild nature of the disease. Few complicated or dangerous attacks were seen, showing, it may be assumed, that atebirin at least modified the symptoms and also that it must have been taken and absorbed for such an effect to be produced.

THE ARRIVAL OF THE 8TH BRIGADE

This episode demands special mention for its bearing on the malarial problems of Wewak.

Near the close of the Aitape-Wewak campaign the advent of a reinforcing brigade in the area was welcomed not only for its assistance, but as a practical test of the effect of the local malarial conditions on a newcomer to the area.

During July and August the epidemic in each brigade of the 6th Division was steadily disappearing, though it appeared to be lingering in the 17th rather more than in the others. The usual dose of atebirin was restored on 15th August. During August the medical units worked chiefly from the Wewak centre; the 2/7th Ambulance was concentrated at Cape Wom on 2nd August, and the 2/15th Field Ambulance had an M.D.S. in the Wewak area. This unit, under command of Lieut-Colonel L. G. Hill, appeared over the horizon late in the campaign, and on 14th July acted in support of the 8th Brigade, which was sent to take part in the operations of July-August. The ambulance sailed from Matupi and disembarked at Wewak. On the 16th an A.D.S. supported the 35th Battalion at Brandi plantation, and on 6th August set up an R.A.P. which took patients from the 16th Brigade area and from the R.A.A.F. advance party as well as from the 8th Brigade. By the 7th the 2/15th M.D.S. was working and carrying out surgical work. Lieut-Colonel A. C. Mendelsohn took over later in the month from Lieut-Colonel Hill.

The 8th Brigade's appearance in the Wewak sector aroused considerable interest by reason of its previous malarial history and record in hyper-endemic areas. It had advanced up the coast to Madang during an earlier phase of the north coast operations, and went on to Alexishafen and Hansa Bay, country of the same type as the coastal sector of Aitape-Wewak. After a doubtful start the brigade had maintained an excellent anti-malarial record. It had as many as 275 and 110 cases of malaria in its 30th and 35th Battalions respectively during the early months of

1944, but, with improved protective methods during the past year, had not had more than thirty cases in either battalion. Within three or four weeks of their arrival at Wewak, both battalions showed an increase in the rate of incidence, the 35th Battalion suffering a rate of 38.6 per 1,000 per week in successive weeks in August. Hill remarked on the appearance in the area of the 8th Brigade that "at the time the malarial discipline in Wewak was good, and the occurrence of malaria in troops who had successfully evaded it in the swamps of the Ramu and Sepik deltas where they depended on themselves for their preventive practice, was to say the very least, devastating".

Following the administration of two tablets of atebtrin a day the disappointingly high incidence rates fell to a mere one or two cases a week. It cannot be exactly stated to what extent a strain relatively resistant to atebtrin was a major factor in this outbreak in the 8th Brigade, but there seems no doubt that the brigade was attacked by the same atebtrin-resistant strain as the division, and the evidence is strongly against any assumption that disciplinary failure played any significant part.

ADMINISTRATIVE PROBLEMS

The solution of the problems raised by the Aitape-Wewak epidemic was not solely a question of science. Like many service problems it also involved administration, as was obvious from the beginning. The divisional commander's conference showed that opinion was divided and that two opposing factions existed. One rested its basis on the suppressive dosage laid down by Fairley on the strength of his accurate and careful experimental work at Cairns, and ratified at the Atherton conference as the officially accepted dosage of suppressive atebtrin for the Australian Army. This faction was unwilling to countenance any suggestion that 0.1 gramme of atebtrin daily could fail as a suppressive, and believed that actions based on this admission would cause a fall in morale in the men, who might feel that they had been misled. The other faction would not accept the implication that the troops were failing in carrying out the rules of personal protection. This view was supported by many capable and observant officers, who were confident that numbers of men had carried out their protective measures faithfully and nevertheless contracted malaria, despite a regular dosage of atebtrin in prescribed amounts. They felt that lack of faith in the men by the officers would have a much more serious repercussion on morale and therefore objected to unnecessarily strict additions to the existing atebtrin drill. They pointed out that some of the men were already disposed to regard atebtrin as fallible, and increased dosage would not prejudice the men against their advisers.

After Fairley's return the answers to the important questions involved were soon obtained, and the hypothesis was proved, that in addition to the usual atebtrin-susceptible strains of parasite, an atebtrin-resistant plasmodium was present in the area.

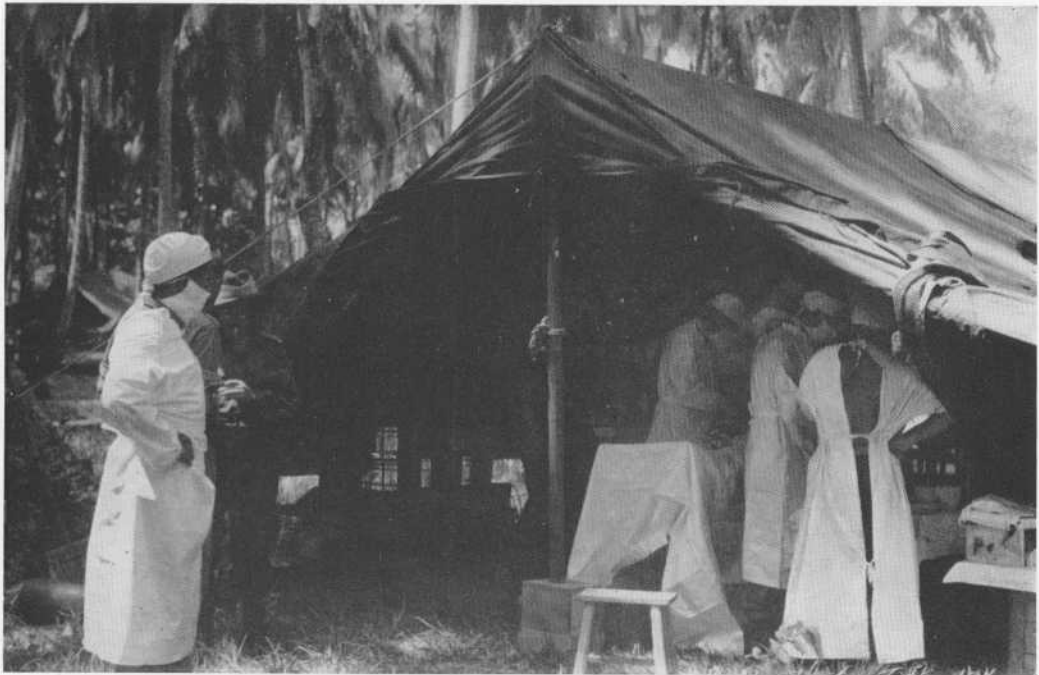
Now that this knowledge was gained, what was the next administrative step? Unfortunately controversy did not die quietly, for, as will be found

on more detailed study of the technical questions arising from the enquiry, exact answers could not be given to all these. Further, if a careful increase in the regular dosage of atebtrin was to be adopted as an important measure, how could this be done without admitting that the previously taught dose of 0.1 gramme daily was not invariably sufficient in the area? What doors of indiscipline might be opened if adherence to the official dose of atebtrin was varied? What difficulties of administration might be met? These were not serious drawbacks, but more serious was the implication that men of the 6th Division were themselves at fault, and were therefore forced to take more atebtrin because of failure to observe the strict rules of prevention.

Perhaps it was unavoidable that a certain slur, or at least some degree of reprehension should lie on the division, but numbers of officers and men felt keenly that they had been blamed without due cause. In particular, those who had looked forward to the honour of participating in further operations after a period of hard training and harder campaigning were greatly disappointed. In spite of this the division accomplished more than was expected of it when it entered the area.

Perhaps the greatest lesson of this episode was that the uprising of a drug-resistant strain may occur, and modern teaching advises that suppression of malaria should not rest on one drug alone. Had paludrine been available at the time the trouble would not have occurred, for this and other new anti-malarials were later proved by Fairley to be effective against the strains resistant to atebtrin. In the light of history it seems just that the 6th Division should be exonerated from the charge that lack of discipline in itself was the major cause of the epidemic. Some of the experimental evidence suggested that the non-taking of atebtrin accounted for a proportion of the cases, but this evidence was hardly complete enough to prove that such proportion was substantial. The experience of the 8th Brigade is here relevant. No doubt there were faults and omissions in the division; there were also those who sought deliberately to evade rules, but these were few and not representative.

It may be admitted that certain technical medical matters may not be wisely or widely disclosed during a state of war. Even in the ordering of a large military formation to take a fully effective dosage of a valuable drug such as atebtrin there is a definite responsibility, for all valuable therapeutic substance may be expected to have some toxic properties. Atebtrin was a most valuable drug, singularly free of toxic effects in therapeutic doses, but prolonged administration of a dose double that known to be an adequate suppressive of malaria was not without risk of sequels. Certain effects like rare disturbances of the liver, the blood-forming organs, and the nervous system were known. The uncommon though troublesome "tropical lichenoid" skin eruption was known by the medical advisers of the armed Services to be due to atebtrin, but this was not generally disclosed. For a time it was perhaps one of the best kept medical secrets of the war. There was never any cause for alarm; many other substances are used daily by persons who are prepared to risk rare sensitivities, but



Field surgical team, Tarakan.

(Australian War Memorial)



The dressing station soon after the landing on Tarakan.

(Australian War Memorial)



(Australian War Memorial)

Aircraft spraying the Tarakan airstrip with D.D.T. for the control of malaria.



(Australian War Memorial)

Battle casualties being carried on to a L.C.M. at Balikpapan from which they were transferred to the 2/2nd Hospital Ship, *Wanganella*.

a whispering campaign could have lost the medical services one of its mainstays, at that time irreplaceable, and would have seriously prejudiced the course of the war in the tropics. For these reasons double atebtrin dosage, a valuable saver of man-wastage, was used only in moderation, and over controlled periods. The atebtrin controversy was, of course, somewhat different, for there was involved also a question of blame, which was not entirely a scientific question. There are psychological lessons too, whose sharper features are still prominent in the minds of some of those who played a part in a worrying and responsible experience.

It was a pity that some of the responsibility laid on the division for the high incidence of malaria could not have been lightened. Morale, as leaders know, depends on confidence, and without risk of indiscretion a certain amount of knowledge, disclosed only to trusted officers, might have mitigated some of the bitterness that was undoubtedly felt by them. The opinions of the D.A.D.H. of the division, who saw these happenings from an intimate level, are of some interest.

Major G. Read, D.A.D.H. of 6th Division, in reviewing the whole position, pointed out that as Fairley had shown both in the 3rd Base Sub-area and the division, atebtrin had been partially successful as a suppressive in spite of the disappointing case incidence, since one of its effects had apparently been to lower the severity of the infection, even during a long and tiring campaign. The A.D.M.S. of the sub-area found at one stage that rises in the malarial rate were associated with slackening of disciplinary detail, and attention to these was followed by a fall. The personnel of this area, both while in Aitape and Wewak, took throughout the standard daily dose of one tablet, and a large proportion of individuals of both the sub-area and the division remained suppressed, particularly with regard to the *vivax* infection.

The outbreak in the division was unexpected, and contrary to other experiences with a force taking suppressive atebtrin. Read found the work of the control units was excellent, in particular that of the 2/4th Malaria Control Unit, and supplies of material were adequate except for some shortage of D.D.T. He finally concluded that "the intellectual and emotional attitude towards suppression and prophylaxis of malaria has been shown to be a factor of considerable importance. To what extent a lack of detachment prejudices anti-malarial activities and affects the case incidence is a matter of opinion, but the D.A.D.H. thinks it is considerable. However, it has been encouraging to find a calm attitude in other ranks of the formation." Yet it would be idle to refuse to recognise that there were two schools of thought both in and out of the division and that a definite degree of tension existed. It was, of course, fully understood by all concerned that all the factors of hyperendemicity were present in the area. The division had everything to lose by faulty discipline, and measures were taken very promptly to locate and deal with the faults. Certain weaknesses were detected in the implementation of the rules laid down for the control of malaria in the field. There is no proof that these were either more frequent or more serious than those observed in other formations.

This was confirmed by the visit of the 6th Division delegates to other areas. The actual drill evolved for use in atebirin parades in the 6th Division was undoubtedly harsh, and in the belief of most medical men, tended to lower confidence of troops in their advisers. It seemed as if the empirical practice found effective in the 3rd Division and elsewhere might have given better occasional results, in spite of the official and scientific objections which might be raised to it.

FINAL ADVANCES

Concerning the military story of July and August there is not much to tell, though this phase of the operations foreshadowed successful strokes against the enemy.

During mid-July the 19th Brigade was advancing on a steep hill known as the Blot, south of Mount Shiburangu, and on Hambrauri. To help this advance the 16th Brigade was ordered to make a show of strength in the Yarabos area. Stiff fighting followed, and with help from air and artillery attack these features were captured. On 21st July the question of fatigue in the 17th Brigade was raised and the divisional commander decided to relieve the 17th by the 19th, and to complete the movement by 7th September. Meanwhile the 19th Brigade was also given some rest by the relief by the 16th Brigade, which took command of the area on 29th July. Using flame throwers this brigade cleared the southern slopes of Numoikum Ridge, and captured Rindogim. On the inland sector the 17th Brigade traversed difficult country, and after taking the Kiarivu strip occupied the neighbouring area with support from aircraft on 11th August.

The sands of the war were now running out, and following rumours of an armistice came the news of capitulation of the whole of the Japanese forces on 15th August. Australian troops at that date had reached points on the double-pronged lines of attack separated by only sixteen miles.

During the nine months' campaign the forces had driven from Aitape to Wewak, seizing *en route* all the strategic points of sea, land and air, and had pressed south from Wewak and west to Forok Point. On the inland sector the force had advanced forty-five miles from Tong to Kiarivu, and had by tactical operations and direct advances cleared the Japanese from an area of 3,000 square miles. Australian battle casualties for the campaign were 428 killed and 1,124 wounded.

Had the end of the war not come when it did the 6th Division's plans would soon have borne fuller fruit, the capture and holding of the northern part of the Mandated Territory from Madang to the border of Dutch New Guinea. These plans were not fully realised, but the operations which began largely as training for other and wider ventures had expanded, with the consent of the Commander-in-Chief, into an arduous campaign. This the division had conducted with notable success, in spite of the handicap of a large-scale epidemic of malaria.