

## CHAPTER 13

### BOUGAINVILLE

**A**FTER the return of part of the A.I.F. to Australia, the military position called for reorganisation of the Defence Forces. These needs called into being First and Second Australian Armies. Only the former became fully functional, while the Second Army remained in Australia and carried out various necessary though often unexciting tasks. For some time First Army, comprising I and II Australian Corps, had its headquarters at Toowoomba in Queensland, and Second Army Headquarters was at Baulkham Hills on the outskirts of Sydney. III Australian Corps, with an armoured division was in Western Australia, under direct headquarters control. Land Headquarters was established in Melbourne, and General Blamey opened an Advanced Land Headquarters in Brisbane, where General MacArthur's headquarters was also situated until August 1944, when it was moved to Hollandia.

The convincing victories of 1943-44 permitted the American Pacific forces to move on from New Guinea to other island bases, from which further combined operations led to the ultimate conquest of the Japanese.

At the beginning of April 1944, Headquarters I Corps commanded the 3rd and 6th Divisions in the Atherton Tableland, and was directed to take over from the II Corps which had the 5th Division and the 29th Infantry Brigade under command, and was in a tented headquarters near Finschhafen. The II Australian Corps then took over the headquarters left in Australia by I Australian Corps. On 11th April both these headquarters moved, and then, on 12th April the two corps headquarters changed designations, I becoming II Corps, and II becoming I Corps. Incidentally this change caused not a little discontent among staff officers, particularly those of I Corps which had operated overseas and valued its record and therefore its tradition. On 20th April, Headquarters II Australian Corps assumed the functions of Headquarters New Guinea Force, which had acted as the operational command in New Guinea, established in Port Moresby at the time of the first threats of Japan to New Guinea. On 6th May the strengthened Headquarters II Australian Corps gave up its designation and assumed the title of Headquarters New Guinea Force. This headquarters was situated at Lae, and had under command 5th and 11th Australian Divisions, 29th Infantry Brigade and the Base Sub-areas at Moresby, Milne Bay, Buna, Lae and Finschhafen. This arrangement was maintained until 2nd October 1944, when further reorganisation and consolidation of the Australian forces were necessary. The reason for this was chiefly related to manpower, since the wartime expansion of industry and the need for increased food production demanded a reconsideration of the future policy of recruiting in Australia. The II Australian Corps was then rebuilt from Headquarters New Guinea Force, which ceased to exist, its functions being assumed by First Australian Army.

Early in 1944 MacArthur was planning an advance on the Philippines, and for this purpose required more troops. Six American divisions and part of a seventh were absorbed in defensive roles. First Australian Army, commanded by Lieut-General V. A. H. Sturdee, took over these tasks and thus set free the American forces needed for the advance to the north. Planning in General Headquarters late in 1944 proposed the employment of the 6th and 9th Divisions in combined operations against Borneo, with the 7th Division held in reserve so that it might be fully rehabilitated after its hard campaign in the Ramu Valley. However, the 6th Division was assigned a demanding role in the difficult and highly malarious country at Aitape, and the 7th and 9th Divisions were used against Borneo.

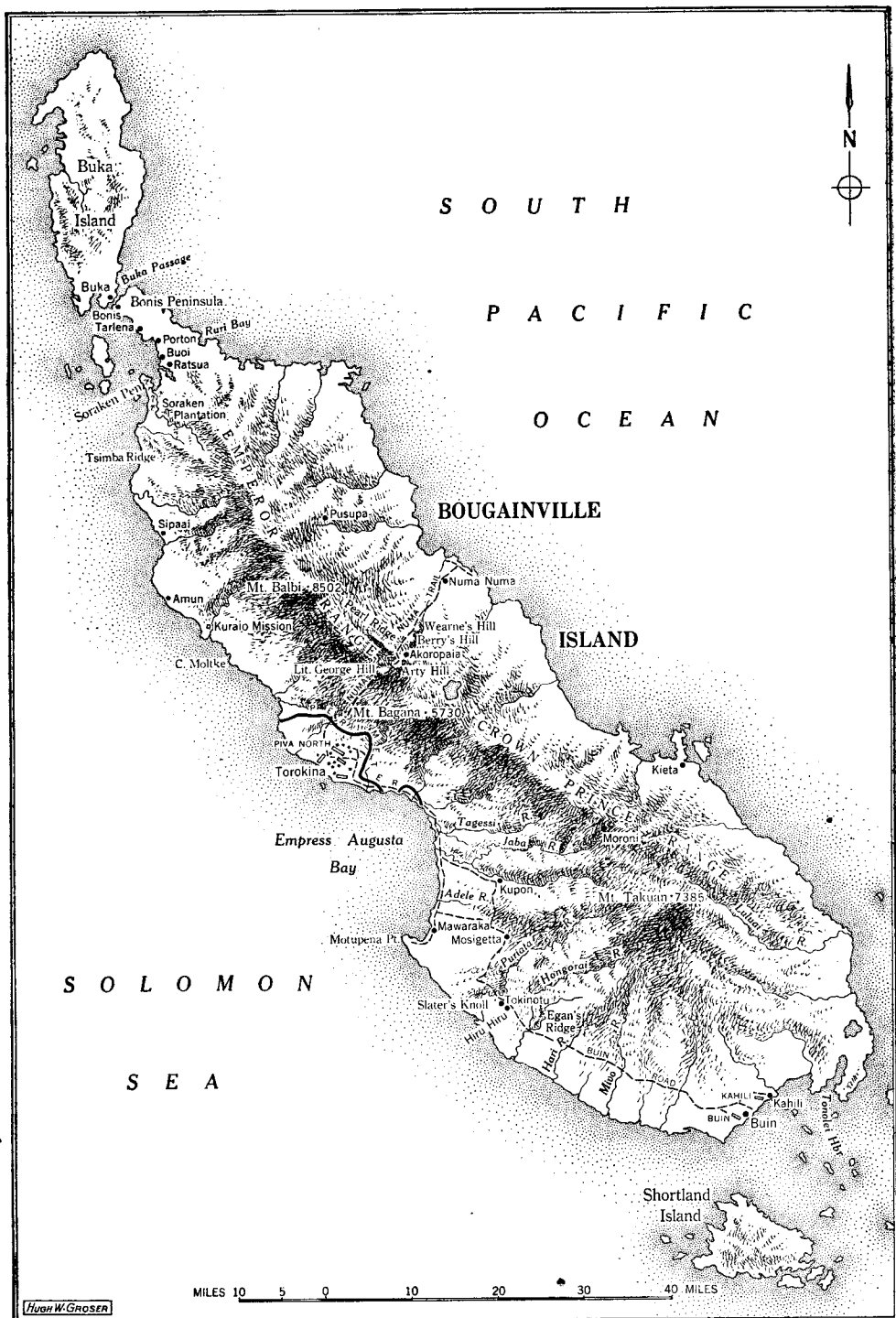
This left the commander of First Australian Army with several campaigns for which the forces used were as follows: II Australian Corps (Lieut-General S. G. Savage) in the Solomons, with 3rd Division (Major-General W. Bridgeford) in the southern sector of Bougainville and two brigades, one in the outer circle of islands and one in the northern sector: 5th Division in New Britain (Major-General A. H. Ramsay) the headquarters being later relieved by headquarters 11th Division (Major-General H. C. H. Robertson) and 6th Division (Major-General J. E. S. Stevens) in the Aitape area, later extended down the coast to Wewak.

The Australian forces were thus heavily committed during the year 1944-45, and far from merely maintaining a defence perimeter, they fought active campaigns, increased their holdings of territories and reduced the Japanese troops in these areas to relative impotence. These campaigns all differed from one another; each presented its individual problems, and added to knowledge, particularly in relation to preventive medicine.

The difficulties imposed by the formidable terrain, by the enemy, and even those due to human perversity showed varied features in these final struggles. In contrast stood the convincing victories in Borneo, where even stiff opposition was overcome by all the measures that could be devised by a plan on the grand scale and troops which showed how they could make the best use of opportunity.

### BOUGAINVILLE

The general characters of the islands of the Solomons group were much the same as the country over which the Australian troops had been fighting since their actions on the Owen Stanley Range. Bougainville, the largest of these islands, was 110 miles in length and its breadth some thirty-five miles or less. A chain of rough steep mountains ran along the long axis of the island, the Emperor Range in the north, and the Crown Prince Range in the south. The average height of these mountains was over 6,000 feet, but Mount Balbi, an active volcano, rose to 8,500 feet at the southern end. Mount Bagana, another active volcano, joined the two mountain masses. Towards the south-west of the island there were rich plains some twenty miles wide, but deep gorges and precipitous ridges abounded on the descents from the central features. In some places movement was practicable only by foot over steep tracks running over



Buka  
Island

Buka Passage  
Bonis Peninsula  
Tarlana  
Porton  
Buoi  
Ratsua  
Soraken Peninsula  
Soraken Plantation  
Timba Ridge

Sipaa  
Amun  
Kuratio Mission  
C. Moltke  
Mt. Balbi 8502  
Sipaa Ridge  
Sipaa

PIVA NORTH  
Torokina  
Empress Augusta Bay  
Motupena Pt.  
Mawarakat  
Mosisgetta

Slater's Knoll  
Hini Hini  
Egan's Ridge  
Honoroi Ridge  
Hani  
Musa

Pusupa  
Numa Numa  
Swearne's Hill  
Berry's Hill  
Akoropala  
Arty Hill  
Mt. Bagana 5730

Tagessi  
Jaba River  
Adele R.  
Kupon  
Moroni

Slater's Knoll  
Hini Hini  
Egan's Ridge  
Honoroi Ridge  
Hani  
Musa

Kieta  
Mt. Takuan 7385  
Lakuni R.  
Lakuni R.

Kahili  
BUIN  
Buin  
Kahili

Shortland Island

sharp ridges. The hills and slopes were covered by forest, watered by copious daily rainfall, which often so swelled the many rivers that they became impassable. Tracks were few and it was necessary to construct a three-ton road and corduroy jeep roads for the transport of supplies for an advancing force.

Towards the centre of the island a track known as the Numa Numa trail led down the bed of the Laruma River and thence across the island to the eastern side. A series of gorges converged to the main cleft through which the Laruma River led to the sea, and from a high feature Choko Ridge ran off parallel to another known as Pearl Ridge. This ridge was of some importance as it overlooked the seaward slopes to Torokina, and at the time of the arrival of the Australians was held by the Japanese.

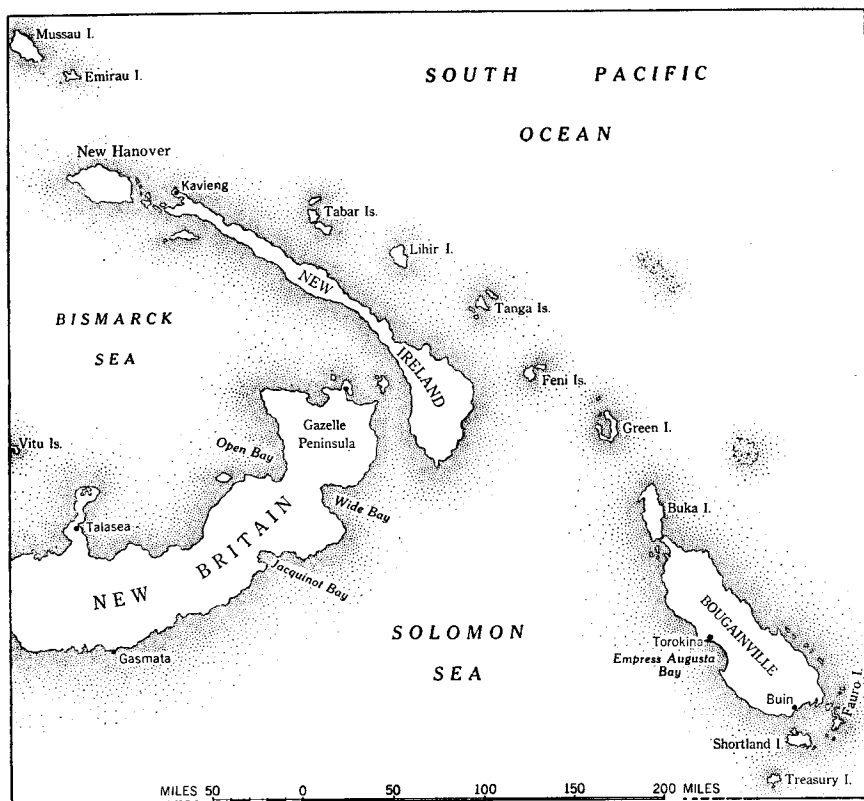
The Americans had built a motor road to a roadhead in the Laruma gorge, from which supplies were carried by porters up the steep escarpment into the central mountains until the trail could be picked up again and followed to Numa Numa on the coast.

The topographical features of the island divided it into three sectors. The central sector was that running from Torokina to the opposite coast astride the Numa Numa trail. The northern sector comprised the northern peninsula on which was the Bonis airfield, separated from Buka Island by the narrow Buka passage. Other small peninsulas projected from the flat coastline, towards which the Emperor Range flattened out, intersected by many rivers. The southern sector also contained a number of large rivers: some could be crossed by ford except after heavy rain, others were never less than waist high at crossings. The rich alluvial soil round Buin produced many native gardens, a lavish source of food, and therefore held tenaciously by the Japanese. This sector constituted the chief defence responsibility of the 3rd Division, and here were the main concentrations of the Japanese force.

#### THE OUTER ISLANDS

The outer islands were Emirau Island, Green Island, Treasury Island and Munda. In March 1944 these islands, which had largely fallen into Japanese hands, came under Allied control, and were used by the American forces in the development of airfields and ports, as adjuvants to the larger air and sea bases. When the Australian Military Forces relieved the American forces in the Solomons, an Australian infantry brigade, the 23rd, was assigned the task of holding the outer chain so as to keep these islands safe for the American and New Zealand naval and air installations. By October 1944 the 23rd Brigade was sited as follows: Emirau Island, to the north of New Ireland, 8th Battalion Group; Green Island, 23rd Infantry Brigade (less two battalion groups); Treasury Island, 7th Battalion Group (less one company); Munda, an air base on the New Georgia Group, one company of 7th Battalion. The 23rd Brigade was thus split into four island garrisons, and further sub-division was necessary for the 17th Field Ambulance, which under command of Lieut-Colonel W. M. Irwin, undertook the medical care of the scattered brigade. There

were certain difficulties in the arrangement of transport to the islands, and in provision of ordinary facilities. Water was obtained by condensation and catchment on tent roofs, and became scarce in dry weather. Sanitation required the blasting of latrines from the solid coral of the islands' foundation. Even the approach of ships was not easy: Liberty ships could not anchor in the lagoon, nor in the deeper water outside, and had to cruise while unloading.



The headquarters of the ambulance was stationed with brigade headquarters, and the 27th Battalion of the 23rd Brigade Group, on Green Island. A surgeon from the 2/1st A.G.H. was attached to the M.D.S. on Green Island for the early part of 1945 but was later recalled. "B" Company was on Emirau Island with the 8th Battalion, and "A" Company with the 7th Battalion on Stirling Island of the Treasury Island Group. A light section of "A" Company went to Munda, in the New Georgia Group with part of the 7th Battalion.

In November, the need for treatment of natives arose on Mono Island of the Treasury Group. Angau medical staff were finding it difficult to

cope with their expanding commission, but Major J. H. Edwards of the 17th Field Ambulance undertook their treatment, while stores and laundry facilities were given unofficially by the American Navy.

Anti-malarial work was needed on the islands, and the field ambulance, with its sub-divisions took over this responsibility: they also carried out inoculations for cholera. Sufficient bed accommodation was held for general needs: in January 1945 the headquarters held sixty beds, "A" Company fifty beds, and "B" Company forty. Evacuation of sick was either by sea or by air. In February a flying-boat service was arranged from the Treasury Island Group to Cairns. The most frequent source of invalidity was skin disease. Very few cases of malaria were seen on any of the islands, and the total sickness rate was 82 per 1,000. Shortage of fresh water was believed to be a cause of skin affections. At one time 90 per cent of the ambulance headquarters were so affected, the most common types of skin affections being *miliaria rubra* and bullous impetigo. Illustrating the communicable nature of neuroses and the adverse effect of isolation, it may be noted that neuroses were common, especially on Green Island.

Following heavy rain in March troubles related to water shortage lessened, but mosquito control was for a time unsatisfactory. On 21st April some regrouping of detachments took place, as the likelihood of offensive action on the islands dwindled. The headquarters moved to Bougainville and set up in Torokina.

On 31st December 1944 II Corps made a recommendation that the outer island garrison should be reduced to a company group on Emirau, Green and Treasury Islands, and on 19th March this was approved by First Australian Army. Movements were carried out in small ships and returning aircraft, and the balance of the brigade was concentrated at Torokina as a reserve.

The altered policy of the outer island defence brought about changed dispositions of the 23rd Brigade, and the alterations in medical arrangements were discussed with Major R. R. Winton, D.A.D.M.S. II Australian Corps, at the end of March. Only small holding units were then necessary, with twenty beds on Emirau, surgical work being done by an R.N.Z.A.F. hospital, fifteen beds on Green Island, and ten beds on Treasury where there was still an American naval hospital. All medical service was provided at Munda by American medical units.

Detachments from the 17th Field Ambulance provided staff for A.D.Ss. on Emirau, Green and Treasury Islands; the greater part of the unit was now on Bougainville working in the central and northern sectors with units of the 23rd Brigade.

A further thinning out of the island medical force took place on 14th June. The 8th Field Ambulance then took over the Numa Numa trail in the central sector, Bougainville, and the 17th Field Ambulance was thereupon assigned to the relief of the 19th Ambulance in the northern sector. By the end of the month Australian medical detachments had left the outer islands.



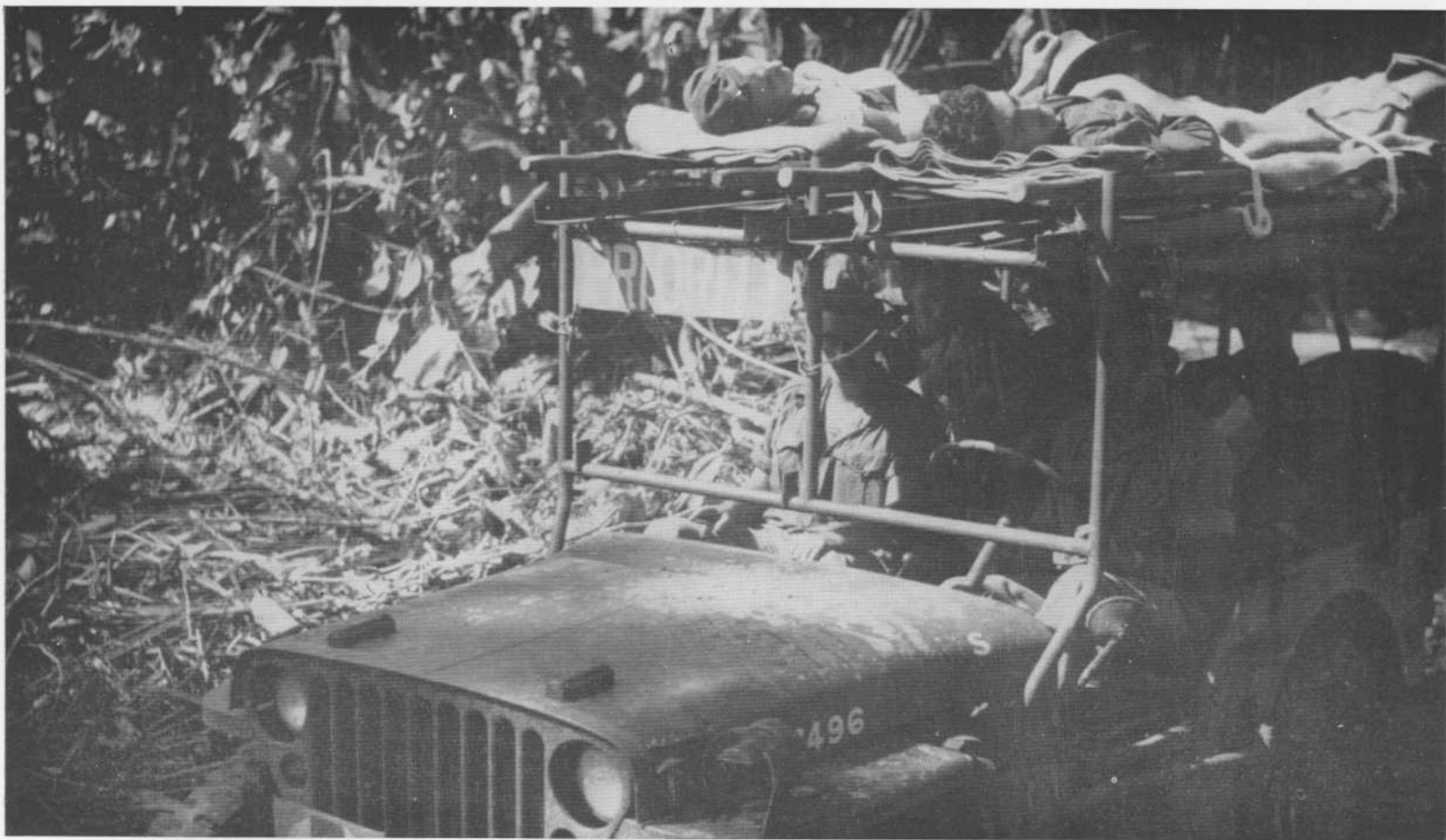
*(Australian War Memorial)*

Loading an ambulance launch from the 109th C.C.S., Motupena Point.



*(Australian War Memorial)*

Heavy surf at Toko beachhead, Bougainville, makes landing difficult.



*(Australian War Memorial)*

Jeep ambulance transporting battle casualties from the 57th/60th Battalion during the advance south of the Hongorai River.



*MILITARY ARRANGEMENTS*

In October 1944 the 3rd Australian Division, commanded by Major-General Bridgeford, arrived on Bougainville and the headquarters took over from the XIV United States Corps until the II Australian Corps arrived in November. The 7th, 15th and 29th Brigade Groups made up the division, together with the 2/8th Commando Squadron, a squadron of the 2/4th Armoured Regiment, and the 2nd and 4th Field Regiments. The 6th Brigade was sent under command of the 5th Division to the New Britain operational area.

The first phase of the activities of the 3rd Division was occupied with the move to Bougainville and the details of taking over from the American force. An immediate duty was that of defence of the beachhead at Torokina, where the headquarters was located. Between 13th and 20th November Headquarters II Australian Corps arrived at Torokina, and assumed command on 22nd November.

The main tasks confronting the Australian force were the defence of the Torokina perimeter and the gaining of information concerning the Japanese on the island. It was evident that operations would be carried out in the southern sector where Japanese troops were concentrated and food was plentiful. It was necessary to prevent the Japanese from approaching Torokina by the cross-island route, the Numa Numa trail, and to allow them no opportunity for reinforcing the central or southern sectors with troops from the north. The overall plan was to attack in the three sectors: in the north to force the Japanese into the narrow Bonis Peninsula where their forces could be destroyed; in the centre to clear them from the high ground and to threaten the main enemy line of communications to the east coast, and in the south to attack the main enemy concentration.

*MEDICAL ARRANGEMENTS*

By December some of the field units were actively engaged in all three sectors. The field ambulances allotted to the Solomons area were the 7th, 8th, 11th, 15th and 19th. The 17th Ambulance was attached to the 23rd Brigade and undertook the medical care of the outer ring of islands while this was necessary. Most of these units arrived towards the end of 1944, and in November the division had in addition under command, the 2/1st Base Depot Medical Stores, the 2/1st and the 19th Malaria Control Units, the 2/3rd Convalescent Depot, and the 115th Mobile Bath Unit. There were also three larger holding medical units; the 109th Casualty Clearing Station, which arrived at Torokina on 8th October and came under divisional control; the 106th C.C.S. in the 4th Base Sub-area, and the 2/1st Australian General Hospital. The 109th C.C.S., under command of Lieut-Colonel M. G. Edison, occupied the site relinquished by the 112th United States Medical Battalion, and was open for patients on 12th October, having 145 beds by the end of the month. The 2/1st A.G.H., under command of Colonel J. Leah, opened on 10th January 1945 on a site which had to be cleared of virgin jungle before the extensive installations of a general hospital could be made. The medical and surgical

divisions were in charge of Lieut-Colonel C. B. Sangster and Lieut-Colonel J. O. Smith respectively. On opening, the A.G.H. took over 100 patients from the 106th C.C.S., commanded by Lieut-Colonel Powell, and by the end of February 930 beds were ready, and 885 patients had been admitted during the month. At a later stage in March permission was given for the hospital to expand to 1,200 beds. Before the general hospital was fully available for patients, an arrangement was observed whereby the 109th C.C.S. received admissions from the southern sector, and the 106th C.C.S. from the northern sector.

At appropriate times the hospital could transfer patients from Torokina to the 2/7th A.G.H. at Lae, from which they could be transferred to the mainland if necessary. Hospital ship transport could also take patients direct to the mainland, and limited air service was available. Surgical teams were provided by detaching surgeons from the base units: throughout the campaign the 109th C.C.S. made available the services of two surgeons on its establishment. This arrangement was facilitated by the largely static role played by the clearing stations.

Colonel F. K. Wallace was A.D.M.S. of the 3rd Division, with Major R. E. Wherrett as D.A.D.M.S. and Major W. D. Exton as D.A.D.H. Under divisional command were the regimental medical officers of the 2/8th Commando Squadron, the 2/4th Armoured Regiment, the 2/11th Field Regiment, the R.A.E. 3rd Division, and the 9th, 15th, 24th, 25th, 42nd, 47th, 61st, 57th/60th and 58th/59th Infantry Battalions, and the Papuan Infantry Battalion.

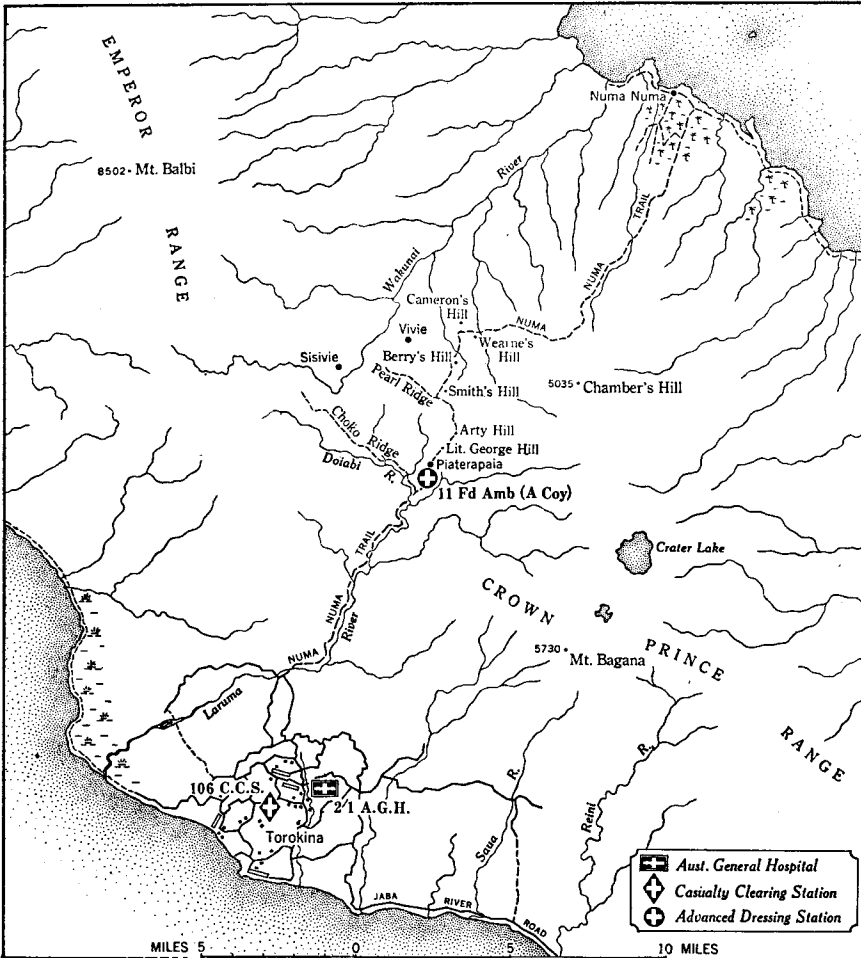
It may be noted that the field ambulances were equipped according to the tropical scale. This provided accommodation for troops but not for holding casualties, hence there was need for extemporisation to provide facilities for resuscitation and surgery, and in addition, wards in which patients could be held for ten days. Though these methods were used with great success, on Bougainville appropriate tentage could have been carried, as motor transport was practicable in the coastal areas.

#### CENTRAL SECTOR

Relief of the United States forces occupying the central sector in the Doiabi-Sisivie area began with the arrival of part of the Australian 7th Brigade to which was attached "A" Company of the 11th Field Ambulance. This company, servicing the 9th Battalion Group, on 26th November opened an A.D.S. at Piaterapaia (Erie), a roadhead which covered both flanks, and permitted transport of patients by road to the C.C.S. direct. A surgical team from the 109th C.C.S. was working at the A.D.S. under command of Major J. C. Balzer. An R.A.P. was set up near Piaterapaia serving two companies in contact with the enemy: from here and from Sisivie casualties were evacuated to the A.D.S. by native carrier teams. The times taken were eight hours on one flank and two hours on the other. A medical staging post on the track cared for casualties sent along this route. From the A.D.S. to the C.C.S. the journey of fifteen miles took up to two hours, depending on the state of the Laruma and Doiabi Rivers.

Though the motor ambulances had a high clearance and had little trouble at the crossings, the rivers had to be crossed twenty-six times on each trip.

The first action of the Australian troops took place on 29th November when the 9th Battalion attacked and captured Little George Hill, one of several high topographical features which were military objectives. After the capture of Little George, the 9th Battalion Group attempted to out-flank the enemy positions on Pearl Ridge and to sever his communications,



but the enemy opposition was too strong. On 18th December an assault was made on Artillery Hill, a 300-yard long ridge, and after preliminary bombardment a company attack succeeded in taking it in spite of the great difficulty in climbing the masses of earth thrown up by fire from the 25-pounders. The 9th Battalion was relieved by the 25th on 21st

December, so that this unit might add to its experience in jungle fighting: the medical arrangements remained the same. Very little action took place during the period of relief.

The due ceremonies of Christmas were observed, and special meals were prepared and appreciated. An attack was planned on Pearl Ridge for the 30th, and information was collected by patrols towards this end. This ridge rose to a height of 2,800 feet, overlooking the west coast and the anchorage of Torokina. The attack began with air strikes, and continued on the following day. By 1st January Pearl Ridge had been taken against strong opposition. During the attack on Pearl Ridge supplies of serum were available for resuscitation in the R.A.Ps. and A.D.S.; whole blood was supplied by the Red Cross Transfusion Service through the 11th Field Ambulance M.D.S. and volunteer donors were to hand. Forty-three men were treated for battle casualties and forty-seven for illness.

The 25th Battalion was relieved by the 26th Battalion of the 11th Brigade on 4th January, to allow the 7th Brigade to be concentrated for future operations in the southern sector. "A" Company of the 11th Field Ambulance handed over to "A" Company of the 19th Field Ambulance, which arrived with the 11th Brigade in December and provided service at the A.D.S. on the Numa Numa trail. Majors A. L. Newson and T. F. Rose were attached as a surgical team from the 106th C.C.S.: facilities for surgery and holding were good. This relieved the command of the 3rd Division from further responsibility in the central sector. The task of the 11th Brigade was now to prevent the enemy from penetrating the Laruma River area, and to establish patrol bases towards Numa Numa, but without advancing beyond Pearl Ridge.

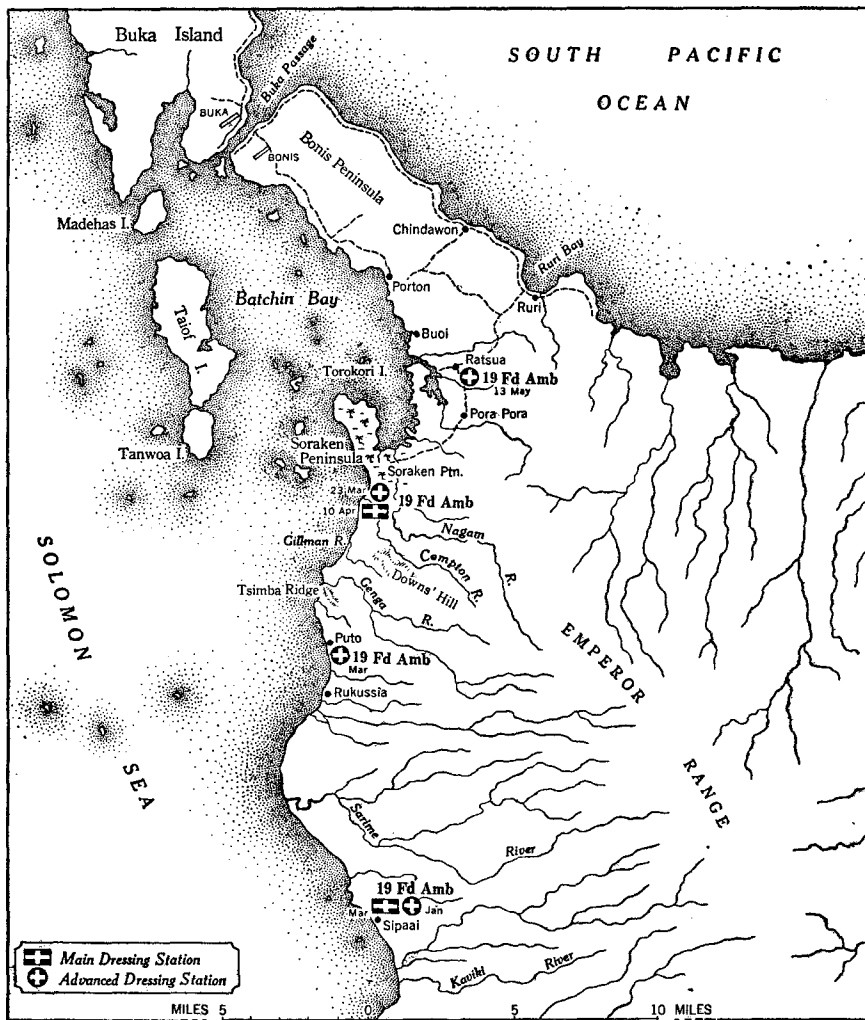
Planning in the central sector provided for continuous and aggressive patrols penetrating several miles into enemy areas without any major engagement. The medical responsibility for the line of evacuation from the Numa Numa trail was taken over by the 8th Field Ambulance on 23rd March with the headquarters and "B" Company situated at the road-head. In order to strengthen the 11th Brigade in the northern sector, the battalion of this brigade which had been engaged on the Numa Numa trail was relieved on 18th April, by a battalion of the 23rd Brigade, which had been withdrawn from duty on the outer ring of islands. This position in the Pearl Ridge area remained unchanged until II Australian Corps reviewed the whole situation, and instructed the forward units to undertake such operations as would destroy Japanese strongholds without using more than a platoon in an attacking force. Following this decision, the forward troops were successful in establishing positions on Smith's Hill, Berry's Hill, Wearne's Hill, and Tiernan's Spur: these actions were conducted by fighting patrols with the support of artillery and mortar fire. Company bases were established as far forward as Cameron's Hill. When the position permitted, the 8th Field Ambulance brought up an A.D.S. to Smith's Hill. Evacuation from these points was made by bearer teams and jeep ambulances: there were very few casualties and this evacuation line was not much needed during the remainder of the campaign.

## NORTHERN SECTOR

In Northern Bougainville the Japanese had forces derived from army and navy units: on the east and west coasts of the northern sector the army units were in small garrisons. The Australian plan was, in general, to force the Japanese into the Bonis Peninsula and then contain them so as to prevent attempts to reinforce their troops in the south. As a preliminary it was further planned to reduce these enemy forces substantially by aggressive patrolling, and to eliminate the series of small garrisons from Cape Moltke to Soraken. Towards this end the 31st/51st Battalion of the 11th Brigade went northward from Torokina along the coastal track to set up a patrolling base; but no contact was made as far as Kaviki River. One company went up on patrol and reported the Sipaai area clear: the remainder of the battalion landed there and established a forward base, and an A.D.S. was set up by "B" Company of the 19th Field Ambulance. The battalion advance continued to Rukussia without hindrance, but Japanese troops were reported in the region of Tsimba Ridge near the mouth of the Genga River. Evacuation was by barge from the A.D.S. to Torokina. From 21st to 28th January the Australians made persistent attacks on the strong Japanese position on Tsimba Ridge, but it was not until 6th February that a company assault with artillery succeeded in clearing the area after heavy fighting. This action produced over twenty wounded in the 31st/51st Battalion; the arrival of the ambulance craft *Stradbroke* from Lae permitted evacuation by sea to Torokina. The surgical team from the 106th C.C.S. under Newson, was transferred from the Numa Numa trail to the A.D.S. Sipaai on 8th February to help cope with the situation. On the 12th the battalion had to deal with strongly entrenched Japanese positions on Downs' Hill, in the rising ground inland from the Genga River. By the 19th the Japanese had been cleared from Tsimba Ridge and two days later the forward troops reached the mouth of the Gillman River. The 26th Battalion relieved the 31st/51st Battalion after the clearing of Downs' Hill on 4th March and began to patrol along the coast.

Early in March the A.D.S. at Sipaai moved with its attached surgical team to Puto. An inland patrol from the 26th Battalion on the 12th, encountered a strong body of Japanese at the Nagam River. On the previous night a company had landed north of the Compton River and a similar operation was carried out nine days later, a mile farther forward. Little opposition was met from the Japanese who were hurriedly withdrawing from the Soraken Peninsula towards Pora Pora. By 28th March they had ceased resistance in the north of the peninsula as an organised force. Thus the Japanese had to abandon an area in which there was considerable garden cultivation. During March the main body of the 19th Field Ambulance had consolidated at Puto, following the relief of "A" Company on the Numa Numa trail. "B" Company was now free to service the Soraken area with an A.D.S. The advance beyond Nagam River towards Pora Pora proceeded with little hindrance, except that due to the rough and difficult country. After the capture of Pora Pora the Japanese

line of communication from base of the Bonis Peninsula to the east coast was cut. These moves, together with an unopposed landing on Torokori Island by troops of the 26th Battalion, secured Ratsua from inroad from the sea.



Meanwhile the 19th Field Ambulance established an M.D.S. at Soraken by the end of April. This had well-constructed wards and theatre, with a surgeon attached at all times. With the capture of Ratsua the A.D.S. was established by "A" Company in that area. Evacuation from forward areas was carried out mainly by barge; *Stradbroke* continued useful work back to the base. This remained the chief medical centre for the sector. On 11th

May the advance was continued across the Bonis Peninsula eastward to Ruri Bay. Light sections of the ambulance were again used to afford necessary medical support to the fighting troops. The 11th Brigade had now completed its task of pressing back the enemy to the Bonis Peninsula and had overrun their garrisons.

The brigade was ordered to consolidate its positions without being committed to major actions. As it was necessary to ensure full supplies to the southern sector, the 11th Brigade was instructed to reduce the force in contact in the forward area to one battalion. The importance of the narrow Chindawon-Porton area was realised; it would be possible to control it by one battalion. A landing was made on 8th June by troops of the 31st/51st Battalion at Porton in an endeavour to outflank the known strong enemy position in Buoi plantation. Troops also moved up along the coast. The Japanese were known to be occupying Porton, but their strength was unknown. Early on 8th June a company group landed unopposed, but the craft of the second wave grounded on the reefs near the shore. The Japanese brought up reinforcements at dawn and launched strong attacks. That night heavy enemy fire prevented the landing of stores and ammunition and the landing force was compelled to retire; this movement was not completed till the night 10th-11th June, thus the objects of the landing were not realised.

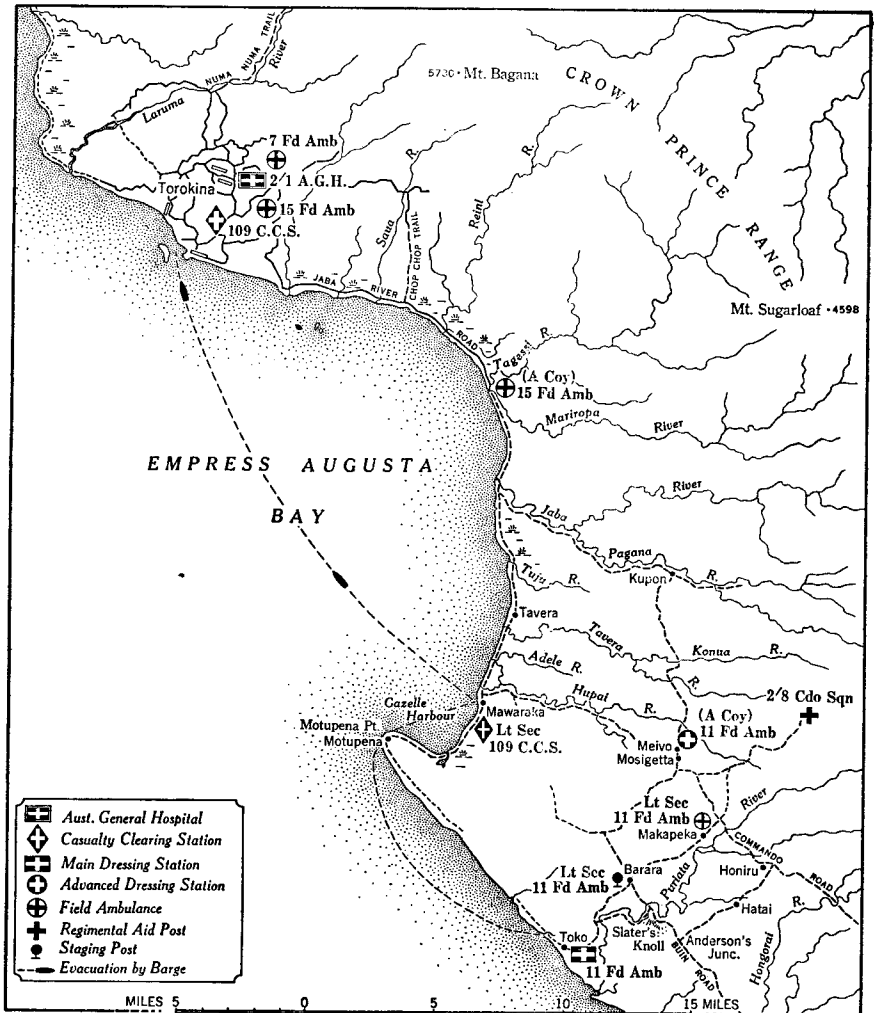
The Australians had many casualties, including some members of the field ambulance, nevertheless they inflicted heavy losses on the enemy. The M.D.S. at Soraken was able to deal efficiently with the wounded, and the hospital launch *Stradbroke* took back fifty casualties to Torokina. Rose replaced Newson as surgeon in charge of the surgical team. Thereafter active patrolling continued against a strongly resisting enemy: on 12th-13th June the Australian forces were consolidated, and supply lines shortened and adequately protected.

The 17th Field Ambulance relieved the 19th Field Ambulance on the 22nd, maintaining the same service to the forward troops. The 23rd Brigade took over the command of the sector from the 11th Brigade. After the Porton action the Japanese became more aggressive and penetration by their forces could not be prevented. Accordingly, the line held between Ruri Bay and Ratsua was shortened, and two battalions were concentrated in the Ratsua-Bonis area. These changes were completed by 24th July and aggressive patrols were resumed at once. This restored the balance again, and by the end of July the enemy was only able to carry out minimum movements south of their chief defensive line. When this end was achieved the position was maintained unchanged until hostilities ceased on 15th August.

#### THE SOUTHERN SECTOR

The first organised group to arrive at Torokina to begin the relief of the American Forces on Bougainville was the 4th Base Sub-area, whose units were given priority of shipping so that arrangements could be put in train for the maintenance of base and field troops. The advanced

headquarters of the base opened on 11th September at Torokina, and units arrived by ship on the 20th. After a couple of weeks the organisation was ready to receive troops and maintain them. The immediate task before the elements of the force, was the taking over of the defence of the



Torokina perimeter area from the American forces. The 3rd Division was allotted this duty, and also had to gather all possible information about the Japanese in the southern sector. In addition it was important to prevent the enemy in the central sector from approaching Torokina by the Numa Numa trail which ran through the cross-island route to the opposite coast.



By the middle of December sufficient information was to hand for the preparation of plans for offensives on the central, northern and southern fronts. On the important southern sector, where enemy concentrations were gathered, these plans provided for reconnaissance by the use of patrols of the 2/8th Commando Squadron, and for an advance towards the southern end of the island. The first objective was Mawaraka on the coast, and after that Mosigetta, a valuable garden area then under control of the Japanese. With these ends in view, II Corps approved the taking over of the defence of the Jaba River area as a contributory step towards the conquest of the enemy in the southern part of the island. It was realised that this campaign would be fought out in the southern sector of Bougainville. For this operational role the 7th Field Ambulance, commanded by Lieut-Colonel Meares, was attached to the 29th Brigade.

Advance parties of this brigade on 3rd December moved down the coast to the Jaba River as a preliminary to the capture of Mawaraka and Mosigetta. After a period of patrolling by the brigade, on the 18th, the 15th Battalion crossed the Jaba River and penetrated to the Tavera River and there established a patrol base. Meanwhile the 2/8th Commando Squadron had also carried out patrolling.

The field ambulance established an A.D.S. at Tagessi on 7th December and sent casualties twenty-three miles by jeep direct to the 109th C.C.S. A car post was opened on the north side of the Jaba River when a ferry service began at the mouth of the river on the 20th. First evacuation by hospital launch was made three days later to Torokina. Walking patients were sent to the M.D.S. which had been established on the Chop Chop trail near the coast. Arrangements were made on 24th December for the *Alea* to be ready to move up the Jaba River at night to collect casualties should this be necessary. Preparations were made at the car post for a team to be available for the carrying out of resuscitation.

The 15th Battalion crossed the Tavera River on 28th December and moved its patrol base towards Adele River. The 29th Brigade was now ordered to capture Mawaraka and to clear the Japanese from Motupena Point, and at the same time to expel them from the inland track, with the objective of taking Mosigetta. At the beginning of January the 7th Field Ambulance expanded the A.D.S. at Tagessi so that it became the main dressing station.

The general health of the force was good. In the middle of December the evacuation rate to hospital was the lowest on record, 9.5 per 1,000 per week. The malarial rate for the 29th Brigade at the beginning of January was also very low, 0.3 per 1,000 per week. A higher rate had been observed during the latter part of December; this was due to a break-down in atebirin administration on the troopship. The actual rate was somewhat in doubt, as a number of patients were classed as P.U.O. when no definite diagnosis could be made. The A.D.M.S. arranged for further pathological facilities as a check on diagnosis. Early in January a further rise took place in the rate, to 0.8 per 1,000. This was believed to be due to operational conditions with consequent relaxation of malarial

discipline. Accordingly, Wallace placed the 29th Brigade on a suppressive dose of atebirin of two tablets per day for a period of one month. Experience and research had shown that one tablet of atebirin a day was enough to suppress malaria, but the larger dose gave better opportunity for the blood atebirin concentration to be maintained at effective level. The malariologist to the corps, Major I. C. MacDonald, pointed out that the men might be encouraged to think that the official dose was not sufficient, but the justification of the larger dose lay in the fall of the incidence rate in the following month, with a consequent reduction of man wastage in forward areas.

The 47th Battalion moved south by barge to the Adele River on 11th January. At the barge-point was a transfusion and resuscitation team under Captain R. U. Bourke; from this casualties were evacuated. On the next day a party moved to the north bank of the Tuju River, and Captain H. Glynn-Connolly and a team, during a night crossing, set up a forward R.A.P. just off the beach south of the Adele River. Arrangements were begun to construct an A.D.S. south of the Tavera equipped to supply resuscitation and surgical service. The enemy were active in the area, and that day shelled the locality but without any direct hits.

The fighting in the Hupai area produced numbers of casualties from the 47th Battalion. These were treated in the dressing station as required, and were transferred by landing craft to the M.D.S., where the staff worked through the night. Many of the patients were severely wounded and suffered from multiple injuries. A lugger took eighteen patients to Torokina, and early on the morning of 13th January a workboat took three more. The A.D.M.S. visited the area and instructed that, as the 109th C.C.S. was full, any additional patients being sent to the base would be admitted to the 106th C.C.S.

The intensity of these engagements had already produced strain on the 109th C.C.S., and lest there be want of further emergency accommodation, the M.D.S. of the 7th Ambulance was equipped to hold up to eighty patients for the 29th Brigade. At that time access for surgical cases was good, and other special surgical arrangements were unnecessary, but there was need for additional transport. To meet this requirement two motor ambulance vehicles were allotted to the 7th Field Ambulance.

Patrols of the 42nd Battalion penetrated along the winding Hupai River near the coast, and into Mawaraka, but even in the settlement itself made no contact with any Japanese. Valuable documents were captured here, some within a day of their issue: after being dealt with by the local Intelligence staff they were passed to the higher formation. The whole of the Mawaraka area was completely cleared of Japanese, and towards Motupena Point further similar successes were gained by the Papuan Infantry Battalion, which dispersed the remaining enemy who fled, leaving equipment and more documents behind them.

The 29th Brigade, having now reached the Mawaraka area, was relieved on 23rd January by the 7th Brigade under command of Brigadier J. Field. On the previous day the 11th Field Ambulance had taken over the installa-

tions of the 7th; the M.D.S. was then at Tagessi, previously the site of the A.D.S., which was moved to Adele River. The former M.D.S. was reduced to a medical staging post.

There was now ample provision for the care of battle casualties, especially since the 2/1st A.G.H., accompanied by its nurses, arrived at Torokina and was able to open for work on 10th January. The 109th C.C.S. had also sent a light section for temporary attachment to the 11th Field Ambulance, and supplied two surgical teams. In the forward dressing stations the combination of tentage with semi-extemporised buildings had proved most practical and useful. The whole area was covered with dense jungle, mostly tall swamp oak and other high timber covered with creepers. Notwithstanding the difficulties the ground was cleared and huts of bush timber erected and covered with sisalkraft, each accommodating thirty folding cots. An American pyramidal tent was used as a theatre, with an adjoining oblong tent for resuscitation.

Up to the date of relief of the 29th Brigade the battle casualties were as follows:

	Officers	Other Ranks
Killed . . . . .	2	32
Wounded . . . . .	6	85
Wounded in action, remaining on duty . . . . .	2	15
Died of wounds . . . . .		6
	—	—
Total . . . . .	10	138
	—	—

The surgical needs of the forward areas were provided by teams, and patients sent on to the base area were cared for either in the 109th C.C.S. or the 2/1st A.G.H. This was in conformity with the general arrangement that casualties from the northern sectors were sent to the 106th C.C.S. and those from the southern sector to the A.G.H. through the 109th C.C.S. Lieut-Colonel J. O. Smith, senior surgeon of the force, pointed out anomalies arising from this arrangement, which was designed to cover the period prior to the full establishment of the hospital. Now that the hospital was in full tide of work it accepted the whole responsibility of the care of casualties passing through the 109th C.C.S. and surgical work in the 4th Base Sub-area. Casualties from the northern sector, however, in some instances remained in the 106th C.C.S. only a mile away from the A.G.H., until ready for return to their own units, or transfer to a convalescent depot on the mainland. The result of this was an inconsistency which allowed casualties from one brigade area to be treated in a C.C.S., and those from another brigade area to be treated in a general hospital. The D.D.M.S. met the position on 20th January by directing that all battle casualties be sent to the 2/1st A.G.H., regardless of the sector from which they had been received. Smith wished to have the principle recognised that certain types of injury were better not to be retained in forward areas longer than could be helped. He suggested that compound fractures

of the extremities could usually be evacuated in forty-eight hours. He further pointed out that long-term cases should not be held in the 106th C.C.S., since the two specialist surgeons had to alternate between the C.C.S. and the surgical team at Soraken.

#### FURTHER ADVANCES

*Jaba River-Mosigetta.* When the 29th Brigade was relieved by the 7th Brigade on 23rd January, the roles of these formations were exchanged, so that operations could be continued inland as well as along the coast. The capture of Mosigetta was an important objective of the 7th Brigade, for here the Japanese maintained their line of communication with the first of a series of garden areas. Control of that part of the coastal area running from the mouth of the Puriata River to Motupena Point was also desirable, and the time for action was appropriate, for this locality was, according to information, lightly held. The 2/8th Commando Squadron now had the role of securing and holding the crossing of the Puriata River south-east of Barara. The light section of the 11th Field Ambulance moved out to serve the 61st Battalion in their advance from the Jaba River to Mosigetta. Kupon, the first important point off the Jaba River track, was entered without opposition and the position was consolidated.

On 16th February Mosigetta was entered by the Australian battalions. The 25th Battalion moved across through the deep swamps near the Tavera River so as to make contact with the 61st Battalion. Their patrols met near the junction of the Tavera and Konua Rivers, after encountering little Japanese resistance. During these actions there was a shortage of supplies, but this problem was solved by the combined use of air-dropping, carriage by water-craft, and by jeeps, for which a corduroy track was laid as the advance progressed.

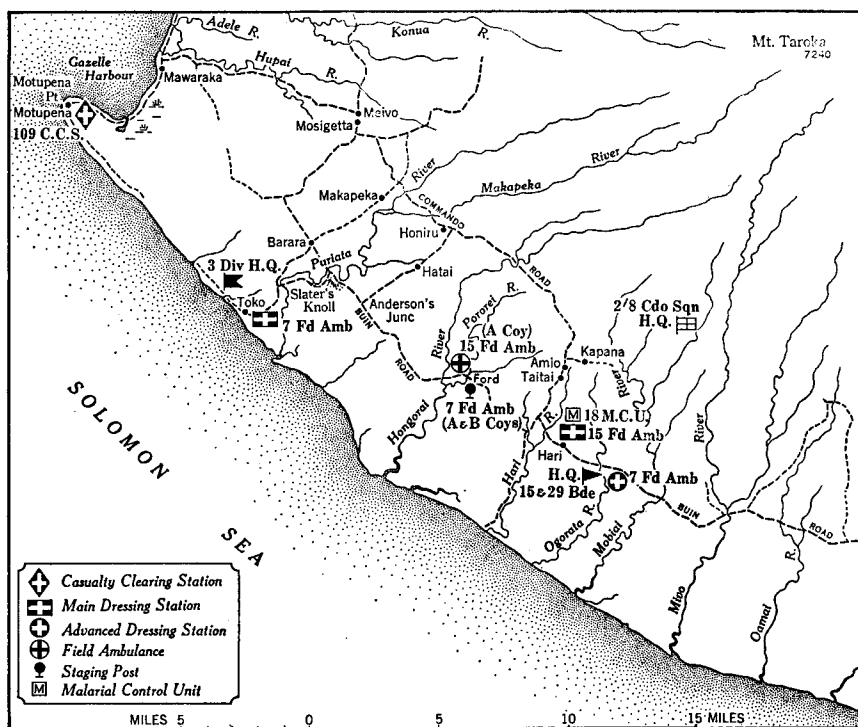
*Mawaraka-Mosigetta.* After encountering the enemy on 3rd February, the 9th Battalion realised that the enemy's opposition was part of a rear-guard action. On the 9th February, with the help of artillery, a company of the battalion secured the Hupai River crossing, and advancing along the river made contact with patrols of the 61st Battalion on the 17th at Meivo just north of Mosigetta. These two battalions continued patrolling in the neighbourhood of Mosigetta until a few days later they cleared this garden area of the enemy.

*Motupena-Toko area.* A company of the 25th Battalion which had landed by barge on the south coast of Motupena Point continued down the coast with only slight opposition and reached Toko on 3rd February. Reinforcements from the battalion were brought in to Toko by barge on the 12th, 20th and 22nd. After the initial landing at Toko, an advance was made inland towards Barara. South of this point strong enemy opposition was encountered, but Barara was occupied on the 23rd. Battalion headquarters was set up here and air-dropping of supplies was begun. Patrols were actively engaged from Toko southward across the Puriata River and were encountering Japanese parties in the garden area.

## MEDICAL ARRANGEMENTS

The accomplishment of these objectives involved two movements inland and one along the coast, and to meet the problem of a three-fold evacuation line an M.D.S. was kept at Tagessi with a surgical team until casualties could be brought through Mosigettaga to Mawaraka by the 11th Field Ambulance. The 7th Ambulance kept an A.D.S. at Tagessi, which was used for evacuation of casualties in the forward divisional area. On 16th February the M.D.S. of the 11th Field Ambulance was closed and reopened at Mawaraka.

To serve the inland advance on Mosigettaga, "B" Company of the 11th Field Ambulance, with a surgical team attached, opened at Meivo on the



19th. As the 25th Battalion moved along the coast, a light section was established at Motupena Point. "A" Company of the ambulance came in by barge to Toko on the 27th to establish an A.D.S. for the troops in that area. At the end of February a light section of the 109th C.C.S. took over the surgical duties of the M.D.S. at Mawaraka and also provided a surgical team for the A.D.S. at Toko.

*Puriata River Actions.* The rapid Australian advance in three lines had delayed enemy preparations for the defence of the Puriata River, and it was realised that there must be a strong enemy force across the river

which was expected to defend the garden area strenuously. The enemy was known to be constructing defences along the Buin Road, which was one of the two main axes of the advance plan towards the southern end of the island. So far, the last part of the advance to the Puriata River had committed most of the 7th Brigade and had needed all the resources of the transport system. The tactical plan provided for the maintenance of a jeep road and a three-ton road which proceeded *pari passu* with the general advance. The effect of heavy traffic and bad weather in causing deterioration of these tracks was apparent during the recent engagements.

The 61st Battalion continued to advance, and on 6th March reached the Puriata River near Makapeka. At the same time the 25th Battalion proceeded from Barara along the Buin Road and after seizing the west bank of the Puriata River on 27th February, crossed it on 4th March and increased the depth of the position by taking Slater's Knoll.

The light section of the 109th C.C.S., which was doing the theatre work at the 11th Field Ambulance M.D.S., moved into the Mawaraka and Motupena Point area in expectation of the ambulance move to Toko. In addition, the C.C.S. was supplying surgical teams to the two A.D.Ss. These teams worked with only half the usual establishment. The C.C.S. supplied both surgeons and the equipment and orderlies for one team; the field ambulance supplied equipment and orderlies for the other. There was no question of the value of these light surgical teams as proved by experience on other fronts, and there was no doubt that the reduction of travel time between a surgical team and wounded men saved many lives.

The plan for continuing the advance was to secure the area between the Puriata and Hongorai Rivers. In the first phase, two companies of a battalion would move independently, one on a native track, the other on the main Buin Road. After this a rapid movement to the Hongorai River was planned for the 25th Battalion. This began on 11th March; both companies reached their objectives without making contact. Evidence of extensive Japanese movements was found, and in view of this, a striking force of a brigade group with tanks and artillery would be necessary, with the 15th Brigade Group in reserve.

#### ACTION AT SLATER'S KNOLL

From 17th March the Japanese forces became aggressive, and on the 19th the 25th Battalion made an attack along the Buin Road. Here "B" Company captured a strongly defended position by hand to hand fighting. Part of the battalion's headquarters company held the high Slater's Knoll, and other companies the area near Anderson's Junction, where the Hatai track crossed the Buin Road. Though these features were not significant of themselves the Japanese were well aware of the strategic importance of these junctions, leading to the twin axes of the Australian advance and the northern part of the southern sector of Bougainville. Heavy rain had been falling, not only flooding and distorting the rivers and their crossings, but ruining the made tracks, so that in places only native transport could bring up supplies. On 28th March the culmination came with

an enemy counter-attack on Slater's Knoll but the 25th Battalion troops stood firm in the face of two night assaults. Heavy fighting ensued during the next few days, and a company attack with a troop of tanks of the 2/4th Armoured Regiment disorganised the enemy, and cleared them from the area, inflicting heavy losses. The Australian casualties were 25 killed and 90 wounded, while known enemy casualties numbered 130 dead and many wounded.

On 29th March a general offensive was launched by the enemy on the region of the Puriata River, and Barara was also attacked and a road block established. Strong opposition with heavy fire and hand to hand fighting dispersed these assaults, and tanks were brought up along the coast by barge, while strong defences were established. Japanese threats on Toko were abandoned in a final wild attack on Slater's Knoll, which was repulsed by steady fire with heavy enemy loss. This final action was launched on 5th April at five in the morning, but the result was disastrous to the Japanese: 292 dead were buried out of an estimated strength of 1,100 committed to this attack. Coincident enemy activity flared up inland north of the Puriata River, but this and other diversionary attacks ended in failure.

The 9th Battalion now assumed responsibility from the 61st Battalion as from the last days of March.

A light section of "B" Company of the 11th Field Ambulance established a medical staging post at Barara. This was necessary for the evacuation of casualties from the 61st Battalion and the 2/8th Commando Squadron, after the line of communication between Mosigetta and Mawaraka had been closed. The A.D.S. at Meivo remained open until the position had stabilised sufficiently to give a secure line of evacuation through Barara. The ambulance which had closed its M.D.S. at Mawaraka and opened at Toko on 22nd March remained there during this engagement. Owing to difficulties arising from tactical considerations and transport, it was not always possible to site the M.D.S. or an A.D.S. as far forward as was medically desirable. The solution of this problem lay in a more extensive use of light sections, which could be gradually built up to the status of a full A.D.S. with the attachment of a surgical team as early as was practicable.

Lieut-Colonel J. M. Blair had been acting as A.D.M.S. in the absence of Colonel Wallace, but now resumed his command of the ambulance. On 2nd April "B" Company closed the A.D.S. at Mosigetta and took over the M.D.S. at Toko. In order to reach the M.D.S., the personnel had to walk from Mosigetta to Mawaraka, thence by barge to Motupena Point and on to the M.D.S. by vehicle. A few days later the road from Mawaraka to Toko was opened; evacuation was then by motor ambulance to Motupena Point, where patients were loaded into barges, which could not land at Toko by reason of an unfavourable beach formation at that spot. By trans-shipment to motor launch at Gazelle Harbour the patients were then taken to Torokina to the 2/1st A.G.H. This journey took eight hours.

By direction of the 3rd Division, the 15th Brigade began to relieve the 7th on 13th April; this relief was to be gradual to permit regrouping of units. The two-pronged advance proceeded as before, with one battalion supported by tanks each following the two main routes and one battalion in reserve. These routes were the Buin Road and a northern track running roughly parallel with it known as the Commando Road. The 11th Ambulance had the task of clearing casualties for the 7th Brigade till 13th April, and then the 15th Brigade when the 24th and 58th/59th Battalions took up positions along the Buin Road in front of Slater's Knoll.

#### *ADVANCES ALONG BUIN AND COMMANDO ROADS*

On the 17th, the 24th Battalion made contact with the enemy at the Hatai-Buin Road junction. Although the enemy had strong defence positions, the battalion reached the Hongorai ford on 7th May.

Medical arrangements for this action provided for jeep ambulance and native carriers from the R.A.P. to the light section. Two motor ambulances were available in case of heavy casualties which fortunately did not occur. An advance party of the 109th C.C.S. arrived at Motupena Point to prepare a site for the main body of the unit, in a position convenient to a safe anchorage with a good beach. By 20th April the C.C.S. was staging casualties from the M.D.S. at Toko to the 2/1st A.G.H. at Torokina.

The 15th Field Ambulance, under command of Lieut-Colonel D. W. Brummitt, closed its headquarters at Torokina on 27th April and prepared to establish an A.D.S. near Shinru Creek between the Buin Road and Toko. A road fit to take three-ton vehicles was almost through to this site, where the M.D.S. was expected to be in full tide of work in about three weeks. A change-over with the 11th Field Ambulance was then planned. This unit had completed its important task of covering the needs of the 7th Brigade and, for a short time, the 15th Brigade.

Meanwhile the 9th Battalion was continuing its advance along the Commando Road to the Hongorai River, and was relieved by the 57th/60th Battalion by the 3rd May. The 11th Field Ambulance M.D.S. at Toko closed on 7th May and on the same day the 15th Field Ambulance opened there. Major D. F. Lawson from the 2/1st A.G.H. was attached to the ambulance as surgeon. The evacuation plan at this date comprised the use of jeep ambulances stationed at the R.A.Ps. of the 58th/59th Battalion on the Buin Road and the 57th/60th Battalion on the Commando Road. Thence casualties went to the A.D.S. under escort during the night hours because of enemy activity. Jeep ambulances took casualties to the motor ambulance post at the three-ton roadhead. They usually arrived at the M.D.S. within four hours of wounding, and after treatment, were taken from the M.D.S. by motor ambulance to the 109th C.C.S. at Motupena Point.

The 15th Brigade now had the immediate task of clearing the Hongorai River with a long-range plan of securing a line from the Hari River to Kapana by a simultaneous advance along the Buin and Commando



Roads. Following a period of active patrolling by the 24th and 58th/59th Battalions and after a week of heavy air and artillery attacks on the enemy positions, a general attack opened on 20th May. Supported by tanks, the 24th Battalion crossed the ford at the Hongorai River and cut the Buin Road on each side of the Pororei ford. By the 22nd, with the help of artillery and air bombardment, Egan's Ridge, a strong enemy position was occupied, and on the following day the Buin Road was cleared south of the Hongorai ford by both battalions.

A crossing was made over the Hongorai River by the 57th/60th Battalion on the Commando Road, and contact made with an armoured patrol of the 58th/59th Battalion moving across from the Buin Road on the 28th. The medical care for the 57th/60th Battalion was given by the R.M.O., Captain J. S. Jeffries, and a light section of the 15th Field Ambulance, with surgical and holding facilities as far forward as possible and evacuation was carried out by jeep ambulance or native carriers to the nearest A.D.S. In preparation for the Hongorai River attack, Captain F. L. Sharp of the 15th Field Ambulance had established an A.D.S. at Dawe Creek on 17th May. This dressing station had a twenty-five bed ward and a theatre with a resuscitation room which on completion became the ambulance M.D.S. on 22nd May. Major B. R. Morey and Captain D. L. Graham arrived at Dawe Creek with their surgical team from the 109th C.C.S. to work at the M.D.S. The A.D.S. of "A" Company moved forward with the advancing battalion to Kekro Creek. One company of the 7th Field Ambulance had moved into the 15th Field Ambulance site at Toko to permit the concentration of this unit at Dawe Creek. The responsibilities of the 7th Ambulance post at Toko included evacuation from the divisional maintenance area, and the line of communication area forward of Toko as far as Slater's Knoll. The 18th Malaria Control Unit was sent forward to Dawe Creek at the end of May so as to coordinate preventive measures in the 15th and 29th Brigade areas. The control unit worked here, and as the infantry moved forward, arranged for the units in the rear to take over the organisation so that the malaria control unit could again concentrate on forward work in the battalion areas.

On 1st June Hammer Road, connecting the two axes of advance, was open for evacuations from the 57th/60th Battalion to the A.D.S. which opened at Pororei. Here Morey and his surgical team were prepared to operate on all casualties whose condition would be prejudiced by a further journey to the M.D.S. The 58th/59th Battalion resumed the advance along the Buin Road on 2nd June, by the 4th had reached Peperu River and three days later was occupying the west bank of the Hari River. At the same time the 57th/60th Battalion, advancing along the Commando Road cleared the track across to the Buin Road from Amio.

Some anxiety had arisen concerning malaria in the 42nd Battalion which was guarding lines of communication in the rear of the advancing troops. The commander felt sure that the considerable rise in M.T. malaria during the first week in June was due to omission to take atabrin, and he proposed to take disciplinary measures if necessary.

The task now assigned to the 15th Brigade was the securing of the line of the Mivo River. To gain this objective there were three river crossings to be made, over the Hari, Ogorata and Mobiai Rivers. To carry out this operation, one battalion, the 58th/59th, advanced along the general line of the Buin Road, while the 57th/60th Battalion simultaneously advanced eastward to cross the Ogorata River, then turned south to cut the Buin Road. Meanwhile one company of the 57th/60th Battalion moved out on an outflanking sweep to the line of the Mivo River, and the 24th Battalion carried out diversionary movements in the south.

The installations of the 15th Field Ambulance covered the operations with their M.D.S. at Dawe Creek, and an A.D.S. with a surgical team at the Pororei River with the addition of two staging posts. As the A.D.M.S. wished the 15th Field Ambulance to remain in the Buin Road area, a party from the 7th Field Ambulance was detached to care for the 57th/60th Battalion.

*Hari River to Ogorata River.* After four days' bombardment, which included air strikes, and persistent artillery and mortar fire, the attack began on 13th June. Two companies of the 58th/59th Battalion crossed the river to the north of Hari 3 crossing, and unopposed, went on to cut the Buin Road at another crossing to the south. Further troops crossing the river found the previously strong enemy force near the Hari 3 crossing had withdrawn. Difficulties with tanks, and the disablement of a leading tank by enemy fire, caused delay in the advance, but on the 15th the forward company of the 58th/59th Battalion reached the Ogorata, and crossed this river next day. On the same day, two companies with strong artillery support disposed of the enemy on the eastern bank of the Hari River and cleared the road to the Ogorata ford. On the 16th, one company after crossing the river met the leading troops of the 57th/60th Battalion which was advancing from the north. The men were on the whole well, but Jeffries reported an increased incidence of florid skin disease, chiefly tinea, caused by the lack of change of clothing and washing facilities, especially during recent actions.

Lieut-Colonels C. H. Selby and R. F. Jaboor from the 6th Division in Aitape-Wewak, New Guinea, visited the M.D.S. at Dawe Creek and forward areas to investigate the difference in the malaria rates for various forces and areas, and the methods adopted for malaria control. This visit was part of an enquiry made on behalf of the commander, 6th Division. Further references to their findings and conclusions are made in the chapter dealing with Aitape-Wewak.

A new M.D.S. was now needed, and a site was chosen west of the Ogorata River, the old M.D.S. at Dawe Creek being taken over by part of the 7th Field Ambulance. As before, two surgeons were employed, Majors Morey and T. E. Wilson, and until the M.D.S. could move up with full facilities, a half surgical team worked at the A.D.S.

Comfort and adequacy of nursing procedures were assured in the 15th Field Ambulance by the carrying of fourteen surgical beds, and the portable X-ray outfit was installed at the M.D.S. The A.D.M.S. found

that this arrangement gave better results in proportion to the men and stores needed, than by the employment of a light section of a C.C.S. It must of course be remembered that the particular features of the campaign, especially with regard to the type of transport used, were considered in implementing this plan. The methods of evacuation at this point in the campaign comprised native carrier teams, jeep ambulance, motor ambulance, water ambulance craft and Auster aircraft. Problems arose, of course. For example, the wear and tear on the jeeps on rough corduroy roads was considerable, and the absorption of these vehicles for casualty transport reduced the amount of transport available for other purposes in the field ambulance. It was not always possible to pool jeeps for movement, as ambulance units sometimes moved together. The C.C.S. at Motupena Point acted as a stationary hospital of 200 beds: it staged patients to the general hospital.

The supply of rations was excellent. When the strain on the usual channels of lines of communication became severe air supply came to the rescue. The 2/8th Commando Squadron received fresh rations by air almost every day. This factor helped greatly in maintaining a high standard of health.

*Ogorata River to Mivo River.* The 57th/60th Battalion resumed its advance on 17th June along the Buin Road towards the Mobiai ford. A Japanese gun, firing from a strongly entrenched position, disabled the leading tank and held up further advance for several days. By successful outflanking movements one company reached the Buin Road in the vicinity of the Mobiai ford, but on the 23rd other companies were still heavily engaged. The next day heavy artillery and tank attacks forced the enemy to withdraw, and on the following day the road was clear from Ogorata to the Mobiai Rivers. Meanwhile the 24th Battalion was engaged in diversionary actions on the northern flank.

In order to take advantage of the speed with which the brigade's patrols were making outflanking movements, prompt advance to the Mivo River was highly desirable. Accordingly, plans were made to this end during the last week of June. On the 26th the 57th/60th Battalion crossed the Mobiai River, while the 24th Battalion came through and made ready for an attack to the south on the Buin Road, which was successful on the 29th. Concurrently the 57th/60th Battalion after a sharp engagement with the Japanese, also reached the Buin Road. After carrying out diversionary activities to the south, the 58th/59th Battalion forced a crossing of the Mobiai River and secured it. Heavy rain had been falling for days, and the roads were rapidly deteriorating. On the 29th June the 15th Field Ambulance experienced great difficulty in maintaining jeep traffic. The road between the M.D.S. and the Ogorata River became impassable: the brigade arranged for native carrier teams from the ford. However the evacuation scheme was working well, though the first stage took up to six hours. A car post at the R.A.P. of the 58th/59th Battalion helped to transport all but the seriously wounded. Captain L. W. Middleton, the R.M.O. of this unit, stressed the importance of having facilities for resus-

citation at the aid post. Serum was always obtainable, and blood also, as a rule, by calling on a mobile blood bank in the headquarters personnel.

The 15th Brigade had now had a strenuous period of activity, and on 30th June the 29th Brigade commenced to relieve them. Two companies of the 7th Field Ambulance were ready at the Pororei River to cover the movement of the 29th Brigade when this force should cross the Mivo River. By this arrangement the 7th Field Ambulance provided service along the line of communications to the C.C.S.

During the first week of July the Japanese made a number of vigorous attacks across the Mivo River, and attempted to push back the Australian forces on the west bank and along the track. All these assaults were successfully repulsed, and the battalions began patrolling on the eastern side of the river.

By 9th July the 15th Ambulance had provided a medical staging post along the Buin Road forward of the Mobiai River. This was designed to be developed as an A.D.S. with a surgical team for the action proposed in the crossing of the Mivo. However, the post was found to be too exposed to the enemy and was withdrawn.

The weather continued to be extremely bad, with incessant rain. Owing to the poor condition of the roads beyond the Mobiai River no patients were received by the M.D.S. for three successive days. On the 13th four patients arrived on stretchers brought by native teams, and ten walking patients were brought by returning ammunition jeeps. From this time onwards torrential rain restricted all but minimum activities. The road forward was almost impassable, and transport of wounded by jeep impossible. Casualties were still arriving, by native carriers, tractor trains, jeeps and all combinations of transport. On 20th July supplies for the field ambulance were successfully dropped from the air. By the 22nd all the rivers were in flood. The Mivo rose to seven feet at the ford, running swiftly, and the Mobiai was almost as deep and fast. Over twenty inches of rain fell on twenty-six days during July. Patients bound for the M.D.S. of the 15th Ambulance at Pororei were taken through washaways by the help of trucks provided by the engineers.

Flooding of rivers along the Buin Road caused many difficulties in evacuation of patients. Most of the bridges were rendered unserviceable in some way, and the bridge over the Hongorai was destroyed. A washaway on the beach road between the 7th M.D.S. at Toko and the 109th C.C.S. at Motupena Point necessitated the ferrying of patients across the creek to ambulances on the other side.

The 15th Field Ambulance war diarist summed up the medical events of the month as follows:—

This month has been marked by the bogging down of all operations owing to the rain and road conditions. As a result little movement of medical posts has been required; casualties and sick have been slight. Owing to the wide infiltration of small enemy bodies, bigger guards and more defensive positions have been required. The M.D.S. has been enclosed within a wire perimeter with four guard-posts; a Bren gun has been acquired to increase fire power and some booby traps set each night outside the wire.

The time was now approaching when the Japanese were facing surrender, and their unconditional capitulation on 15th August brought hostilities to a close. The campaign on Bougainville was far from static. The force under the command of II Corps had three sectors in which active fighting proceeded during the greater part of the period, and for part of the time the services of one brigade were needed for an unusual perimeter defence in a chain of islands surrounding the larger island member of the group. The Australian forces carried out a well-conceived and well-supplied campaign, and, although no final decisive result was won, largely owing to the colossal hazards of the weather, the military position was stabilised after severe loss had been inflicted on the enemy.

Medically the campaign offered many difficulties and problems of considerable magnitude. An attack consistently pressed on a narrow front, ever advancing over difficult country, placed the obligations of medical and surgical service on detachments of field ambulances often slender in size, who had to show their skill in carpentry as well as surgery. Endemic disease threatened the force to some extent; in particular, malaria and disorders of the skin, but resource and a practical approach, especially with regard to the use of suppressive atebtrin, solved these problems satisfactorily.

#### HEALTH DURING OPERATIONS

The battle casualties for the whole campaign numbered 39 officers and 472 other ranks killed; 82 officers and 1,478 other ranks wounded. The ratio of battle casualties to sick was 1 to 3.8. The most striking feature of the sickness suffered was the preponderance of affections of the skin, which accounted for 21.8 per cent of the total. Malaria produced 345 cases in the campaign period, the weekly rate being 0.73 per 1,000. The average strength of the force was 12,220 and only 100 reinforcements were brought in.

*Malaria.* D.D.T. was used as an offensive weapon against the adult mosquito. In December 1944 a supply of 200 pounds was obtained from the United States Army, and was used constantly until it became an A.S.C. issue. Suppressives atebtrin was the standby of preventive measures. In semi-static units seven tablets of 0.1 gramme per man per week sufficed to suppress the disease, but troops in battalions in contact with the enemy were found to require nine to ten tablets a week to allow for any element of break-down. Such element might be due to the conditions of battle, or to the occasional frailties of human nature. Under special conditions men on patrols were taking, under instruction, three tablets a day.

A field test was carried out and the results from forty-five units were consolidated. This showed that twenty units had not varied their atebtrin dosage, officially or unofficially. These were all small units, with strength under 200, and were semi-static in type. Five units took extra atebtrin after reference to the divisional headquarters, and five of these also took extra dosage unofficially. During the preceding six months, twenty units

had from time to time taken unofficial increases in atebtrin. There were nine battalions in the formation, and seven of these took extra atebtrin unofficially. Infantry battalions with the exception of one which had only three cases of malaria, took extra atebtrin for a period of at least seven days. The conclusions reached from this information were that men in contact with the enemy at some time or other took extra atebtrin; it seemed as if this was necessary for some individuals, in order to maintain an effective blood concentration under service conditions. A dosage of nine to ten tablets a week was found to be effective in suppressing malaria in combat troops, and in preventing mild infections from reaching clinical level. The divisional report in summarising these findings could not state whether seven tablets a week was insufficient under certain service conditions, or whether the larger dose merely ensured taking or absorbing a minimum of seven tablets. The latter was considered more probably true. This report further pointed out that even under the controlled conditions of Cairns the human factor could not be disregarded. To this may be added a comment, that there are reasons for believing that the amount of extra atebtrin unofficially taken by officers, in particular, was underestimated. In a discussion on the role of atebtrin in the prevention of malaria Major G. H. McQueen, the D.A.D.H., pointed out that some medical officers were sceptical of the results because of their ignorance of the Cairns investigation. They sometimes blamed the "breaking through" of the atebtrin barrier by the parasite when the real cause might be carelessness, or the breaking down of precautions under stress. In January 1945 the G.O.C. Corps ordered that all men contracting malaria were to be charged with failure to take atebtrin.

The malarial rate in the 3rd Division was low; in June 1945 it was 0.4 per 1,000 per week. The active work of the malaria control unit played an important part in this. Liaison was established between the Allied control units immediately after the 18th Malaria Control Unit landed on Bougainville, and this ensured that existing control measures were continued in the base area and on the outlying islands where troops were stationed. When a sharp increase in the malarial rate caused a rise to 1.3 per week the dose of suppressive atebtrin was raised to two tablets daily for one month. Some slackness had been observed, and the D.D.M.S. thought the value of the increased dose lay in the assuring that the correct dose was actually taken. He suggested that a better method of using a temporary higher dose would be to order five tablets daily for two days, then to revert to the usual dose after a sufficient elevation of the blood level had been achieved.

Spraying with D.D.T. was found most effective in destroying adult mosquitoes, and the pyrethrum "bombs" were of great value for local use. The higher rate recorded in the 3rd Division was 2.5 per 1,000 per week up to January 5th, the 7th Brigade demonstrated that a "nil" incidence could be attained even on active operations.

*Typhus Fever.* At the beginning of operations on Bougainville a mild type of scrub typhus was not uncommon. Most of the cases came from

two river areas, the mouth of the Laruma River and near the Jaba River. On 9th January the A.D.M.S. stated that no cases occurred after full anti-mite precautions were taken. These included the application of anti-mite fluid to clothing in the prescribed way, and the use of blankets treated so as to impregnate them with the fluid. In June more severe cases appeared in the 2/1st A.G.H., and during the next few months a serious type of infection was seen. The most severe cases came from a small island off the north-western tip of Bougainville known locally as "Death Island". It was declared out of bounds.

*Dengue Fever.* *Aedes Scutellaris* was prevalent in places, for example in the base area. From the beginning, care was taken to lessen contact between men and the vector mosquitoes. Some doubt was expressed whether some of these infections were in fact dengue, but the variable symptomatology of this disease is often deceptive. In January 1945 cases of epidemic polyarthritis were seen, conforming to the description of Lieut-Colonels J. P. Horan and J. H. Halliday in the Northern Territory. It is possible that some of the "? dengue fever" cases may really have been due to this infection.

*Dysentery.* The greatest number of patients under treatment for dysentery at one time was fifty-four, but never was there a serious outbreak, and during the last three months of the campaign there was a steady drop in the incidence, owing to improved hygiene.

*Ankylostomiasis.* The prevalence of hookworm in this theatre of war was notable and was associated with a heavy degree of infestation. As the troops moved forward into other areas the incidence lessened, and acute cases were not seen.

During March an investigation was carried out on the prevalence of hookworm in the 58th/59th Battalion. Middleton, the R.M.O., sent eighteen men to the 15th Field Ambulance for investigation into a state of malaise suspected to be due to hookworm. Fourteen of these men were found to be passing ova, and 418 soldiers were examined at the 2/1st A.G.H. Of these 117 were found to harbour the ankylostoma, and of a total of 521 investigated at the 2/1st A.G.H. and the 109th C.C.S., 28.5 per cent were proved to have hookworm. Mass treatment was instituted in the unit lines, the men were given tetrachlorethylene and oil of chenopodium and rested for the day, no check of efficacy of treatment was possible. Very heavy infestations were discovered in some of these men: one showed 300 ova per field, but in other respects the health of the men was good.

*Respiratory disease.* The general hospital treated many men with a prevalent mild respiratory infection. Some instances of "atypical" pneumonia occurred; these were not of the severe type of which some instances were seen among Allied troops in Australia, but were thought to be of virus origin. Investigation did not reveal evidence of influenza or psittacosis. Upper and lower respiratory tract infections were prevalent for a time among the natives, among whom cerebro-spinal meningitis was also seen. An outbreak of tonsillitis due to haemolytic streptococci

occurred among the troops during the June quarter, an unusual episode in the tropics.

*Infective polyneuritis* occurred in the force in small numbers, mostly of the type affecting isolated muscle groups. These resembled those seen on other fronts.

*Infective hepatitis* occurred in the 3rd Division just as in other formations during the island campaigns. The clinical course was of usual type, but two men died from acute liver necrosis with terminal uraemia, raising the question of infective hepatitis as a possible cause.

*Psychiatry.* A special ward was provided for psychiatric patients. Major H. J. B. Stephens, the psychiatrist to the hospital, found that the commonest types of condition treated were acute confusional psychosis, about 30 per cent, anxiety state 25 per cent and hysteria 24 per cent. Cardiazol shock therapy enabled the patients with confusional states to improve sufficiently to permit air travel to the mainland. Only for special personal reasons was full insulin coma used. Most of the psychoneurotics were returned to duty.

*Affections of the skin.* The prevalence of skin affections aroused concern on all tropical fronts. On Bougainville the self-contained conditions suggested facilities for further observation or investigation. Brigadier A. L. Dawkins, D.D.M.S. II Australian Corps, requested that an experiment be carried out on the personnel of the 2/1st A.G.H. to find out whether leaving off gaiters would lessen the incidence of skin lesions round the ankles and feet. The commander of the 4th Sub-area assented to a month's trial. The preliminary examination was made of the men some two months after their arrival at Torokina, and inspections were repeated at about weekly intervals. Most of these men had been engaged in heavy work in establishing the hospital. Clinical observation indicated that skin lesions of the feet and ankles were much less frequent when gaiters were not worn, though no statistical analysis was attempted. It was also noted that lesions reluctant to heal promptly cleared up when gaiters were left off. Permission to discard gaiters was not given except for the purpose of this enquiry, and then only during daylight hours in a controlled area. In other units where opportunity offered there was no doubt felt that the avoidance of minor trauma to the skin and its exposure to the sun and air prevented many of the infected traumatic lesions common on the lower limbs. It was not suggested, of course, that traumatic factors were the only cause, or even the predominant cause of minor lesions of the skin, nevertheless the environmental conditions were not favourable to the skin. The principal conditions occurring were *pyoderma*, *miliaria rubra*, and fungoid infections.

Sea bathing was noted to have a favourable effect on lesions of the skin. The 15th Brigade for example, established rest camps along the beach near Toko where sea bathing was extensively practised, reducing the sick wastage considerably, especially that due to skin infections.

To the D.D.M.S.'s. war diary of II Australian Corps on July 1945 a report was appended on the incidence of skin conditions in that forma-



tion. This was the work of a special skin investigation committee and included surveys of the dermatological state of soldiers evacuated to hospital or while at work in their units. It was the outcome of six months' work and observation.

During this period 2,568 cases of skin disease were admitted to medical units, an average incidence of 4 per 1,000 per week. In the same period 340 patients were transferred to the mainland and 47 reclassified as "B" class, unfit for service in a hot humid climate.

The experiment tried in the A.G.H. was repeated, but no conclusive results could be obtained. Comparison with the American and New Zealand forces disclosed no tangible difference, though the New Zealanders suffered much less from tinea, but much more from abrasions infected with staphylococci. This was thought to be due to their wearing shorts.

The committee did not suggest any major alterations in the official instructions relating to skin diseases. Tinea and intertrigo continued to give a great deal of trouble, even though over-treatment was then uncommon, as its dangers were clearly understood by all medical officers. The degree of care each man paid to his skin was an important factor in skin health, and the committee felt that more effort, by inspection for example, should be made to inculcate the precautions already laid down. In chronic tinea of the feet very encouraging results were obtained by the use of copper iontophoresis as suggested by Dr E. H. Molesworth. No X-ray therapy was available on Bougainville.

The committee considered questions such as the occupation of the men and climate. The effect of climate was evident. Numbers attending the aid post of an infantry battalion for skin affections rose sharply when the unit left a cool high area and went to a hot and humid one. Fungoid infections were also discussed and consideration was given to the possible means of infection. A dermatological survey was also made of troops on the outlying islands of the Solomons Group. On Green and Emirau Islands inspection parades were carried out, and the frequency of different types of lesion was compared with that in other areas.

On the basis of the material gathered the committee submitted a technical instruction on the diagnosis and treatment of skin disease, and an administrative instruction dealing with factors of probable importance. Dawkins felt that the suggestions were perhaps idealistic but that the investigation and deliberations did positive good, as they affirmed the value of well-established principles, and stated the need for these to be translated into practical terms.

As the Pacific war was over when this document was presented for consideration, and as similar and more extensive investigations had been planned in other areas, the time had passed by for the pursuance of these plans, but the importance of the problem was reinforced, and still remains as significant in tropical warfare.

The work done by the surgical teams varied greatly in the gravity of the clinical condition of the patient, hence the high value of facilities for resuscitation and transfusion. The time elapsing between wounding

and operation varied considerably in different areas, and with the mode of transport, as has been seen in other campaign areas. Transfusion services direct from Australia to the islands were very efficient. Blood taken by the transfusion units in Australia arrived at Torokina within thirty-six hours. Compound fractures, especially of limbs, continued to be a common type of injury; so too were soft tissue wounds, but many of these needed only the routine treatment of wounds not involving other important structures.

In December the team of the 109th C.C.S. found that patients from the vicinity arrived in less than an hour, those from forward areas in two to six hours, but men wounded in the late afternoon or at night might not be seen for twenty-four hours. Gas gangrene was not of significance, owing largely to the value of prophylaxis. Penicillin was of major importance, as it helped to give that armament against infection already given in part by necessary surgical intervention, and by resuscitation. The relative danger of certain injuries such as those involving the head, the long bones or the abdomen was much the same as previous experience on other fronts had shown.

During the last five months of the operational period on Bougainville, out of 380 battle casualties, fracture of the skull occurred in 10, and of the extremities in 68. Smith had 665 surgical beds available at the 2/1st A.G.H. during this period, and the average bed state, over a time when 500 beds were equipped, was 450. As the result of experience in that unit, and after visiting officially the southern and northern areas, he reported on the technical aspects of the work. He found that the disposal of casualties was not always satisfactory, as they were sometimes held longer than was desirable in C.C.Ss. and M.D.Ss. In certain instances better results would have followed prompter disposal, as in cases of secondary suture, compound fractures, wounds involving joints, perforating chest wounds and local gas gangrene.

He emphasised that the conditions on the island were such as to allow earlier transport of casualties, and that this was not only possible but desirable. The actual organisation of surgical work on Bougainville was of course conditioned by such hazards as flooding of rivers, by the type of available transport and of forward accommodation. The mode and time of movement depended largely on these, always having regard for what was best for the individual patient.

The forward organisation owed a great deal to the pioneer work of surgeons in previous campaigns, but on this front more material help was available to the men who constructed the jungle operating theatres, and those who worked in them. The advantages of a cement floor in a theatre are obvious, and of refrigerators as far forward as an A.D.S., which can thereby hold stored blood within reach of men suffering from shock. In some areas a team could work at the M.D.S., but where the evacuation time from A.D.S. to M.D.S. exceeded two hours, and when the total waiting time of the patient was over the safe period, the surgical team was more useful at the A.D.S.

The medical officers of the 3rd Division were given such opportunities for post-graduate study as were practicable under the existing operational conditions. On 5th January a meeting was held of senior medical officers at the Headquarters of II Corps to discuss the possible facilities. The importance of basic studies was emphasised, such as physiology and pathology. Arrangements were made to hold clinical meetings at the 2/1st A.G.H. and the C.C.Ss. weekly. It was pointed out that there were difficulties in obtaining replacements for medical officers for whom a period of study in hospital was desirable. Lectures and symposia could be given at night in addition to ward rounds; a medical and a surgical round could be held weekly or on regular days. Special subjects could be covered also, such as ear, nose and throat, skin, X-ray, pathology and anaesthetics.

In his quarterly report the D.D.M.S., Brigadier Dawkins, expressed the hope that arrangements could be made for exchange of medical officers with three years' service in the field. Those who had had long experience as R.M.Os. were to be sent to field ambulances, and other medical officers might be attached to a general hospital or a C.C.S. for special instruction. A useful purpose was served by these arrangements, as the interest taken by medical officers in the practical aspects of their work reached a high level. Greater difficulties were apparent in arranging for tutorial work in the theoretical subjects necessary for higher degrees and diplomas. Though these were an immediate post-war objective for many young medical officers, theoretical lectures and even ward rounds did not evoke a very keen response. Nevertheless plans were made for post-graduate work, and if there were difficulties in carrying them out it must be remembered that by this time hostilities had ceased, and a natural restlessness arose not assuaged by educational facilities alone.