CHAPTER 17

EL ALAMEIN

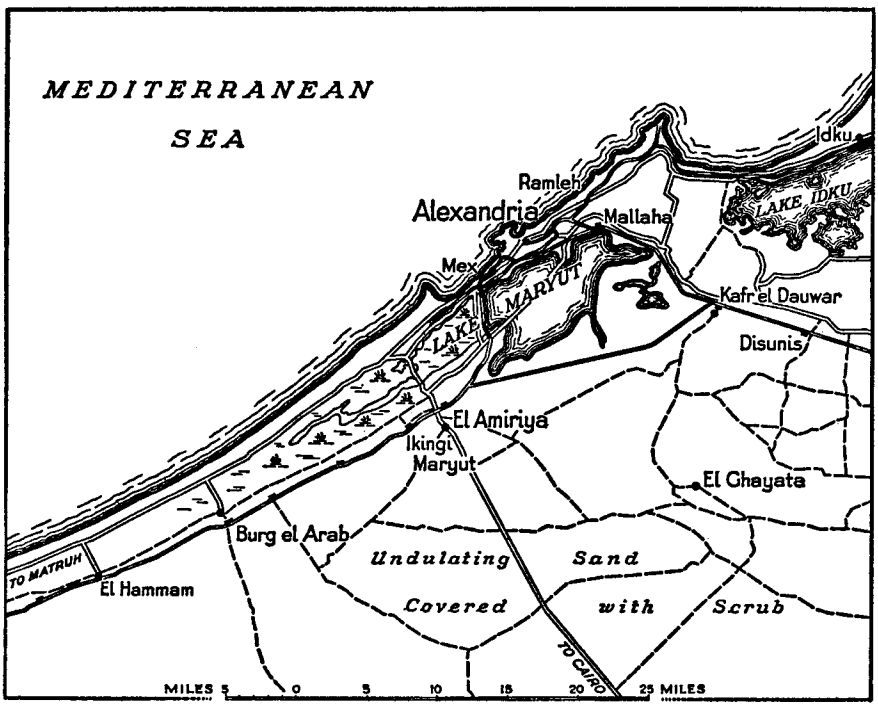
THE strategic position in Syria and Egypt has been outlined in the previous chapter. When the major part of the Australian forces in the Middle East returned to Australia the 9th Division remained. After being relieved in Tobruk this division had been assigned the task of defending the Lebanon and Syria, in particular the fortress area south of the Turkish border. By the early part of 1942 there was no imminent threat of an enemy force attacking through this region, and the fluctuating tides of battles in the Western Desert clearly showed that there the future of North Africa would be decided. The 9th Division appreciated the honour and the opportunity of joining the Empire forces in the desert, and the men, experienced, trained and hardened by the Syrian winter, were ready for this important assignation.

THE MOVE OF THE 9TH DIVISION FROM SYRIA

The move brought with it important changes in the medical services. One feature of medical interest in the military work in Syria was that no Australian general hospital had been established there. Since the occupation the work of a general hospital had been carried out by the casualty clearing stations at Beirut, and by the hospitals in Palestine. Early in 1942, however, the improved local situation in Syria led to a decision to establish an Australian general hospital at Sidon on the coast. Buildings were prepared, the 2/7th A.G.H. which had closed at its previous site at Kafr Balu in Palestine and was waiting in camp for word of further movement, was instructed to set up at Sidon. On 28th June, however, movement was suspended, and it seemed that this was part of a general change of plan. The 2/6th A.G.H. had taken over the hospital area at Gaza in Palestine, so long occupied by the 2/1st A.G.H., which had returned to Australia. The 2/1st Casualty Clearing Station had closed at Beirut and left for Australia early in February 1942. The 2/3rd C.C.S. after being stationed at Beirut since shortly after the occupation of Syria, took over the Italian hospital at El Mina at Tripoli during June, and continued working there till early July. The field ambulances of the division, the 2/3rd and 2/11th at Tripoli and the 2/8th at Aleppo were also closed in their existing locations and attached to corresponding brigades for the purpose of movement into forward areas in the Western Desert.

The British forces in the Western Desert had been forced to withdraw on 26th June, and axis troops and armour were following on closely. By 5th July the whole 9th Australian Division was disposed at Amiriya near Alexandria, and leaving a small nucleus for protection of the delta area, the main body moved forward and reached the area El Hammam-El Alamein by the 8th July. This urgently made move was headed by the

26th Infantry Brigade. The three brigade groups of the 9th Australian Division were each scheduled in turn for a fortnight of desert exercises at Forqlos, between Homs and Palmyra. The 24th Brigade with the 2/3rd Field Ambulance completed its exercise, but the 26th Brigade with the 2/11th Field Ambulance reached Homs with all vehicles loaded, only to be sent on through Bekaa Valley *en route* for Egypt. In order to deceive enemy agents unit markings were concealed and hats were changed to steel helmets, but the local inhabitants recognised the troops by various things, including their tan boots. Incidentally the value of this manoeuvre



Alexandria area.

was possibly offset by the increased risk of traversing a malarious area at this time of year. The 2/8th Field Ambulance had occupied a hospital in Aleppo, and early in June handed over to the 6th N.Z. Field Ambulance. When the N.Z. Division preceded the 9th Australian Division to Egypt on 17th June the 2/8th Ambulance returned to Aleppo for a short time. Here work was carried out with the help of nurses, but was not continued long, for the nurses were removed on 29th June, and by 4th July this field ambulance had arrived at a very congested assembly area at Alexandria with the 20th Australian Infantry Brigade. The 2/3rd Field Ambulance after running a hospital at Tripoli also with the help of nurses, and coping with a considerable epidemic of an unidentified short-term fever, closed, and on 1st July moved to Ismailia and thence to Amiriya.

ARRIVAL IN WESTERN DESERT

With these hurried movements the field units reached the threshold of the desert area where the division was to participate in the coming struggle. Meanwhile, the 2/3rd C.C.S. left behind early in July as the sole Australian medical unit in Syria, was relieved by the 120th British Light Field Ambulance, and thus freed to participate in the move south, arrived at Ikingi Maryut on 12th July.

The 2/7th A.G.H., commanded by Colonel J. G. Hayden, had sent a surgical team to Egypt on 30th June for work with a forward unit, and on 5th July opened the hospital at Sidon and began to take patients. The Australian convalescent depot authorised on 23rd May 1942, was first assembled at Sidon in June under Lieut-Colonel G. Fitz-Hill, and began to prepare for up to 500 patients. The Australian forces in the Middle East at this time comprised the 9th Division, A.I.F., in Egypt and the establishments at the Australian base area in Gaza, Palestine, where the A.I.F. headquarters was placed. The medical units were the 2/6th and 2/7th A.G.Hs. of 600 and 1,200 beds respectively, 2/3rd Casualty Clearing Station, 2/3rd, 2/8th, and 2/11th Field Ambulances, 2/4th and 2/6th Field Hygiene Sections, and the 2/4th Convalescent Depot.

The 9th Division was attached to the XXX British Corps of the Eighth Army. This corps included also the 51st Highland Division, the 1st South African Division and the 4th Indian Division. Medical arrangements for the corps were controlled by the D.D.M.S. Eighth Army, Brigadier J. Walker, and D.D.M.S. XXX Corps, Brigadier Austin. Colonel J. Steigrad was D.D.M.S., A.I.F. in the Middle East, Colonel H. G. Furnell A.D.M.S. of the 9th Division, and Major J. S. Peters D.A.D.M.S.

No time was lost in sending the 9th Division forward to join troops in the area behind the Alamein line. For the purposes of this advance into the desert mobility was essential. Accordingly, each of the field ambulances accompanied its brigade into the forward area, with the headquarters, one company and a mobile section from another. There was the usual shortage of transport: this was relieved in the main by vehicles loaned from the Australian Army Service Corps. The area assigned to the 9th Division was on the coast, one recognised as being of great importance, as it included the only transport arteries of road and rail, and its security was vital to the British right flank.

TERRAIN

The country in which two opposed forces faced each other was in some ways similar to other parts of Libya and Cyrenaica, but one important difference lay in the restricted area in which the battle for North Africa was shortly to begin. A strip of country along the Mediterranean coast carried a railway which had been extended westward to Tobruk in 1941, and a road closely following the coast from Alexandria. In the region of Alamein defensive line the armies were disposed in a narrow belt of desert, which was only some thirty miles wide from the Qattara Depression to the sea. This depression, in places below sea level, was marshy and

treacherous for motor transport and even for loaded camels. Though shallow and flat, it was flanked by a steep escarpment, which became a more precipitous barrier farther westward close to the sea. Beyond the depression to the south stretched the seemingly limitless sea of sand dunes of the Libyan desert. In the section allotted to the Australians along the coast were good beaches, and the climate was pleasant. A little inland from the sea stretched a low range of sand dunes, and beyond this a flat salt pan never wider than several miles. Beyond this again over a low escarpment lay a stretch of desert, stony and flat except for occasional inconspicuous ridges, rising in dusty clouds with every wind and every vehicle that passed over it. In this waste land a "line of defence" was really a number of heavily manned strong points behind wire and minefields, and the smallest rise or declivity was a potential site for a defensive position. Extensive minefields, many of them hundreds of yards in depth were a menace to movement, which was always dangerous in daylight on this featureless terrain which afforded no protection or shield from observation. In the desert there were few places as such, merely objectives; even the most inconsiderable cairns of stone or ruins of mud huts were welcome guide marks.

From the medical point of view the secure holding of the coastal strip was of great importance, as it provided the links of communication between the forward areas and the advanced bases. Ready access was specially desirable to a medical concentration area which had been set up in the Hammam area, including Gharbanayat, which was a railhead, and Burg el Arab.

The 2/3rd Field Ambulance had the earliest Australian experience of medical work in this part of the campaign on 7th July, when a small collecting post was set up to take casualties from a raid on the south flank: a light section from the ambulance accompanied the raiding party from the 24th Brigade.

PRELIMINARY ACTIONS

The 26th Australian Infantry Brigade was soon involved in the action of the XXX Corps against the enemy west of El Alamein on 9th July. In this counter to a previous German thrust an advance of five miles was made, and commanding ground at Tel el Eisa was captured which had given the enemy good observation over the defended area at Alamein. This valuable gain was held, though over ensuing weeks many attempts were made by the enemy to dislodge the Empire forces. Foothold on the coastal area was thereby strengthened and communications made more secure. The 2/11th Australian Field Ambulance under Lieut-Colonel W. W. Lempriere accompanied the 26th Brigade forward, after obtaining medical supplies at the 7th British Advanced Depot Medical Stores at Ikingi Maryut. Attached to the unit was a surgical team from the 2/7th A.G.H., Major T. Giblin and Captain C. B. Berryman. Extra ambulances were borrowed from the other two Australian field ambulances, the 2/3rd and 2/8th and the 16th British Motor Ambulance Convoy. During this action the unit handled all the casualties for the division from attacks and

counter-attacks over a period from 10th to 25th July. The main dressing station was in the Tel el Shammama region, set up several miles behind the battle area, far enough to permit all necessary urgent surgery to be carried out. Two small advanced stations were also opened, and with a "cab rank" of ambulance cars and a car post near the rearward of these, prompt movement of wounded was secured.

Following this initial action the 24th Brigade undertook a further series of attacks to stabilise the coastal position, where the deep forward thrusts had made communications vulnerable. These took place during the period 17th to 22nd July.

Many casualties came through the M.D.S. from both of these engagements. The 2/8th Field Ambulance was with the 20th Brigade Group in the early stage, and being in reserve was able to send a mobile team and vehicles to the 2/11th Field Ambulance. One company was left in Alexandria and afterwards was used in running a rest camp. It will be seen that in these preliminary engagements the same principle was followed as in the first desert campaign in providing forward medical and surgical attention. The divisional front, consisting of the 20th and 26th Brigades, was served by one main dressing station which was reinforced by additional staff from other units, and was allotted additional ambulance cars so that patients could be brought practically direct from aid posts.

On 10th and 11th July casualties were heavy, chiefly from shell and mortar-fire. Considerable strain was imposed on the ambulances, whose drivers worked long hours, but the arrangements worked well. Patients were retained in the M.D.S. until they could safely travel and then were sent by motor ambulance convoy cars to the 14th British C.C.S. in the medical concentration area at El Hammam. Thence they were sent to the 2/6th A.G.H. at Gaza Ridge; one early convoy travelled by the hospital ship *Aba* to Haifa and by train to Gaza. The 2/11th Field Ambulance carried the responsibility of the active M.D.S. till 25th July. This period included several exceedingly busy spells of work, particularly on 17th July when an attack by the 24th Brigade produced many wounded and on the 22nd when another large scale attack began. During the former of these actions the staff of the 2/3rd Field Ambulance was kept continuously working bringing patients to the M.D.S. where the surgical team was constantly engaged. There were many calls for resuscitation and the demand for blood was great, as its value in increasing quantities was more apparent. It should be noted that as early as 14th July numbers of men were treated for exhaustion, largely of psychological origin, and fear states also began to appear. Though it was desirable to treat men so affected in the lines the noise was a bar to proper rest. Captain T. E. G. Robertson, R.M.O. of the 2/24th Battalion treated thirty such men but was in some doubt if it would not be better to give them morphine and other more powerful sedatives, and to transfer them a little farther back than to keep them in the lines.

During the attack on 22nd July, the strain on ambulance drivers was very great, owing not only to the long hours but also to the frequent

necessity of working under fire. Shelling was so heavy during the night that one forward ambulance section had to be withdrawn. Light sections of the 2/3rd Field Ambulance brought in many patients under heavy shell-fire, in some cases through columns of withdrawing troops, and two ambulance waggons were damaged by shell-fire. Little progress was made with this attack, but in forty-eight hours the position became much quieter. There were heavy losses particularly in the Tel el Eisa area, where lay numbers of unburied dead. General sanitation was poor in some places, and everywhere there were swarms of flies.

MEDICAL PREPARATIONS

A new phase of the situation now began, that of preparation for a battle which seemed likely to be decisive. A regrouping of units was made in order to present greater strength in depth. Supplies of many kinds were arriving, and reinforcements were being sent from England. There were difficult problems of logistics in this, for there were long routes which had to be traversed, and passage of the Mediterranean was more hazardous than formerly. However, the forward medical units, though straitened in the supplies of some drugs and materials, were better equipped and organised than ever before, and British medical stores, now returned to Amiriya with the improved situation in Egypt, kept them well stocked with most necessities. Other difficulties arose from technical reasons. For example, a divisional rest station was opened on the coast by Major V. Bulteau with detachments from the 2/8th and 2/3rd Field Ambulances for a time, and later was re-opened and run by the 2/3rd Ambulance. It was not easy to obtain sufficient ordnance equipment for this useful adjunct to medical care, for there was no official establishment, but with help from D.D.M.S. XXX Corps this obstacle was overcome.

Further expansions of Australian medical units were made in Egypt. Another Australian hospital closer than Gaza was needed, and much closer than Sidon where the 2/7th Hospital had been instructed to proceed with developing the unit. On 9th July this unit had 192 beds equipped, on the 21st 588 beds equipped and 188 occupied. The number of patients had increased to 417 by 28th July, and on that day the 2/7th Hospital, having been summoned to Egypt, exchanged equipment with the 3rd British General Hospital, and three days later arrived at Buseili near Rosetta in the delta area in Egypt. Within a few days the hospital was working there, and by the end of August held 500 patients. The 2/6th A.G.H. at Gaza Ridge was instructed to expand to 1,500 beds. The need for a convalescent depot closer than Palestine was also felt; accordingly the 2/4th Australian Convalescent Depot, which was originally intended to supplement the work of the hospital at Sidon in Syria, was brought back on 22nd July to Nuseirat in southern Palestine and from there was moved on 15th August to Tolumbat near Aboukir in the Nile Delta.

As an intermediate holding unit on the route of evacuation from the desert, the 2/3rd C.C.S. under Lieut-Colonel J. E. Gillespie was available. This unit after being brought to Egypt, settled temporarily at Sidi Bisher

and on instructions from Steigrad began to equip for mobile warfare, using a new "G 1098" scale of establishment and equipping its light and heavy section separately. The light section, using Italian panniers, was completely packed up on 23rd July, and expected to be able to shift all its equipment with nine trucks. Some difficulty was found in obtaining a lighting set; trial was made of one large French trailer set brought from Syria instead of the two 1-kilowatt sets supplied. At this stage the arrangements for the heavy section were unsettled; the problem of its mobility was not yet solved.

On 24th July on a few hours' notice the 2/3rd Field Ambulance set up an M.D.S. at the site of a small advanced dressing station on the coast, and on the next day took over the care of casualties from the 2/11th main dressing station three miles away, thus permitting that unit to cease admitting and giving relief after a strenuous spell of work.

These arrangements allowed the forward units to share the work more evenly and to have enough time for rest and further preparation. Experience gained during the month showed that some of the ideas held at the beginning of this action period needed revision. The importance of adequate resuscitation was stressed, and the quantity of blood required was now recognised as being greater than had been previously used. Only limited amounts of blood could be obtained from slightly wounded donors as the proportion of severely wounded was greater than in previous actions, and the resources of the British blood bank at El Hammam were welcome. An old trouble arose with Thomas splints, how to reclaim them from units nearer the base. The presence of a Red Cross representative in the M.D.S. was very helpful in securing prompt supply of special stores. The number of stretcher bearers required was not found as great as expected, since ambulances could reach most aid posts; the bearers were most needed for loading and unloading. Patients awaiting transport were held in shelters under tarpaulins 30′ x 30′ and 40′ x 40′; it was found desirable for all hands in field ambulances to have practice in erecting these. This was all the more necessary as changes in staff had resulted in a number of ambulance officers being relatively inexperienced at the beginning of this campaign, though any such defects were promptly made good. From 10th to 25th July, 1,157 casualties were treated in the 2/11th Field Ambulance M.D.S. Three operating tables were in action in the M.D.S., and the surgical team acted as consultants. The results of treatment were on the whole very satisfactory; the only trouble was one recurrent with all medical units holding patients, that of dealing with the soldiers' kits.

The arrangements made for the reception and care of patients in the areas behind the front line had so far been satisfactory, but expansions were now planned which would secure prompt evacuation of sick and wounded to an intermediate unit, and thence to fully equipped hospitals. This plan followed the classic pattern, and had two advantages; it saved unnecessary travel for the sick, and secured the continuous care of Australian soldiers in Australian units.

HEALTH OF THE TROOPS

The health of the 9th Division was not in all points satisfactory. The men were fit and in good spirit, but endemic disease was causing considerable wastage. The most prevalent disease was diarrhoea; much of this was declared dysentery, though exact bacteriological diagnosis was not always practicable. Sigmoidoscopy was of course an established procedure, and was most useful in differentiating the dysenteries from other bowel disturbances. At the divisional rest station Major R. F. West acted as a medical consultant, and used the sigmoidoscope almost as a routine for this purpose. Infective hepatitis was also beginning to be troublesome in the area, and caused relatively more wastage, because of the longer convalescence it demanded. As summer waned respiratory tract infections increased in number: during September a number of units suffered depletion through an outbreak of tonsillitis.

Fortunately the Australians were in a good area on the coast, where the climate was not oppressive, and the dust less troublesome than farther inland. Most of the water came direct by pipe-line from Alexandria. Food was also good, and the accumulated experience of quartermasters and cooks resulted in the supply of a ration that was adequate and palatable when it reached the men. Red Cross supplies were well organised by the representative being in the divisional area.

ORGANISATION OF MEDICAL UNITS

The methods of work of the medical units were determined to some extent by the need for maximum mobility. Orders were given that field ambulances going up with brigades should leave behind as many men and as much equipment as could justly be spared without sacrifice of efficiency. Accordingly as at the beginning of these operations, each field ambulance entered the forward area with its headquarters and one other company, with only a mobile section of the remaining company. Though shortage of transport was felt again, loans of vehicles from the A.A.S.C. did much to remedy deficiencies. The tactical need for rapid advance and consequently for great mobility lessened by August, when the second phase of action began.

It will be seen from the arrangements described above that two ambulances combined in handling the casualties during the earlier phases of the campaign. At this time the division had a front of two brigades. One field ambulance collected casualties from its brigade and ran a main dressing station which served the division. The other ambulances collected casualties from the other brigade and took them to the same M.D.S. Advanced dressing stations were few and rudimentary only: a minimum of surgical aid was given here, the aim being to transport the men to the main station as soon as possible. Usually the ambulance waggons could go right up to the advanced posts, and, as in the preliminary engagement the need for stretcher bearers was only slight. Waggons from the M.A.C. were working as far forward as a rearward advanced dressing station, since the medical unit itself did not possess enough vehicles of its own.

Sections of the "Friends' Ambulance Unit", a voluntary unpaid unit raised by the Quakers, were closely associated with the 9th Division. One driver, R. Palmer, and his vehicle, by reason of a breakdown in a vehicle of the 2/11th Field Ambulance, remained attached until the end of the battle in July, and collected casualties from advanced dressing stations, an unusual role for an M.A.C. car. Even in these early engagements the value of a mobile surgical team was apparent. Equipped more fully than before, and more independent, the team had the advantage of good lighting, and facilities for sterilising dressings on the spot. Hitherto surgeons working in forward areas had clamoured for a generator set and an autoclave: now, though not on the official equipment tables, these items were recognised as essential.

The wisdom of providing a divisional rest station early was evident. The organisation did not permit the use of any extra field ambulance as in the corps rest station set up in Syria, but by employing men who had not gone forward with field units (the "left out of battle" or "L.O.B." category) and adding officers of appropriate experience from field ambulances a most useful unit was produced.

August found both sides organising their forces for the forthcoming battle. Lieut-General B. L. Montgomery assumed command of the Eighth Army on 13th August. Tactically the position was unaltered, except that the new army commander had secured additional defence for the Alem el Halfa Ridge in the south, towards the escarpment leading into the Qattara Depression.

During this month the base and forward base medical organisations were perfected. In the forward areas a more aggressive policy reflected somewhat on medical arrangements. For example within a small fortress area formed on the railway line at Shammama Halt Major N. H. Morgan of "A" Company 2/11th Field Ambulance set up an underground A.D.S. with operating theatre, resuscitation and holding rooms. At the base the 2/7th A.G.H. lost no time after arriving at Buseili, and by the 27th August had 729 beds equipped and 422 of these occupied, while by the beginning of September expansion to 1,000 beds had begun. Some difficulty was experienced in accommodating convalescent and long-term patients, and at first transfers to the 2/6th A.G.H. in Gaza were necessary, but by 26th August the 2/4th Australian Convalescent Depot was established at Tolumbat, after some delay in securing a full water supply, and began to take patients. The 2/3rd Casualty Clearing Station was completing details of its ordnance equipment, including such important items as a generator set for lighting. Mobility of this unit was aimed at as far as possible: Steigrad did not wish the heavy section to be immobilised in a building while the light section was freely mobile. Decisions concerning details of the part to be played by this C.C.S. were deferred till the full scale action drew nearer. By the beginning of September arrangements for the full operation of the divisional rest station were complete. This was designed to take lightly wounded men who would only need up to two

weeks of institutional care, the mildly ill, and all men suffering from exhaustion states or the psychological effects of bombardment.

At the end of August a determined attack was launched by the *Afrika Corps* on the extreme south of the Alamein line. This thrust began after midnight on the 30th, and was reinforced by other holding attacks and raids in the central and northern parts of the line. Rommel had boasted of a speedy entry into Alexandria, but the initial successes of the *Afrika Corps* were not sustained, though the German armour turned north behind the British left flank. The deep defences provided by the troops disposed on the Alem el Halfa Ridge, together with harassing attacks by the British armour in the south were able to counter this assault, and on the afternoon of 3rd September the German armoured force began to retire with heavy losses. The 2nd New Zealand Division was also involved in this action. On the 7th the fighting ceased, with the Axis forces still holding the western edge of the minefields originally set by the British in the south. Without hazarding a counter-attack, the British forces resumed their re-organisation and re-equipment. Without question this was a British success, and the moral uplift to all the troops was great. The spirit of the Australians was high, their discipline was good, and the reinforcements coming forward were men of good type; many came from the 6th and 7th Divisions, held back by illness or other reasons from moving with their own units.

This action was a good test of the medical arrangements. The 2/8th Field Ambulance was strengthened by the surgical team from the 2/7th A.G.H., Major Giblin and Captain Berryman, the last mentioned being replaced a few weeks later by Captain H. I. Turnbull, and also by the remainder of its "B" Company which previously organised the rest station. The rest station was temporarily closed, the M.D.S. of the 2/11th Field Ambulance taking minor medical and surgical casualties. A little later, as the time approached for the big attack, a rearrangement of field ambulances was made, and the 2/3rd then took over the rest station, which was designed to hold up to 200 patients.

The main dressing station of the 2/8th Field Ambulance was accommodated east of El Alamein in E.P.I.P. tents, which here, as elsewhere in the Middle East, were found most satisfactory and versatile. A group of five tents accommodated the surgical teams, two were used as theatres, two for resuscitation, and one for sterilising. Two other brigaded tents provided dressing posts. In their location the unit made ready for action: ambulance pits were dug, and, following current policy, only a small advanced dressing station was set up. Small tents and tarpaulins provided other accommodation, and three marquees were kept ready for emergencies, for example even the possibility of the area being surrounded. During the action a fairly low level air attack damaged an ambulance vehicle and wounded both drivers, though the patients were unhurt and the waggon was successfully driven in. The arrangements worked well and prompt resuscitation and surgical treatment were carried out on wounded.

(*W. G. Smith*)

Walking wounded and members of the 2/11th Field Ambulance at A.D.S. El Alamein.

(Australian War Memorial)

Underground operating theatre El Alamein.

The 2/11th Field Ambulance had an M.D.S. in undulating sand dunes near a beach within the 26th Brigade fortress area. A resuscitation centre was provided in tents, and an Anderson iron shelter made a satisfactory theatre. Here the unit took stock and had a brief rest after a strenuous month. Medical stores were fairly satisfactory on the whole though some items could not be obtained. Thomas splints were still difficult to reclaim, repeating the similar experience in the earlier desert campaigns, through failure of base units to return or exchange splints. Two dental units, the 14th and 20th were stationed in this area and were kept continuously busy.

Rations were good, so too was water, provided at the rate of one gallon per day, with supplementary supplies for medical units. Some trouble was experienced in the water containers in the R.A.Ps. as they did not withstand much transport. It was observed that while the men had opportunity for sea bathing "desert sores" were few, though they still troubled others like the infantrymen, who had no such opportunities. During the busy period the men had worked well in all the forward medical units. Both the ambulance drivers and the orderlies showed courage, endurance and gentleness.

FINAL PREPARATIONS

During September advantage was taken of the lull in operations to consolidate the position. Medical stores were still not fully obtainable, but supplies were improving. Sites were picked for main and advanced dressing stations, and the light section of the 2/3rd C.C.S. was brought forward to assist in the treatment of casualties. The commander of the C.C.S. suggested that the heavy section should also be brought into the operational area so as to reinforce and expand the light section: to this the D.D.M.S., A.I.F. agreed. The plan was that the light section should come forward to an administrative area without any sign that it was a medical unit. From there it was to infiltrate the area then occupied by the 2/11th Field Ambulance leaving the tentage undisturbed till the eve of the coming battle, and moving vehicles as little as possible. The 2/11th Ambulance began work on a new M.D.S. in partly finished underground rooms north of the main road at El Alamein, and as the C.C.S. light section moved in unobtrusively to the old M.D.S., the ambulance unit occupied the new site, moving small detachments only at a time, chiefly by night. No red cross ground signs were displayed. Further concealment was gained by leaving a certain number of trucks in neighbouring areas by day.

Efforts were made in general to remedy existing faults and shortages. As far as possible lighting sets and autoclaves were supplied for surgical work. Shortages of such equipment were difficult to overcome, for the actual materials could not be obtained except in small quantities, but it is difficult to understand why so much delay occurred in placing these items on the official equipment lists. Some of the tents supplied were unsuitable. By the middle of summer it was obvious that khaki coloured marquees had lost their light proof value; E.P.I.P. tents were found much better, though they had the drawback of added weight; R.D. tents were

found of little value for any purpose. There was of course still a shortage of vehicles and even increased establishments were found insufficient. Such necessary appliances as kerosene stoves of "Primus" type were never sufficient in number. Their value was so great that every opportunity was taken to obtain them from the Red Cross or any other source. Spare parts were also scarce, and had a supply been available delay and inconvenience could often have been saved.

By the time October had come the British forces were far advanced in plans for a major battle at the next full moon, at the end of the third week of the month. High level orders for the battle of El Alamein were drawn up early in October and on the 19th explained by General Montgomery to every commander down to the rank of lieut-colonel. All army units realised the necessity for perfect organisation; this was completely understood by all ranks, to whom the plan of battle was explained just before the action. The cover plan demanded also a high degree of secrecy of movement in order that concealment of purpose should be achieved, particularly in the placing and timing of the main thrust.

The medical services in their own field had to provide for sufficient mobility and elasticity, balance of reserves without wastage, and adequate handling and transport of casualties. The Commander-in-Chief predicted that the action would present three phases, "the break in, the dog fight, and the break out and pursuit". This gave the keynote of all the preparations.

The disposition of the medical units for the battle were as follows. The 2/3rd Australian Field Ambulance expanded the D.R.S. at El Hammam to 240 beds and was prepared to receive the lightly sick or wounded patients, or those of the neurological type, and retain them up to two weeks. Even in the less forward areas the daily risks were emphasised by the blowing up of Lieut-Colonel Mugford's car on an unsuspected minefield, fortunately without casualties. Captain Barry and two theatre orderlies were lent to the M.D.S. of the 2/8th Field Ambulance. In accordance with the need for mobility one company of the unit was kept "on wheels" ready to move. It will be seen that as in the first desert campaign the principle was followed of the field ambulances being used in accordance with need and efficiency, and if necessary subjected to a process of fission.

The 2/8th Field Ambulance had Lieut-Colonel Hanson once more in command, after relieving as A.D.M.S. Colonel Furnell who had been ill. The sites occupied by this unit remained unaltered, but in accordance with the tactics of deception of the enemy, the necessary changes in forward posts were not made till after dark on the eve of battle. More ambulances were brought up and lorries for walking wounded, who were to be collected at a divisional medical post controlled by the transport officer of the 2/3rd Field Ambulance. Other lorries were provided for taking men to the rest station. Additional vehicles were ready in the care of a small detachment in the 24th Brigade Group. Majors S. L. Seymour and V. Bulteau looked after evacuation arrangements from the 20th Brigade, with the necessary assistance of bearers and transport. Two stretcher

bearers were also placed with each regimental medical officer as guides. The advanced dressing station was not a conventional dressing station, but reduced to its simplest terms as a collection point with several slit trenches. The 2/13th Field Company marked the tracks to the R.A.P., making the way easy to find, though it was noted later by some drivers that a road could be readily lost, especially at night, when the dust and smoke obscured even the light of a full moon.

The 2/11th Field Ambulance had moved up to its new M.D.S. on the coast, near Abiar el Shammama and with its "B" Company opened an A.D.S. near which was an ambulance car park, with vehicles pooled from all field ambulances. A surgical team, Major R. N. Howard and Captain A. J. Kennedy, with five men, was attached, with its own transport and equipment. The light section of the 2/3rd C.C.S. went forward to the old site of the M.D.S. of the 2/11th Field Ambulance to take part in the surgical work there, and final arrangements were being made for the disposal of the heavy section.

As the time set for the battle of El Alamein approached all medical arrangements were concluded, certain connecting links being left until the last. The field units made their necessary exchanges cautiously and with stealth. Manoeuvres involving the collection of vehicles in parks or in shifting equipment were done with all practicable concealment. At the other end of the chain the base hospitals and a convalescent depot were now well settled in and expanding their resources. There remained the heavy section of the 2/3rd C.C.S. Arrangements were made to set it up at the eastern end of the medical concentration area, Gharbanayat, under the control of the D.D.M.S. Eighth Army. Fourteen 3-ton lorries were needed to transport the material and equipment. The move was made without display of red cross emblems and after some delays from a dust storm and a heavy air raid, the unit reached the area safely and promptly began to make the necessary excavations and to site and pitch tents. With the help of a Mauritius labour corps the work was completed only just in time for the beginning of the action. As soon as accommodation was ready nurses were sent up to work at this advanced base, where they arrived on 21st October, while the concrete was being laid for the theatre floor. Some difficulties of administration of this unit were apparent, since its two sections were in different areas and under separate commands. The light section's constitution did not permit it to act as an M.D.S. but it was placed under 9th Division A.I.F. for administration, and the D.D.M.S. XXX Corps promised that its services would not be overtaxed. On the eve of the battle an arrangement was made for each C.C.S. in turn, including the heavy section of the Australian C.C.S., to receive 150 patients, so as to give time for dealing with admissions. The 2/4th Field Hygiene Section was attached to the 2/3rd C.C.S. light section for general duties.

Conferences were held with the commanders of the New Zealand C.C.S. and other units as to the times and methods of evacuation of casualties. It was arranged that all A.I.F., Greek and French wounded, and all those

with facio-maxillary wounds should be sent by road to Alexandria. The plastic surgery was done in No. 1 Facio-maxillary Unit in a general hospital in Alexandria under the care of Major D. Officer Brown, A.I.F. who was on loan as surgeon in charge. Others were sent to Cairo. Air transport from the medical concentration area to Buseili was also discussed, particularly the possibility of using an airstrip close to the hospital site. Transport from Egypt to Palestine was also organised by land and sea, and in emergency by air.

It was of course essential that during heavy attacks a smooth flow of casualties be ensured, so that no surgical team should be overloaded, and none left without occupation. The plan revolved round the check post established at the roadside at a point about eight miles west of El Alamein railway station. This was manned continuously by the D.A.D.M.S., Major Peters, his assistant, Captain M. R. Gold and an N.C.O. The chief car park for ambulance cars and lorries for walking wounded was close by, separated in fact by a minefield. Movement of casualties was directed solely by Peters or Gold, who had a telephone to the A.D.M.S. at divisional headquarters and to the car park. A car replacement was promptly sent forward as each loaded vehicle passed towards the M.D.S., and empty vehicles returned as soon as possible from the M.D.S. to the car park, where they received any necessary maintenance and the drivers were fed and rested. Sometimes it was advisable to leave severely wounded men at the 2/11th M.D.S., rather than expose them to the eight miles longer journey to the C.C.S. This check was useful for communications also, and the A.D.M.S. who could use it as a sort of tactical headquarters through which messages could be promptly sent. If any M.D.S. became unduly crowded casualties could be diverted to another by ringing the check post. Before the battle began detailed arrangements were made for transport vehicles for wounded. All the thirty-two ambulance waggons belonging to the division were pooled. Of these five motor ambulances served the 24th Brigade on the coast, running to the 2/8th Field Ambulance, M.D.S., and two were left at the rest station for use by the 2/3rd Field Ambulance. The remainder were devoted to general use forward. Arrangements were made for each field regiment and each battalion of the 24th Brigade on the coast to provide a 30-cwt. or 3-ton lorry for walking wounded. These vehicles did not enter the car parks. In addition, each field ambulance supplied eight lorries for similar purposes, all equipped with blankets and two stretchers, and each with an orderly. The drivers of the ambulances and lorries had their meals at the main car parks, where they also had such sleep as circumstances permitted. Modified advanced dressing stations were established during the battle as need arose.

THE ATTACK AND BREAK IN

The attack began before midnight at 2140 hours on the night 23rd/24th October, and after the severe preliminary barrage infantry units were engaged. The early casualties came back promptly; though some of those

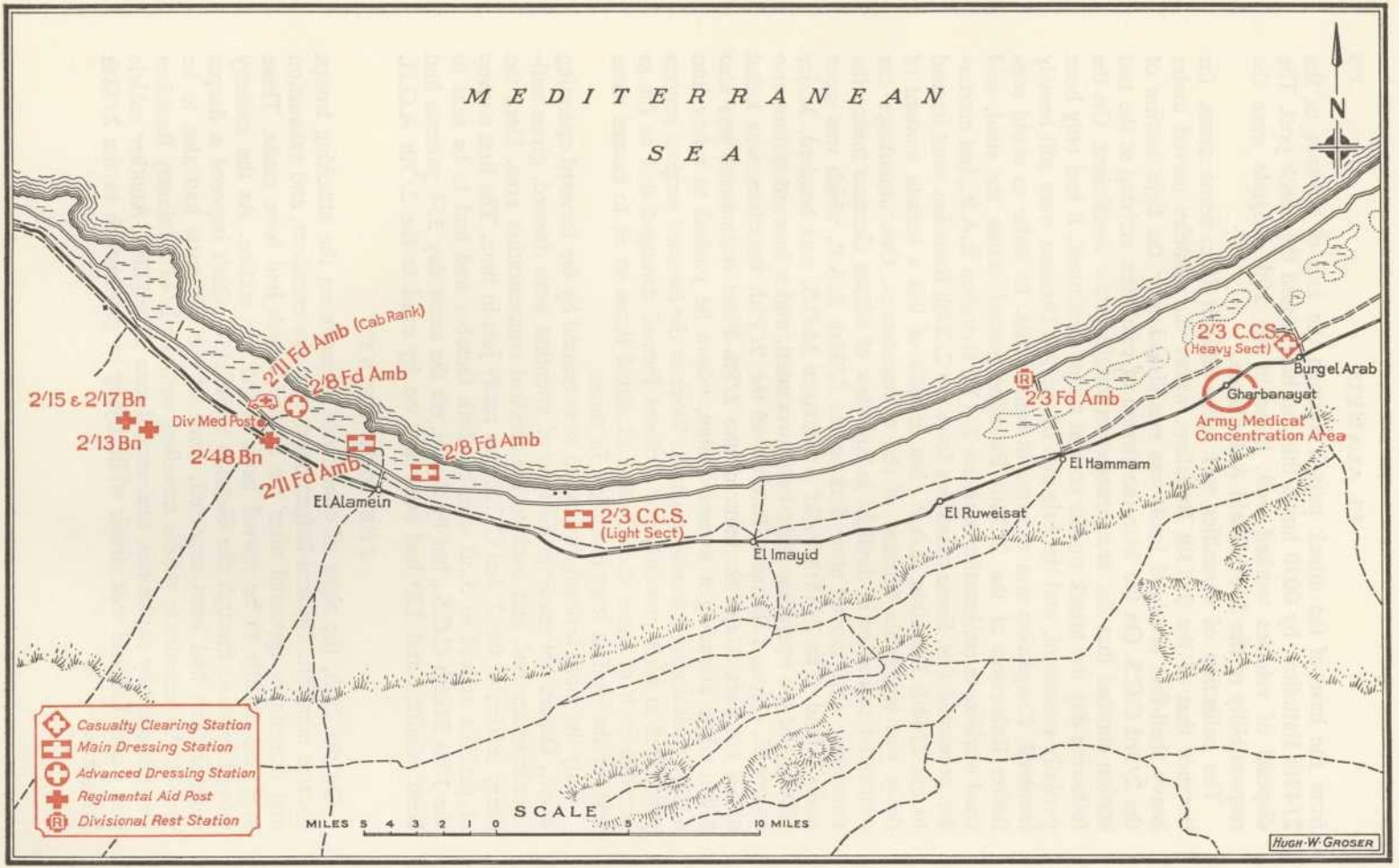
from the base of the attack passed through the axis of advance of the 2/48th Battalion, by 0030 hours thirteen had passed the check post. The disposal of vehicles worked well; those in the 20th Brigade were the responsibility of the 2/8th Field Ambulance.

The collection of casualties was more difficult from some areas, for instance that of the 2/13th Battalion, where the vehicles moved under heavy shell-fire. A blood bank was established near the light section of the 2/3rd C.C.S. On the 24th the stream of casualties arriving at the rest station showed that the accommodation would prove insufficient. On the following day the attack on the coastal sector continued: it had only been partially successful, and the brigades of the 9th Division were still heavily involved. Congestion was extreme in some areas. In order to avoid confusion Robertson of the 2/24th Battalion moved across the road, and tried working in conjunction with the 2/17th Battalion R.A.P., but mortar-fire prevented this. Some casualties from the 2/24th Battalion went instead to the 2/48th Battalion R.A.P., but in spite of this a certain amount of delay was inevitable because of the circumstances. One ambulance car evacuated casualties in daylight in full view of fifteen German tanks: the remainder were moved after dark to the 2/24th R.A.P. which was more easily found. The 2/11th Field Ambulance M.D.S. was bombed, Major Howard of the operating team being wounded, and a forward station also damaged. Captain Samuels, R.M.O. of the 2/15th Battalion, was killed at his aid post. Major Seymour of the 2/8th Field Ambulance was also killed while attending a wounded man, whom he pushed to safety into a slit trench during a bombing attack. Work in the forward surgical centres proceeded at high pressure, and Colonel Furnell arranged that as far as possible each of these should close at stated times so as to ensure some rest for the staff at least one night in three.

Only the more seriously wounded were treated by the forward operating teams. Others not needing this type of attention were dressed, given anti-tetanic serum and sent back to the medical concentration area. Here the heavy section of the 2/3rd C.C.S. was ready just in time. The first convoy of patients arrived at 5.30 a.m. on 24th October and had to be sent to the 10th British C.C.S., but by 3 p.m. on the same day 354 patients had been admitted and 120 had been sent on by road to the 2/7th A.G.H.

THE "DOG FIGHT"

On the 26th, the signs of continuous pressure on the attacking troops became manifest. Physical fatigue began to make exactions, and exhaustion and fear states appeared after the second attack had been made. These men had usually to be moved back to the rest station. As the infantry moved forward through the German minefields, which imposed a deeper defence than had been expected, some of the aid posts had also to be moved. An ambulance vehicle travelling with the 2/48th Infantry Battalion was damaged by explosions, and several men were killed. Another vehicle was under fire and was struck while trying to get through to the 2/48th Battalion.



El Alamein, 24th October, 1942.

By this time the momentum of the attack was diminishing. The Australian troops had made considerable advances in the northern sector and the men were tired after three days and nights of action. German anti-tank defences and heavy counter-attacks held up the advance. On 27th and 28th October a regrouping of forces took place. This involved the 9th Division in an assault on the coastal salient of the Axis forces and was designed as a necessary preliminary for the hoped for break-through of the XXX Corps, followed by engagement of the British armour farther to the south. A counter-attack by Rommel was frustrated by heavy bombing by the Desert Air Force.

The strain on the troops was reflected in the medical units. Blood plasma and serum were running short, and suggestions were made for supply of blood from members of the A.I.F. in Palestine. At the forward section of the 2/3rd C.C.S. the high proportion of seriously wounded made post-operative nursing a heavy responsibility. Furnell had found it advisable to extend the scope of this light section and had built it up with extra officers and men till it could function as a main dressing station. As it consisted of an operation team and an officer for resuscitation and anaesthetics with nursing orderlies it would have been ideally attached to an M.D.S. in the ordinary way. It was not as self-contained as its name suggested, and came in rather late for other disposition. In addition, there was no available room at the 2/11th M.D.S., and the 2/8th M.D.S. was near a salt marsh which might have been an obstacle to traffic in case of rain. Help was given to the 2/8th Field Ambulance both in an advanced dressing station and the main dressing station by attachments from the 7th British Light Field Ambulance. Vehicles were finding difficulty in movement on some of the tracks, as the forces went forward, and the rank of ambulance cars was exposed with no efficient cover. The divisional rest station was working practically to capacity and found it difficult to cope with the stream of lightly sick and wounded and the men with exhaustion states. The need for psychiatric guidance was felt at this time, for although Major A. Stoller had been detailed to study the problems at the 2/1st Australian Convalescent Depot, the staff of the rest station realised that treatment of many of these men would be much more effective if undertaken promptly in a forward area.

THE BREAK OUT

On the night of the 28th/29th October the 9th Division began an attack which was hoped to be a prelude to the break-through. Against strong opposition the Australians drove a narrow wedge through the extensive minefields. This ground was held in spite of strong counter-attacks. An advanced post of the 2/8th Field Ambulance was discovered to be on a minefield only by the blowing up of a vehicle. The dressing station was therefore moved to a more appropriate site on "diamond track". The R.A.P. of the 2/23rd Battalion could not be reached except through fixed machine-gun fire and by day vehicles could only safely be left at the aid post of the 2/13th Battalion. Transport conditions were in fact most

difficult everywhere. All roads were jammed with tight masses of traffic, the dirt surfaces were cut up badly, and heavy clouds of dust obscured vision. This congestion made it difficult to reach and remove the large numbers of wounded who suffered chiefly from the heavy shell and mortar-fire, and the shelling of sites of R.A.Ps. accentuated this problem. In preparation for further movement forward the remainder of "A" Company of 2/3rd Field Ambulance went up to the 2/3rd C.C.S. light section.

The next day the roads were freer and wounded were brought back more easily, but as the division pressed its attack northwards the movement of wounded was again difficult. The attack was successful in penetrating beyond the coast road, but did not reach as far as the sea. This action cost many casualties. The R.M.Os. were somewhat hampered in their work at the R.A.Ps. on account of the great congestion. On occasion the halting or turning of a battalion's line of advance increased these difficulties and casualties were not always met by their own medical officer. Such movements also interfered with prompt evacuation of wounded at times. On the 31st wounded could be safely sent away in daylight from the 2/32nd Battalion aid post at the "blockhouse", north of the railway, although the movement was under direct observation of the enemy. Two of the tired battalions were relieved by others.

The "blockhouse" was a railway building of six rooms between the railway stations at Tel el Eisa and Sidi Rahman. It was captured by the 2/32nd Battalion and was found to be occupied by three German medical officers with orderlies and some wounded Germans. The R.M.O. of the battalion, Captain W. Campbell set up his R.A.P. there, and Captain Grice settled his section of the 2/11th Field Ambulance there also, and a kind of international medical post was established with two Australian and two German medical officers working together. The German forces did not attack it, but fired on vehicles approaching it in daylight, though a German ambulance brought back one Australian and five German casualties the next day. Later this area was stabilised, and the German personnel were brought back to the 2/11th M.D.S. to help with their own casualties, but as they showed discrimination against their Italian allies they were sent to join other prisoners. The "blockhouse" was used as an A.D.S. later, but on 31st October and 1st November it was in a dangerous area, as appeared when a walking wounded lorry was blown up on "diamond track", and Captain J. F. Sullivan R.M.O. of the 2/17th Battalion was wounded.

The divisional rest station was kept very busy, and the strain imposed by psychiatric casualties was such that Mugford of the 2/3rd Field Ambulance asked for skilled assistance. The surgical teams and staffs of main dressing stations continued to work at high pressure, and a steady flow of patients proceeded thence to the medical concentration area and so on to Buseili and Gaza. On the 2nd, shelling of the area which surrounded the 2/17th Battalion R.A.P. was continuous, and the patients were moved from the "blockhouse".

Meanwhile the battle tactics had been altered to take advantage of the opportunity of a break-through farther south. Here the 2nd N.Z. Division and armoured brigades established a new corridor through Axis lines. Strong anti-tank screens used by Rommel held up further armoured advances by Montgomery's forces but increased Axis traffic on the coastal road showed that the enemy were extricating themselves, and that the break-through was almost complete.

FINAL TASKS FOR THE 9TH DIVISION

On 4th November the British forces were in pursuit. Strong resistance in places still had to be overcome, and shelling made the main road unusable for routine evacuation of wounded. The M.D.S. of the 2/8th Field Ambulance was now virtually closed except for local sick, but the nursing orderlies attached with the operating team were still very busy caring for patients recently operated on, and were therefore not free for movement. Men with exhaustion and fear states were still coming in, but Major Stoller, detached from the 2/6th A.G.H. was working as a psychiatrist at the 2/3rd Field Ambulance Rest Centre. For the first time in the war an Australian psychiatric first aid post was established at the front line. Over 100 patients passed through Stoller's hands, and only a very few of these had to be passed on to the 2/7th Hospital. A little later he saw some of these patients when they appeared before a medical board, and saw several others still later at the 2/6th A.G.H. The follow-up thus made showed that very few of the men treated in forward areas continued to have severe psychiatric symptoms, and corroborated the value of early treatment and disposal. It has been previously pointed out that medical officers who saw psychiatric patients in forward areas both in Tobruk and Alamein felt that the plan followed in Tobruk in recording the diagnosis of "fear state", when this was justified was fair to all parties.

Movement of wounded by the main road was possible by the 5th, and on the following day the general situation was such that the 9th Division could be allowed to rest and then to refit. By the 8th the phase of pursuit of the enemy had begun. Operations were hampered by a heavy fall of rain which prevented movement of the armoured vehicles, and thus the complete disintegration of the Axis forces in the area was impossible. The 2/8th Field Ambulance and 2/4th Field Hygiene Section were placed under command of the 20th Infantry Brigade in case this force was used in the pursuit. The light section of the 2/3rd C.C.S. had transport troubles, as the M.A.C. cars had been withdrawn, but the next day obtained an extra lorry and was then able to move the remainder of its equipment. This C.C.S. was the only Australian medical unit to advance beyond Alamein, reaching the neighbourhood of Matruh; the heavy section moved from El Hammam in the wake of the victorious Eighth Army, and set up a hospital and staging post at Garawla. The nurses were brought forward with the N.Z. nurses, and though the swiftness of the German retreat limited the activities of the unit, useful work was done in the area. Further

movement westward was planned, but this was cancelled and on 9th December the unit began its move back to Palestine.

By the middle of November the tasks remaining for the medical services of the 9th Division were no longer of the high intensity demanded during the battle. The division now came under the command of the XIII Corps, and the field medical units carried out the normal maintenance medical work. By the 14th the surgical team from the 2/7th A.G.H. was no longer required, and had returned to its parent unit. The 2/3rd Field Ambulance still continued to run the divisional rest station and by the middle of November the 2/8th Field Ambulance was ready to move, while the 2/11th Field Ambulance acted as a giant aid post for various units in the area. Once again diarrhoeal diseases became prevalent, no doubt spread by troop movements and by the occupation of areas vacated by retreating enemy troops. Flies were swarming in millions. The hygiene of the battlefield area was of a low order; a number of dead bodies were still not buried, a task left to others while pursued and pursuers took the long road to El Agheila. On 29th November the headquarters of the 9th Division moved back to Palestine.

MEDICAL REVIEW OF THE CAMPAIGN

It is now opportune to review the general health of the troops during their periods of preparation and action in the desert. Diarrhoeal diseases were common soon after the arrival of the division, as may be seen from the figures for the twelve weeks ending 3rd October. During this period there were 1,253 cases of these infections out of a total of 3,976 medical casualties. This figure may be compared with 844 for minor infections of the skin and areolar tissue, 750 pyrexia of unknown origin, and 465 mild respiratory infections. The number of obscure pyrexias really expressed the impossibility of achieving a final diagnosis in the divisional area. Some of these may have been infective hepatitis, of which 243 cases were seen. The experience of the New Zealand division is much more enlightening here, as this force suffered heavily from hepatitis, and its medical officers produced strong epidemiological evidence of the intestinal origin of this disease. The long period of convalescence necessary after a severe attack of infective jaundice caused considerable loss to the force. Colonel Furnell, A.D.M.S., and Lieut-Colonel Lempriere, commander of the 2/11th Field Ambulance, were among the victims. Since it is now known positively that this is a sanitation disease, it is permissible to include it with the diarrhoeal group from the hygienist's point of view; these combined groups then represent 40 per cent of the medical diseases affecting the Australian force for the period of three months ending 3rd October.

In his quarterly report, the A.D.M.S. commented that great disappointment was felt in the early summer months that the lessons of sanitation seemed to have been little regarded; though this was largely owing to the constant need for mobility there was really a breaking down of a previously high standard. Later on, the workshop of the 2/4th Field

Hygiene Section under Major Fryberg gave great help in providing fly-traps, safes and superstructures for latrines. At an earlier period carrying about such fittings was unpracticable, and wood was an unknown commodity to most units in the desert. These preventive measures and the natural decline in fly population in the ensuing hot months helped to limit the losses due to these diseases. It was noticeable that when more active measures could be taken to prevent fly breeding and to exact a high sanitary standard the numbers of bowel-borne disease decreased. Other useful measures were the holding of classes in military procedures and hygiene for medical officers who had not had previous experience, and even more valuable, the provision of hygiene inspectors who lived with the units. The constant efforts put forward did much to keep the fighting force at a good general level of fitness.

The water supply, as above mentioned, was good throughout. In order to conserve the piped supply from Alexandria, local supplies were drawn upon as far as possible. The engineering feat of keeping a constant supply was notable especially in the turmoil of the engagement with its varying needs and movements.

Malaria was not a serious problem, most of the clinical infections were of extrinsic origin. A sharp outbreak attacked a battalion after exposure to infection in Syria. The risk here was unusual as mosquitoes in deep caves bit during the daytime, and the suppressive measures were not sufficient to control overt infection. Men in other units had occasional relapses of benign tertian malaria, and a few cases of local infection occurred. Attention was drawn to the malarial potentialities of the area where the 2/3rd C.C.S. was sited for a time in the Nile Delta, where a few cases of malaria emphasised the need for care. During the preparatory period two plagues of mosquitoes visited the force, apparently borne on easterly winds from the delta, where was the habitat of this species *Anopheles pharoensis*. A slight increase of primary malaria was thought by some to follow this visitation, but no serious results ensued, as fortunately this mosquito is not an efficient vector.

At the end of the 9th Division's service in the Alamein sector general health was good, but dysentery and diarrhoea were again prevalent even to the end of November. Flies increased in numbers and were difficult to control as they were carried eastward by returning troops. The same applied to superficial septic sores. Pharyngeal infections were again common at this time. One curious feature was the prevalence of flatulent dyspepsia, but this was but a passing phase, and on return to Australia the men soon regained their usual fitness.

It is appropriate now to review the medical affairs of the whole action and see what generalisations may be made and what lessons may be drawn from this hard fought battle. In the fighting line the work done by the R.M.Os. and stretcher bearers was splendid. It was sometimes necessary for the bearers to concentrate on moving the wounded, and to reduce first aid dressings to the necessary minimum. R.A.Ps. were not always useful in proportion to their size or convenience, the problem was to

bring the men there. Some medical officers suggested as the result of their experience that stretchers be supplied to walking wounded trucks and fitted in carriers. The stretcher bearers often ran great personal risks as the casualties in some units showed. Their numbers were sometimes inadequate. Captain Goode of the 2/13th Battalion pointed out that ten to fifteen bearers have had to cope with 100 casualties in some operations. Captain Samuels of the 2/15th Battalion had to train six more men in September owing to heavy losses in the previous action.

The figures given for the Australian casualties during the period of heavy fighting which began on 23rd October were 449 killed, 2,032 wounded and 222 missing. Though opposed to Italians troops in the early part of the engagement the Australians fought against the Germans for most of the period. The disposal of casualties in the various actions provided that ordinary sick and slightly wounded men would be sent straight through from the M.D.S. without admission, and taken to the D.R.S. after receiving any necessary temporary treatment. The "N.Y.D.N." psychiatric casualties were also sent to the D.R.S. but not past this unless by instruction of the A.D.M.S. The main dressing stations and the light section of the 2/3rd C.C.S. were cleared by motor ambulance convoy vehicles to the concentration area at Burg el Arab. In general these routines were followed, with specific additions and modifications during the final engagements as already described.

SURGICAL WORK

After the action, Furnell concluded that the arrangements had worked satisfactorily, ensuring surgical treatment to wounded in a minimum of time without holding up their movement. The D.D.M.S., A.I.F. in the Middle East reported to Australia as follows:

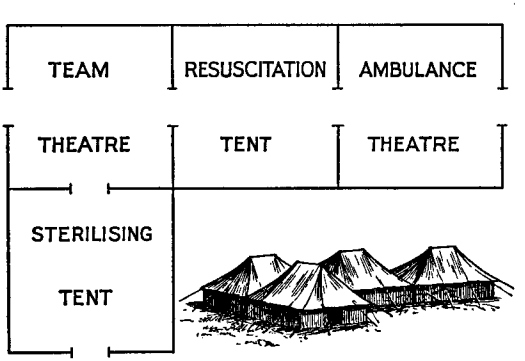
> The work of our units was splendid. The medical arms of the Eighth Army made it possible for A.I.F. to be cleared from the front, resuscitated and treated in forward units and admitted to A.G.Hs. with great expedition. The blood service was excellent and medical equipment was in ready supply. The No. 1 Australian Air Ambulance Unit was used for the evacuation of sick cases from Burg el Arab to Buseili.

From 24th October to 7th November 1942, 430 operations were performed in main dressing stations by attached operating teams, and 229 by surgeons on the staff of field ambulances. In this total of 659 there were 119 abdominal wounds treated, 218 compound fractures, 18 wounds of the chest, 38 amputations were performed and 276 excisions of wounds without other procedures. In all, from 1st July to 30th November 1942, 9,147 sick were admitted to main dressing stations of the 9th Division of whom 7,991 were Australians, and 4,678 battle casualties, of whom 3,644 were Australians.

Resuscitation was extensively used. A small percentage of wounded men needed only warmth, rest and morphia, some 10 to 15 per cent of the remainder required transfusion of blood or serum. Wet serum sent from the Commonwealth Serum Laboratories in Australia arrived in

excellent condition, with very slight amounts of denatured protein, and no faults developed in the bottle assemblies. A notable feature of the forward surgical treatment during these actions in the Western Desert was the extent to which blood transfusion was used. The Australian giving and taking sets again proved efficient and their adequate size was a convenience. Taking blood on the spot was not always practicable, as it absorbed the special attention of medical officers who were already busy. Further, the proportion of lightly wounded men was smaller in these engagements, and the quantity of blood called for was greater. For instance, during the Alamein battle, in one period of twenty-four hours in the 2/11th M.D.S. 80 pints of blood were given, and as many as seventeen transfusions proceeded simultaneously during one period of action. During the latter part of the fighting the British overseas pattern of blood transfusion equipment was used exclusively, the blood being obtained from a forward blood bank. Large amounts of serum and plasma were also used. Lavish transfusions often saved lives and the value of a skilled medical officer to take charge of all resuscitation was proved. He could decide priority of need for blood, which to some extent decided priority for operation, subject to the surgeon's opinion. Lieut-Colonel Buttle, R.A.M.C., in charge of the British blood bank, was most helpful in advice and in securing adequate supplies of blood and blood fluids. The British giving sets were very satisfactory, but the filters and rubbers needed renewal frequently, and blockage tended to occur after about two pints had been given. Rapid transfusion was found necessary in many instances. It was often found convenient to use the intravenous needle for anaesthesia also, it was left *in situ* after the pre-operative infusions and "Pentothal" administered through it. No severe reactions were encountered but numbers of patients had a mild rigor, probably due to a rapid rate of administration. Mild jaundice was sometimes noted at the hospitals; this was apparently harmless, but Lieut-Colonel F. J. Clark at the 2/7th Hospital observed that jaundiced patients frequently had persistent oozing from raw surfaces. The occasional observation of anuria in severely wounded men should also be mentioned.

The most convenient arrangement of a tented M.D.S. was found to conform to the general pattern shown in the diagram. E.P.I.P. tents were found to be the most suitable and even when "dug in" were comfortable and secure.



Tented M.D.S. as used at El Alamein.

It is of interest to examine the forward surgical work from the view point of the general hospital

where the patients were received. The 2/7th A.G.H. at Buseili sent on 533 casualties after treatment to the 2/6th A.G.H. at Gaza by road, and six by air. Three hundred and ninety-one were transferred to the convalescent depot; fourteen to a staging camp and at the end of November 395 were still in hospital. Special attention should be drawn to the small death rate: of all the wounded arriving after forward treatment only five died. Colonel Hayden at the 2/7th A.G.H. found that air transport was very satisfactory: the choice of individual patients was on the whole apt, and the men arrived comfortably and promptly.

Sulphanilamide was used as a routine in wounds, but even at this date it is interesting to note that some instructions were taken literally. A blue and red sulphanilamide card was used for recording the dosage of the drug used: this stated that 10 grammes of powder should be applied to the wound. This was interpreted by some to mean that this quantity should be introduced into every wound, a feat requiring some ingenuity at times. The moral probably lies in the need for unequivocal wording of all instructions.

The handling of men with fractures of the femur was much facilitated by the general use of some form of the "Tobruk plaster", which gave good immobilisation. By contrast, the poor immobilisation of fractures of the humerus caused much pain to most men and increased shock. The fixation of the upper arm is difficult, of course, but it cannot be said that attempts to rely on the "U" plaster recommended in "Notes of battle casualties from the fighting in September 1942", were at all successful. The best solution was to hold the man long enough for a plaster to be applied in the sitting position, which could only be done a few days after he had recovered from shock and preliminary excision.

Men with injuries of the chest and the abdomen did not travel well, owing to the adoption of the lying position. One important lesson of this action was the need, previously recognised and voiced by surgeons, for facilities for using the Fowler position during transport of wounded in ambulances. The greater facilities for early and thorough treatment of abdominal wounds, and to some extent too the adoption of exteriorisation in treating wounds of the colon, gave results better than any hitherto in the A.I.F. for battle surgery. Experience with chest wounds also yielded improved results. An appreciable number of injuries of the spinal cord and *cauda equina,* were seen. In three of six early cases of compression of the cord good results followed laminectomy. Infection of wounds was not serious or widespread; only four men suffered from gas infection and two of these died. Injuries of the eye were as a rule treated in base areas. The ophthalmologist at the 2/7th A.G.H. stressed the unsuitability of forward areas for ophthalmic surgery. Massive doses of sulphanilamide were advised while the patient was *en route* to hospital. Intra-ocular haemorrhages were by no means rare, though external signs of damage were often minimal.

Dental units and teams attached to a brigade or a field ambulance according to circumstances, did good work in maintaining oral health

whenever the military situation permitted it. By this time the general dental health of the A.I.F. was good on the whole, and most of the work was maintenance. This was continued throughout the preparatory periods and resumed as soon as possible after action. Dental officers sometimes found it possible to work in reasonable comfort under a canopy spread across a vehicle, using one side for a surgery and the other for a work room. At the 2/4th Australian Convalescent Depot a dental centre was established by the 3rd Dental Unit on 20th September, and there over 1,000 men were examined.

The convalescent depot was conveniently situated at Tolumbat where by 3rd September 575 patients were accommodated. An officers' wing was opened also. In order to maintain adequate feeding of the men rations were overdrawn at first until with regular discharge rate any adverse balance could be corrected. It was noticed that most of the men coming from the desert had enormous appetites, and it was difficult to supply enough potatoes and other vegetables.

The divisional rest station proved most valuable, saving strain on transport and on other units and economising manpower. Though the appointment of a psychiatrist for front line work was rather late in materialising, its value was undoubted. The notion that only severe psychiatric casualties are really urgent was proved short sighted: prompt readjustment was effected in numbers of men who were handled early and were thus not confirmed as neurotics by being sent back to a base.

The functions and disposal of a casualty clearing station once more aroused some discussion. The commander of the 2/3rd Australian C.C.S. pointed out that this unit was particularly experienced, both in technical procedures and in packing and moving. It was organised on the basis of a mobile unit, with a heavy and light section. The light section was designed to be fully mobile, and to take fifty patients in a forward position, handling battle casualties soon after injury. This calls for at least two surgeons capable of dealing with severe injuries, including those of the chest and the abdomen and compound fractures. The disposal of head injuries would depend upon the facilities available in the area. Experience in action showed that it is best that only preliminary treatment should be given forward, the patients being then sent back to a unit equipped for neurosurgical work. With the addition of a resuscitation officer and an anaesthetist the light section could be attached to an M.D.S. Experience during this action led the A.D.M.S. to attach such staff to the light section as would bring it up to the personnel standards of an M.D.S., thus making it self-supporting. Circumstances at the time did not permit of any other course being taken. The heavy section was prepared to hold at least 200 patients, acting like the light section as an evacuating unit. It will be noted that the unit as a whole fulfilled two functions, that of a more or less self-contained forward operating unit and that of a true clearing station with surgical facilities. The trend of thought, whether consciously or not, seems to have been towards the idea of a forward mobile surgical unit with some provision for holding patients for post-operative treatment,

so as not to hinder the M.D.S., the surgical spearhead of the unit, from moving on with an advancing force.

Furnell expected that some difficulties would arise, and in his report on the medical aspects of the action recounted some of the lessons learnt as follows:

The attack was to be in a new direction and from country not occupied by the division before D minus 1 Day. The distance from the final objective to the nearest M.D.S. was 20 kilometres.

An exposed right flank would be left from which it was expected that the enemy would harass the routes of evacuation.

The move forward of the whole of X Corps (Armd) would bring enormous masses of transport and it was anticipated that congestion would be severe.

The usual difficulty of liaison officer with the R.M.Os. was expected to be increased. The R.M.O. did not know when he would be called forward, or how far. All battalions started from lying-up positions in which they had hidden the whole of the previous day.

In the later phases, with changes in the direction of attacks and changes in brigade areas, and intra-divisional reliefs, these problems were intensified.

The method used to attempt to solve the above problems was:

(a) Attachment of four field ambulance bearers to each R.M.O. before the battle. Their primary function was to act as guides; the R.M.O. was instructed to leave a bearer at the original R.A.P. site and drop another at any point on his advance which might present difficulty for following people to find him.

(b) Two vehicles—either two motor ambulances or one motor ambulance and one W.W. lorry—were attached to each infantry R.M.O. before his battalion moved to its assembly area. He was to call these forward when his unit's echelon vehicles moved forward—that is, after dark on the night between D minus 1 and D Day.

R.M.Os. were assured that field ambulance personnel would follow behind them as soon as the advance started and behind the battalion and so comb the area for any casualties which unit stretcher bearers might not have been able to collect Each field ambulance used one or more bearer officers[1] and the remaining S.Bs. of a company to do this.

Once the battle was on, liaison depended on frequent visits to R.A.Ps. by field ambulance officers. This duty was carried out in spite of frequent heavy fire from guns, mortars and machine-guns and contact throughout was good.

LESSONS

(a) It was proved possible to evacuate casualties from a difficult and dangerous area, over bad going, so that high grade surgical attention was available early enough to be effective. The light section of 2/3rd Australian C.C.S. (6 miles further from the front than was 2/11th Australian Field Ambulance M.D.S.) reports that the average time between wounding and arrival at light section was 6½ hours. This applies only to cases operated on, as times were not carefully checked for others; but it should apply equally to all their patients.

(b) Classical A.D.Ss. are unnecessary in a battle such as this. The establishment of more A.D.Ss. and the examination of patients in them would have been definitely harmful, by delaying admission to M.D.S.

(c) Surgical teams as provided for this battle are so valuable that they should always be available in a campaign.

(d) The old W.E. of eight motor ambulances in a field ambulance is hopelessly inadequate. Fourteen should be provided. Even with eleven, as was the case here, the drivers were all close to exhaustion by the end of the battle.

(e) Flagging of routes by R.M.Os. and the full use of guides provided by the

[1] Actually liaison with R.M.Os. was carried out by medical officers of field ambulances and senior N.C.Os. Many of the latter were commissioned as "bearer officers" on their return to Australia. Bearer officers were not on the establishment of field ambulances in the Middle East.

(*2/6th A.G.H. War Diary*)

Evacuation by 2/4th Motor Ambulance Convoy, September 1942.

(*Australian War Memorial*)

R.A.P. "Tank Gully" El Alamein.

(Australian War Memorial)

The 2/11th Field Ambulance July 1942, before battle of El Alamein.

(H. G. Furnell)

The "Blockhouse" El Alamein.

field ambulances speeds up collection of wounded. In certain cases in this battle, drivers went astray due to inadequate use of these methods.

(f) The value of messages—written unless absolutely impossible—sent back on every vehicle was again forcibly brought out.

(g) One of the dangers of pooling vehicles was illustrated by the fact that two vehicles were lost, and their loss was not discovered for some days by the field ambulance to which they belonged. This can be overcome only by the transport officer concerned, constantly accounting for all his vehicles by consulting the Check Post records.

(h) There is one point that should be remembered in considering fatigue of medical personnel.

Fighting troops can fight and endure only up to a definite limit. Medical personnel can work at least as long.

After the limit is reached the troops must rest, so either the tempo of the battle slows, or the troops are defeated. If the first, the medical services can be rested. If the second the matter is taken out of our hands.

These conclusions strikingly resemble those arrived at by other medical administrators in earlier campaigns, but whether further experience in similar military operations would produce still higher grades of efficiency cannot be told, as the campaigns of the then unknown years ahead were entirely different. The A.A.M.C. like other branches of the Service suffered considerable losses, their casualty list being as follows:

Killed . . .	3 officers	10 other ranks
Wounded . . .	4 officers	46 other ranks
Wounded and remained on duty . . .	2 officers	
Missing . . .		4 other ranks

This was the end of the Middle East for the A.I.F. The 9th Division and most of the other Australian troops gathered in Palestine once more, and in the beginning of February 1943 embarked for return to Australia.