

CHAPTER 16

OCCUPATION OF SYRIA

WHEN the brief but arduous campaign in Syria ended on 12th July 1941 the occupation force had many tasks ahead. The "convention" which settled the terms of surrender was concluded before any attack had been launched on the towns and larger settlements of this attractive country and most of the damage was not serious. There were several hazards of health facing the force, of which the most important was malaria. The most dangerous part of the malarial season was yet to come, as malignant tertian infections occurred most frequently during the later part of the summer and early autumn. Colonel Norris, A.D.M.S. of the 7th Australian Division, expected an increase of the numbers of sick; already the period of action had produced twice as many casualties due to sickness as those due to wounds. However the corps command took the matter seriously, and ordered that no sites for camps should be selected without the advice of a medical officer. The presence of experienced malariologists was of the highest value, and the surveys of native villages, and mosquito breeding places, and studies of types of mosquitoes enabled the hygiene staff to mark all areas with a clear indication of their safety or otherwise as camp sites. These preliminary precautions enabled the troops to settle into camps with lessened risk, though much anti-malarial work remained to be done. Before the medical problems of this period are considered it is necessary first to gain an idea of the military tasks likely to be required of an occupation force in Syria and the Lebanon.

As pointed out in Chapter 14, the necessity for the invasion and occupation of Syria lay in the evidences of German infiltration into the country, and the danger of German forces penetrating from the north. This danger appeared to be lessened by a number of factors in the situation, but it could not be disregarded. Though losses in Greece and Crete had been heavy, and the 6th Australian Division needed rest and refitting, the Germans had also suffered heavy losses in Crete, and their resources would be strained by Hitler's new Russian venture, which was begun on 22nd June. If, however, Russia gave way, the Persian oilfields might be endangered, or an advance through the Caucasus might cause a collapse of Turkey and the entry of enemy troops into Syria. These considerations were nebulous for the time being, but the occupation plan necessarily included preparations for a defence of the Tripoli fortress area. This comprised the Lebanon Range and the coastal plain north to the Turkish border, the area between Hama and the border, and the country between the Euphrates and the Mediterranean. The 7th Australian Division, under command of the I Australian Corps was assigned garrison duties in this area; for this there were available three brigades, the 17th, the 21st and the 25th and attached troops, in all numbering about 19,000. Corps headquarters was established at Aley, a hill resort some miles from Beirut.

MEDICAL ARRANGEMENTS OF THE 7TH DIVISION

The medical policy of the corps was influenced by the existing state of equipment and supplies, sadly depleted by the losses in Greece, and by the need for conservation of manpower in view of the widening commitments of the forces in the Middle East. There was a natural reluctance to place large immobile hospitals in areas which might not be secure, and it seemed better to expand hospitals in Palestine, and to use the existing resources in Syria as far as possible. For these reasons there was no intention of bringing an Australian general hospital up to Syria at this time, though every effort was to be made to retain sick within the corps area. These ends could be met by using the 2/1st and 2/3rd C.C.S. as holding units, virtually acting as hospitals, and expanding the M.D.Ss. of field ambulances to enable them to hold patients with relatively short-term illness in the brigade areas. The C.C.Ss. would then take patients from the field ambulances and hold them to the limits of their capabilities. There was, of course, a certain inescapable overflow of patients with severe or long-term maladies who could be sent down by road ambulance to the 2/1st and 2/7th A.G.H. in Palestine. As the Australian troops were still chiefly in the coastal sectors, their medical units centred mainly round Beirut and Tripoli; the 6th British Division and other British and Indian troops occupied the inland areas and used the 14th British C.C.S. or other holding units in the region of Damascus. The corps rest station re-opened at Ez Zib, took convalescents from the C.C.Ss. and field ambulances and returned them to reception camps.

Evacuation was mostly by road in the coastal sector carried out by the American voluntary field service motor ambulance convoy, which had sections staying with the Australian C.C.Ss.: one aircraft was available at Beirut; movement to Damascus was mainly by train. On 31st August 1941 Flight Lieutenant J. G. MacDonald flew up to Beirut from Gaza, shortly after the arrival of ambulance planes from Australia. Group Captain E. A. Daley, D.D.G.M.S., R.A.A.F., accompanied the flight of specially converted DH86 planes. Then Flight Lieutenant MacDonald took Colonel W. W. S. Johnston on a reconnaissance of airfields in Syria, and a plane also flew from Beirut to Cyprus taking Major Lorimer Dods to investigate an outbreak of poliomyelitis there and to bring patients back to Gaza. These ambulance planes later carried out service in the desert.

Soon after the armistice the 2/4th Australian Field Ambulance (Lieut-Colonel S. H. Lovell) moved into an Italian hospital in Tripoli, and worked with the headquarters and another company, the remainder of the ambulance serving several combatant units. A convalescent annexe was attached. The 2/6th Field Ambulance (Lieut-Colonel G. B. Gibb Maitland) worked temporarily in a site vacated by the light section of the 2/3rd C.C.S. at Ain Sofar near Beirut, and the 2/3rd C.C.S., moving up from Haifa, began work as a complete unit in school buildings in Beirut. Later the 2/6th Ambulance moved into a monastery at Achache. This was in a filthy condition, and was not convenient, as the evacuation

routes to the hospitals in Palestine were long. Urgent surgical and medical cases were sent to the 2/4th Field Ambulance: others were treated at the 2/6th Field Ambulance main dressing station.

The 2/1st C.C.S. had worked at Nazareth during the campaign; now, the main body of the unit, preceded by its light section, came up to Syria, and moved into a mental hospital at Asfurieh between Beirut and Aley. The two casualty clearing stations worked in unison; isolation cases were distributed between them, cases of dysentery were taken by the 2/1st C.C.S., and suspicious throat conditions by the 2/3rd C.C.S.

By August these arrangements were running satisfactorily; nurses were brought up to the C.C.Ss. as soon as conditions were settled, and were also used in the hospital run by the 2/4th Field Ambulance, and later in other similar hospitals staffed by field ambulances. Special clinics were also established. Major F. Scoles, ophthalmologist of the 2/9th A.G.H. opened an eye clinic in conjunction with the 2/3rd C.C.S., and Major N. W. Francis from the 8th A.S.H. at Gaza opened a clinic for venereal diseases. In the 7th Divisional area were also the 2/2nd Australian Field Hygiene Section, to which were attached two Australian anti-malarial control units, two Australian dental units and the 14th British Light Field Ambulance. During August also the 2/9th A.G.H. took over the buildings occupied by the 2/1st C.C.S. at Nazareth and provided hospital service closer to Syria.

On 7th August 1941, an episode occurred with some medical implications. Lieut-Colonel S. H. Lovell, commanding the 2/4th Field Ambulance, received a message from Brigadier S. G. Savage, commander of the Tripoli area, instructing him to go with the brigadier to the residence of General Dentz. Savage had presented an order from the force headquarters to Dentz requiring him to proceed at once with the area commander to the headquarters of the force commander in Jerusalem. It was understood that the Vichy Government had failed to observe an undertaking with regard to release and return of prisoners of war, hence General Dentz by reason of this order was virtually if not actually under arrest. Dentz submitted that he was unfit to travel, and at his residence Lovell consulted with the French Director of Medical Services for the Levant and the general's personal physician. The general had just recovered from a fever described as dengue fever, but more probably sandfly fever, and still complained of malaise. Lovell after examination of Dentz reported to Savage that, while the general would certainly feel mentally and physically fatigued, there was no reason why he should be considered unfit to travel. Though the French physicians tried to prevent the general from going to Jerusalem they gave no further opinion as to the degree of his illness or what harm he might suffer by this journey. Dentz travelled in his own car with his own physician, and arrangements were made for Colonel Johnston, D.D.M.S., 1 Australian Corps, to see him on arrival at Aley. After long discussion Dentz departed for Jerusalem as desired and arrived without harm or discomfort.

On 20th August Major-General R. M. Downes, Inspector-General of Medical Services, with Major C. H. Fitts, visited Syria in the course of a tour of inspection of the A.I.F. in the Middle East. He reviewed the work of the medical units and discussed matters of interest, especially transport and equipment for field units: other observations made during this visit are referred to elsewhere.

In September the remainder of the 7th Division arrived in Tripoli; the 18th Brigade with the 2/5th Field Ambulance (Lieut-Colonel A. H. Green) had been in Tobruk, and after resting in Palestine they joined the parent formation. The concentration and organisation of the Tripoli fortress area was begun, with some recasting of the medical services. By September the relief of the 9th Australian Division in Tobruk had begun, and by the end of October practically the whole of this formation had returned to Palestine for rest and reorganisation. The 6th Australian Division, restored and re-equipped after its losses in Greece, was ready for further service, and when the 6th British Division relieved the 9th Australian Division in Tobruk, the 6th Australian Division was able to take the place of the British formation in Syria. This exchange placed two Australian divisions under the command of the I Australian Corps, and concentrated the forces chiefly in the central and northern parts of Syria and the Lebanon. One effect of this was to widen the scope of the medical organisation, which embraced the country from the Turkish border southward. Though there was still no Australian general hospital in Syria, full medical and surgical services were available, with all facilities for laboratory investigations, pathological, bacteriological and biochemical, and radiological work. The attachment of the 2/1st Mobile Bacteriological Laboratory under Major E. Ford to the 2/3rd Casualty Clearing Station was a very satisfactory arrangement, and full advantage was taken of the close contacts of the laboratory service with clinical work.

ARRIVAL OF THE 6TH DIVISION

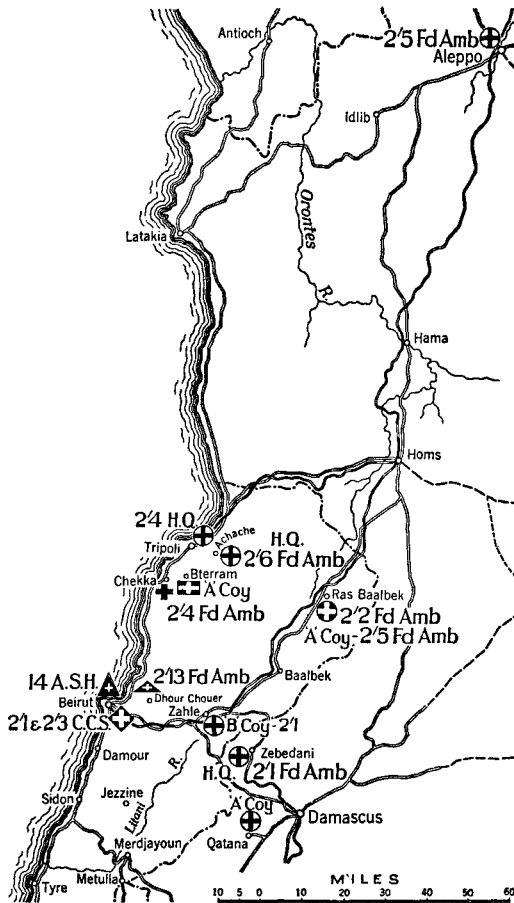
In October the medical units of the 6th Division began to arrive, and took over from British units. The 2/5th Australian Field Ambulance, which had been working in a school in Homs, running a hospital of 110 beds, handed over to the 2/2nd Australian Field Ambulance (Lieut-Colonel D. M. Salter), and moved on to Aleppo, there taking over a hospital from the 189th British Field Ambulance in buildings of an Italian school and hospital. Here this ambulance serviced the 18th Brigade, and sent patients on *via* Homs to Damascus. The 2/1st Field Ambulance (Lieut-Colonel R. H. Russell), relieving a British field ambulance, took patients at Zebedani, and had companies at Qatana and Zahle. Thus the two main evacuation routes were in use, the central route passing through Damascus, and the coastal road passing from Beirut to Haifa. The most difficult part of the task of the most northerly sited of medical units was the care of those troops controlling the frontier posts, which were widely scattered with poor means of communication. Each company had a medical orderly with the usual equipment of an aid post, and a medical

officer made a tour from one to another, taking about three days to complete the inspection of all the posts. The possibility of the introduction of exotic or epidemic disease across the border was borne in mind, for it was recognised that if any military action took place north of the Turkish border, refugees might constitute a real danger.

MEDICAL CONDITIONS

The diseases actually encountered during this phase of occupation will be described later: for the present it may be noted that malaria was assuming less importance, owing to the oncoming of autumn and the colder weather, and also to the improving organisation whereby the activities of the hygiene and malaria control units lessening risk of infection. Infective hepatitis was still a source of worry and during the months of September and October was increasing in incidence. Dysentery though usually mild in type, was still occurring and a few cases of typhoid were recognised.

During October the first patient with frost-bite was admitted to the 2/4th Field Ambulance at Tripoli. Working parties in the more mountainous areas were now feeling the effects of cold, and special care was necessary. Adequate supplies of warm clothing were obtained including balaclavas, thick socks and scarves, leather jerkins and gloves. Tinted goggles were needed for the glare from snow, and some emollient in a lanoline or greasy base was desirable to protect the face and hands. A few new cases of malaria



Occupation of Syria, October 1941.

were still seen in the coastal districts, usually related to the occupation of unsatisfactory sites, but the incidence was low enough to warrant the suspension of suppressive quinine. During October members of the nursing service from the 2/9th A.G.H. were attached to the 2/1st Field

Ambulance at Zebedani thus providing a full range of medical and nursing activities in all the larger centres. Many of the patients with hepatitis needed care for some time; they were admitted to the casualty clearing stations, and thence sent to the rest station to convalesce, unless it was thought advisable to send them on to a general hospital at an early stage.

At the end of September approval had been given for the formation of a 300 bed special hospital for the treatment of venereal diseases. Major N. W. Francis was promoted to lieutenant-colonel, and after gathering staff and equipment began work in the 14th Special Hospital at Bhamdoun on 3rd November.

During November there was some increase in sickness in the 6th and 7th Divisions, thought to be due in part to fatigue after campaigning, though no doubt the prolonged close contacts of more static duties of an occupation force, contrasted with the higher mobility of action are of themselves an important predisposing cause of infections.

On 1st November a change was introduced in the general organisation. The Palestine and Transjordan Command ceased to exist, and a new Ninth Army came into being, corresponding with the Eighth Army formed a little earlier in Egypt. General Sir H. Maitland Wilson commanded this Ninth Army and controlled all troops in Syria and Lebanon. Lieut-Colonel Saxby was attached to the army headquarters staff as an Australian medical representative.

Ski School. During November a ski school was organised by the I Australian Corps. This was held at the Cedars, a mountain resort some 2,000 feet below the *Col des Cèdres*, where the road crosses the Lebanon at a height of 8,745 feet. Here the cold and the high elevation demanded supplementary rations and for this purpose the addition of the following extras was approved: 2 ounces bacon, butter and sugar, 1 ounce tinned milk and $\frac{1}{2}$ ounce cocoa. Conjunctivitis was a common complaint among those attending the school. Special arrangements were made for handling of casualties; and two methods were evolved, one using a light French type of stretcher mounted on skis, and another making an emergency stretcher with the wounded man's skis and sticks, applying special clamps to the skis. Even apart from the special risks in ski-ing, accidents became much more frequent on the steep roads. The first light falls of rain on tortuous mountain roads brought many vehicles to grief, and snow intensified the risks. In December it was necessary to remove all patients from the 2/2nd Field Ambulance from the Bekaa Valley to the coast near Beirut. Even ambulance trains found difficulty in running, although special protection was provided to railway tracks in Syria to cope with heavy falls of snow. In December the cold intensified and the snow in some parts was so heavy as to impede the delivery of supplies; some field medical units were isolated for periods of several days. Malaria, as might be expected, practically disappeared during the cold weather. In January there was a week of very severe weather over most of the occupied area. Units were cut off from all communication in several places, with temporary dis-

ruption of telephone, light and power and the roads were blocked with snow. Even at Ez Zib near the coast the temperature did not rise above 10° for four days.

THE MILITARY POSITION CHANGES

A change in the general hospital policy took place at the end of December. Instead of being held in Syria patients were sent on to Palestine; the forward units no longer acted as C.C.Ss., and the C.C.Ss. no longer as hospitals. This policy relieved the strain of transport under difficult conditions, but more important external conditions were really responsible.

The British forces in the Middle East had the task of preparing an offensive against Rommel in North Africa and defending Syria in the event of the Germans overcoming the Russians' resistance and advancing through Turkey. This resistance had stiffened with the successful Russian counter-offensive in the winter, beginning in November 1941, and in turn offset to some extent the difficulties which the British armies in Egypt had experienced in building up reinforcements of men and material for the coming trial of strength. While forces were being built up in the desert the threat of hostile interference from Japan became more ominous. Japan, a former declared ally of Britain, had determined on an independent path of ambition, and had sealed that determination in 1931 by occupying Manchuria in defiance of previous undertakings. More recently the linking of three partners of the so-called Berlin-Rome-Tokyo axis drew pointed attention to the dangers inherent to the British and American nations, especially in the Far East and South-West Pacific. These threats culminated in the lightning air attack of the Japanese on Pearl Harbour on 7th December. Britain and the United States of America were now at war with Japan, and Australia also declared war. The bombing of Patani and Singgora in Northern Malaya by the Japanese was followed by an invasion of land forces on the Malayan peninsula and at several points in the Netherlands East Indies. These hostile actions created a most perilous situation for Australia, and by agreement between the British and Australian Governments two Australian divisions were withdrawn from the Middle East theatre of war for action in the Far East and the defence of Australia.

A few days later, on 10th December the investment of Tobruk came to an end, but the improved position in Africa did not substantially lessen the danger in the East. The Russians continued to counter German successes on the Black Sea, and Rommel early in January retired to El Agheila. Long range strategy demanded that the Axis powers should be expelled from the Mediterranean littoral of Africa, with a view of future invasion of Europe. It was decided that the 9th Australian Division should remain in the Middle East to take part in future desert actions, in which it was hoped that the German forces would be not only repelled, but destroyed, and that for the present the division should contribute to the further defence of Syria. Therefore the released 6th and 7th Divisions of the A.I.F. were brought back to Palestine to join movement "Stepsister".

The destination of this movement was a top secret, and, though the men of these two divisions could at first guess their next assignment with some accuracy, the situation was more obscure when the movement became reality at the end of January 1942. This part of the story must now be left for later telling, while we follow the fortunes of the 9th Division in the Middle East.

THE 9TH DIVISION TAKES OVER

The 9th Division was sent into Syria shortly after its release from Tobruk, and its units relieved the corresponding units of the 7th Division. In January 1942 the 2/11th Field Ambulance (Lieut-Colonel W. W. Lempriere) took over the hospital run by the 2/4th Field Ambulance; the nurses were detached to their own units. All seriously ill patients were sent to the 2/3rd Casualty Clearing Station in Beirut, and some assistance was given by local civilian practitioners in X-ray and pathological work. The other ambulances of the 9th Division also took over hospitals, the 2/3rd Ambulance (Lieut-Colonel J. M. Dwyer) at Le Gault French Hospital in Tripoli, and the 2/8th Ambulance (Lieut-Colonel B. S. Hanson) at Aleppo. Patients were evacuated by ambulance train three times a week to Damascus. At this time some anxiety was felt over the number of refugees coming in from Turkey, especially as there were rumours of typhus fever in the Balkans. Numbers of these passed through the 2/15th Battalion, whose medical officer was instructed to examine all refugees and to see that disinfestation was carried out, after which they were kept in a compound up to twenty-one days. Disinfestation of clothing had already been found occasionally necessary in men entering field medical units for treatment of minor disorders. Part of the 2/8th Field Ambulance opened a camp reception station at Latakia in the grounds of a Franciscan monastery.

The medical position at the beginning of 1942 was as follows: the A.D.M.S. of the 9th Division, Colonel Furnell, was in administrative charge of medical arrangements for the Australian troops in Syria and the Lebanon. The three field ambulances covered the troops areas with the usual organisation, the 2/8th Field Ambulance at Aleppo and Latakia, the 2/3rd Ambulance at Le Gault Barracks Hospital at Tripoli and the 2/11th Ambulance at an Italian hospital at Tripoli. The 2/4th Field Hygiene Section, relieving the 2/2nd Hygiene Section was stationed at Chekka. The 2/1st C.C.S. had left without special relief by any other unit, and the 2/3rd C.C.S. carried on the work it had already been doing in Beirut. There was still no general hospital in Syria, but after the 6th and 7th Divisions had sailed, and with them the 2/1st, 2/2nd, 2/4th, 2/5th and 2/9th Hospitals, the 2/6th and 2/7th General Hospitals remained in Palestine. The 14th Special Hospital having worked for less than three months, also left the Middle East at the end of January 1942, and was not replaced by a separate special unit in Syria. Patients needing treatment for venereal disease thereafter were sent straight to the 8th Special Hospital in Palestine. Medical units holding patients were com-

fortably housed in Syria during the winter: the buildings occupied were usually solid and well warmed. Tents were satisfactory in some of the districts near the coast, but the advantages of buildings were obvious. Water supplies were usually good: at Aleppo in the absence of reliable information concerning the bacterial content precautions were taken by boiling and chlorination.

During February some movement was observed in mosquitoes in the coastal area, and as an anopheles had been caught in one battalion area, nets were again advised. Arrangements were made to begin spraying villages to kill hibernating mosquitoes, for, although the official army information stated that the malaria season began early in April, local information placed it in the first week in March. A malaria school was conducted at the American University in Beirut during February for regimental medical officers and others selected from the combatant units. Meanwhile the 2/2nd Field Hygiene Section had been busy continuing the work of canalising streams to prevent breeding of mosquitoes, and also spraying to kill adult mosquitoes. The 2/13th Field Ambulance, which had moved the corps rest station from Ez Zib to Mruj and Dhour Chouer left Syria at the beginning of February.

In March there was news of a possible movement of the 2/3rd C.C.S. from Beirut, but this was cancelled, and instead there was a reversion to the previous policy, by which this unit held patients for treatment of conditions within its resources, provided they could be discharged in reasonable time. A further change was approaching, the establishment of a general hospital in Syria. Buildings were begun on a site at Sidon on the coast, and here the 2/7th A.G.H. was to be placed when accommodation was ready. A little later the 2/4th Australian Convalescent Depot was formed, also to be sited at Sidon. Meanwhile the disposition of patients proceeded as before.

A malarial survey of the Tripoli fortress area was completed in March. Some units were found to be sited in malarious areas, and their camps were moved, though there was little mosquito breeding noticeable at the beginning of April owing chiefly to recent rains. Malaria control was being carried out actively. The 3rd, 4th, 5th and 6th Anti-malarial Control Units were completed, and each squad worked under the medical officer of the combatant unit in the area. Streams and pools were treated, and maintenance carried out, and notices were posted at all bivouac sites stating whether these were safe to use or not and what precautions were to be taken. Educational measures such as posters, circulated instructions and short courses on malaria control were adopted as soon as possible after Syria was occupied. As the weather became warmer enormous numbers of anophelines appeared in some areas, and the malarial risk was as usual increased by troop movements. For example, the move of the 20th Brigade to Aleppo so intensified the risk of infection there that atabrin was used as a suppressive: 0.2 gramme was given twice weekly.

During April 1942 the nurses attached to the 2/8th and 2/11th Field Ambulances returned to their units, and were replaced by nurses from

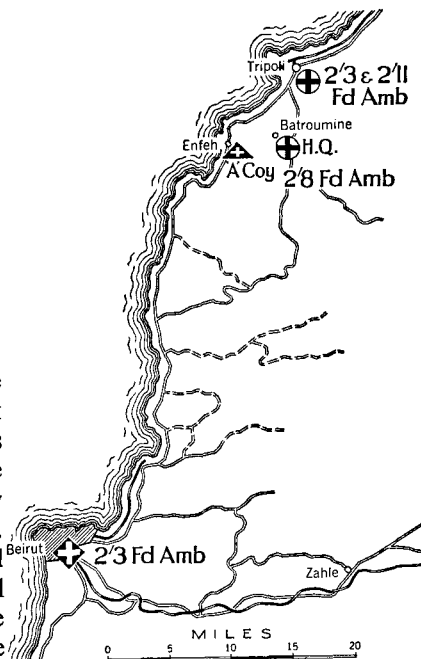
the 2/6th and 2/7th General Hospitals, specially selected for their ability to instruct orderlies. In order that staffs of field ambulances might have field training the 2/8th Ambulance moved into the French hospital at Tripoli late in May, freeing the 2/3rd Ambulance for training in different types of country, including desert. By this time the incidence of dysentery and malaria was again increasing.

In June there was a general feeling of unsettlement, engendered by the German successes in the Western Desert, culminating in the retaking of Tobruk and finally the advance of Rommel's army to El Alamein.

This uneasy feeling was enhanced by the rescinding of orders of movement soon after they were received, but it was known that the order for a general movement of the 9th Division to Egypt could not be long delayed. Early in June the 2/3rd C.C.S. took over the Italian hospital at El Mina in Tripoli from the 2/11th Field Ambulance, while a British C.C.S. took over the site in Beirut. The 3rd N.Z. General Hospital opened in Beirut in June and took care of the Australian patients left in the 2/3rd C.C.S. The 2/11th Field Ambulance then took over the hospital in Le Gault Barracks in Tripoli, until its own hurried move to Egypt: this hospital had previously been run by the 2/3rd Ambulance. The 2/8th Field Ambulance occupied the French hospital in Aleppo until June, and then handed over to the 6th N.Z. Field Ambulance. At the same time the 2/7th A.G.H. packed up at Kafr Balu in Palestine and sent an advance party to open the hospital at Sidon. Further movement was stopped, but the hospital opened and started work, only to be ordered to close on 28th June and to proceed to Buseili in the Nile Delta. The 2/4th Convalescent Depot likewise was sent to Sidon, but little was done to develop this unit there before it was sent during July to a site at Tolumbat, on Aboukir Bay in Egypt.

By the third week in June the medical units caring for the 9th Division had packed up and were ready to move. The field ambulances moved, each with a brigade, starting with the 26th Brigade which moved on 26th June. The 2/3rd C.C.S. moved on 9th July.

Many changes occurred during this phase of the occupation of Syria, most of which were a more or less distant reflection of military affairs elsewhere. Medical administration in the beginning was controlled by the



Occupation of Syria, May 1942.

I Australian Corps, and each of the three Australian divisions in the Middle East occupied in turn parts of this country, so varied in terrain, and in seasonal climate. The corps administration included for a time British medical units also, but when the corps left the Middle East the Australian medical work chiefly consisted of that controlled by the 9th Division. Since we are concerned with the activities of Australian troops it is now of interest to enquire what standard of health was maintained during the occupation, and what diseases were encountered.

ANTI-MALARIAL MEASURES

Malaria has priority as the most important disease in Syria, where there were some additional features of local interest. One of the most significant of these was the formation of special units for carrying out anti-malarial work, for the first time in the Australian Army. Administrative Instruction No. 5 of the I Australian Corps states:

There will be two control units known as 1st Australian Anti-malarial Control Unit and 2nd Australian Anti-malarial Control Unit respectively.

Officers were appointed to command these units, which were raised from the 2/2nd Field Hygiene Section and comprised a staff of seven other ranks. Five malaria control units were formed in all and attached to the 7th Division and unit squads were trained. This was a most important innovation which marked the beginning of a new phase of malaria prevention in the Australian Army, and these units did most valuable work both in the instructional and constructional field.

Anti-malarial courses were begun immediately conditions were reasonably stabilised after the campaign, and important control works were begun by Croll's 2/2nd Field Hygiene Section, with the advice of Lieut-Colonel Mulligan, Indian Medical Services, and Major Leeson, R.A.M.C., malariologist and entomologist respectively. *Anopheles superpictus*, *elutus* and *bifurcatus* were the most important vectors in Syria; the former was found breeding in the chains of pools in the Beirut River. A canal nearly a mile and a half long was dug to secure fast running water, and necessary oiling carried out. Labour was a difficult problem, and native labourers were hired by the engineers; the first offering belonged to other trades, and would not dig, but an employment bureau on the spot soon produced fifty workers. Other drainage works were carried out under the supervision of the 2/2nd Hygiene Section, such as draining the Chekka swamp with a canal and flood gates, emptying and controlling large waterholes at Homs, and drainage of irrigation canals and wadis at many places. These works were of a magnitude usually not attempted by field hygiene sections, even with additional labour. From August onwards standard protective measures were enforced, and mosquito breeding was controlled in important localities by spraying, oiling, and dusting with Paris green. In addition to mosquito surveys, the habits of local flies were studied, and other work was also carried out on water supplies and sanitation. The larger centres were supplied with good water coming from the uplands, but the outlying units were not always so well served and had to take the usual precautions.

Water supply in the towns was sometimes concerned with the propagation of malarial mosquitoes. *A. bifurcatus* usually bred in dark wells under the houses, and had to be controlled by judicious spraying and oiling. During Allenby's occupation of Jerusalem a generation earlier the same measures were necessary.

The malarial problem in Syria was intensified after the armistice, as it was essential to take immediate steps to protect the troops of occupation. To do this thoroughly meant surveying about 1,000 square miles, collecting larval and mosquitoes and estimating spleen rates. There was also a shift of native population which introduced disturbing factors. The I Australian Corps gave full cooperation and issued the following order on 14th July 1941:

Owing to incidence of malaria, special care must be taken to avoid malarious areas for camps. Commanders will consult medical staffs, who should be included in reconnaissance parties, and medical advice will be followed unless urgent reasons cause other action. All informed.

Notwithstanding this order, and the expressed opinions of eminent local authorities on the medical and industrial aspects of malaria, some military officers were still sceptical. Surveys showed that *A. superpictus* was very common in the coastal areas, where spleen rates were often high, occasionally up to 100 per cent. Overprint maps were prepared, and large notices were fixed through the country indicating to troops on the move which areas were "highly malarious" and which "safe for malaria". Breeding control was instituted in some places. Leave trips for the troops were permitted later, and a good deal of control was needed to ensure that itineraries provided safe stopping places each night. In August protective clothing, the use of nets at night, the use of cream and the taking of suppressive quinine were ordered for all men on leave, and directions were given to assist wise choice of bivouac sites, away from low, swampy or irrigated areas. Later the 2/3rd Australian Field Hygiene Section took over preventive measures for an area stretching from the hills near Beirut to the Rayak plain. Suppressing quinine was continued up to September and October 1941, 5 grains daily, later increased to 10 grains. Administration of the drug was not closely supervised and there is little doubt that quinine was not taken by all men. Spraying was usually done with "flysol" or similar preparation with 3 per cent pyrethrum extract, or naphthalene, creosote and iodoform in kerosene. Up to the end of November 1941 there were 1,250 reported cases of malaria in the 7th Division, and the infection rate over a six months' period was less than 10 per 1,000 per week. The actual infection rate must have been higher, as numbers of recurrences occurred later in men who had been in Syria, though apparently well at this time. The importance of the malarial control work there lies not merely in its achievement, but rather in the fact that a foundation was laid for much more extensive and responsible work in the time to come.

The diagnosis of malaria was accurately carried out once conditions were stabilised: the help of the mobile bacteriological laboratory was

valuable. Treatment offered no special problems; in Beirut patients were sometimes sent to the rest camp where treatment could be continued. Not infrequently a man labelled as "P.U.O." would be found to have malaria. The only deaths which occurred were those of one man who had cerebral malaria and of four others who had other coincident infectious diseases; one man died of malignant and quartan malaria. In December on the advice of Colonel Fairley all patients with relapses were given intravenous quinine for three days, followed by a standard sequence of atabrin and plasmoquine. The total number of cases of malaria in the A.I.F. in the Middle East during 1941 was 2,435, a rate of 31.8 per 1,000 strength per year. Consideration of the combat and base areas occupied by Australian troops during that period shows that the majority of these came from Syria. Before leaving the purely preventive activities of the medical services mention must be made of a radical and important change made in the organisation and administration of the Australian Army Hygiene Services. Colonel M. J. Holmes, Director of Hygiene at the Australian Army Headquarters devised and introduced this system, which abolished field hygiene sections as such, and placed trained personnel in every major unit, and maintained adequate central control.

OTHER DISEASES

Infective hepatitis was a troublesome disease: between August 1941 and January 1942 the 2/3rd C.C.S. treated 639 cases. In the earlier stages of the epidemic a number of men arrived as yet undiagnosed, but jaundice appeared with some regularity about the fourth day. The symptoms are fully described elsewhere and need no further emphasis, save to point out that anorexia and nausea were symptoms of great constancy. Intense depression was a frequent sequel.

Diphtheria appeared at intervals throughout the whole period of Australian occupation of Syria: it was sometimes seen in members of hospital staffs, suggesting the advisability of performing Schick tests on persons exposed to infection. The wisdom of administering antitoxin to adults within easy reach of a diagnostic centre was seriously questioned, as in some of these cases the difficulty of establishing a diagnosis was increased, a matter of some epidemiological importance. Other forms of upper respiratory tract infection were common, outstanding points were their frequency during the coldest part of the winter, and the high incidence of sinusitis. Cerebro-spinal meningitis appeared at irregular intervals chiefly during the months of February and June; all patients recovered with sulphapyridine.

Dysentery was prevalent, the incidence was highest in August 1941, gradually diminishing as the weather became cold, and once more increased in April of the following year. The predominant type was Flexner, and no serious epidemic occurred. The results of a special investigation carried out in the earlier months of 1942 on dysenteric therapeutic methods helped to confirm the value of sulphaguanidine as a specific. Amoebic infections were not seen in great numbers, but later experience has illustrated the

considerable latent period which may elapse before overt symptoms appear.

Enteric infections formed a group of thirty-three cases seen at the 2/3rd C.C.S.; probably this represents the total incidence in Syria during the occupation. Careful investigations of the soldiers' living conditions were carried out, but no conclusions could be drawn, as infections occurred equally in barracks and in open camps, and in sewered and unsewered areas. Convalescent whole blood or serum was used in treatment and appeared to help tide very ill patients over critical periods in their illness.

Relapsing fever, an endemic disease, was found in moderate numbers in Syria. The diagnosis was helped in some instances by a history of exposure in the haunts of the vector ticks, and also by neurological signs. A considerable number of the cases occurred in men who had been in Tobruk. As usual, spirochaetes were often difficult to demonstrate in the blood; incubation of blood samples was tried without success.

Intestinal parasites were common in Syria; infestation by tapeworm not infrequently needed treatment. The most usual form was *Taenia saginata*; excepting for the usual care necessary in ensuring complete removal of the upper segments no special difficulties arose in dealing with these helminths.

Rabies was also endemic throughout the Middle East, and is conveniently mentioned here. Though more common in Egypt, it also occurred in Palestine, and in Syria and Lebanon was frequent enough to warrant special facilities for prophylaxis. In Palestine dogs were not officially allowed in camps, and instructions were issued that any instances of bites from dogs or jackals must be reported. The treatment was immediate cauterisation, followed by a course of specific prophylaxis at an anti-rabies centre. There was a special centre at Jerusalem under Dr V. S. Krikorian, of the Public Health Department and civil centres at Gaza, Majdal and Ramleh. In December 1941 an anti-rabies clinic for Syria and Lebanon was formed at the 2/3rd C.C.S., in charge of Major Bruce Hall who attended a special school in Jerusalem. Supplies of vaccine were held in Beirut, and the full anti-rabic course of injections of 5 c.cm. of vaccine on each of fourteen successive days was given when necessary. The rabid animal was killed and the brain preserved for examination. Late in 1941 an increase in rabid jackals was reported in Syria, and between August 1941 and July 1942 ten men were sent for prophylactic treatment. No cases of rabies occurred among the troops.

Two other important types of infective disease remain to be dealt with, short-term fevers and venereal disease. A number of special features of importance relating to the experiences in Syria with short-term fevers which merit detailed attention. The label "pyrexia of unknown origin" may be used with some reservation, for in a considerable proportion of cases the implied doubt in this diagnosis was only in the early stages. Sandfly fever appeared in epidemic form in the summer of 1941 and again in 1942. The first cases in 1942 were seen in April and did not conform to the type previously seen, but study of a large outbreak in a field punish-

ment centre established the diagnosis without doubt. This is a good example of the well known difficulties in diagnosis of a disease whose signs may vary considerably, as do those of all epidemic diseases, until the outbreak reaches some density. Lethargy was characteristic in 1941, but was much less common in 1942. Early in 1942 cases of pyrexia of short duration were seen, which were apparently of identical type, but did not appear to conform to the pattern of sandfly fever or other infection to which a name could certainly be given. The symptoms were the familiar febrile malaise; no other physical signs were demonstrable. Fever was fluctuating in type and rose till about the third day it reached 104° or 105° F. and subsided in the same way, reaching normal about the 7th or 8th day. Groups of men so affected were seen in the 2/3rd C.C.S. at Beirut, the 2/11th Field Ambulance in Tripoli and the 1st New Zealand C.C.S. at Zahle. Pathological examination revealed no parasites or organisms in the blood, and the serum did not agglutinate *Proteus*, *Brucella melitensis*, or any of the enteric group.

From July to December 1941 a series was analysed at the 2/4th Field Ambulance at Tripoli: 80 per cent of pyrexias were considered to be due to sandfly fever, though sandflies were found only in small numbers. No vectors of dengue were found, but no sustained investigation was possible. In 1942 Captain K. J. Grice and Lieutenant J. Chvapil studied a number of cases of fever at the 2/11th Field Ambulance, and felt that they were suggestive of mild typhus, which was stated to be endemic in the area. Clinical evidence supported the possibility, but the serological findings were inconclusive. Colonel Furnell in his quarterly report on 30th June 1942 classed the pyrexias into three groups (1) a fever of the sandfly type, (2) a disease of the murine typhus group, a few agglutinations being found with OX19 and X, (3) fevers of five to seven days' duration of undetermined type.

Venereal disease caused anxiety soon after the Syrian campaign ended, and continued to do so till troops left the country. The incidence, and the methods used in preventing infection are described in Volume I. The remarkable experiences in Beirut and Tripoli are there recounted; here, brief reference may again be made to the successful experiment of permitting brothels under strict disciplinary and medical supervision. This saved many men from taking almost certain personal risks in villages, though the figures of the attendances at the prophylactic centres form a sad social commentary. Treatment was given at first in a clinic under the same roof as the 2/3rd C.C.S., but later in the 14th Special Hospital at Bhamdoun. In January 1942 approval was given for its establishment as a 400 bed hospital, but by the end of the month the unit was ordered to join the move "Stepsister", and proceeded to Palestine, *en route* for Australia. From the point of view of prevention the emphasis was always laid on the need for education and of amenities, and the provision of prophylactic centres. The latter at least could be linked up with the work of a special hospital, which could advise on standard procedures, and supervise the work in preventive centres. Colonel Norris in trying to

reduce the incidence of venereal disease in the 7th Division found that these centres were often badly sited, a trouble which was met to some extent everywhere. One unusual task was performed by the 2/2nd Field Hygiene Section when this unit staffed preventive ablution centres for nearly eight weeks soon after the cessation of hostilities in Syria. In this time over 400 men passed through the centre daily, 75 per cent being Australian troops, and in all some 18,000 treatments were given. Only sixty-one of these men contracted venereal disease, which must be reckoned as a reasonably successful outcome of the work. Even with better organised facilities in 1942 venereal disease was reported by the A.D.M.S. of the 9th Division as still being a major problem in Syria.

Most of the psychiatric casualties in Syria occurred during the campaign, when special arrangements were made at Ez Zib. Here in good surroundings with adequate accommodation and sea bathing, Major Gwyn Williams treated men with fear and anxiety states. After the armistice there was no need for this service, and the 2/13th Field Ambulance, which had run the rest station at Ez Zib, moved to Dhour Chouer, and opened a rest camp which could take up to 1,200 men. This unit was able to relieve the strain on other holding units in Syria, acted as a malarial treatment centre and helped to carry out the policy of conserving manpower.

SURGICAL WORK

Surgical work did not include any battle casualties in the period under review; the chief conditions treated were fractures and burns. The frequency of fractures of the lower part of the radius, the lower third and the malleolus of the fibula and the carpal navicular bone, deserves special comment as a reflection on the dangers of transport under peaceful conditions. A few severe skull injuries were seen; in fatal cases severe multiple injuries were also present. Most of the soldiers involved in these accidents were despatch riders, in whom the incidence of all kinds of injuries was very high. The danger of riding motor cycles on the tortuous, steep and, during the cold weather, often slippery roads of Syria was much greater than that of driving a motor vehicle, and even that frequently had its times of peril. Men with major fractures were sent on to the base hospitals after shock had been treated, necessary manipulations carried out, and immobilisation achieved by the use of plaster. In Beirut at the 2/3rd C.C.S. the need for an orthopaedic table was felt, and the Australian Light Aid Detachment under directions of the surgeons of the unit constructed a suitable table which was invaluable in immobilising fractured limbs, and far superior to the pelvic rest supplied. Thomas splints were used only during transportation of the patient from field ambulances to the C.C.S., but even here their use left much to be desired. The fit of the splints was frequently faulty, and immobilisation was seldom achieved, mainly because a large poorly fitting ring permitted the splint to ride up and loosen the extension. In spite of instructions to the contrary a clove hitch was sometimes used for extension.

Burns were also frequently seen. The practice was adopted as far as possible of two surgeons carrying out necessary toilet of the burnt area under anaesthesia, so as to lessen the time occupied. After a thorough toilet wet gauze was applied to face, hands and feet, after a light dusting of sulphapyridine powder, and the limbs and trunk were tanned with 10 per cent tannic acid and then 10 per cent silver nitrate. Triple dye was also used, but with less success. The best emergency treatment was found to be morphine and the application of a temporary dressing of saline, bicarbonate of soda, picric acid or acriflavine. Adequate stocks of dried plasma at the C.C.S. were found indispensable.

Most of the other surgical activities concerned operations of the non-urgent variety, and the treatment of septic ulcers, here usually called "Syrian sores". By far the greater number of these sores occurred in the months of August and September. Possible factors suggested for this apparently seasonal distribution were lack of a balanced diet, some lessening of resistance during the campaign, lack of care in treating abrasions, lack of facilities for washing and the omnipresent flies. No constant bacteriological findings were reported; the bacterial flora were usually mixed in type, and sometimes included diphtheroid organisms. Infections of this kind seemed to respond well to the local application of anti-diphtheritic serum.

The dental clinic in Syria was kept busy, as is usual during a lull in military operations. Service was given to British forces, members of the Royal Navy and Royal Air Force, as well as Indian troops. The number of fillings inserted was more than double the extractions, and many gingival treatments were given. Hundreds of dentures were made, over 600 in the C.C.S. clinic alone. Appliances for fractures of the jaws were also made in cooperation with the surgical staff. Though radiological work was carried out in Syria, it was with some difficulty. Local assistance was available in Beirut and Tripoli, but most of the work devolved on the 2/3rd C.C.S. When this unit arrived in Beirut it possessed no X-ray apparatus, and at first patients had to be taken to the American University Hospital. In September a portable unit was obtained, which had only limited application, and a mobile unit capable of doing ordinary work, was later acquired through courtesy of the British forces. The mobile unit had its own generator, which was more reliable than the line supply of Beirut, and though without a Potter-Bucky diaphragm, was able to fill most requirements.

During the period of Australian occupation of Syria the greatest assistance was given by numbers of organisations and individuals; the American Consul in Beirut and the American University of Beirut in particular. Technical advice and help from library facilities and even loan of apparatus were freely given by the University Medical School, and the Beirut University Medical School held combined lectures and clinical meetings with the staff of the C.C.S. and neighbouring medical units.

In general, from the point of view of health and hygiene the occupation period terminated on a rising note. The hazards of Syria were considerable

for a force in action, and also for a garrison force. Once the campaign was over prophylaxis exerted a steadily growing pressure, and in spite of those anxieties and temporary losses of manpower which have been mentioned, the 9th Division, facing a responsible task in the Western Desert, was fit and ready when the movement south began at the end of June 1942.