CHAPTER XXI

THE ALLIED COUNTER-OFFENSIVE: AUSTRALIAN CORPS PREPARES

THE events and action to be recorded in this chapter belong to that phase of the Great War in which the Allied Powers, backed by the first American Divisions and by the knowledge that this army of two millions was now constantly streaming across the Atlantic, wore down the German offensive and prepared for the counter-stroke that was to end at the Rhine. In point of time it covers three months from the Battle of Villers-Bretonneux, April 24th-25th, to the end of July, including the Battle of Hamel—a dress rehearsal for bigger things which came unexpectedly soon in the great Battle of Amiens, August 8th, "Germany's black day."

As they concern the history of the A.I.F. these events fall naturally in three groups:—

1 Certain changes of method introduced by the new Corps Commander, and in connection with these, various adjustments in the administration and direction of the Medical Services required by the new conditions and the new military outlook.

2. Inventions and innovations in the technique of the Medical Service

3. The further development of these during the operations of this phase, which (as with the 1st Division at Hazebrouck) took the form of an extraordinarily enterprising patrol warfare punctuated by a series of raids and minor actions culminating in the Battle of Hamel. The medical arrangements for these operations present some features which call for note.

The military situation: Fourth Army

By the beginning of May the defence of Amiens had been secured by continuous systems of trenches, adequately manned and covered by large belts of wire and machine-gun emplacements. The French had extended from the south up to within half a mile of Villers-Bretonneux. The Australian Corps front reached from this point 10 miles northward across

both Somme and Ancre. The Corps Commander had at his disposal the 2nd, 3rd, 4th, and 5th Divisions which he disposed three in the line (one to the north and two mainly south of the Somme), the fourth division being in support.[1]

The New G.O.C. and Staff. Shortly after its replacement by that of Fourth Army the British Fifth Army headquarters, then in reserve, was reorganised; General Birdwood was promoted to its command, with the B.G.G.S. Australian Corps, Major-General White, as his Chief of Staff. He was succeeded in command of the Australian Corps on May 31st by Major-General Sir John Monash but retained the position of "G.O.C., A.I.F." The appointment of Australian leaders on the Staff had of late been proceeding rapidly under Birdwood and was continued by Monash, one of Birdwood's last changes being the replacement, already referred to, of Colonel C. C. Manifold, I.M.S., by Colonel G. W. Barber, A.A.M.C.

Staff changes in Australian Corps

"I joined the Corps," Colonel Barber says,[2] "under very favourable auspices. It had been brought to a great pitch of perfection by General Birdwood and the B.G.G.S., General C. B. B. White I found that the staff worked in a most harmonious manner and that every assistance possible was given by one department to another.[3] . . . The D.D M.S had direct access to the Corps Commander and was his adviser and responsible for all A.A.M.C. activities within the Corps. The presence of the D.D.M.S. at the daily conferences of the Chief of General Staff was informative and helpful to all concerned"

Of the divisional administrations and executive units Colonel Barber says.—

"The A.A.M.C. had become highly efficient; A D's.M.S, D.A.D's.M.S. and O's.C. Field Ambulances, and most of their officers and the R.M.O.'s, were experienced, the unfit and unsuitable having been eliminated. The other ranks were a fine body of men, bearer, tent, and transport divisions

[1] The lines of evacuation for these three divisional sectors are shown in sketch map on *p. 656*

[2] In a memorandum to the D M S, A I F, already referred to. In this chapter and those that follow the author has borrowed freely from this memorandum, and from a special narrative written by Colonel Barber after the war for the purpose of this history

[3] Colonel Barber specifies as "most valuable" the assistance given to the Medical Service during the succeeding months by the Engineer Service and "Signals." "Wherever possible adequate cover was provided for personnel and patients." The Assistant-Director of Signals "gave great assistance by providing telephonic communication between Dressing stations, which greatly facilitated evacuations and enabled one readily to furnish the Corps Commander with information as to casualties during an action."

It is to be noted that, while administratively under the "A" branch of the staff, the Medical Department was now in much closer touch with the "Q" branch.

well acquainted with their duties. The N.C.O's were particularly well qualified and efficient in spite of heavy casualties and loss by promotion to the commissioned rank in combatant units"

—which be it noted, apart from appointments as quartermasters, was the only outlet in the A.A.M.C. for promotion to officer.

In Major-General Monash the Australian forces had a commander whose aptitude for the type of warfare that had developed on the Western Front amounted to genius, and one who by nature and intelligence was prone to allot to the medical service its full share in every part of the task of warfare, and to call it in to every consideration. It was typical of him (and what a contrast to the proceedings of G.H.Q., M.E.F., in 1915!) that, when on March 26th he hurried south to the threatened gap between Somme and Ancre, a medical officer was one of the four who personally accompanied him.

Problem of Effectives. The problem of maintenance now became the outstanding factor in the military situation. Between March 21st and May 7th the losses by battle casualty in the Australian Force numbered 15,083.[4] During the same period wastage in the force from non-battle casualties totalled some 14,000.[5] By the end of May, with recruiting in Australia fallen to less than 2,000 a month, the Australian Depots in the United Kingdom were unable to keep pace with the demands of Third Echelon of G.H.Q. for reinforcements.

Reconstruction. It was now found necessary to begin a process of reduction in the numerical fighting strength of formations. The German, French, and British Armies had already in varying degrees taken this course, the reduction occurring mainly in infantry and cavalry. In the British Army, infantry divisions had been reduced from twelve battalions to nine, and in June the authorised strength of the battalions themselves was reduced, though Lewis guns, artillery, tanks, and other weapons had increased. After the Villers-Bretonneux fighting a begin-

[4] This figure is from the *Australian Official History, Vol V, p. 657* and includes "missing," and prisoners of war.

[5] The cost to the B E F of the two offensives (March 21 to April 30) was 302,869 battle casualties including—as is customary in British statistics—"missing" and prisoners. The non-battle casualties during the same period are not available from published British records French battle casualties totalled 92,000 The German loss is estimated by the British Official Historian at 490,000. The British casualties from wounding were based on "admissions to hospital"—in effect to a field ambulance, the German, on evacuations from railhead Thirty per cent is allowed (as an estimate) by the British Official Historian as representing German casualties "not evacuated from the corps area."

ning of reduction was made in the Australian Corps also, three battalions being disbanded and used to reinforce others. This accretion, the comparatively small losses sustained during May and June, and the attention now being paid to the problem of "return to duty," combined to bring the remaining battalions, by the end of June, almost to full strength.[6] But the fear of disbandment of more battalions, to which the whole force was strongly averse, was constantly present.

Preparations in the Medical Service

Within the medical service inventions and innovations, to meet the new conditions and the expected offensive by the Allies, sprang from initiative in two distinct spheres of action—that of the administrative departments, D.D.M.S. and A.D's.M.S.; and that of the executive units, Field Ambulances, Sanitary Sections, and Regimental Medical Establishments. The innovations to be described were the almost automatic response of officers and men to a new situation. Through four years of varied warfare these officers and men had come to know their jobs and the place of the medical service in the scheme of things. Probably the outstanding feature of medical work in this period of the war was the prompt reaction of its administrative and executive sides to initiative in each other.

Colonel Barber's administration

The new D.D.M.S. initiated his régime by tightening up medical administration within the Corps. In particular the status and function of the several administrative officers were defined more clearly than heretofore. For the medical service the Army Corps became more directly the military "unit."

The duties of medical "directors" in the British military system were very diverse. To summarise, under the G.O.C. and the dual control of his "G" and "A.Q." staffs, they directed the activities of the medical personnel—including in the Australian force the dental; administered their interior economy; and exercised command of medical units.[7] The duty of a "Director"

[6] Thus, on June 30, the average weekly strength of the 4th Division, in which the 47th and 52nd Battalions had been broken up, was 15,631, the average strength of the ten remaining battalions was 860 (full strength being then about 930), and other arms were well up to strength The only retrenchment made in the medical service in the B E F was to withdraw the five "A M C attached" for "water duties" Under a general order from G.H Q , B E F. this was carried out in the Australian Corps *See p. 716*

[7] *See Vol I, pp. 5-6* (Statement by Major-Gen Sir Edward Hutton) and *Appendices Nos 1 and 2.*

and his deputies in connection with the "medical arrangements" for an offensive had been crystallised in instructions issued by G.H.Q., B.E.F., before the First Battle of the Somme ("Preparatory measures to be taken by Armies and Corps before undertaking offensive operations on a large scale") which are given in *Appendix No. 3* to this volume.[8]

Rôle of Corps and Divisions. On the main fronts in the Great War the Army Corps, despite its varying size, was the unit of action for the higher command.[9] The duties of the Deputy, the Assistant, and the Deputy-Assistant Directors of Medical Services—as understood in the Australian Corps, have been put on record by Colonel Barber.[10] The following summary is, so far as possible, given in his own words.

The Deputy-Director of Medical Services (D.D M S.), a specialist officer advising the Corps Commander, was also "deputy" to the Director of Medical Services of "Army"—in the case of Australian Corps, he was deputy to the D M S. of Fourth Army.

"The orders received by him from the D M.S. Fourth Army, and which related chiefly to measures for the prevention and treatment of disease, were promulgated to his Divisions by Circular Memoranda An important duty of the D.D.M.S was administration of the Corps and Army troops and sanitation of 'Corps' areas. He was responsible for evacuation from M.D.S. to C.C.S. and he controlled the work of the Motor Ambulance Convoy attached to the Corps.[11] The D.D.M.S. Australian Corps had a special function, namely that of correspondence with the D.M.S. of the Australian Imperial Force concerning the welfare of the A.A.M.C. and the officers and other ranks in respect to promotion, reinforcements and leave. Orders to A.D's.M.S. relating to operations were issued as 'Medical Instructions' through the 'G' Branch.

"*A.D's.M.S. of Divisions* commanded the Medical Services and co-ordinated the regimental work of the officers and Field Ambulances, and were responsible for the evacuation from the line to the Main Dressing Stations.

[8] These arrangements for First Somme had, owing to the failure to break through, remained a dead letter They were recently made available to the Australian War Memorial through the courtesy of the Historical Section of the Committee of Imperial Defence They have been published in the *British Official History of the War: France and Belgium 1916 (1), Appendix 16*

[9] A D.A D M S. of the Australian Corps (Major W H Donald) has "appreciated," from the medical point of view, the position of the Corps in the military cosmos as follows —

"The Corps was a most indefinite and jelly-like formation—its responsibilities were constantly revised and were never exactly defined At times a highly complex formation, with duties far beyond the scope of the relatively small staff, at others it would subside into the merest go-between to the organic military formations, Division and Army. Relations were always more or less strained. the Corps was suspected of encroaching on Divisional duties with the object of justifying its existence—the Corps criticised the Divisional attitude as parochial"

[10] In the memorandum referred to on *p. 648*

[11] Colonel Barber adds that throughout his own time as D D M.S the Corps Motor Ambulance Convoy "was the 3rd British, whose admirable services should be recorded"

"An important officer of Corps and Division was the D.A.D.M.S. who was selected from officers with both R.M.O. and Field Ambulance experience. His duties were onerous and responsible, including general responsibility for sanitation within the area."[12]

"*Offices: Records and Returns.* The offices of D.D.M.S. and A.D's.M.S. were the clearing houses for the A.A.M.C. and were run on business lines. The office staff (Warrant Officer, 2 Other Ranks, and an Orderly) were mostly drawn from men of business education and clerks. The Warrant Officer was responsible to the D.A.D.M.S. for the important 'Field Return' and numerous other general returns."

No note on administrative medical duties in the field could be valid without special reference to this matter of returns and records. The misuse of "returns" is of course a hoary military joke, but it is not too much to say that the ordered life and activities of a modern army in a major war are absolutely dependent on the systematic rendition of returns and maintenance of records. The keeping of casualty records and rendition of corresponding returns were an important and onerous duty of the medical service. A special note on the subject will be included in *Volume III.*

Standing Orders for A.A.M.C., Australian Corps. On his becoming A.D.M.S. 4th Division Colonel Barber's first action had been to formulate "Sanitary Standing Orders"; after a few months' experience in France he had embodied his views on the medical administration of a Division in "Medical Standing Orders." Now, one of his first actions on becoming D.D.M.S. of the Corps was to integrate the various administrative instructions and precedents into *Standing Orders for A.A.M.C., Australian Corps,*[13] which with the approval of the Corps Commander, served as a ruling for the medical service throughout the Australian Corps;[14] all medical officers, in particular, those

[12] The following is from a D A.D M S of II Anzac —

"It would appear to me that the duties of the D.A.D.M.S. Corps are what the D.D M.S. makes them. I was D.A D M.S II Anzac under both Roth and Begg. Under these two I found very different conditions Roth made me do a great deal while Begg allowed me to do very little In the latter case I was a clerk and nothing else. Roth on the other hand discussed everything with me and sometimes acted on my suggestions. A great part of our dealings with A D's M.S. Divisions was carried out by me by his direction. Also inspections of units occasionally. Sanitation and Health were dealt with by me under his supervision."

[13] *See Appendix No 4.* These are not to be confused with "Medical Instruction No 10" referred to in the last chapter (*p 634*)

[14] Colonel Barber of course had no authority over Australian medical units outside the corps. In II Anzac Corps instructions corresponding to these were given in a pamphlet, "Lecture to Medical Officers," by the D D.M.S, Colonel Mackie Begg

Colonel Barber has recorded how, as A.D.M S, 4th Division, he first became

recently joined, were required to make themselves familiar with it—and also, with *Field Service Regulations.*

Promulgation of Medical Instructions.[15] It was found necessary at this time to systematise the method for transmitting the instructions of A.D's.M.S. to the medical units.

"The chief mistakes (says Barber) made were the giving of too much information, imperfect paragraphing, inclusion of standing orders in routine, and the giving of orders calculated to cramp the initiative of Ambulance Commanders and Regimental Medical Officers."

Posting of R.M.O's. Closer rapprochement than heretofore was effected with the office of the D.M S., A.I.F., and, as a consequence, the Deputy-Director secured a freer hand within the Corps. The important matter of the replacement of any Regimental Medical Officers who became casualties, was made automatic and immediate by leaving direct action to the Field Ambulance Commander. Reinforcing officers were to be posted to field ambulances before taking over regimental duties and at the same time experienced regimental officers were posted to field ambulance to qualify for promotion and future command.

Preparations for mobile war

"It seemed obvious," wrote Colonel Barber, after the war, "that we had done with stationary warfare and that we should be engaged in mobile warfare—advance or retreat. It was therefore urgently necessary to make arrangements in preparation." The "more important" of these, he said, were:—

"the mobility of medical units, the co-ordination of medical service within Corps and Divisions; the method of issuing medical orders; measures—in the form both of treatment and of transport—to combat the long distance from M.D S. to C.C.S.; measures to ensure adequate medical supplies in a war of movement; and measures for preventing

aware of the need for such instructions which had been lacking under his predecessor

"I drafted these as the result of attending a lecture on 'The R M O' at one of the British Casualty Clearing Stations The lecture was given in a humorous vein and was of little value, but in the discussion which followed many R A.M C. officers (T and S R) expressed themselves very strongly concerning administration and complained that they could obtain little or no information about their duties regarding which many of them realised their ignorance I returned to the Division determined that my officers should not have a similar complaint" He accordingly issued standing orders for the A A M C in his division Other Australian divisions had issued—the 1st, a summary of rules, the 2nd, "Instructions for the guidance of all Medical Officers", the 3rd, "Hints to Medical Officers"—extracts from G R O's, A R O's, D R O's, and A D M S. Circulars; the 5th—a somewhat similar compilation

[15] For the vague and anomalous position of the medical service with regard to the issue of "orders," see *p. 114n*

sick wastage." In particular the work of Sanitary Sections required attention and the working of dental units had to be readjusted.

Some measures with the same object were taken by higher authorities—Army and G.H.Q. A few deserve special note.

Reserve of Equipment Formed. To relieve the ambulance transport of equipment additional to the strict allowance and yet ensure special supplies for emergency, a special "Army" order permitted D.D's.M.S. to hold stores of stretchers and blankets. These, together with extra tentage, were dumped at the headquarters of the M.A.C., and lorries were specially attached to the M.A.C's for carrying them wherever the D.D.M.S. directed.

Effort for mobility

Changed Rôle of Sanitary Sections in Fourth Army. The views upheld in the Australian Divisions on the function and proper employment of the Divisional Sanitary Sections—that they should be rather instructing and directing units, like engineers, than skilled labour units[16]—were now accepted by Fourth Army. A standing order laid down:—

"To rectify a prevailing misapprehension, a Sanitary Section is not responsible for, and is not in a position to carry out, the provision and distribution of the various sanitary appliances that are necessary in an area. Every unit must be able to maintain satisfactory sanitation with improvised appliances until more permanent structures can be supplied."

The procedure that had previously been general in the British Army, of making these units stationary under "Army" control, was replaced in the Australian Corps by a judicious compromise, whereby, for administrative purposes they were made "Corps units" under the D.D.M.S. who might—and often did—hold them in an area other than that occupied by their own division. But normally the sections moved with and under the Divisional A.D.M.S., and were responsible for the sanitary efficiency of their own divisions.[17]

Mobility of Baths and Laundries. The prevention of what

[16] *See pp. 594-600.*

[17] The order for the transfer from Divisional to Corps control took effect as from April 21. For the purpose of giving instruction to battalion "pioneers" official provision was made for a workshop at the Headquarters of each Sanitary Section. A special Corps routine order (A.Q.) authorised supplies of material, arranged for indent and drawing, and provided for transport. (The 3-ton lorry originally provided had lately been replaced by an inadequate box-car.) "When these matters had been put upon a sound basis" (Col. Barber records) "one had little or no trouble with sanitation."

we have termed diseases of dirt and squalor was now fully taken in hand by the "Q" Branch of Corps and Divisions. A special "Baths and Laundries" sub-department of "A.Q.," with a commissioned officer (lieutenant) in control, was made fully responsible for these, under the D.A. and Q.M.G. Efforts were made to improve their mobility, a matter in which the British Army had lagged behind the French.

Of Dental units. During the siege warfare in common with all other units the dental units attached to Australian field ambulances had acquired far more equipment than could be carried, and they, too, believed this equipment to be essential. The result was that, in the rapid Divisional moves in the first part of 1918, not only the equipment but the dental units themselves (says Colonel Barber) "were scattered broadcast over the country." They were now assembled and steps were taken by the D.D.M.S. to ensure mobility, without loss of efficiency. These particulars, however, will more suitably be dealt with in the general account of the work and significance of these units in *Volume III.*[18]

Technical developments in evacuation scheme

The inventions and innovations referred to at the beginning of this chapter originated in the fighting of the field units during the warfare of May, June and July; and, to understand their development the reader will first require a short description of the medical arrangements of the Corps at that time.

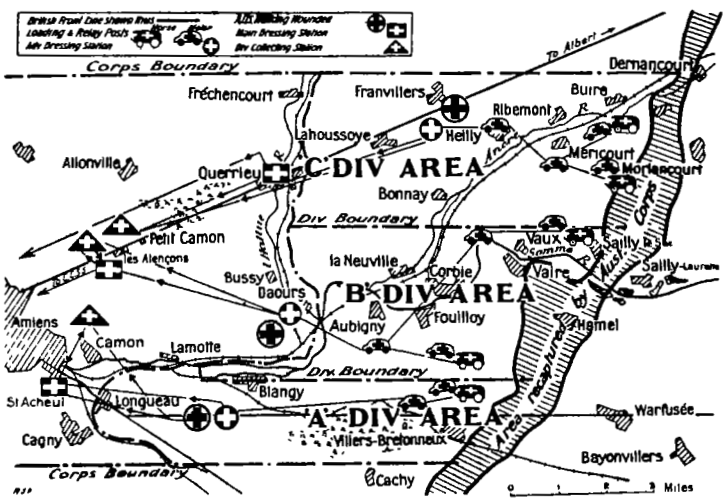
During the period of intense minor activity on the part of the Australians during May, June, and July culminating in the Battle of Hamel, each of the three divisions in line developed its own scheme of evacuation, based on groups of casualty clearing stations at Crouy and Vignacourt. With slight changes in the position of the more advanced posts and stations the scheme remained unchanged until the general advance.

The Terrain The River Somme During the next five months the problems of clearance in the Australian Corps were dominated by the River Somme. Its wide wooded valley and partly canalised stream

[18] Equipment was cut down to 350 lb. Owing to the large number of British and American troops attached to the Corps the Australian dental units were overworked It consequently became necessary to restrict the work done by Australian units for non-Australian troops to urgent cases.

divided the Australian front, each of the plateaux, north and south of the river, being held by one Australian division, with a third holding the valley between them and a fourth in reserve. Each sector was held by one division, usually on a two-brigade front.

A second important feature of the terrain presented itself in the old Roman roads Amiens-Albert and Amiens-St. Quentin which enticed all traffic towards the southern corner of the Corps area. The whole front was roughly eleven miles in length.



General Scheme of Evacuation from Divisional Areas, May-July.
(The A D.S. situated between Bonnay and Franvillers is that figured in plate and diagram at p 660.)

The evacuation scheme was in great part determined by these geo-physical features—in particular in the central sector, where the position of the bridges decided medical sites and routes.

The accompanying sketch map shows the general scheme of clearance in the three divisions during May, June and July; only the main transport routes are indicated. "Main" dressing stations and "divisional collecting stations," sited on the two great roads, cleared from advanced dressing stations which lay within range of the enemy's 5·9-inch howitzers. A special feature of the forward clearance was that motor loading posts were pushed far forward: at times Ford cars even cleared some

of the R.A.P's.[19] Much attention was paid to the problem of the *walking wounded*—in particular an endeavour was made to clear them to C.C.S. with a minimum of interim manipulation, leaving the stream of stretcher cases to pass down through the treatment centres and ambulance waggon routes. The 3rd British M.A.C. cleared for the Corps from main dressing to casualty clearing stations. Within the framework of this scheme were made the experiments in transport and treatment now to be described.

Transport of Walking Wounded: Corps Motor Relay Post

In this scheme the first innovation deserving mention was the "Corps Motor Relay Post." Four years of war had taught that, in heavy fighting, the ambulance transport of the field units and motor ambulance convoy sufficed only for stretcher cases; for the mixed group of "walkers" and "sitters"—most of whom had walked from R.A.P. to waggon loading post—other rolling stock must be found. The new war of movement, and the rearward emplacement of C.C.S. groups, compelled a more exact use than heretofore of "returning empty" ammunition lorries to supplement the buses supplied by "Army." The "motor relay post" at Toutencourt[20] gave the idea for an improved method of tapping the ammunition supply lorries, in particular those of the "Ammunition Parks"[21] on their return from rendezvous or refilling point to their own railhead.

"Full advantage was taken of returning ammunition transport," writes Colonel Barber, "but, as the ammunition railheads did not coincide with the location of the Casualty Clearing Stations, it was found necessary to establish ambulance posts where the routes diverged; one ambulance post each for the right and left sectors. These were christened Corps Relay Posts, and had establishment of one tent sub-division, with transport; they were administered by the D.D.M.S. as they were too far in

[19] The impressions of the warfare at this time, recorded by Capt W. J Newing who joined the Corps in May, offer instructive contrast to the records of the Third Battle of Ypres.

". . . One could not help thinking what a large unwieldy organisation a Field Ambulance is. Except when there is actual fighting the men do very little except clean up after themselves, and, from later experience with the 26th Battalion in actual fighting, one noted that the Ambulance bearers sometimes go all day without a carry. Ford Ambulances can get up so near to R A.P's that it struck me that perhaps it would be better if bearers were battalion men, to be called upon in emergencies"

[20] *See p. 626*

[21] In view of modifications in the method of ammunition supply since the war the detailed technique of *liaison* is not described. It must be emphasised however that medical officers should be closely familiar with the movements of the transport concerned in both forms of supply—ammunition and rations

rear of their respective A.D's.M.S. Walking wounded were debussed here [*i e* removed from the lorries], and proceeded to Casualty Clearing Stations by lorries or buses obtained from the Army and kept at the Post for this purpose; this plan worked very well.

"Certain buses worked between Advanced and Main Dressing Stations, others from M.D.S. to C.C.S. When conditions allowed, patients were transferred direct from Advanced Dressing to Casualty Clearing Stations. Thus the 'Walking Wounded Dressing Station' might be an annexe of the A.D.S. or the M.D.S."

The Corps Relay Posts were moved or multiplied to meet changes in the routes. On occasion they served, in effect, as the "M.D.S." for walking wounded; kept "Admission and Discharge" Books, and furnished returns to Third Echelon.

The standardised underground A.D.S.

The second innovation was the "standardised A.D.S." The history of ambulance work in France was, as the reader will already have gathered, largely the history of the "A.D.S." Yet that history can be understood only when dealt with in terms of facts and constants, and the meanings of the terms "advanced" and "main" dressing station were not constant. In evacuation the vital constant factors have been identified in *Chapter XI* as those of time and distance on the one hand and of the vital reaction to trauma on the other; and it was these that determined both the character of the "advanced" dressing station under various conditions of warfare, and also its location. During May, June, and July this problem of the A.D.S. was tackled scientifically in the A.I.F. The first experiment was undertaken by the 6th Field Ambulance when, at the end of April, it moved up from Warloy to clear the 2nd Division's front on the Somme and Ancre. The purpose in view was then to safeguard wounded who should be held up by enemy shell-fire at the A.D.S., and as well to minimise losses among the bearers. With the assistance of the A.D.M.S. (Colonel A. E. Shepherd) the commanding officer (Lieut.-Colonel H. L. St. Vincent Welch) secured the co-operation of the 2nd Pioneer Battalion in constructing a "model dugout" to house the A.D.S. on the exposed Franvillers-Bonnay road.[22]

[22] The dugout was driven into the side of a slope some 30 feet underground, with independent entrance and exit, and accommodated some 50 stretchers on struts, in a gallery with two bays A trolley track, with a reciprocating windlass at each end, admitted and discharged casualties. A model scheme with plans was designed to house underground all the posts, from the R A.P's to the A.D S.

The A.D.S. was completed by the end of May and served well the purpose for which it had been designed. It was found, however, that complete headcover was seldom required at the A.D.S., and it fell to the 14th Field Ambulance (Lieut.-Colonel C. W. Thompson), which took over the post on June 15th, to complete the scheme of "a standard type A.D.S." With the help of the Divisional Engineers, a new station was designed and was constructed to plan by the unit personnel helped by the Pioneers. The object of this new experiment was chiefly to obtain protection against fragments from the new German shells with instantaneous fuses ("daisy cutters," as they were called) and aerial bombs. This station was accordingly sunk only a few feet below ground level.

The principles which guided this unit were set out thus:—[23]

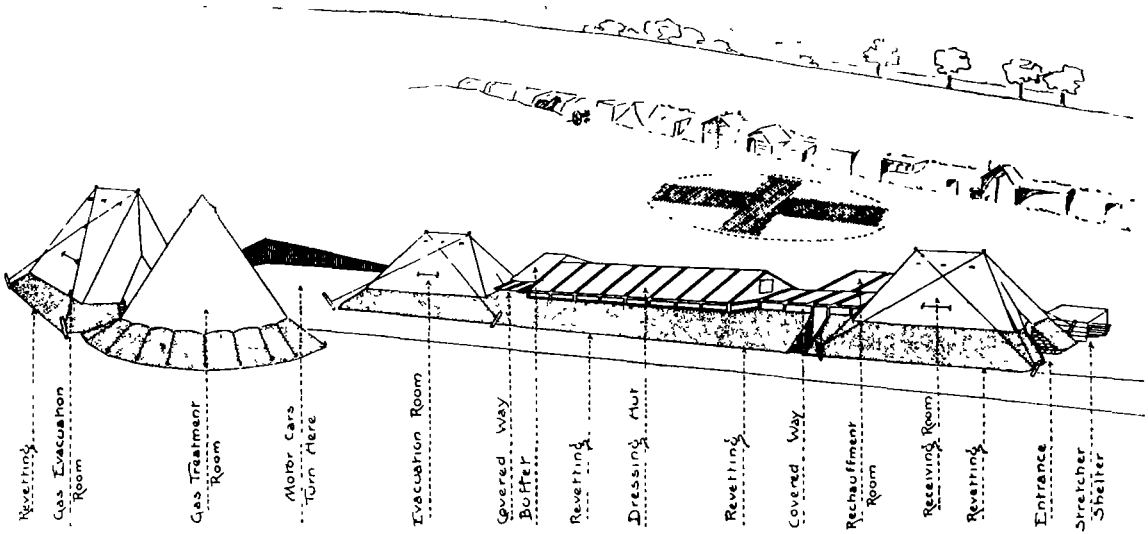
"Local conditions may indicate that a M.D.S. be the place where treatment is carried out. But in stationary warfare it is . . desirable that the A.D.S. be designed for heavy shelling, situated, as it [the station] generally is, well within the shelled zone. It is a good plan to have an alternative dressing hut above ground since a wounded man may get handled much quicker on the surface." "It is highly necessary, we think," the writer adds, "that a patient should leave an A.D.S. fit to travel to C.C.S. That is an ideal to which one should approximate."

How from this station there was evolved the so-called "portable" station is told by Colonel Barber:—

"The idea was first conceived after inspection of the excellent tented A.D.S. constructed by Lieut-Colonel Clive Thompson, C.O. 14th Field Ambulance. . . . Three wooden huts were constructed in sections and were kept in readiness at the Engineer dumps. As a rule one was erected in either sector if possible beside the A.D.S., which became the M.D.S. when we advanced. The other was kept in reserve to be 'leapfrogged' forward in event of an advance. It was found that the material could be transported in three lorries. When time allowed these huts were sunk and sandbagged. . . . In addition plans were drawn up (in consultation with the C.E.) for standard dugouts at R.A.P's, Bearer Relay posts, and Advanced and Main Dressing Stations. Relay posts were so constructed that by further digging they could be converted to an A.D.S. to carry 30 stretchers."

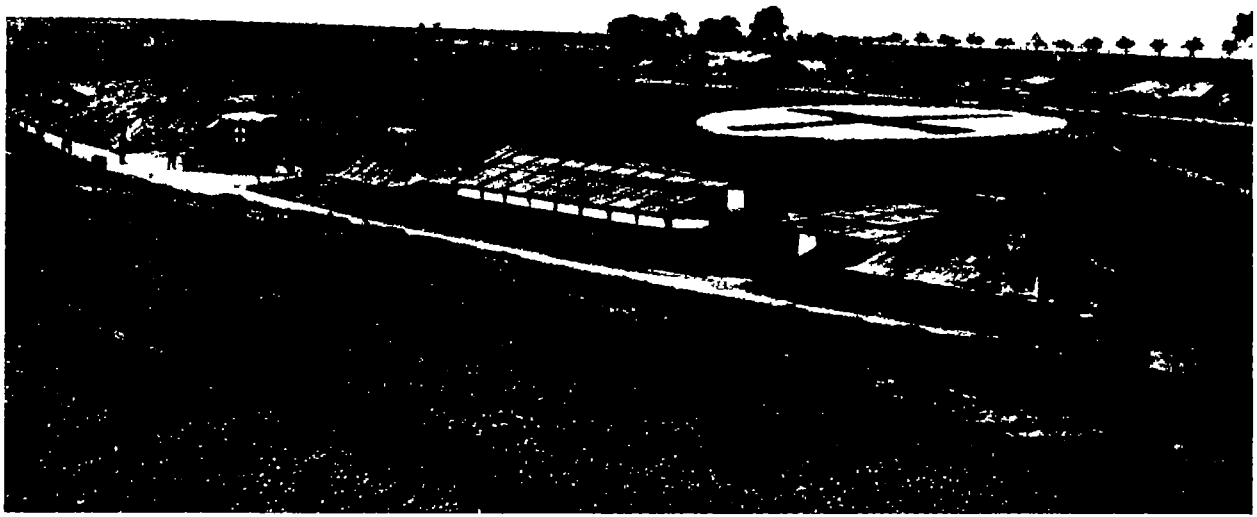
The third innovation was the Field Ambulance Resuscitation Team. Always difficult, the problem presented to the field medical units by the man whose wound called for prompt but effective surgery—"the problem of the tourniquet" as it might

[23] In an excellent study of the whole problem in the *War Diary* of the 14th Field Ambulance, 31 July, 1918



THE UNDERGROUND DRESSING STATION ON THE FRANVILLERS-BONNAY ROAD

From drawing by Lance Mattinson in war diary of 14th Fld Amb



71. THE ADVANCED DRESSING STATION (14TH FIELD AMBULANCE) ON THE FRANVILLERS-BONNAY ROAD, JULY, 1918
This became the model for the standard A.D.S.

Aust. War Memorial Official Photo. No. E3877

To face p. 660



72. THE CONGESTION OF WOUNDED AT THE LOADING POST NEAR 4TH BRIGADE HEADQUARTERS DURING THE BATTLE OF HAMEL

Aust War Memorial Official Photo No E2099



73. OPERATING ROOM IN THE MODEL DRESSING STATION, FRANVILLERS ROAD

Aust War Memorial Official Photo No E2771



74. GASSED MEN AT THE R A P OF THE 42ND BATTALION IN VILLERS-BRETONNEUX, 27TH MAY, 1918

Aust War Memorial Official Photo No E4850

To face p 661

be termed—with the equally prominent factor of wound shock, became in this phase of the war again a very pressing one. The partial solution effected by evacuation direct from A.D.S. to a C.C.S. placed far forward (as in the Third Battle of Ypres) was not now possible. It is true that the Thomas splint had provided a radical solution in the fractured femurs; and the "discovery" of warmth, transfusion, and rest had reduced the incidence of wound shock. But that there remained a very real problem[24] is shown by the urgency with which, so soon as the front had somewhat settled down, the field units set about to find a solution for what they held to be a professional *impasse*. From gropings at this time in all the medical units of the Corps there evolved the *Field Ambulance Resuscitation Team*—a purely Australian innovation, which not only played a most useful part in the work of evacuation during this phase of the war, but—what is even more important—had a high educative value for the personnel of the field ambulance.

The Field Ambulance Resuscitation Teams

A note on the constitution of these "teams," and an outline of their work and place in the medical scheme will be found in *Appendix No 14*,[25] but the mode of their development must be described here. Two factors were equipotent in it, and these may be summed as "demand" and "supply."

Demand—and Clinical Experiment at the Front. From accounts of sundry strivings within the field units the following is selected to show "demand."

In the first weeks of May the 14th Field Ambulance (5th Division) "ran" the Main Dressing Station for the Central Sector of the front. This station was then at Daours.[26] Its Commanding Officer had formed the opinion that "on an average" in some 2 per cent. of battle-casualties "the long trip to the C.C.S." is excessively dangerous. In view of this he decided to provide effective surgical treatment in cases "of

[24] It might be argued that from the strictly military standpoint, or by the "totalitarian" standard of "humanity," the logical procedure in the severest types of wound would be euthanasia by an overdose of morphia, failing this, the remedy of No-Man's Land, a bullet. The ordinary standards of humanity, however, are deeply implanted in all civilised troops and great resentment follows their non-observance.

[25] *See pp 953-7*

[26] After being shelled on May 20 it was moved to Les Alençons. The note is from a report by the O.C. Lieut.-Col. Clive Thompson to the A.D.M.S. 5th Division (Col. M. H. Downey) "Operations performed at M.D.S. in Daours May 5-19, 1918." (Diary 23 May, 1918.)

haemorrhagic urgency" and in some others, including "selected abdominals." Through the Australian Red Cross Society the official equipment of the unit was augmented by a steriliser, a Shipway warmed ether apparatus, and a "Max Page" *réchauffement* apparatus. An operating theatre was fitted up and also rooms for post-operative treatment. During two weeks some 30 operations were performed and "on the experience gained" Lieut.-Colonel Thompson recommended to the A.D.M.S. that "an operating team" for each Division should be placed at the disposal of the A.D.M.S. for attachment to "suitably placed Main Dressing Stations."

The difficulty of providing early and effective surgical treatment for the seriously wounded in the Corps area was brought officially to the notice of the D.M.S., Fourth Army by the D.D.M.S., Australian Corps on May 21st but "without result."

Supply—and Scientific Research at the Base. Pari passu with these clinical experiments, advances in technical methods were moving other men toward the same ends.

Reference has elsewhere been made[27] to the research work on haemorrhage and wound shock carried out by the Medical Research Committee in association with various American and British workers; in particular its treatment by blood transfusion. The results of research were translated into practice in France first at the Bases, in particular at Boulogne where in January, 1918, surgeons at No. 2 A.G.H. were using the "whole blood" method. At the front, early in 1918, at No. 3 British C.C.S. at Gézaincourt (Third Army), under the Consulting Surgeon (Colonel Gray), Captain Kenneth Walker, R.A.M.C.(T.), had built up a "Shock Centre," which became a Mecca for front line medical officers, among them a number from the near-by Australian Corps. From these came the idea of field ambulance resuscitation teams—analogue of the C.C.S. "operating teams."[28]

Consummation: The Australian Resuscitation Teams. Towards the end of June officers of the 4th Field Ambulance took the initiative in applying this new line of treatment to field ambulance work. The matter was brought to a head by the occurrence of several unfortunate happenings. The following created a deep impression.

On June 24th, at Daours, the A.D.M.S., 4th Australian Division (Colonel A. H. Moseley) was wounded in the leg by a fragment of H.E. He was evacuated to the M.D.S. (4th Field Ambulance) at Les Alençons

[27] In *Chapter xii and Appendix No. 14.*

[28] The above is from a note by Lieut.-Col. Victor Hurley, A.A.M.C., who worked at this time with his "operating team" at Gézaincourt, and kept the D.M.S., A.I.F., posted in developments.

where under existing conditions no effort could be made to ligate the posterior tibial artery which had been severed in its upper third. Evacuation to C.C.S. at Crouy (18 kilometres) over bad roads involved several more hours before effective surgical aid was possible—and this when the division was holding a quiet front. The limb had eventually to be amputated.

With the approval of the A.D.M.S.[29] and concurrence of the Deputy-Director the Officer Commanding the 4th Field Ambulance (Lieut.-Colonel R. S. McGregor) now formed, unofficially, a "resuscitation team," directed by Major A. W. Holmes à Court.[30] Equipment for blood transfusion was obtained by various devices: serum for the typing of donors, gum and glucose solution, and so forth were supplied by No. 3 (British) C.C.S. The "team" was ready to undertake urgent surgical work in time for the Battle of Hamel; and during this action and subsequently it was kept fully employed at the M.D.S. at Les Alençons.

Early in July General Howse visited the Australian Corps, and unofficially approved the scheme.[31] Subsequent developments are recorded by Colonel Barber as follows:—

"With the consent of the G.O.C. Australian Corps (Lieut.-General Monash) a 'Corps Resuscitation Team' was formed for the purpose of performing urgent surgical operations, *réchauffement* and transfusion of blood. The necessary gas and oxygen apparatus for anaesthesia and equipment for transfusion of blood and gum solution were obtained and the team proved a complete success. As soon as it was thoroughly established and made mobile, it was detailed in turn to one Ambulance in each Division where it 'doubled up' with a similar team drawn from that Ambulance who received instruction, the necessary equipment being supplied by the D.M.S. Australian Imperial Force (from the Australian Branch of the Red Cross Society).

"Australian Corps 'Medical Instruction No. 14,' of August 23rd, authorised an establishment and equipment table. Thus in a short time we possessed a resuscitation team for each Division. That for the 1st Division, like the rest, was in full working order when that formation rejoined the Corps after the Battle of August 8th."

Within the Australian Corps these teams replaced the

[29] Lieut.-Col. R. S. McGregor acted as A.D.M.S. until July 6, when Col. Kenneth Smith was appointed to the position.

[30] To this officer is due the major credit for the creation of these teams, and for their successful development. The Australian war records are indebted to him for an admirable account of the origin and activities of these teams.

[31] The Consulting Surgeon B.E.F. (Surgeon-Gen. Sir Anthony Bowlby) and of Fourth Army (Col. G. E. Gask, and, later, Major G. Gordon-Taylor) co-operated *con amore* in the project and were of great help in overcoming some official inertia in the matter of Army supplies

C.C.S. as centres for education in the prevention of wound shock—*réchauffement* and so forth; and they were an important element in field ambulance work throughout the advance to victory. In the great battle of the St. Quentin Canal the "Corps team" was attached to the 27th American Division.

On September 20th General Howse approached the Corps Commander with the recommendation that surgical resuscitation teams for the forward areas be made a permanent A.I.F. establishment. This recommendation was in due course forwarded to the D.G.M.S., B.E.F., who officially sanctioned the employment of the teams in the forward area of the Australian Corps.

The following is quoted from a statement by the Acting Consulting Surgeon, Fourth Army (Major G. Gordon-Taylor) in a report by the "Resuscitation Teams Committee" appointed by the D.D.M.S., Australian Corps:—

"Several months' experience in the Casualty Clearing zone behind the Australian Corps has enabled me to form an estimate of the excellent work of the resuscitation teams of that Corps. There can be no room for doubt that very many lives have been saved by the work of Major Holmes à Court and the members of the other resuscitation teams. Their experience in the Dressing Stations coincides with that of the Casualty Clearing Hospitals that in blood transfusion we have the most remarkable and valuable means of treating cases of severe shock and haemorrhage. Their results conclusively prove the value of these methods of resuscitation in the Field Ambulances."

On October 30th the following circular memorandum was sent from G.H.Q., B.E.F. to the Directors of Medical Services in all Armies:—

"The attached report on the organisation and work accomplished by Divisional Resuscitation Teams, Australian Corps, is forwarded for your information and consideration with your Consulting Surgeon. The employment or not of such Teams with Field Ambulances naturally depends on the factors imposed by the variations in the military situation—distance of Casualty Clearing Stations behind front line—time taken in transporting wounded from the latter to the former—number of Surgeons and other personnel available for the work etc. Where circumstances are such that the maximum good is likely to result by the employment of Teams as indicated in the report, you will no doubt be able to bring the principle into operation."

Thus three innovations instituted by the Australian Medical

Service at the front became an official practice throughout the Australian Corps, and, in this case, an authorised one in the British Army.

Health May-July

Apart from the first wave of the influenza epidemic, which struck the Australian troops in June, the health of the force was very satisfactory.[32]

"Good facilities for various sports were found to exist at the present location (says the diary of the 8th Field Ambulance in June), and these were fully availed of. Cricket, football, or baseball matches were arranged with the surrounding units. Daily bathing parades were held at a spot some mile and a half distance from the camp."

Military Operations

From the many and varied fights of this time, three may be selected for note as having particular points of interest, namely, the fighting north of the Somme on May 19th (Ville) and June 10th (Morlancourt), and the Battle of Hamel south of the river.

Fighting north of the Somme—Ville and Morlancourt. During May and June the 3rd, 2nd, and 5th Divisions in succession carried out a series of very successful "raids" and patrol actions, but the most important "set pieces," mentioned above, were both undertaken by the 2nd Division.

It is not possible to enter upon a particular account of the exceptionally varied and interesting medical events of these actions. It must suffice to say that they open up a new phase of field ambulance work in this war—it may even be said, in warfare. The main lines of evacuation were the same for both operations, modified to suit place and circumstances. An important factor in the success with which casualties were cleared through the "bearer" posts was the construction by the medical units, in conjunction with the engineer service and the pioneers, of safe and commodious shelters for R.A.P's and bearer posts. A feature of the *transport* work in these, as in later operations, was the forward emplacement of motor loading posts, whereby the bearer carries were reduced and clearance to the A.D.S. speeded up. What were called *"motor loading posts"* became, in effect, the pivot of clearance, all arrangements forward of the M.D.S. being adapted to the working of them.

[32] *See Graph No 9 at p. 494, and Chapter xxiii*

Both regimental and ambulance carries were short and evacuation correspondingly rapid.

In the operations at Ville on May 19th in which the 5th and 6th Brigades sustained 506 casualties, the 6th Field Ambulance (A.D.S. and motor loading post) with pooled bearers cleared 417 wounded to Querrieu (M.D.S. 5th Field Ambulance) in 12 hours, the wounded arriving, the war diary notes, "in excellent condition"; this was attributed by the O.C. to "the warmth of the day and the excellent *morale* of the service." For this "stunt" a special motor loading post had been constructed to accommodate 30 stretcher cases. Walking wounded arrived here two hours after the opening barrage and at the M.D.S. within three and three-quarter hours. From this stage of the war onwards German prisoners were always available for stretcher-bearing.[33]

In the operations near Morlancourt on June 10th-11th, the 7th Brigade had losses amounting to 487, the 397 wounded being evacuated by the 6th Field Ambulance through their new underground A.D.S. on the Franvillers-Bonnay road.[34]

The try-out; Battle of Hamel

By the end of June the Australian Corps, general staff and troops alike, were ready for a more ambitious effort, and the Army Commander (General Rawlinson), Lieut.-General Monash, and the tank commanders combined in devising a minor offensive which should serve incidentally to rehearse new tactical methods for the first stroke in the Allied offensive, for which the time would probably arrive before long.

Military Operations. The Battle of Hamel was the logical and inevitable outcome of Cambrai: a phoenix from the ashes of that brilliant but mismanaged effort. It was the first of the great series of battles undertaken during the next three months by the Australian Corps. The objective involved a German salient enclosing the village of Hamel; the advance was made on a 6,000 yard front to a depth, in the centre, of 2,000 yards. Secrecy was a special feature of the preparations for the battle. The G.O.C. 4th Division (Major-General Sinclair-MacLagan) was made responsible for its conduct. The tactical plan, worked out

[33] This was officially permitted but only for the journey *from* the line. It created the difficulty that the stretchers used were not returned. This was met by forming stretcher dumps at the motor loading posts and A.D.S. to "feed" the R.A.P's.

[34] This station has been described on *p 658* It was made the subject of a special report to his Minister (Senator Pearce) by the D.G.M S. Australian Military Forces (Surgeon-Gen. R. H. J. Fetherston) who inspected it, during the course of these operations, on the occasion of his visit to the British and French fronts.

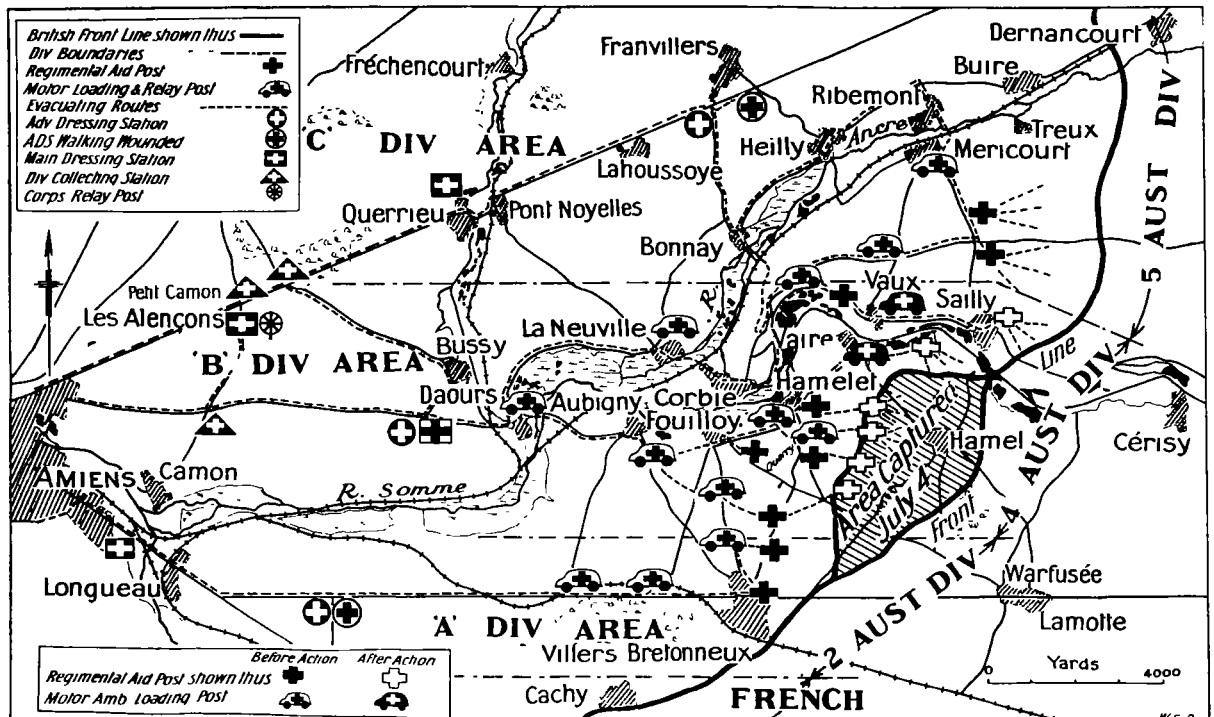
under General Monash with great care by the staffs concerned, involved parts of all three divisions in the line (2nd, 4th, and 5th), and the 11th Brigade of the 3rd Division was attached to the 4th Division for the operation. Part of the 33rd American Division was at this time attached to the Corps and four of its companies took part in the fighting. Tanks were used on a novel plan, operating on a general scheme but under the orders of each battalion.

Medical Arrangements for Hamel

As in other operations prior to the great advance, the normal divisional lines of clearance were used and improved to meet the special requirements of the action. Medical arrangements were put in the hands of the acting A.D.M.S. 4th Division (Lieut.-Colonel R. S. McGregor). Those for the 6th Brigade (2nd Division) were made by him in consultation with the A.D.M.S. (Colonel A. E. Shepherd) and the D.D.M.S., and were carried out by the 6th Field Ambulance (Lieut.-Colonel H. L. St. Vincent Welch). Evacuation was based on the main dressing station at Les Alençons (4th Field Ambulance, Major H. B. Lewers) clearing by 3rd M.A.C. to Nos. 5 and 47 casualty clearing stations at Crouy, and by light railway to Vignacourt. Arrangements were made for the surgical work at the M.D.S. to be controlled by Major Holmes à Court as a "try out" of the value of "resuscitation" methods by a specially trained and equipped "team." The "gas centre"—to which all gassed cases were sent—was worked from the M.D.S. A "divisional collecting station," now a regular feature of the evacuation scheme, was formed by one tent subdivision of the 12th Field Ambulance near Petit Camon.

Forward Clearance. The "Medical Arrangements" issued on June 30th by Lieut.-Colonel McGregor made the 13th Field Ambulance (Lieut.-Colonel F. C. Wooster) responsible for clearing the front of the 4th Division (4th and 11th Brigades). The A.D.S. on the Aubigny-Amiens road, four miles from the M.D.S., was of the new type. Two "Nissen" huts were specially dug in by the ambulance personnel to a depth of six feet. The station was also designated as the "M.D.S. for Walking Wounded,"[35] who were cleared thence by lorries direct to C.C.S. Much construction work was done forward.

[35] It would later normally have been called the "Walking Wounded Dressing Station" (or "W.W.D.S.").



Map No. 11

MEDICAL ARRANGEMENTS, BATTLE OF HAMEL, 4TH JULY, 1918

"At each of the forward posts," says Lieut.-Colonel McGregor, "there was a safe accommodation for wounded varying from 15 to 100 lying cases, and a varying number of walking cases, and in addition cover for stretcher bearers, and also at Ambulance Posts for Ambulance cars [recesses cut into the bank at the side of the road]."

Sick and "Stragglers." Very exact arrangements were made by the A.D.M.S. 4th Division for dealing with sick. On and after "an hour to be named" walking sick were to be evacuated direct to C.C.S. unless likely to be fit for duty "within 2 to 3 days," in which case they would be sent to the D.C.S.

Five "stragglers' posts," to which medical officers were to send all stragglers were formed by the Provost Corps, for the most part between Corbie and Daours.[36] A "divisional stragglers' collecting station" was established at Daours. Here, "when required by the officer in command to do so" a medical officer from the A.D.S. would "medically examine all stragglers."

Records and Returns: "Died of Wounds." No casualties were to be recorded at the A.D.S. save and except that all men who died at medical posts in the forward area would be "advised to the A.D.S. and recorded in the A. and D. books of the W.W.M.D.S."

Transport. Three bearer divisions were in the forward posts or at the A.D.S.; the 11th Field Ambulance bearers were held at M.D.S. in reserve. In addition to the ambulance transport of the 4th Division, that of the 3rd was made available by the D.D.M.S.—a total capacity of some 140 stretchers. Cars were run in two circuits—between "forward Ambulance" (Motor Loading) Post and A.D.S., and between this and the M.D.S.

Clearance routes from the forward ambulance posts were arranged north and south of the Somme by two officers (Major L. B. Elwell and Major D. M. Steele) detailed by the O.C., 13th Field Ambulance. Transport was allotted as follows:—

South ("Quarry Post"). Complete Bearer Division of 13th Field Ambulance. Complete Bearer Division of 12th Field Ambulance. Seven large and four small motor ambulance cars—36 stretchers.

North. Two Bearer Sub-divisions of 4th Field Ambulance, three large and four small motor ambulance cars—36 stretchers.

[36] 4th Division headquarters were at Bussy. All Brigade headquarters were less than a mile from the front line.

The remainder of ambulance stretcher-bearers and ambulance cars were retained by the C O. at the A.D.S. as a reserve and for evacuation of cases back to M.D.S.

Corps Motor Relay Post. For the evacuation of walking wounded "full use" (the D.D.M.S. instructed) was to be made of empty returning mechanical transport, which would carry cases to a corps motor relay post at Dreuil just behind Amiens. For clearing stretcher cases to A.D.S. the Ford cars and "Sunbeams" would to a great extent work in relay, the former replacing the horsed-waggons, for wounded.

To ensure effective co-ordination of the efforts of the three Divisions concerned, Colonel Barber conferred with the Assistant-Directors. On June 30th Lieut.-Colonel McGregor met the senior officers of the 4th, 12th, and 13th Field Ambulances and all the Regimental Medical Officers concerned. The latter were instructed to move forward with their battalions, and to select sites for new aid-posts in consultation with the respective battalion commanders, "notifying the site as soon as possible to O.C. Field Ambulance and to A.D.M.S." Direct *liaison* was arranged between Brigade Headquarters and Field Ambulance.

The Action (July 4th). The battle was one of the most dramatically successful of any fought by the Australian troops. "Zero" hour was at 3.10 a.m. By 5 a.m. all objectives had been captured with a loss in the 4th and 11th Brigades of 110 killed and 709 wounded, and in the 6th of 17 and 107. The total casualties at Hamel on July 4th were about 1,500. Prisoners numbered 1,472.

Medical Events of the Battle. Overwhelming military success involved the medical service—as did overwhelming failure—in special difficulties. The history of the medical events of this battle shows us an unpleasant and even dangerous situation met with the resource that derives from forethought and preparation.[37] The crux came in the central sector. Elsewhere everything went according to plan. On the right the 2nd Division cleared 132 stretchers and 111 walkers to St. Acheul by 10.30 a.m., and on the left the 5th evacuated a total of 173 to Querrieu even more quickly. The A.D.M.S. 5th Division records that, on this front, the enemy "scrupulously

[37] It is related of Napoleon that he once affirmed that his resourcefulness derived not from any peculiar faculty but from the fact that he thought out every contingency beforehand

observed the laws of war," permitting bearers to clear across the open during heavy sniping.

The Quarry Ambulance Post. Casualties began to arrive at the Quarry post in less than an hour from zero. At 5 a.m. Major Elwell was asking for more bearers and, urgently, for stretchers. Then the trouble began. Wounded were brought in with quite abnormal rapidity from the R.A.P's, the stretcher squads being supplemented by German prisoners on their way to the rear as well as by infantry volunteers looking about for something to do; a number of urgent cases were brought in, through previous arrangement, by tanks.[38] Many cases drifted in also from the left flank. By 5.30 a.m. the incoming stream at the post was so great that the cars allotted to the circuit were quite unequal to the demand, and cases banked up until over 100 were waiting. Urgent communications from Major Elwell, and from the D.A.D.M.S. (Major Lind), who was sent up to report, as well as independent ones from 4th Brigade Headquarters near by, led to the transfer to this circuit of almost all the available ambulance vehicles. Through Brigade Headquarters there were even obtained from the Engineers six pontoon waggons, each of which did two trips with six stretcher cases. By 1.30 p.m. over 900 wounded had been cleared to the A.D.S., and this in turn banked up. By 3 p.m. "all the wounded were at the A.D.S. or behind it."

Advanced Dressing Station. The movement of events here cannot better be presented than from the report of the Commanding Officer (Lieut.-Colonel F.C. Wooster) to the A.D.M.S.

"*A.D.S.* (*N.4.c.9.2.*).[39] The first casualties arrived at 4.30 a.m. and thence continuously with increasing rapidity. The walking wounded were easily coped with, the standard dugout proving most suitable for the purpose. The lorries got away well and averaged about 3¾ hours for the trip to C.C.S. and back. Stretcher cases banked up until about 2 p.m. as the vehicles available could not keep up with the rapidity of their arrival. [At 1.30 p.m. the cars were switched to the rear circuit—A.D.S. to M.D.S.] At 3.5 p.m. O.C. was able to advise A.D.M.S. that Walking Wounded were clear, and stretcher cases rapidly clearing. At 5 p.m. A.D.S. was quite clear, having put through about 930 cases in 10 hours.

[38] For tanks as a means of evacuation at Hamel and Cambrai *see R.A.M.C. Journal Oct. 1920, p. 309. See also Brit. Off. Med. History, General, Vol II, p. 110.* Like the aeroplane, though to a less degree, the tank created medical problems of its own of which a brief note is given in *Vol. III.*

[39] On the Aubigny-Amiens road, west of Vecquemont

The proportion of stretcher to walking cases was about three to four, and there was a large proportion of abdominal and thigh wounds especially among the German wounded who numbered 180. A noteworthy feature was the very good condition of the wounded generally, due to the rapid evacuation and good weather. Casualty list of A.M.C. personnel (including attached) during the battle was only three O.R's."

Main Dressing Station. The first cases arrived at the M.D.S. at 6 a.m. Except for some slight delay about 2 p.m., "due (says Colonel McGregor) to the great distance cars had to travel to C.C.S.," evacuation was carried out "most expeditiously." Though the conditions were not such as fully to extend it, the work of the resuscitation team was considered by the A.D.M.S. "most excellent"—chiefly in the treatment of haemorrhage and shock and for urgent amputation.[40] The results achieved were such as to impel him to recommend a "special transfusion team" with each division; it should work at the M.D.S. "or even if possible," he adds somewhat naively, "at the A.D.S."

Casualty Clearing Stations. Colonel Barber has put on record that he was informed at the C.C.S. that the results were extraordinarily good, "in fact a record." Some cases were operated upon within 3 hours of being wounded; and the majority were evacuated to Rouen during the next 24 hours by ambulance train. On the experience gained in the battle the D.D.M.S. issued instructions as follows:—

"It has been noted that after prolonged occupation of a sector and consequent improvement at motor posts and A.D.S's there is an increased tendency among medical officers to redress wounds at these posts. Many cases do not require dressing between R.A.P's and C.C.S's. Commanders of medical units will be instructed that only such cases as require additional first aid shall be redressed at motor posts or A.D.S's and that all other cases should be forwarded to M.D.S's, pausing at A.D.S's for inspection by a medical officer who will order the unloading of any patient requiring further first aid. A double circuit (motor post to A.D.S., and A.D.S. to M.D.S.) is only permissible when it is desired to remove large numbers of patients quickly from a shelled area."

These instructions accord with "text book" procedure. Read in conjunction with the recorded views of field ambulance officers, they give further proof of the importance to

[40] Of 410 stretcher cases who passed through in 15 hours, between 6 a.m. and 9 p.m., "roughly 30 cases [7·3 per cent.] demanded immediate surgical interference . . . chiefly shattered limbs and other severe cases complicated by haemorrhage and shock."

the medical service at all times of keeping clearly in mind (1) the essential purpose of "evacuation"; (2) the factors and constants involved; and (3) the military and environmental conditions at the moment.

The Americans

Apart from its considerable military importance, the Battle of Hamel has an interest which derives from a source which is novel to this narrative but which enters to an increasing degree into the history of the A.I.F., as it does also into that of the Great War. This was the entry on the British front, for training and fighting, of formations from the American Expeditionary Force—"A.E.F."[41] In this last phase of the war the experience of the Australian formations in France and that of part of the American Army was closely interwoven; so as to provide, indeed, material for a useful study in national co-operation. A description of the technical machinery of Anglo-American *liaison* on the Western Front is postponed till we reach its consummation in the last great battles of the war.[42] But the first association of the two forces, at Hamel, requires a short note.

33rd American Division. At the end of June four companies of the 33rd American Division were attached for training to the 4th Australian —whose personnel they found "an independent, alert, energetic lot of men, and splendid fighters." This American Division was served by two improvised medical units, the 129th and the 130th American "Provisional Field Ambulances," which had been formed by combining two "Field Hospital Companies" with two "Ambulance Companies" from the 108th American "Sanitary Train."

The Americans in Action. Four companies of the 131st and 132nd Regiments, U.S. Infantry, were (as afterwards appeared, against the will of General Pershing)[43] attached for this battle to the 13th, 15th, 42nd, and 43rd Battalions, A.I.F. On the medical side some of the American regimental establishments took part in the action, and a company of American engineers also acted as volunteer stretcher-bearers. Their

[41] It may be recalled that the United States declared war on Germany on 6 April, 1917. The account which follows is largely based on *The History of the 33rd Division, A.E.F.*; see, in particular, *Vol. II, pp. 359, 379, 439, and Vol. III, p. 301*

[42] See *Chapter xxiv* A brief account of the organisation and methods of the American Medical Services will be found in *Appendix No 9*

[43] The story of this misunderstanding will be fully told in *Vol. VI* of the *Australian Official History*. Six other companies were withdrawn at the last moment.

experience in the battle was recorded by the R.M.O. of the 132nd American Infantry Regiment (Lieutenant F. E. Schram) :—[44]

"Reported to Major B. C. Kennedy, Medical Officer attached to the 15th Battalion, 4th Brigade, 4th Australian Division, at R.A.P., 6:00 p.m. as ordered. We moved from there to Battalion Headquarters at 10:30 p.m., accompanied by 5 hospital men and 2 stretcher bearing squads from Field Hospital. Those Field Hospital stretcher bearers were taken with us so as to let the Field Hospital know where our R.A.P. was.

"We moved from Battalion Headquarters about 12:45 a.m., accompanied by these men, to 'No Man's Land.' It had been previously arranged between Colonel MacSharry and Major Kennedy to do a 'hop-over' with the troops, as there was no suitable R.A.P. in their own present trenches without the carrying distance being too great, the idea being to establish themselves in an R.A.P. in the new trenches.

"We lay in 'No Man's Land' until the barrage started; then moved forward with the troops. We attended wounded men in 'No Man's Land' while the barrage was going on. We reached (the German) pear shaped trench with the troops, looked for a suitable dugout and could find none, so we started to do our dressing in the open trench. Cases were brought in rather fast, but we succeeded in dressing them and getting them out in rapid time.

"The carrying distance from our present R.A.P. to the A.D.S. was approximately a mile. To start with, there was no relay post established, but after a few trips a relay post was established midway between the R.A.P. and the A.D.S. We had some difficulty in getting rid of our dress cases. They were not evacuated fast enough. We had difficulty for a while in obtaining sufficient stretchers. Our supply of Thomas splints ran out and could not be replenished for a time. As a consequence we had to use rifles as splints. Of all the cases that I saw and dressed, no tourniquet was used. Pressure with the shell dressings was sufficient to check the haemorrhages.

"We had 12 stretcher bearers from each company, also one man in charge of each stretcher bearing detail from the company, which made 3 stretcher bearing squads. Four Americans were assigned to each bearing section, and these were mixed or distributed with experienced Australians, so that each stretcher squad had at least one American and experienced Australians. It is impossible to use diagnosis tags on each case, because they come in too fast, and to use diagnosis tags would delay them in getting out."

On his experience in this action Lieutenant Schram recommended that

"the present [American] Field packet be replaced by a larger dressing, similar to that used by the British."

The American Field Ambulances. The 65th Brigade group from the 33rd Division remained attached to the Australian

[44] For his work on this occasion Lieut. Schram was decorated with the British Military Cross

Corps throughout July for training and experience, the "A," "B," and "C" sections of the 129th Provisional Field Ambulance being distributed among the Australian divisions in the line (2nd, 3rd, and 5th). Americans were also attached to the field ambulances of the 1st Division in Flanders. Cordial relations were established.

"One of the most important incidents [in July]," says the C.O., 3rd Field Ambulance (Lieut.-Colonel D. D. Cade), "was the arrival in the early part of the month, of a second party of American Medical Officers and personnel, who were sent to us to acquire information as to the method of work in our field medical units. These officers we found to be the best of good fellows, modest, unobtrusive, courteous in decision and very appreciative of any hospitality we endeavoured to show them. What particularly struck me in connection with them was the uniformly fine standard of physique both in officers and men and the keenness and intelligence of their faces. We parted from them with regret."

The D.D.M.S., Australian Corps (Colonel Barber), records that the Americans "did very good work. . . . Officers and men were of fine physique and were very keen to learn."[45] And of the "other ranks" a field ambulance officer (Captain W. J. Newing) writes:—

"After the Battle of Hamel the arrival of a batch of American bearers somewhat relieved the monotony—they were so keen, and were very amusing. I remember the first wounded man they brought in, at 3 a.m.—they woke everyone in the dugout to exhibit their prize. . . ."

After Hamel

As on the wider stage of the general war, events now move swiftly towards the final scenes. Two matters only need hold us here.

The Distance-time Factor in Evacuation. In the course of the fighting during May, June, and July an experimental investigation was initiated by the Officer Commanding the 7th Field Ambulance (Lieut.-Colonel A. M. Wilson) with the purpose of arriving at some exact data that should assist in determining the "medical arrangements" for an action.[46] Medical

[45] Col Barber gained the impression that "the American Medical organisation was not so elastic as the British," and that "their Dental officers had far too much equipment"

[46] The use of "Macpherson's formula" (for deducing from the numbers of wounded expected and the distance to be travelled the amount of transport that would be required, or of calculating from the vehicles available the time that would be occupied) involves the possession of such data The inventor of the formula (it may be recalled) was Lieut.-Col W. G Macpherson (universally known in the British service as "Tiger" Macpherson)—later Sir W. G. Macpher-

officers along the whole chain of posts and stations, from R.A.P. to C.C.S., co-operated in this enquiry into "the distance wounded travel" from front line to M.D.S. It was based on the "Field Medical Card" (*Army Form W. 3118*). He found that at that time a man wounded near the front line had to travel from 24 to 26 miles "before obtaining sufficient operative treatment"; that the time taken between the "advanced ambulance post and the C.C.S. is practically constant, and is about 4 hours" under the circumstances of this test.[47]

Chemical Warfare. Throughout the whole of this period German bombardments with gas-shell were a special symptom of the warfare and of the medical work. After Hamel this became "chronic."

On the night of July 16th-17th the enemy threw about 6,000 gas shells on the 2nd Division's front, producing some 200 casualties; again on July 22nd-23rd about 9,000 shells caused some 450 casualties. In each case a few "Blue Cross" shells were first thrown in order to cause sneezing and deaden the sense of smell, and they were followed by "Yellow Cross" containing dichlorethyl-sulphide ("mustard"). The nights selected were slightly wet, and misty.

"The advantages of night gas-shelling (an R.M.O.[48] comments) are obvious to anyone who has tried to move about with a respirator on in the dark.

"In each bombardment the first cases appeared at the Ambulance (Motor) Post three to four hours after the shelling commenced, and after that a steady stream followed and a few drifted in up to 24-36 hours later. Practically all were mild and showed varying degrees of conjunctivitis, laryngitis, bronchitis and gastric symptoms. Owing to congestion at the Advanced Ambulance Post most were made 'sitters,' but at the M.D.S. many were re-converted into stretcher-cases. At the Advanced Post the cases were given doses of the Soda Bicarb. and also their eyes were washed out with this solution—this treatment was also carried out at the R.A.P's. A few cases, in which the gas was obviously

son, Editor-in-Chief of the *British Official Medical History of the Great War*. His formulae were.

T = time allowed. W = number of sick and wounded
t = time taken by transport for one journey and return.
M = units of transport required or available
n = number of patients each unit of transport carries

To find out the time required. $T = \frac{1}{M} \times \frac{W \times t}{n}$

To find out the transport required. $M = \frac{1}{T} \times \frac{W \times t}{n}$

[47] This valuable report is given in *Appendix No 10.*

[48] Captain R. H. Crisp, R.M.O., 49th Bn.

present in the clothes, had their clothes removed at the Forward Ambulance Post, but the remainder were sent through as quickly as possible to the M.D.S. where they were completely bathed and changed Theoretically, it would be better to bathe and change the patients at the Advanced Ambulance Post, but practically it is imperative to clear the forward area as soon as possible and only change a few of the worst cases. None of the cases showed any signs of collapse at the forward area, and restorative measures were not used to any great extent."

A much larger proportion of gassed cases were now being classed at M.D.S as "N.Y.D. Gas" and sent to the special centre.

During the period of minor operations from May to the end of July there were evacuated from Australian units in the Fourth Army 10,585 wounded (including 3,417 gassed) and approximately 20,000 sick (chiefly influenza). During the same period the 1st Division in front of Hazebrouck evacuated 2,192 wounded (325 gassed).

The Military Situation: Thrusts on the French Front. Although the months May to July had been comparatively uneventful on the British front, they were far otherwise on the French. Ludendorff had decided, before delivering a final blow at the British, to draw away all French and British reserves. Calculating on the psychological incubus of Paris on French strategy, he thrust on May 27th with terrific force and complete surprise straight for that city, and advanced to the Marne River with a rapidity greater than that of March against the British.[49] The fighting was unsurpassed in its intensity and the losses were tremendous: the exhausted British VIII Corps, which had been brought south to recuperate on part of this quiet front, was almost wiped out. Between the two salients created by this offensive and "Michael" the Germans struck the French again on June 10th, near Noyon, but with less success. Meanwhile American formations were being trained with feverish energy, and a number of them were thrown into the defence in the Marne area. The moment was arriving for the counter-offensive. News of Hamel reached the Supreme War Council at a moment tense with expectation, and was dramatic in its "psychic" uplift. On July 17th Haig informed Rawlinson of his intention that plans should be prepared for an offensive on the Somme. Meanwhile on the 15th the Germans made a last advance and crossed the Marne, but only to fall into the pincer grip of Foch's counter-attack on both flanks on July 18th. This battle was the try-out for the American Army. Its strategic plan envisaged the envelopment of the Germans in the Marne salient, but stubborn defence and some tactical failures defeated this. The Germans withdrew to the line of the Vesle (captured by them on May 27th).

[49] The British attached to the French Sixth Army had with them Nos. 37 and 48 Casualty Clearing Stations In the break-through at Mont Notre Dame British and French casualty clearing stations and their wounded were captured together with their personnel (*Brit Off Med History, General, Vol III, p 276*) No 37 barely escaped With these units were a number of officers of the A.A.M.C., "lent to the D.G., A.M.S., on March 24 by the D.M.S., A.I.F., as a gesture," the circumstances of which will be found on *p 806*

The Australian Corps has the limelight. The terrible counter-stroke delivered by the French and American Armies on July 18th, on the Marne, made clear the fact that the moment was at hand for a general Allied advance. On July 21st General Rawlinson held a conference attended by the commanders of the Canadian and Australian Corps and a representative of the Tank Corps, and unfolded to these leaders a project, put forward by Haig and himself and provisionally accepted by Foch, for an offensive on the plan of Hamel but on "Army" scale. On July 24th Foch in his turn put forward the project as part of a much wider scheme of Allied offensives. Its scope was subsequently much enlarged, extending to two French armies as well as Rawlinson's.

In order to concentrate the necessary force—a much increased one—on the front of the intended operation, two British divisions of the III Corps relieved the 5th Australian between the Ancre and the Somme and at the same time a brigade of the 4th Australian Division temporarily replaced the 37th French Division south of Villers-Bretonneux. These moves were complete by August 1st. Starting from First Army on July 30th the Canadian Corps came south and by August 4th its brigades were moving into support behind these Australians who would screen them by holding the front line till a few hours before the attack. By August 6th the Canadian, Australian, and III British Corps stood ready for the Battle of Amiens.