NOTES ON MEDICAL SERVICES IN THE FIELD.

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(Continued from p. 191.)

Bearer Relay Posts.

The number of these required and their size depends on the distance of the A.D.S. from the R.A.P.’s, the number of casualties expected, their situation in the chain, and the nature of the ground. It may be said that the carry should not normally exceed half a mile, and when the ground is difficult or the casualties numerous the distance should be decreased to 500 to 600 yards, i.e., two to three posts per mile. With a centrally situated A.D.S., the lines of evacuation from the R.A.P.’s will converge, the central one being shorter than the two flank ones (assuming three battalions to be in the front line). If the force is advancing on a definite objective, a central “main artery” will probably have been given in operation orders, relative to which all movements take place. In such a case lines of evacuation will converge to a point on this main artery, which advances with the force; at such a point of convergence would be the bearer officer with his most forward bearer relay post, and a reserve of bearers with him to enable him to establish further posts ahead as occasion demands and the front moves forward. With two stretcher squads working between each R.A.P. and this head relay post, it will be seen that six squads are required there to keep up a continuous clearing; and it is generally stated that each bearer relay post should consist of sixteen to twenty-four bearers with an N.C.O. or senior bearer in charge. Each relay post in rear will require to have at least the same number, and more in proportion if other lines of evacuation converge on the main line.

In trench warfare these posts are usually situated at points of convergence of trenches from different parts of the front, and they become small medical aid posts. At the main one the bearer officer usually makes his headquarters during active operations, and here are collected reserves of stretchers and blankets, and arrangements are made for accommodating lying cases which arrive before the return of the bearers working on the next stage.

Reliefs are normally sent twenty-four-hourly, but during operations twelve-hourly if available. It is to be remembered, too, that the longer the operations the greater the number of lying cases will be. In the first few hours of an attack numbers of casualties are able to make their own way back walking, but as excitement diminishes and fatigue and mental weariness and fasting increase, so does the power of the fighter to withstand shock to
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his system decrease. Hence, though the actual number of casualties coming in does not increase, yet the number of bearers has to be increased; this is also necessitated by the exhaustion of the bearers themselves.

When the A.D.S. is on a flank on account of the position of the main road of evacuation, the carry from the R.A.P. on that flank may be direct without the intervention of relay posts, but the carry from the opposite flank may be a long one; in this case the numbers of posts may be great, but their strength will depend on whether they have to serve two or only one R.A.P. Again, although the distance of the front in a direct line from the A.D.S. may be quite short, yet, on account of a stream, or hills, or broken ground or lack of cover, the line of evacuation is often a circuitous and lengthy one. Every advantage should be taken of cover, such as nullah beds, winding though they be; it is very tempting for bearers when they are carrying loads to cut off large bends and go over the top. The bearer relay posts should be situated in nullahs, or advantage should be taken of old trenches, dug-outs, shell holes, etc., definite arrangements for cover being made. Relay posts should be marked with directing flags or in some distinguishing way to indicate their nature, and that aid can be obtained there, even if the bearers are temporarily absent. It is better to have one spare man for duty there and to act as a relief when required.

**Walking Wounded Collecting Posts.**

(It will be noted that the term “post” is now used and not “station,” since this is the nomenclature adopted in the new R.A.M.C. Training; earlier writers named the forward ones “posts” and the main rearward ones “stations”.) A large percentage of the wounded, especially in the early stages of the battle, are able to make their own way back from the R.A.P. These are the slightly wounded, and if casualties are numerous, they will quickly fill the A.D.S. So it is usual on such occasions to form a walking wounded collecting post for them, its position being notified in Administration Orders, and to it all walking casualties are instructed to proceed direct. A certain number find their way to the A.D.S., where they are redirected. If the A.D.S. itself has to form and find personnel for a W.W.C.P., this should be sited on a separate road and slightly further back than the A.D.S. It may be that one company is detailed to form the A.D.S. and the other a W.W.C.P., the bearers of both companies forming the relay posts; or it may be that the duty of forming the A.D.S. is allotted to another F.A. The main requirements of such a post on a large scale are that it should be in some conspicuous spot so as to be easily found, have good road approaches to enable lorries and buses to clear it, or be so located as to allow of any system of light railways or trolley lines to and from the front area to be made use of; but it should not be in the neighbourhood of dumps of stores. Its organization should be on the lines of other dressing stations. Ample accommodation for reception, dressing, waiting and evacuation are its most important features. This should be
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sufficient to enable men to lie down and sleep till attended to or evacuated. A refreshment buffet, on a generous scale, must be supplied. In big battles this may be furnished by the Y.M.C.A., and may be divided up so as to serve men of different divisions in a Corps. Hot tea, sandwiches, biscuits and cigarettes should form the bulk of the provender, and in cold and wet weather warming and drying stoves are essential. Facilities to enable men to cleanse and dry their feet and put on dry socks are much appreciated, and indeed almost necessary when casualties will have to make a train journey before they can be taken into hospital. Sanitary arrangements for a large number of men must receive attention, and latrines and urinals be constructed on a liberal scale.

In the initial triage it will be found that a certain number of cases should not have come as walking cases, are seriously wounded, and require treatment as lying cases. They should be separated out and passed to the M.D.S. for treatment, being evacuated in motor ambulances as lying cases. For them a supply of stretchers and blankets must be maintained. The bulk of the casualties are capable of being evacuated as sitting cases in motor lorries or buses, four to twenty of which may be placed at the disposal of the Medical Services by "A" branch for evacuating direct to a C.C.S. Each three-ton lorry can accommodate twenty-five sitting cases. One or two motor ambulances are required for lying cases. A few slight cases can be sent back to the front, and of the sick a certain number to the Divisional or Corps rest station.

When the W.W.C.P. is functioning as a unit independent of the M.D.S., it will be recorded and returns submitted and field medical cards made out (except for lying cases passed on to the M.D.S. of another unit, in which case it will have acted merely as an A.D.S.). In this event it is generally situated further back, in the vicinity but in front of the M.D.S., and it may also establish an advanced collecting post in the forward area in the vicinity of the A.D.S., utilizing massed horsed ambulance transport or sometimes lorries for clearing the worst cases to the main W.W.C.P. In fact, it functions as a field ambulance, forming, as it were, an A.D.S. and M.D.S. for slightly wounded, though they are known by other names.

The clearance of the main W.W.C.P. to the C.C.S. by lorries is preferable to its clearance by train or light railway. Train loads have to be waited for longer, leading to considerable congestion, and for economy in transport a full train load must be first collected. In addition, the C.C.S. finds much more difficulty in dealing with numbers when brought all at the same time in a train than when they come in lorries in a continuously steady flow.

The W.W.C.P. is formed by the unit providing the M.D.S. or A.D.S. when expected casualties are fewer, and the area served is smaller; its situation is then usually further forward than in the former case, and in rear of the A.D.S. A suitable site is the forward car post, where ambulance cars are parked pending their turn to go forward to the A.D.S. as soon as
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a full car load comes down. For such a W.W.C.P. the following staff, with necessary equipment, is sufficient: 1 officer, 2 N.C.O.’s, 4 nursing orderlies, 2 clerks and 1 cook. If acting merely as an accessory A.D.S., all casualties will pass through to the M.D.S., to which they will be taken by the horsed ambulances or any auxiliary motor transport supplied. The recording of cases and making returns will then be carried out at the M.D.S., but if evacuating straight to the C.C.S. or to a rest station the recording must then be carried out at the W.W.C.P., and reports sent at regular intervals to the M.D.S. for inclusion in their returns to the A.D.M.S., unless orders have been received for them to be submitted separately direct to him.

Sick Collecting Post.

In association with a W.W.C.P. there is sometimes established what is known as a “Sick Collecting Post,” through which pass the majority of the “sick” as opposed to the wounded. It is run quite separately from the former, and has its definite arrangements for reception and evacuation. Such units as the above assume larger proportions and importance and independence of action when operations are continuous and involve the employment in the same area of troops of many divisions or corps, for all of whom the same medical arrangements will serve.

Divisional Collecting Post or Car-loading Post.

Some of the bearer relay posts assume greater importance than others, e.g., those at the convergence of different lines of hand carriage. The above name has been given to such a post when a change from hand carriage to wheeled carriage can be made, whether the nature of the wheeled transport be wheeled stretchers, trolleys, trucks, tramways, light railway, light motor ambulances or horsed ambulance. Such transfer will set free numbers of stretcher-bearers, but a certain fixed number are always kept here to act as attendants on the casualties who may have to be temporarily accommodated waiting the making up of a car load or returning transport, and for the purpose of loading up. It is further used as a relief station for the bearers and for the posting of some of the reserve bearers. A small dump of reserve stretchers, blankets and dressings is kept here. The post is also the point at which it may be possible to separate out and direct walking wounded and gassed cases to the dressing stations or posts specially detailed to deal with these cases. It is a sort of advanced walking wounded collection post on the line of evacuation. As before mentioned, it is a suitable spot for the headquarters of the M.O. i/c of the bearers, and with him will be his working and relief staff of one N.C.O. and sixteen to twenty-four bearers. When a break in the trolley line or wheeled system occurs it may be necessary to form a Rear-Divisional Collecting Post.
RESERVE BEARER POSTS.

In battles of some magnitude and of long duration, it is usual for additional bearers from troops in reserve or from other areas not engaged to be sent forward and placed at the disposal of the Divisional or Corps Medical Services as stretcher-bearers by Divisional or Corps Commanders. When at full strength the three field ambulances of a division can muster fifty-four stretcher squads, but in actual practice these numbers are rarely available for service under the M.O. i/c bearers, except when reinforced by bearers from other field ambulances not engaged, or from troops. In the latter case some 200 to 600 men or more under platoon commanders or company officers may be detailed, and for them large numbers of additional stretchers are required. They are generally sited one half at the A.D.S., forming a rear reserve bearer post, and assisting with the loading and unloading of ambulances, wheeled stretchers, etc., and the other half at the divisional collecting or car-loading post, forming an advanced reserve bearer post, until they are required as reliefs or additions to forward bearers.

REST STATIONS.

It is most important for the maintenance of the fighting strength that sick or slight casualties should not be evacuated further back than is necessary, and to carry this into effect arrangements are usually made in each divisional or corps area for one or more medical units to be detailed to open in the back divisional or corps area, to receive such slight cases from the field ambulances, and even convalescent cases from the C.C.S.’s, which are likely to be able to return fit to their units in ten to fourteen days, depending on the nature of the operations. In laying out such a unit, the O.C. can afford to make things more elaborate and comfortable for the patients, as he is more or less permanently fixed. If for a division, accommodation for 300 cases should be made available; and if for a corps, for 1,000 cases upwards. Such a large unit would generally be under canvas. It would be formed by a company or a whole field ambulance, according to its size, and would be organized on the lines of a Convalescent Depot with its dining and recreation rooms, ablution rooms, baths, etc. Special sections may deal with special types of cases, e.g., scabies, or be appointed for special classes such as officers, employed civilians, prisoner of war, etc.

Field ambulances do not as a rule retain their cases more than three or four days, and if a man is likely to recover within that period and there is no immediate likelihood of a move, or of receiving numerous casualties, and if adequate treatment can be given, such a case is kept in the field ambulance. Ordinary cases of mild sickness or disability are transferred to the rest station instead of the C.C.S. When once a case has gone rearwards past the C.C.S. he is counted as lost to the division, corps or even Army (except when an advanced convalescent depot exists for the use of the C.C.S.’s, when it is really acting as a more permanent corps or army rest station).
DIVISIONAL MOTOR AMBULANCE CONVOY.

Under ordinary circumstances, when a field ambulance forms both an A.D.S. and a M.D.S., the transportation of casualties from the former to the latter is carried out by the unit motor ambulances directed from the headquarters of the unit at the M.D.S., where or near which they remain parked whilst awaiting calls to the A.D.S. Two are placed on duty at the A.D.S. for a period of twenty-four hours, and working backwards and forwards carry out the normal requirements. It is only when the numbers of casualties become excessive that the other resting ones are called on, though they may be required for special duties, as, for example, the removal of infectious cases to special hospitals. If the casualties are likely to prove very numerous, then the cars of one or both of the other two field ambulances are placed at the disposal of the O.C., M.D.S., or the cars are massed together to form a divisional ambulance convoy and an officer is detailed to take charge of the whole of the evacuation. This charge may also include that of auxiliary lorry or bus transport used for walking wounded. When such amalgamation occurs, the M.D.S. car park is too small to accommodate the increased number of vehicles, so a park is arranged for on or close to the main road of evacuation from the A.D.S., at a convenient spot for sending out relief cars. If the distance between the two dressing stations is on the long side, it is generally desirable to form two parks. (1) A rear one near the M.D.S., used as a main depot where drivers can be relieved, petrol, tyre and oil stores maintained and minor repairs done to the cars; in fact, when the cars are all working at full pressure, it is well to ask the M.T. unit which is responsible for the upkeep of the cars to supply a small workshop unit for attending to these minor repairs if such aid is not available close at hand; the stocking beforehand of a sufficient supply of petrol is of particular importance, and a careful watch must be kept on its consumption and replacement to see that it does not run out; there is nothing more annoying than to have cars stranded from a shortage of petrol; and (2) a forward one situated usually at or near a point where two or more lines of evacuation controlled by the officer in charge D.Amb.C. converge. As this forward park is more likely to be subject to shell fire, more cars and petrol than necessary should not be retained here. If the system is adopted at both parks of checking every loaded car as it comes past and immediately sending forward another to replace it, then both forward park, A.D.S.'s and advance W.W.C.P.'s can be furnished with a continuous supply without delay.

In connexion with the equipment of cars, the importance in cold weather and in long runs of keeping the interiors warm by means of exhaust heaters, by a sufficiency of blankets, and by the exclusion of draughts by properly closing the front and rear openings, cannot be over-estimated when transporting severely wounded or shocked cases. A wagon orderly, to see that blankets do not get blown off the patients (and lost) and to give
notice to the driver of rear conditions, is necessary, and more than once comment has been made when car loads of patients have been despatched without orderlies. In hot countries on dusty roads, the proper closing of the rear curtain to prevent the drawing in of clouds of dust, and the provision of sufficient openings in front to admit air to keep the interior cool are problems which need attention.

Certain classes of cases, such as G.S.W. head or abdomen, which need immediate operation, are generally passed direct to the C.C.S. without unloading from the field ambulance cars. Such cars must call at the M.D.S. first to register the casualties in the A. and D. book before taking them on to the C.C.S. Returning ambulance cars are the means available for taking extra supplies of blankets, stretchers, dressings, etc., to the forward area, and drivers must be very careful to see that the numbers of these articles kept in each vehicle's charge are always replaced when taken into the M.D.S. or C.C.S.

**Motor Ambulance Convoy.**

This unit, better known as the M.A.C., had its first beginnings during the Battle of the Aisne, though endeavours had been made previously by the medical authorities, but without success, to have motor ambulances provided for the Expeditionary Force. The Headquarters Staff were then, as now, very averse to any increase in transport, and considered that their use would cause too great road congestion and even blockage. However, from their first employment their value was never doubted, and their general adoption followed as a matter of course as soon as they could be supplied. They have provided perhaps the most important asset we possess for the removal in comparative comfort of the wounded soldier in a space of time short enough to allow of the more thorough treatment of his wounds in a hospital remote from the area of active operations, with the beneficial results of the prevention of much suffering, the more rapid healing of wounds, the saving of life and the more speedy return of greater numbers to the fighting line. And further, from the combatant's point of view they have prevented that congestion in the front area brought about by collections of wounded there. The M.A.C.'s are controlled by the army and are usually provided to the number of one per corps with one reserve per army. The actual movements within the corps are controlled by the corps. Their main function is to evacuate casualties from the M.D.S. to the C.C.S., and from the C.C.S. to train sidings or canal wharves on their way to L. of C. units, and for any specific transportation of wounded in the army area behind the M.D.S., though in times of stress they may be detailed to give assistance in front of the M.D.S.

Each M.A.C. has seventy-five cars divided into three sections of twenty-five cars, together with the necessary attendant vehicles for the transport of personnel, stores and workshop, the whole being under the command of an R.A.M.C. major. The personnel consists of an R.A.M.C. wing of 1 commanding officer and 25 other ranks, and an M.T., R.A.S.C. wing of 3
officers and 153 other ranks. Their headquarters are situated in the corps area convenient for access to the C.C.S.'s and M.D.S.'s which they are serving. In ordinary times arrangements are made for the clearance of the latter at definite hours each day, a motor cycle dispatch rider going round beforehand to each unit to ascertain the numbers of lying and sitting to be cleared, so as to enable the requisite number of vehicles to be sent up. But in times of stress the service is continuous, and each vehicle is dispatched as soon as loaded without waiting for the convoy. Definite road circuits may be allotted by corps or army headquarters staff, and these must be strictly adhered to though they may mean a circuitous journey. It may further happen that in control of the traffic the roads are allotted to ambulance vehicles during certain hours of the day only, e.g., they may be allotted to supply vehicles from 6 a.m. to midday, and may be open for ambulance vehicles only from midday to 6 a.m. the following morning.

In order to keep the vehicles in good running order, they are each taken off the road after a certain number of hours running for examination and adjustment; this also enables the drivers to get a short rest. An important duty of the returning ambulances is to see that they take back the same number of blankets and stretchers from a unit as they brought to it, and when required to convey additional ones from the dump maintained at the C.C.S.

In heavy engagements, additional sections of units from other areas may be brought up, and motor lorries, buses or charabancs, supplied by "Q" Branch of the corps or army, placed at the disposal of the O.C., M.A.C. for clearing the light casualties and sick from W.W.C.P., etc.

The reserve M.A.C. is kept by D.M.S. army near G.H.Q. or at the advanced base, and is used for (a) local duties, (b) as a battle reserve for pushing forward to any area where needed, (c) filling the breach in case of any railway breakdown in evacuating casualties, and (d) to supplement the ambulance trains if these are insufficient to relieve the congestion at C.C.S.'s.

On the L. of C. the work of road transportation of sick is officially carried out by auxiliary ambulance car companies of the R.A.S.C. (M.T.), which convey them from ambulance trains to general hospitals, and from hospitals to hospital ships; but at the bases are usually to be found Red Cross Units known as Base M.A.C.'s which may be furnished with women drivers.

To whatever formation attached, a point that must not be lost sight of is the efficient disinfection of a car and its blankets after it has been used for the transport of an infectious case before it is again used. Spraying apparatus is usually available in infectious hospital units, where disinfection should be carried out before the car is allowed to return. In other cases the unit to which the car belongs must see that the work is done with the means at its disposal.
The simplest method of employing the three field ambulances of a division is that in which each field ambulance is attached to and moves with one of the three brigades, and in which two of the brigades are forward in the line and one is in reserve. With a wide front (three to six miles) each field ambulance will work independently of the others and form its own A.D.S. and M.D.S., and the wounded will be evacuated separately to the C.C.S. Some modification, however, is often introduced so as to prevent the opening up of more medical units than are necessary. The employment of one field ambulance to form an A.D.S. and M.D.S. centrally situated is frequently possible on a narrow front or when there are good lateral communications and when the casualties are not heavy.

If the front is a little wider (say two to four miles) and the lie of the roads suitable for them, two A.D.S.’s may be formed and only one M.D.S. retained. In this case the second field ambulance employed may be called upon to form a W.W.C.P. with its headquarters and to assist No. 1 in forming the M.D.S. When the front is very broad and for any reason the main line of evacuation becomes remote from the flank operation a second line must be opened up. This means the establishment of an additional A.D.S. and generally, though not always, of another M.D.S. A frequent cause of such an arrangement is the presence of a river, canal or wood dividing the front. In the case of two formations operating alongside each other it should often be possible to arrange for casualties from such flank operations to be cleared to the A.D.S. of the adjoining formation, though when possible evacuation of casualties through medical units of their own formation is preferable on the ground of retaining information and control of their own individuals, as touch is often lost when they pass through units of other formations. Whenever possible Field Ambulance No. 3 should at first be kept in reserve in rear of the brigade in reserve for employment should any flank movement demand it, or to move quickly forward in case of speedy advance, or to send bearers, nursing personnel, or ambulance transport to the other two field ambulances in times of stress. Combining the ambulance transport, and employing the bearers of all three units under one control are perhaps the commonest modifications made. But if the casualties are likely to be very heavy, the employment of all three field ambulances from the first may be necessary, in which case it may be decided to utilize a whole unit for the formation of each of the two A.D.S.’s, and to employ the third in forming the M.D.S. and W.W.C.P. When a complete F.A. forms an A.D.S. the O.C. makes his headquarters there, but frequently a rear headquarters is formed under the second in command just in rear of the brigade in reserve. To it all unnecessary transport and stores are sent and it also forms a sick post for troops in the reserve area and deals with casualties from medium artillery who are in position in the vicinity. The employment in the forward line of two field ambulances only of a division enables the third one to be utilized for one of
the numerous special employments to which this unit can be put in the rear divisional area, e.g., the formation of a rest station. When the units of more than one division are working together over the same ground, and the same dressing stations are suitable for them all, the control of the medical units is then generally taken over by the corps, and the M.D.S. and W.W.C.P. and rest station at any rate become corps units, while divisions carry out the collection from the front and transportation to the A.D.S. and W.W.C.P. Such control is usually employed in position warfare on a narrow front with fighting continuous over some days, when units of one division are continually being replaced by those of others, and when road communications allow of it.

The Advance.—With two units employed together as one, the system of “leap-frogging” is easily carried out. As the advance progresses No. 2 Field Ambulance, whose bearers are in the line and whose companies are at the A.D.S. alongside of those of No. 1, pushes forward its companies to form a forward A.D.S. before the closure of the first A.D.S. As the forward movement continues No. 1 A.D.S. closes and its companies “leap” through those of No. 2 A.D.S. and establish a third A.D.S. further forward, still close behind the advancing troops, and so on. The headquarters of the two units act similarly, though not so rapidly as regards the advancing of the M.D.S., headquarters No. 2 Field Ambulance going forward and establishing a forward M.D.S. at or close to the site previously occupied by say No. 2 A.D.S.; No. 1 M.D.S. closes as soon as it has cleared its casualties and is ready to come up to and to “leap” through No. 2 M.D.S. and establish No. 3 M.D.S. as soon as the advance has been sufficiently pushed to necessitate this.

The orders for the advancing of an A.D.S. are usually given by the O.C., field ambulance, and are based on his own observations or those of his bearer officer who is in touch with the forward situation. Any such move should be immediately made known to the A.D.M.S. and brigades concerned. But frequently the orders for its move, and almost invariably for that of the M.D.S., come from the A.D.M.S.

The Defensive.—The frontage taken over by a brigade may be reduced to 1,200-1,500 yards. In defensive warfare such a front will be occupied in depth, allowing for outpost, front support and reserve lines or trenches. The R.A.P. may be situated as far back as the last-named line, some 500 to 600 yards behind the front line. The A.D.S. will also be kept some 1,500 to 2,000 yards further back to allow time to move when there is a possibility of the front line falling back. In such case an advanced car-loading post, protected if possible, will be required between the A.D.S. and the R.A.P. Prospective rear sites both for A.D.S. and car posts will also be selected for occupation in case of a withdrawal. The M.D.S. should in these circumstances not be nearer than five miles.

The Offensive.—In the event of a deliberate offensive being undertaken, plans are usually prepared some time beforehand, but preparations are
made as secretly as possible. Medical units and supplies are not moved forward till as late as possible to prevent information being given to the enemy's observers, but there is time for individual reconnaissance of sites, for selection of suitable ones, and for studying maps and air photos of the enemy's area in case of an advance into it. Information may be available as to the sites of enemy R.A.P.'s and dressing stations; these are likely to be suitable and may be used if their positions are known. Much information may be obtained by the A.D.M.S. at the Medical Divisional Conference usually held forty-eight hours before the attack and before the issue of operation orders, which should include such medical information as it is necessary for the troops to know. With the prospects of a formal movement, medical arrangements will include the establishment of lightly-equipped, readily mobile and divisible dressing stations, both advance and main, to allow of the leap-frogging movement being adopted, with reserves to be available for dispatch at once to any position of the front. The collection of wounded in groups along the main road facilitates their removal, and if the sites are well chosen they may progressively become A.D.S.'s and some of them eventually M.D.S.'s. It will thus be seen that an A.D.S. with a collection of wounded in it may be left in the advance with a very small attending personnel to be taken over by an M.D.S. party, thus avoiding much evacuation and traffic of field ambulance motor transport; this is of special help when roads have been made impassable for motor vehicles by shell fire, mines, obstacles, etc., and by bridges blown up. Whenever a W.W.C.P. is to be established under tents, it is very important for work of erection not to be commenced until the attack is launched, as the observation by the enemy of a conspicuous new unit beforehand gives him very valuable information.

**Enemy Counter-attack.**—When the enemy assumes the initiative and a hostile counter-attack develops, which brings the A.D.S. too near to or in danger of being included in the fighting area, the A.D.S. must be closed as such but retained as a car-loading post or bearer relay post and a new one opened or prepared to open 1,000 yards further back, or in a place suitable to the prepared positions in the rear. If the pressure still continues and develops into a withdrawal the system of backward leap-frogging with two A.D.S.'s must be adopted with a 1,000 yards or mile interval. The advance of the enemy may necessitate the opening of an entirely new line of evacuation, the closing of the old M.D.S. and the establishment of a new one in quite a different area.

**The Withdrawal.**—It is during withdrawals under enemy pressure that the greatest difficulties in evacuation of casualties are encountered, and it is often impossible to avoid having to leave behind a certain number of stretcher cases through inability to obtain transport to move them from the A.D.S. The main principles are (1) to utilize the vehicles so as to send back the maximum number possible in each vehicle for each journey (sitting cases take up much less room than lying cases) and (2) to
avoid capture of medical personnel and stores. Difficulties are increased by lack of information, absence of orders, interruption of signals, casualties amongst the transport, lack of lorry transport, road blockage, etc. Every effort must be made by divisional headquarters to control the withdrawal and to establish the rearward dressing stations and collecting posts at fixed points, of which information must be given to the forward units evacuating; if the withdrawal is well organized, traffic instructions and road control orders will be issued and strictly enforced. There will be no properly established R.A.P.'s, but collecting posts will be formed towards which all the field ambulance's bearers and wheeled stretchers must be brought up; the horsed ambulances and light motor vehicles must get in touch with them, forming their car-loading posts as far forward as possible, and remove the casualties to the A.D.S. This likewise is a mere collecting post in suitable buildings, so that if wounded have to be left they may be under shelter.

All unnecessary transport and baggage is kept with that of the M.D.S., and is sent back to definite spots in rear to await the further withdrawal of the unit when it is again moved further back. If it is known where the night's bivouac or halt will be the transport and baggage may be sent back there or to a site one or two miles in rear, when a temporary M.D.S. can be formed to deal with the casualties which will be coming in through the night; but advantage should be taken of railway stations for clearing purposes. Doubtless, trains will have been sent forward to assist in the clearance; and evacuation direct to them both from A.D.S. and M.D.S. may be possible without the need of the M.A.C., which will, however, help to clear the M.D.S., as traffic conditions will allow. Walking wounded will be marched back in definite small parties under a senior soldier or N.C.O. casualty to definite collecting posts at railway stations, or road points, where it may be arranged that lorries or buses are available.

The M.D.S., like the A.D.S., is of the simplest type, being arranged so as to provide shelter and temporary attention. Depending on the rate of the withdrawal, a backward leap-frogging will be taking place periodically. Ambulance transport will be controlled by a reliable officer, as much depends on its proper utilization. As before mentioned, all unnecessary baggage is pushed back to a site further in rear at the first opportunity so as not to hamper the collection and removal of casualties, and to get it out of the way. In the absence of orders from the A.D.M.S., which more than likely will be difficult to get through, the field ambulance commander assumes the initiative for moves and for issuing necessary instructions as to disposal of casualties. He is in a much better position to judge the emergencies, just as the A.D.S. commander too is better able to fix the time for vacation of his sites. But it is important to keep all concerned informed of all moves, so that arrangements in the rear for helping on the evacuation may be developed to as great an extent as possible.

Should it be absolutely necessary to leave wounded behind, only the
smallest amount of personnel and material for their treatment must be left to fall into the hands of the enemy. In laying down directions for the conduct of medical units during operations, it must be recognized that whilst the principles remain the same there is no hard-and-fast rule as to the method of employment of the different units or portions thereof. Different A.D.M.S.'s and field ambulance commanders have different ideas, and there are more ways than one of carrying them out effectively. One commander may advance his A.D.S. close to the fighting line, whilst another may carry out the clearance of casualties equally well by placing it further back, and establishing car-loading posts ahead; one A.D.M.S. may provide two M.D.S.'s, whilst another would carry out the work with one, and so on. So long as the plan is well laid, feasible, and carried through in all its details, and is understood by all concerned, it is likely to achieve success. Situations too arise for which a fixed plan cannot well cater, and which must be left for the man on the spot to deal with on his own initiative. Much valuable information regarding the employment of medical units during operations is given in the Journal of the Royal Army Medical Corps of 1921-22, in articles by Colonels Grattan, Ensor and Hannay, from a perusal of which it will be seen that their individual experiences lead to different methods of employing their units to the same end. It may generally be said though, that the simpler the method and the smaller the amount of intermingling and splitting up of medical units, the easier will be the application of the principles, the fewer the difficulties that cannot be overcome, and the greater the certainty of carrying through the plan to its termination without any contretemps. Too much elaboration at times defeats its own end.

Liaison and Communications.—Field ambulances are officially provided with no means of communication by signal or telephone, and they are dependent on their own motor cyclists, cyclist and duty personnel, or on the chance proximity of a signal post of a unit or formation. The A.D.M.S. has no direct means of his own of keeping in touch with them, and all messages have to be sent through headquarters signals. Experience has shown that considerable disadvantages accrue through this, and numerous are the instances in which units or A.D.S.'s have been captured, or barely escaped capture, or have not sent medical aid when needed through failure of, or delay in, delivery of messages and orders. Signals having no detachment posted with them are frequently unaware of their position. In these circumstances it behoves the medical services to do all they can to help themselves in the matter, and seek for information from all possible sources in order to be able to put themselves in the best position to be of use to the troops.

The A.D.M.S. usually details a motor ambulance car, a motor cyclist and orderlies from a field ambulance for his own use to render himself and the D.A.D.M.S. independent of the divisional arrangements which are rarely sufficient to meet his requirements. His headquarters are often at some
considerable distance from those of other branches of headquarters; "G" branch, who are occupied with the fighting, keep themselves as far as possible from the constant comings and goings which are inevitable, especially with departmental branches. But it is of extreme importance to the medical services that they should be able to get information from, and give information to the other branches for the proper interworking and the making of necessary arrangements, which cannot be done without their assistance. "G" want to know the sites of A.D.S. and M.D.S. and W.W.C.P. for the information of the troops and for the allotment of roads, movement of units and supplies, and in action the number of casualties coming in and their nature, and also the situation as to their evacuation; it is the office which issues intelligence and can give valuable information as to the nature and situation of the fighting and the probable casualties to be expected, and in the case of a possible advance information as to the condition of the roads and the positions occupied by enemy medical units; it controls the issue of maps and field telephones of which it may be possible to spare one for connecting up to A.D.S. and M.D.S.; and it is to "G" that application must be made for the allotment of fighting troops as additional bearers. With "Q" there is much in common, but of especial importance are his powers of allotting accommodation and of arranging for additional transport in the shape of light railways, lorries and buses to evacuate walking casualties and to bring up necessary stores for construction work, etc. "A" can give considerable help with regard to replacement of personnel, disposal of prisoners of war, burials, disposal of effects, return of discharged men to their units, official returns, money requirements, etc. The C.R.E. can give great help in construction and protection work and in repair of roads, etc., especially in the shape of material if units can supply their own labour.

The field ambulance commander, by attending brigade conferences, comes in touch with the brigade headquarters staff and the officers commanding units of the brigade with which he is serving. Much information is gleaned by listening, and many difficulties can be settled and much help given in a few moments conversation. During operations this liaison is maintained through the bearer officer, or officer in charge of collecting duties, so that the earliest possible intimation of operations can be obtained. A whole-time officer can rarely be spared as liaison officer at brigade headquarters, but if one is so employed he must be furnished with means of communicating with his bearer officer and the A.D.S. by telephone, dispatch rider, or messengers. The bearer officer must keep in constant touch with the R.M.O.'s and their R.A.P.'s, and if necessary arrange to bring help to them in times of stress. Field ambulance stretcher squads are attached to the fighting units when necessary and feed and stay with them; and it is the duty of the O.C. field ambulance to replace casualties among R.M.O.'s from his own unit, until replacements can be obtained by the A.D.M.S. Communications with the R.A.P.'s are maintained through the bearer relay posts.
Notes on Medical Services in the Field

Hill Warfare.—When a force is operating in a hill country, such as the North-West frontier in India, where roads are non-existent, and the transport of the fighting column is wholly pack, when the countryside immediately off the route of advance is hostile, when the lines of communication are only opened at stated times under the protection of armed pickets and an armed convoy, when the force must camp each night in its own armed ring-fence or zareba, and when the Geneva Convention is non-existent, conditions of warfare for all concerned are entirely different from those applicable to fighting in civilized European countries. Such a force has to be dependent on itself alone for periods of days, and be self-supporting in the matter of supplies, as the country of operations rarely can furnish anything to sustain the force. Everything has to be carried on mules or camels; wheeled transport, much less motor transport, exists in no shape or form beyond rail- or road-head. Along with other units, medical units are put on the “alternative scale” of transport, or in other words ponies, mules, camels, or even at times donkeys, replace the orthodox wheeled transport, and additional man power in the form of extra stretcher-bearers help out the sick-carrying capacity. As the track is generally along the rocky bed of a stream even wheeled stretchers have to be left behind. With such warfare in view the equipment of medical units is made such that it can be loaded without change, either on wheeled or animal transport, and a unit which has started out with wheeled transport may suddenly be ordered to change it to animal transport at a couple of hours’ notice. Only those who have experienced both kinds and have had personally to be responsible for the equipment and its loading and safe arrival each evening can appreciate the blessings of wheeled transport and good roads.

In India the system of supply of transport is different from that of the home Army, in that the transport is not permanently attached to the unit with which it is working, but only for the actual hours of the march, since the transport, whether mule, camel or bullock company, returns each evening to its own transport unit. This system has its exceptions, for a certain number of pack mules may be normally retained by a unit which when separated from the transport unit becomes responsible for them. In a field-ambulance which is normally altogether equipped with so-called first line transport, when wheeled traffic is supplied, motor ambulances, bullock tongas, and riding ponies for sick, together with a pair or more of water mules, are left permanently with it; when acting with a division, and at any time when liable to be separated from its transport unit, the field-ambulance becomes responsible for the whole of its transport which remains with it. But in mountain warfare, when on the move and forming a ring camp each night, all animals go to their own transport unit lines in the rear.

As the force advances from its concentration point at rail- or road-head, it deals with enemy opposition and establishes “strong points” or “staging
posts" along its line of advance at intervals of eight to ten miles, thus forming its line of communication. On the establishment of one such post, an advance is made to form the next by the construction of permanent barbed wire, walled picket posts of commanding points suitable for the protection of the line. Considerable opposition is frequently met in this operation, and numerous casualties may occur amongst the protecting troops. Until each of these picket posts is constructed and occupied, the force does not advance further. And if the opposition is very great and the situation demands it, it may have to withdraw at night to its previous strong point and complete the work the next day. If able to find a suitable camping ground at night at the point reached, it may hold its ground, either retaining its transport or sending it back to the strong point for the night. Sometimes it is necessary to hold the ground reached, though it may be unsuitable for defence, and on such occasions the enemy takes advantage of his opportunity and casualties are likely to be heavy.

The usual disposition of the advancing force is: (1) Strong advanced guard of infantry, 1 battalion or 2 companies; depending on the strength of the force and opposition expected, with some pack artillery and sappers and miners; (2) main body followed closely by the transport at short interval; (3) rearguard.

As regards medical arrangements, each battalion has its usual establishment, but provided with pack transport. The field ambulance or ambulances likewise have only pack transport. For casualties this consists of 40 riding ponies and 12 camels, each of the latter being fitted with 2 kajawahs for lying cases, the camels being in lieu of 8 bullock-drawn ambulance tongas or 4 motor ambulances when wheeled transport is not taken. These are supplemented when necessary by additional bearers attached from the bearer unit, who assist the 20 stretcher squads of the field ambulance.

In order to meet the local situation the A.D.M.S. or senior medical officer of the force is responsible for clearing the casualties from the field ambulances to the first staging post to the rear on the L. of C., and to carry out this he has placed at his disposal: (1) A bearer unit, or company thereof; (2) a half-troop or two to five sections of a camel corps; and (3) additional riding ponies if considered necessary, though usually these are borrowed from the field ambulances. The average Indian foot soldier does not like riding.

The bearer unit consists of 2 officers, 4 W.O.'s (assistant surgeons) and 503 I.O. ranks together with followers. It is a non-divisional unit, and its normal function is the replacement of the M.A.C. by man power under conditions when the use of wheeled vehicles is impossible. Its internal organization is, as far as possible, like that of an Indian regiment of infantry. It is used chiefly to remove lying casualties from the A.D.S. to the M.D.S., and from the M.D.S. to the next post on the L. of C. as well as between staging posts on the L. of C.

The ambulance unit of the camel corps consists of camels specially
selected for their quietness, easy gait, and gentleness in "baithoing" and getting up in loading and unloading. They are each fitted with a pair of camel kajawahs for taking one lying down patient on each side. If only one side is occupied the other must be weighted with baggage or stones to balance. These kajawahs project on each side, so care has to be taken to keep the files of camels with sufficient intervals between them to prevent them bumping their kajawahs against each other, and also to see that when passing along a hillside track there is sufficient clearance for them between the hillside and the camel. Owing to these bumpings the kajawahs become bent and the patient lies in them frequently on an appalling lateral slope, yet I have never known a patient fall from them despite their dangerous look, and the I.O.R. travels in comfort in them, though he appears to be hanging on by the skin of his teeth. He infinitely prefers them to the riding pony which he loathes.

To go with the advanced guard there is usually detailed from the field ambulance a small advanced dressing station party of say five stretcher squads, nursing orderlies, etc., and riding ponies under an assistant or sub-assistant surgeon, which is placed at the disposal of the M.O. i/c the unit forming the advanced guard; or it may be that a M.O. is sent in charge. If opposition is met a small dressing station is formed, and casualties are collected and sent back by the bearers and ponies to the headquarters of the field ambulance with the main body. The latter sends up reinforcements if required, and if a battle develops the field ambulance sends up a full A.D.S. party and all its bearers to take over from the advanced guard party, and opens a M.D.S. to deal with casualties sent back. If the route to the A.D.S. is well protected, as is often the case when advancing up the stony bed of a river, camels may be sent forward to help in bringing back the casualties and the A.D.M.S. who is usually at force headquarters and alive to all that is going on in the fighting line, details additional bearers from the bearer unit to assist in the clearance of the A.D.S.

As the force is advancing the question arises as to what is to be done with the casualties collected at the M.D.S. The force being on the move the situation is not such that the field ambulance can open up and give full treatment to them, so one of two measures must be adopted: (a) If communications are still open with the staging post just left casualties should be sent back to it by means of kajawah camels, bearers of the bearer unit and riding ponies, the medical unit at the staging post assisting by meeting half way and taking them over; (b) if the distance advanced is the greater part of the day's march and near the intended new camp, and the rearward line is not open, then application may be made by the A.D.M.S. for an armed escort to send them back the same day, or they may be carried forward to the new camp where the M.D.S. can open up fully and give them adequate treatment and render them fit for evacuation the next day by convoy when the L. of C. is opened.

To return for a moment to the strong point or staging post; in estab-
lishing it the main body, when it advances, leaves behind a sufficient force to hold it and strengthen it against attack until it can be taken over by L. of C. troops following up in close proximity. The troops at the post have not only to hold it, but have to furnish the pickets for the picket-posts and the daily armed convoys to the half-way point both to the staging post in rear and to the main body or staging post next in front. So that a convoy passing down the line from one post above is "taken over," at a half-way meeting point by troops coming up from the post below and bringing with them an up-going convoy, which in its turn is "taken over" by the troops from and returning to the post above. These convoys are accompanied by a small medical detachment consisting of a M.O., assistant or sub-assistant surgeon, three or four stretcher squads, riding ponies and camels, with medical panniers and water mules; this detachment takes charge of the sick convoy and furnishes medical aid to the escorting troops in case of attack. In this way a daily or a half-weekly convoy system is arranged which enables escorting troops to return to the same camp each night, and by this daily convoy casualties are evacuated to the next staging post on the line, bearers and ponies doing only the half journey and returning after handing over to up-coming bearers and ponies from the post below at the half-way meeting point; but kajawah camels go right through and do the full stage, returning empty by the next up convoy on the following day. Notification is sent by signals each night from the upper to the lower post of the number of stretcher squads, camels and ponies required to be sent on the next day to the half-way meeting point.

If there are two field ambulances with the force it is common practice to leave one M.D.S. behind when the main body leaves the front staging post, in order to act first as the force M.D.S. and later to take in casualties sent back from the M.D.S. of the other field ambulance accompanying the force. When on the next day L. of C. troops take over the post from force troops and free the latter to advance and rejoin the main body, one or more L. of C. medical units, known as "staging sections," accompany them and take over from the field ambulance M.D.S., which is thus enabled to rejoin the force. These staging sections are twenty-five bedded units (expansible to fifty) and may be either British or Indian. In mixed forces it is customary to pair them, i.e., one British and one Indian, and this has the advantage of doubling the number of bearers available (twenty-three each) for staging, since both up- and down convoys have to be arranged for each day. To supplement these the A.D.M.S. L. of C. may have been given a company or more of the bearer unit, and the bearers of this are posted to the staging sections in numbers proportionate to the evacuating powers of the force. There are also attached a proportion of kajawah camels and riding ponies if arrangements have been made for the daily return of those coming down.

The nearest casualty clearing station is situated at road- or rail-head, or at a main staging post. It will be seen, therefore, that the further the
force advances the more stages will be necessary, and the longer the time taken for a casualty to get to a hospital where he can find rest and full treatment. Knowing this it is therefore very necessary for field ambulances, if they are not on the move, to do as much as they can towards the full treatment of the wounded; and advanced staging stations must be prepared to act if necessary as retention hospitals and carry out more than mere dressing station duties. It is hard for wounds that are crying for rest to be moved on day after day for a whole week, but if the chain of evacuation is not kept up the staging sections will be clogged. It must further be remembered that these units have to take in the sick of the L. of C. troops doing duty at the post, and the sick rate is usually a pretty high one.

Occasionally an independent column goes out from a base carrying supplies for six to seven days, and is cut off entirely from it, leaving no lines of communication. Under these circumstances arrangements must be made for additional sick transport, as all casualties must be carried along with the column until it returns to its base, or until it sends in a convoy, in which case a sufficient amount of medical personnel and equipment must accompany them to give them field hospital accommodation and treatment on the return marches.

Rear-guard Actions.—Under normal circumstances the rear-guard is a small one and requires no special medical provision other than what can be readily obtained from the field ambulances with the main body. But in a withdrawal, or with an independent column, conditions are different, as the hill enemy appears suddenly from nowhere and frequently harrasses or attacks the rear-guard of the withdrawing force. In such circumstances the rear-guard is considerably strengthened, and as all casualties must be carried along with it the medical detachment of the field ambulance (or dressing station party) is supplied only with first-aid equipment, and with a large proportion of bearers, ponies and kajawah camels. A particularly difficult operation in which to avoid casualties is the withdrawal of the advanced outlying permanent pickets, as the opportunity for attack is seized upon by the enemy. This withdrawal is usually carried out at night, just before dawn, and a small force is usually sent out to cover the withdrawal. Until all these pickets are in, the rear-guard does not follow the main body, which, however, must act accordingly. The medical assistance that can be given under these circumstances is very small, if any, and if casualties occur, every endeavour must be made by the troops themselves to bring in their wounded comrades. The leaving behind of a wounded man is a condemnation to certain death, as the hillman enemy has no use for wounded. It is remarkable how few wounded and even dead of their own hillmen leave behind; they nearly always, except in the very heaviest fighting, manage to get the wounded away. They are a hardy, active and agile race.

(To be continued.)