NOTES ON THE MEDICAL SERVICES IN THE FIELD.

By Lieutena mt-Colonel T. S. Dudding.

Royal Army Medical Corps.

(Continued from p. 357.)

PART III.

Sanitary Sections.¹

There still remain for consideration certain medical units whose activities take them into the Army areas. The first of these is the Sanitary Section. This is normally a divisional unit, one being mobilized with and moving with each division, but similar units are also mobilized as required for work on the L. of C. It is very necessary that one of these should be amongst the very first troops to be dispatched to the base of the area of concentration, and that the actual divisional sanitary section should be very early on the spot in the area of concentration.

Now the infantry divisional sanitary section is normally for administration purposes, under the A.D.M.S. of the division to which it is attached, and in mobile warfare accompanies the division when it moves; but when divisional areas become stationary, and troops move from one such area to another, or are relieved in the one area, then the control of the movements of sanitary sections passes back to the Army, and the units become Army area units, and not divisional units, though for actual working they may be still at the disposal of the A.D.M.S.'s of the particular divisions occupying the areas in which they are located. The number of sanitary sections required will in this case correspond to the number of sanitary areas or sub-areas mapped out and charted by the Army, and not necessarily to the number of the divisions mobilized. They may increase or decrease in numbers according to the numbers of new areas or sub-areas taken over or given up. Army sanitary areas are under the control of the Deputy-Assistant Director of Hygiene, Army.

On the L. of C. the number of units employed depends entirely on the length of the lines and importance and size of the various bases and posts. For example, a large base will require one sanitary section, railhead or advanced base, half a section, and each post in between a sanitary squad; this last-named consists of one R.A.M.C. N.C.O. sanitary inspector with up to five R.A.M.C. trained sanitary men, and locally employed labour as required. They are all commanded by the O.C. sanitary section working under the control of the D.D.M.S. (or A.D.M.S.), L. of C. through his A.D.H., or D.A.D.H.

¹ Since this article was written the official designation of the Sanitary Section in the British Army has been changed to "Field Hygiene Section."
A cavalry division sanitary section accompanies its division from one area to another, moving with it wherever it goes. This is chiefly on account of the importance of the proper disposal of manure.

The personnel of a sanitary section consists of 1 sanitary officer (not necessarily a medical officer), and 27 N.C.O.'s rank and file R.A.M.C., and 4 attached R.A.S.C.M.T. The R.A.M.C. men are all trained in special duties, e.g., 8 N.C.O.'s as sanitary inspectors, 1 N.C.O. and 5 men skilled in wood, iron, painting and mechanical work and 5 men as sanitary orderlies. In the cavalry unit there is an additional N.C.O. and 3 men. The vehicles consist of 1 light and 1 heavy motor van, 1 motor lorry disinfecter and 9 bicycles (12 in the cavalry unit). The equipment is chiefly workshop tools, a few brooms, axes and spades, a wheelbarrow, spare parts for the bicycles, bleaching powder and the necessary articles for the internal economy of the unit. A study of the personnel and the equipment shows the unit to be one intended to carry out skilled supervision, and to direct the work of others rather than itself to carry out actual necessary sanitary duties, and to be lacking in the labour element. This is to be supplied by regimental and departmental units in their own areas, and by locally engaged civilian personnel or labour corps in non-unit areas. The bicycles indicate the amount of inspectorial work that must be carried out.

Generally speaking, then, the duties of a sanitary section are to act as skilled instructors in hygienic methods and as supervisors of conservancy work, especially outside unit lines and in connexion with the smaller units who are less able to look after themselves. They form a sort of protective health screen between the troops and the civil population, as they work in with the civil health authorities through the A.P.M., town commandants, etc., and they are empowered with the authority of Sanitary Police. When required, they exercise the necessary skilled supervision over units in regard to the construction of sanitary appliances in their lines. But in their dealings with units provided with M.O.'s it is always necessary to remember that the medical officer is the adviser of the O.C. unit, and their representations should be made through him. A most important aspect of their duties is in connexion with infectious disease and its notification, the marking of infected billets and disinfection of the same either by their own appliances or through the civil authority, and the disinfection of clothing. Adjuvant to this is the supervision of ablution places, bathing establishments and laundries, especial attention being paid to waste water disposal, and to the disinfestation of vermin-infested clothing. The supervision of central water supplies and their proper protection and purification come, too, within the scope of their duties. When troops move it is very necessary for the sanitary sections to see that the proper cleaning up of the vacated areas, the proper closing of latrines, and the destruction or sanitary disposal of rubbish, manure, etc., are effectively carried out. This is especially of importance in the case of units with numbers of animals attached.
In India the Sanitary Section, as laid down in War Establishments, India, is a mixed unit, having 12 trained sanitary R.A.M.C. N.C.O.'s and men, 9 trained Indian N.C.O.'s and men, and 70 Indian followers. Of these last-named 9 are trained as skilled workmen or mistris, 36 are sweepers for conservancy work, and 21 are coolies chiefly for constructional labour and for manure burning work. It will be seen, therefore, from its composition that much actual executive sanitary work falls to the lot of the sanitary section in India, especially in connexion with transport units, and very small units and detachments which in some cases appear without sweepers or sanitary appliances of any description, and are expected to be dependent on some adjacent unit for these necessities of life.

The method in which the Indian Sanitary Section forming part of a moving force is employed is as follows: When the force moves out, each unit leaves a portion of its unit sanitary detachment behind to clean up the ground occupied by it, close the latrines, and see that every waste thing combustible is left burning. The sanitary section is divided into two parts, one accompanying the troops, and the other, half or two-thirds of the unit, remaining behind to assist in the cleaning up especially of the transport lines, the outskirts of the camp, and the areas of the small detachments which have possibly only one sweeper each who has to accompany his unit. This rear sanitary party works on until the camp is cleaned, the O.C. section remaining behind to supervise; it is most important that the work should be done rapidly and thoroughly as the site will probably be occupied later the same day by L. of C. troops coming up to protect the line. When the work is finished, the rear sanitary party either rejoins the main body the same day or, more commonly, remains behind till the following day, when it rejoins with the up-going convoy, the other half of the section now carrying out the work done by the first half the previous day. In these Indian mobile forces, supplied as they are with pack transport and with animals running into thousands, the disposal of manure is a very difficult problem. The manure is practically pure dung, and will not burn until it has dried. The forage is usually all eaten up, and there is very little waste to assist in the burning. The bale iron round the forage is all saved and made into incinerator grids, and each unit is instructed to make one such fresh grid to take along with it each time it moves so that it can have an incinerator going as soon as it arrives in camp for the burning of solid excreta and rubbish. Thus, when it moves off, it can leave behind its rubbish, burning properly, without having to dismantle its incinerators in order to take along its iron fire-bars.

Especial attention must be paid by the sanitary section to the slaughter area; animals for slaughter are all brought up on the hoof, and the killing is done on the spot. As there is no time to dry and save the skins, these must all be burned with the entrails. Burial has sometimes to be resorted to, but is very unsatisfactory on account of fly breeding. In one test made
in Waziristan in 1920, entrails were buried and covered with two feet of earth in a fresh camp where flies were practically absent. On returning two months later after considerable snow followed by winter weather and the occupation of the camp as an L. of C. post, the flies had become very numerous, there being also other sources of origin than the buried entrails. One of the entrail pits was opened up to see the condition of affairs, and as the loose earth was shovelled away flies with closed crinkled wings were seen crawling amongst it, and when thus liberated of the weight of earth their wings expanded and they flew off. The nearer to the buried entrails the spade arrived, the more numerous the flies became.

**Medical Stores Depots.**

These depots are of two kinds: (a) Advanced, which are army units, and (b) base, L. of C. units. Advanced depots draw their stores from base depots and any local sources, and supply field ambulances, casualty clearing stations, motor ambulance convoys, sanitary sections, advanced convalescent depots, and in certain cases unit requirements. As a rule, regimental M.O.'s obtain their medical stores through field ambulances, but on occasions may have to indent direct on the advanced depots. In any case the field ambulance motor vehicles are the means by which medical stores are sent up to the front line. These depots are mobilized to the number of three per army of three corps, i.e., one per corps, and they are controlled by the D.M.S. Army. They are usually situated close to a C.C.S. group, and require suitable buildings near a railway line to allow for protection from weather and to facilitate the obtaining of additional supplies. Their staff consists of one quartermaster in charge with one N.C.O. dispenser, one clerk, and four packers and storeman, of whom one is a carpenter. The transport consists of one Ford box van with R.A.S.C. driver for distribution of stores. It will be seen, therefore, that for their moves they require assistance from "Q" Branch of A.H.Q.

Base stores are mobilized normally to the number of one per army; but where one army has two bases and two different L. of C., an additional base store is required, or one is divided into two with some slight additions. They are controlled by the D.D.M.S., L. of C., and supply the wants of L. of C. medical units as well as advanced depots. Where there is more than one store, there is formed a stores branch on the staff of the D.D.M.S., and all indents for supplies pass through this to the War Office or to the medical stores in the home country. It was found in the Great War that if base stores indented individually direct on the home store, accumulations of stores occurred overseas through one store not drawing on the surplus stock of another. By thus controlling them much unnecessary accumulation and deterioration of stores was prevented, and likewise the supply of numerous varieties of certain articles indented for to meet the idiosyncrasies of individual officers was modified to correspond with articles recommended by a selection committee. The staff is considerably larger than that of an
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advanced depot, consisting of two quartermasters, one W.O., and nineteen other ranks. Sera and vaccines require especial care, and they are placed in charge of additional special staff (which, if the demand is likely to be great, consists of two N.C.O.'s and two privates) for their care and handling. Like other base units stores have no transport, being dependent for it on "Q" Branch of the L. of C. H.Q. Staff. Additional labour is also required for unloading from ships and loading for dispatch.

Mobile Laboratories.

These are army units. The official ones are: One hygiene laboratory per army with its headquarters normally at railhead or the advanced base, and two pathological laboratories per army, one or both of which work in the C.C.S. group areas, and sometimes one in the advanced base area. Their field of work is much enlarged by the possession of a light motor car which enables an officer to advance right amongst the fighting troops if necessary, and certainly to the field ambulances, to assist in the elucidation of the diagnosis of infective diseases. The laboratory is a specially fitted-out hygiene or pathological unit on a motor lorry chassis, and is sometimes fitted with trailer attachment. The staff consists of two officers, one laboratory assistant, one batman, and three M.T. drivers. When the situation allows, a suitable room in a building is taken over for working in.

Other mobile laboratories or medical branch outfits in use during the Great War were X-ray outfits and dental outfits; though now that C.C.S.'s are furnished with X-ray outfits (a perfectly satisfactory field outfit has yet to be devised), and that dental officers with field outfits are attached to field ambulances as well as to C.C.S.'s, the necessity for the travelling outfits is not so great. It may be mentioned that the Americans utilized travelling operating theatre outfits with surgical teams accompanying them.

All these special mobile units are directly under Army control, though they may be placed temporarily at the disposal of corps. Fuller details of the working will be found in the various volumes of the Medical History of the War. They are of more particular interest to the specialists in these subjects, and it is not necessary to enter into particulars here.

Ambulance Trains.

These are L. of C. units under the medical control of the D.D.M.S. (or A.D.M.S.) L. of C. Their actual movements are carried out by the transportation section of "Q" Branch, on demand by the D.M.S. Army. They are of three kinds, viz. (a) ambulance trains proper, (b) improvised ambulance trains and (c) temporary ambulance trains. The last-named (T.A.T.) are made up at short notice to meet the requirements of special emergencies when the normal service is insufficient. They consist of ordinary third-class rolling stock, with one first or second-class coach for personnel and officers, and are intended to take sitting casualties and very lightly wounded who need little or no attention on the journey and can look after
themselves. It is useful to have an "upper berth" for bad sitting cases who may develop into lying cases during the journey. If the class of case is properly selected these trains serve a very useful purpose, as they can deal with large numbers—one train in some cases being capable of taking up to 1,000 sitting cases. There can of course be no hot meals supplied on the journey, except at halts, which are necessary periodically for purposes of nature, for supply of drinking water, hot drinks, &c., and for medical attendance on a certain number who may require it. These halts are arranged for at certain specified stations, where necessary preparations have been made; otherwise boxes of rations which need no cooking, are made up of bread, cheese, biscuits and jam, each box containing the requirements of one compartment, and one is issued to each at the entraining station. The personnel are detailed temporarily from the regular ambulance train service, and consist of 1 M.O., 1 N.C.O. and 8 O.R.'s, all instructed in train work. Special orders for the control of such trains are laid down and issued to the M.O.'s. On the cessation of the emergency the train is immediately broken up and the personnel returned to their units. Difficulties in control of the casualty patients are frequent at the halts, as the men get out and wander away, and it is very necessary to put each carriage and coach under the charge of the senior N.C.O. casualty therein, and under the control of one R.A.M.C. orderly for each section of three coaches. Each train carries a definite scale of supplies, medical comforts, medical, surgical and ordnance equipment to meet requirements. Necessary particulars of the dispatch of such loaded trains are wired to the D.M.S. L. of C and A.D.M.S. detrainig base, giving the source, numbers and destination of the casualties as determined by the A.D.M.S. ambulance train.

Improvised ambulance trains are taken into use when a force moves overseas and ambulance trains proper are not available in the country, or have not yet arrived from the home base. They are made up of (1) the best type of covered goods rolling stock available in the country, or (2) of passenger parcel vans, or (3) of ordinary third-class passenger coaches, partly gutted and converted, or (4) of corridor communicating coaches for lying casualties, and ordinary passenger coaches and brake vans for a proportion of sitting cases, personnel, stores and cooking. The lying accommodation is provided by fitting sets of Brechot-Desprez-Ameline frames for stretchers. Each frame consists of three tiers, and each goods wagon will take four sets, i.e., twelve lying patients. The sets are kept ready in Ordnance for mobilization, and transhipped with the force. These non-communicating trains are never satisfactory, and the goods wagons, having only two ordinary axles, are uncomfortable, have no heating or lighting arrangements, no automatic brakes and no sanitary or water fittings. The passenger vans are generally fitted with bogey wheels, heating and automatic brakes. The corridor stock, whilst being convenient from the communication point of view, has ordinarily no lying accommodation, except when the long-distance "wagon lits" are available; and they
require considerable alteration. It will thus be seen that the composition of these trains depends to a very large extent on the nature of the rolling stock available, although in their assembly a definite scale is followed as far as possible to enable their composition to be based on the lines of an ambulance train proper. A further point to be considered is that the rolling stock of different companies varies, and each train should therefore be made up of the stock of one company. This is particularly important from the point of view of repairs, as one company does not keep the spare parts of another, and a composite train may thus be put out of action for a long period when undergoing the necessary three-monthly overhaul for the lack of necessary replacements. The number of goods vehicles required to make up a complete train is about forty.

The ambulance train proper is really a mobile hospital and is complete in itself. It is specially built, constructed or fitted for the purpose, and provides accommodation for 396 lying patients in addition to personnel. In its evolution, it has undergone numerous alterations and rearrangements from time to time, and it is liable to changes to meet the special local conditions of the country and campaign for which it may be used. It is about 320 yards in length and ordinarily consists of an engine and sixteen communicating bogey coaches arranged somewhat as follows, though different trains have variations according to the period of construction:

Engine; Coach No. 1, brake and infectious; No. 2, M.O.'s and sisters; No. 3, kitchen and sitting officer. patients; No. 4 to 7, wards; No. 8, office, dispensary and dressing theatre; No. 9 to 13, wards; No. 14, kitchen and cooks; No. 15, personnel; No. 16, stores and brake van. Each ward coach accommodates thirty-six lying patients, or a larger number of sitting cases. The staff consists of 3 M.O.'s (one major as O.C.), 3 sisters, 3 W.O.'s and N.C.O.'s, and 42 rank and file. One train is mobilized per division, and two per corps of three divisions.

In France, owing to the vast size of the force, the control of the supply and running of ambulance trains was somewhat complicated, as the number and extent of the army areas, the necessity of arranging the runnings to fit in with those of the numerous supply trains and the limitations of the railway system had to be taken into consideration. With a smaller force, the channels would be considerably fewer and shorter, though the underlying principles would be the same. The actual system latterly adopted was somewhat as follows: From reports received from the O.'s C., C.C.S.'s, the D.M.S. Army noted the requirements of each C.C.S. and made his demands accordingly on the A.D. Transportation (of "Q" Branch) of his army, who in turn demanded the trains from the Director of Transportation, G.H.Q. The latter instructed his L. of C. representative on the Railway Branch to arrange for the supply of the trains if available. This officer, the A.D.R.T., instructed the R.T.O. of the ambulance train garage, where the trains were kept in waiting, to dispatch the trains to the C.C.S. railhead in charge of the O.'s C. ambulance trains, as
required by the D.M.S. at railhead. The movements of the train were controlled by the R.T.O. railhead.

The O.C. train, having loaded up his train, notified by wire the A.D.M.S. ambulance trains (who with a D.A.D.M.S. was on the staff of the D.D.M.S. L. of C.) of the completion of the loading, and of the number and varieties of the casualties. The A.D.M.S. was kept informed daily of the numbers of vacant beds at the various L. of C. hospitals and on this decided the destinations of the various trains, either before or on receipt of the loading notification of the O.C. train. Notification of these proposed destinations was passed immediately to the D.T., who sent out instructions through the Railway Transportation Officer concerned to the R.T.O. at the ambulance train garage, and hence to the O.C. ambulance train. If the A.D.M.S. had not yet notified the transportation branch of the required destination of the train, it was despatched by the R.T.O. railhead on its way towards the base, and on receipt of the information this was wired down the line by him, to catch the train in time to turn it into the right channel at the appropriate junction, the D.D.M.S. (base) or O.C. hospital, and R.T.O. at the detraining station being also notified so that they might be prepared for its arrival.

At the detraining station, on completion of the unloading, the O.C. train informed the D.D.M.S. or A.D.M.S. base, through his D.A.D.M.S., of its completion; the latter passed on the information to A.D.M.S. ambulance train.

The R.T.O. detraining station then despatched the train to its garage in its army area, via the A.T. supply store, for replenishment purposes, and notified the D.T., who was thus kept informed of what ambulance trains he had available to send out from his pool. In the meantime the train was receiving the necessary cleaning and disinfection before being again sent out. In order to be nearer the C.C.S. railhead, a train might be passed from its garage to a regulating station, usually at an important junction, where it was held in readiness to proceed at once to the one of a number of C.C.S. railheads to be reached from this spot where it was most urgently required.

In continuous battles, lasting over many days, a regular daily service of ambulance trains was fixed, and a train was timed to leave C.C.S. railhead at a definite hour each day, and thereby O.'s C. C.C.S. were able to make their arrangements accordingly. When more than one C.C.S. was clearing casualties in one train, a local representative at railhead of the D.D.M.S. L. of C. co-ordinated the numbers to be sent from each, in order to prevent crowding, and waiting at entraining stations. To alleviate this event, which occasionally occurred in spite of arrangements, the D.D.M.S. L. of C., in conjunction with the movement and control staff, arranged for waiting and refreshment rooms suitably fitted.

Ambulance trains are equipped with ordnance and medical equipment on special scales. The former comprises all that is necessary to complete
the fitting of the train to act as a light field hospital, and includes stretchers, blankets (3 per patient), pillows, sheets, towels, plates, mugs, spoons, kitchen utensils, brooms, etc.; and the latter, besides the usual set of field medical equipment, consists of additional drugs and dressings, including oxygen apparatus, which are likely to be required.

Besides the ambulance trains on the L. of C., a modified form of rail transport in front of the C.C.S. was used wherever possible in France and other theatres for the evacuation of casualties. In its simplest form it consisted of tramways or trolley-ways laid for the conveyance of water supplies and ammunition to the front line trenches on the up journey, and on the return journey of casualties from the tramway head, which became a collecting post, to the advanced dressing station of the field ambulance. The lines were laid in the communicating trenches themselves either on the floor or overhead, depending on which system was adopted, and also in the open. The trolley carriages were simple platforms, each on two pairs of wheels, and stretchers were placed on them, some were constructed with end-railings which allowed of stretchers being also placed across them in an upper tier, the total load being three below and two above. They were hand pushed by the field ambulance stretcher bearers, or in some cases mule drawn. Advantage was taken of local facilities for their construction when these existed, existing light railway lines and colliery trolley lines and stock being taken up and relaid as required.

The light railways themselves were taken into use whenever conveniently situated for conveying casualties from the A.D.S. to the M.D.S., and also to the C.C.S., and they were especially useful when it was possible to place a W.W.C.P. on one of them and so to connect it up to a C.C.S.; large numbers of sitting cases were thus easily conveyed in trucks. In some cases when the journey was long, a regular small ambulance train consisting of an engine and six trucks covered with tarpaulins or even fitted with racks for stretchers, was employed, the capacity of such a train being about 100 sitting cases or thirty-six lying cases. For these trains a staff of one R.A.M.C. N.C.O. and two men was appointed.

Decauville railways were used in many theatres of war for the dual purposes of conveying supplies and ammunition upwards, and casualties downwards. Both these returning empty supply trains and special ambulance trains were used. The latter usually consisted of two covered hospital trucks or specially constructed coaches on bogeys, each capable of carrying twelve lying cases, and of one large truck which accommodated twenty-four sitting cases. In Mesopotamia and Persia, special single motor hospital trolleys were also brought into use on the light railways constructed there.

**INLAND WATERWAYS AMBULANCE TRANSPORT.**

Mention may here be made of the method of evacuating casualties towards the base by means of barges and other river craft, use being made of canals and rivers to help the road and rail lines of evacuation. In France
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The craft used were chiefly ordinary commercial river barges specially altered and fitted to meet the requirements of a hospital ward. The later ones were each provided with beds for 31 patients, and accommodation for 1 M.O., 2 sisters, 8 R.A.M.C. N.C.O.'s and men, and 3 I.W.T. crew, in addition to the necessary administration annexe, comprising kitchen, dispensary, store-room and laboratories. They were furnished with lifts, electric lights and fans, and warming arrangements, and the wards enabled the casualties to be conveyed in comfort almost equal to that of a hospital ashore. The barges were grouped in flotillas of six barges, one tug per barge being provided. The difficulty of manipulating more than one barge per tug on the narrow canals was too great to allow of a desirable economy both in tugs and personnel, though later on one tug and one M.O. were detailed for two barges. On larger rivers economy in tugs is possible. At night the vessels were moored to the banks, as they only travelled in daylight. This type of transport was chiefly used for special types of cases, seriously wounded, such as injuries to head and chest, and fractured thighs, for whom smooth transport was highly desirable, and it served a useful purpose. Over 70,000 casualties were conveyed by this means in France.

In other theatres of war, small native river craft were adopted for use for varying distances, and included types such as the native boat on Lake Dorian in Serbia rowed by one man and carrying one stretcher and one attendant, the small "bellum" of the Shatt-al-arab, a craft 15 to 20 feet long propelled by poling or paddling, and the larger one of the same name and the "mahela" of the Tigris, Euphrates, and Persian Gulf, with dimensions of 60 feet by 12 feet, capable of being propelled by sails if the occasion demanded it, but often towed by a tug. These mahelas were fitted with chetai (matting) roofing to give protection from the sun, the hold being generally open. In some of the larger ones, side-racks in tiers were fitted as cots or stretcher rests, a lifting hoist was provided, and a partial flooring was laid over the hold at deck level to increase the carrying capacity, but this made the holds very stuffy. When longer journeys had to be undertaken a latrine was fitted near the stern overhanging the side, and on these occasions the boats travelled in convoy, having a M.O. in charge on a separate craft containing stores and additional personnel. Specially constructed or converted hospital steamers of various types were used extensively later on the waterways of Mesopotamia and of North Russia for sick transport.

L. of C. and Base Hospitals.

The mobilization of a force for active service not only includes the actual medical units for front line work, viz., field ambulances and casualty clearing stations, but also a definite scale of L. of C. and base hospitals according to the strength of the force. A short account of how these establishments were affected by the situations on the Western Front.
during the Great War will show the underlying motives which influence present-day arrangements.

When the Expeditionary Force was dispatched to France in 1914, these hospitals consisted of two stationary hospitals of 200 beds each, and two general hospitals of 520 beds each per division of the Army, including cavalry and the L. of C. troops. This gave a total of 1,440 beds per division, or a little over seven per cent of the strength of the whole force. The accommodation in the field ambulances, casualty clearing stations and convalescent depots was not taken into consideration when calculating permanent beds. As the force increased, and with it the need for increased accommodation, and as home hospitals came into use, modifications were found necessary. Both types of hospitals were found to be too small and were doubled, and in some cases more than doubled in size. The stationary hospital, originally intended for any place where a small hospital was required, possibly in the forward areas of the L. and C., or for a special type of case such as infectious disease, became to all intents and purposes a general hospital, though it retained its designation until after the war, and it has now been abolished. It was also found much more economical and easier of administration to increase the size of existing hospitals than to add to their numbers. Hence the vast increase which some of the general hospitals underwent when hospital centres were established; in one centre alone, three of the hospitals had each 2,500 beds. It was at one time considered that beds for a force of not more than 500,000 men need be maintained in France, i.e., 35,000 beds at the rate of seven per cent of this number of troops, on the assumption that there would be adequate accommodation provided in Great Britain and sufficient means of transfer there. But the increase in the number of casualties, the difficulties of conveying such large numbers at once, the effects of submarine warfare, and the necessity for keeping the slighter cases in the country in order to provide early reinforcements, caused a considerable number of beds to be added to those available on the Western Front, so that at the time of the Armistice there were 95,000 beds in the various classes of hospitals there. The mean ration strength at the time was something over 2,500,000. This gave an accommodation rate overseas of 3·8 per cent.

At home the number of beds available at this time for patients from all sources, i.e., from troops in training at home and from all theatres of war, was 364,000. Many of these were filled up by the casualties of the preceding years of war who had not yet sufficiently recovered to leave. So it is difficult to estimate the number that can be attributed as available for the requirements of France. The total number of casualties received from the Western Front in home hospitals in 1918 was approximately 675,000, and only a further 45,000 were received from other overseas theatres, so that, excluding the home admissions, it may be assumed that at least 250,000 of these beds were occupied by or available for casualties from the Western
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Front. If these assumptions are admissible it would appear that at least 250,000 + 90,000 = approximately 350,000 beds, were considered necessary for a force of 2,500,000, i.e., fourteen per cent. There are many fallacies in the argument, but they tend rather to under- than overestimate the eventual total requirements of hospital beds for a long continued modern war, which may therefore be regarded as in the neighbourhood of fifteen per cent of the Expeditionary Force strength if the figures for the operations on the Western Front can be taken as a criterion.

It was the aim before a big engagement to have at least 40,000 vacant beds in France alone. That these were very necessary was shown by the figures of casualties during 1916 in the Somme battles, when an average of 70,000 sick and wounded were evacuated monthly to England for five months, though in the first month alone 114,000 were sent back, whilst the largest number embarked on any single day was just under 12,000. The number actually admitted to field ambulances during this month was over 145,000, and in one particular period of twenty-four hours they received 26,600 wounded. It was only, therefore, by immediate evacuation to hospitals that such numbers could be dealt with, as at the beginning of the operations on July 1, 1916, there was a total of 61,000 beds of which 36,000 were vacant. The near ration strength of the whole force was in the vicinity of 1,300,000. The methods adopted to obtain in France the beds desired were: (1) Evacuation to England, (2) increasing the accommodation of convalescent depots, and (3) expansion of existing hospitals. This last-named was of two kinds: (a) "Normal expansion," by which the accommodation was increased nearly twenty per cent above the normal by taking over more buildings or increasing the number of tents or huts to the extent capable of administration by existing units; this expansion was of a semi-permanent nature; and (b) "crisis expansion," brought about (1) by reducing the bed space in existing hospitals and placing more beds in them, this giving an increase in beds of about thirty-three per cent over the normal, and (2) by utilizing dining, recreation, and other accessory rooms, as well as the rooms or tents of the personnel, and fitting them up with trestle cots and mattresses, an increase of about twenty-three per cent above normal being thereby obtained. To meet the requirements of this crisis expansion special sets of equipment were set aside and kept available by Ordnance for issue when the expansion was ordered, and an increase in the personnel of one M.O. and five other ranks was sanctioned for each additional 100 beds above the normal.

The development of special hospitals to deal with one particular class of case tended to increase, but this cramped and limited the general accommodation in addition to creating difficulties in regard to transportation by ambulance train; whenever possible evacuation to England was preferred so as to prevent beds being occupied for long periods, and to leave them vacant for the really serious cases, which it was undesirable to move further. One particular class of case, viz., fractured thighs, was found to be benefited
by being retained for from four to six weeks, and at each base a selected hospital received all of these cases, who were tended by surgeons and staff with special equipment and with special experience in dealing with this class of injury. But owing to difficulties in removal in case of fire from air raids, and for other reasons the period of their retention had to be considerably shortened. The other diseases which were definitely retained, and for which special hospitals were detailed, were venereal diseases and infectious diseases. It is interesting to know that the last named required about three per cent of the total number of beds in France for their accommodation. For certain other types of diseases and injuries which it was thought desirable to bring together for more experienced and standardized treatment, special wards in certain general hospitals were detailed. Such were skin diseases, eye injuries, face and jaw injuries, and mental diseases, though the last named were evacuated to England as speedily as possible.

The experience gained in the Great War has abolished the Stationary hospitals, and altered the size of and increased the accommodation in General hospitals, so that these are now of two sizes: (1) A 600 bedded unit including 60 beds for officers, and (2) a 1,200 bedded unit including 120 beds for officers. The scale of supply of hospitals to a force is not laid down in war establishments, but will evidently depend on the length of the lines of communication and the facilities for evacuating to home territories. For a force of one division with army troops, at least two of the smaller units will be required, and probably three, or else one large and one small unit. The two small hospitals will give accommodation for about six per cent of the troops, whilst in one large and one small hospital the percentage will be about nine, which is slightly higher than the pre-war allotment. The smaller unit is intended for use in the neighbourhood of the advanced base, whilst the larger one is located at the base or at some hospital centre.

The medical establishments of the two units are respectively: M.O.'s 19 and 31, W.O.'s, staff-serjeants and serjeants 16 and 25, rank and file 119 and 190, Q.A.I.M.N.S. 50 and 80. It will be seen that the larger unit is much more economical relatively than the smaller one. They are each divided into a headquarters, and a medical and surgical division on the same lines as a fixed peace time hospital, from which they differ little in their principles of administration. In the event of expansion an increase in establishment is authorized per complete 100 beds of M.O.'s 2 and 1, R.A.M.C. 9 and 11, Q.A.I.M.N.S. 4 and 5 respectively. The smaller hospital is therefore better off in this respect, but it feels more the drain on it in providing medical personnel for base and outside duties, which they will both be called upon to furnish. Amongst the M.O.'s are five and six specialists, respectively, including a radiologist and a pathologist; and the larger unit furnishes a surgical team, consisting of 1 surgeon, 1 anaesthetist, 1 Q.A.I.M.N.S. and 1 R.A.M.C. operating room attendant.
As the general hospital arrangements are those of an ordinary hospital, adapted to meet the special conditions prevailing, no description of them is necessary. Much of what has been written regarding casualty clearing stations in a former article is applicable to them, but especial attention must be paid to the arrangements for the reception at one time of large convoys of patients from ambulance trains and M.A.C.'s, and similarly to the rapid evacuation of large numbers to hospital ships, for which procedure special instructions are laid down in Field Service Regulations. The hospitals are complete in themselves in every respect, except in the provision of buildings or huts and transport which are supplied from other available sources. But tents are supplied on mobilization, as well as collapsible wheeled-stretchers, hand-carts and water-carts. Some of the articles supplied to the smaller unit, as, for example, operating tables, are portable. The pathological laboratory, dental, X-ray, ophthalmic and ear, nose and throat equipment is all appropriate and according to special scales. The general equipment of the smaller unit is divided up into that for a "Headquarters" which contains the bulk of it and all central articles, and that for each of two similar sections which is much smaller in amount and variety.

The figures showing the eventual disposal of the patients in base hospitals in France in 1917 are of interest. These show that 14 per cent were sent out as fit for discharge for front line duty to the base depots through the discharge centre, 27 per cent passed to the convalescent depots 3 per cent were fit for P.B. men, making a total of 44 per cent retained in the country; whilst 55 per cent were evacuated to home territory, and 1 per cent died.

Convalescent Depots.

F.S.R., vol. i, states that these "are intended for officers and men who require no further active medical or surgical treatment, and who, although not yet fit for duty, are likely to become so in a reasonable time." With the original expeditionary force only one convalescent depot of 1,000 beds was mobilized, and its staff consisted of two M.O.'s, a quartermaster and three R.A.M.C. other ranks. The depots however increased rapidly in number, but they were at first only organized as overflow units to relieve the congestion of the L. of C. or base hospitals and to treat until fit for duty the lighter cases not yet sufficiently recovered to rejoin their units. It was not till the latter half of the war, that the depot as it is known to-day, was developed and organized, though its extreme value in the saving of man power for the Army had come to be well recognized. And with the new unit came considerable changes in its functions, so that it was no longer merely a hospital overflow, but was expected to play an active part in restoring men to full fitness of both mind and body, by training and exercising them without an irksome discipline.

The advantages gained by the employment of these units are many. They retain their original raison d'être of acting as overflows to hospitals.
in the event of congestion of the latter and thus enabling them to provide at
short notice a considerable number of vacant beds which are required on
the eve of commencing operations. But in addition to this they save many
men for their units who would otherwise be evacuated to the base or to
home territories, and who would not return for a considerable amount of
time. They save expenditure of transport and the extra work otherwise
thrown on the railways or other system of ambulance carriage. They
complete the physical healing of the man by improving his mental and
moral outlook, so that he leaves them with higher ideals, stronger in
'esprit de corps', and with his moral restored.

The present-day unit is authorized for 2,000 convalescents, and two
units are mobilized per corps of three divisions. Each unit consists of a
headquarters and two divisions, each division being sub-divided into four
companies of 250 men each. The staff consists of ten officers, sixteen
W.O.'s, sixteen staff-serjeants and serjeants, and sixty-two rank and file.
The medical side is represented by a lieutenant-colonel, as officer commanding
the depot, a captain or subaltern as registrar, a dental officer, a major in
charge of one division and a captain in charge of the other, together
with one serjeant dispenser and four rank and file R.A.M.C. for the
detention hospital. The headquarters is responsible for the administrative
work, and controls the orderly room, guard room and police, pay duties,
dining hall, cookhouse, quartermaster's stores for equipment, clothing and
supplies, bath, laundries, disinfection, conservancy and fire arrangements,
recreation rooms, churches and church rooms (three chaplains are attached),
band and entertainments, gardens, serjeants' mess and officers' mess, in
addition to the detention hospital and dental work. The divisions carry
into effect the training work and the placing of men in different categories
according to their fitness, re-classification being carried out once or twice
weekly. As regards the non-R.A.M.C. regimental staff, these are chosen
from officers and men who are classified as somewhat less than A1, but
they must be suitable for their duties and be fit both physically and
morally, tactful, good disciplinarians, capable instructors in P.T. and
bayonet exercises, and able to lead and command men. They are usually
taken from those who have had front line service. The medical officers
must be of "A" category, and fit in every respect.

The accommodation on mobilization is in double fly bell tents, eight men
to a tent, with marquees for hospital, dining and recreation room, etc.;
but huts may be supplied in lieu, in which case sixteen Nissen huts for
sixteen men each per company are needed, in addition to headquarters
requirements.

The length of stay in the depot varies from two to six weeks. The
convalescents come from the neighbouring hospitals. It is found that a
certain number, about 12 per cent., have to be sent back for further
treatment. The majority, about 76 per cent, are passed on when fit (after
an average stay of four weeks) to the base depots, for re-equipping and
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return to duty in the front line; the remaining 12 per cent consisting of men not considered fit for front line work are passed on to be dealt with by a medical board, and the bulk of these become the permanent base men, and are utilized for work at the base depots on the L. of C., and as batmen, etc. In practice it is found that a number of the patients up to 10 per cent have to be employed on administrative work of the depot; and as a rule there is competition for this, as it gives those selected an extra week's stay in the depot. But in the last week at least they should undergo vigorous P.T. exercises to complete their hardening.

There are certain considerations which should be taken into account when choosing the locality and site of a depot: (1) It should be in the vicinity of general hospitals. If there is a general hospital at the advanced base, a convalescent depot should be there also, though occasionally one is located in the vicinity of a C.C.S. group, so as to save the lighter cases from being evacuated out of the army area. (2) It should be easy of access to the hospitals and to the base depots. (3) It should be easy of access for food supplies and stores. (4) Railway facilities should be available. (5) Its site should be healthy and its surroundings congenial. The ideal site is on a hill near the sea and within two to three miles of a town. (6) It should have plenty of space and not be cramped, and should be furnished with playing grounds and ample means of recreation and mental occupation. The importance of items (5) and (6) cannot be over estimated. The creation of an atmosphere of mental interest and an occupation which is looked on as amusement or recreation rather than as work goes a very long way towards restoring the vigour of the men. For this reason inter-company or inter-divisional competitions in sports and boxing play an important rôle; for indoor amusements, draughts, billiards, whist and bridge will each attract a number of men; and a very large number take a deep interest in intellectual lectures and discussions, and in the study of languages, history and drawing. Others of a practical turn of mind find their interest in workshops, whilst the majority are ready to listen to suitable propaganda of current events.

In fine, the rôle of the convalescent depot lies in the completion of the healing process of the hospitals and in the restoration of health and vigour to both body and mind.