REFLECTIONS ON THE ARMY MEDICAL SERVICE IN CAMPAIGN.

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INTRODUCTION.

The importance of the medical branch of an army in the field is now fully recognized by all civilized nations, but although the medical objective of every nation's army medical service must be the same in principle, considerable differences are met with in their medical organization for an army in the field. There can be no doubt that our own army medical department has made great strides towards efficiency in the last few years; but can we critically examine our present field medical organization and pronounce it perfect? Our present scheme of medical organization is the result of lessons received in the South African War, when our army was operating a considerable distance from its base and often many miles from the railhead. Our next war is likely to take place under totally different conditions. It is more than probable that it will take place in a more civilized and densely populated country than South Africa. Mechanical transport has replaced horse transport; scouting is carried out by aircraft; and the range of both artillery and rifle fire has increased. Owing to these new conditions of warfare individual battles are likely to be more protracted, but the mobility of the fighting force has been greatly increased.

Is our present field medical organization able to contend with these new conditions of warfare? If we were asked to summarize the principles on which our present system of medical assistance in the field is based, as evidenced by the organization and equipment of the field medical units, our answer would be the collection and first aid of casualties by regimental medical establishments and the bearer divisions of field ambulances, and their further treatment at the dressing station before evacuation to the clearing hospitals; whilst, on the other hand, the system of medical assistance required in modern warfare in a civilized country would appear to be the collection and treatment of the sick and wounded by regimental medical establishments and the bearer divisions of field ambulances, and their further evacuation by the field ambulances.

In the critical remarks which follow there is no desire to disparage our present field medical organization, but rather to express
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certain views that have arisen from a theoretical study of this interesting subject. The writer is fully aware of the little value that can be attached to any such destructive criticism which is not based on practical experience. In the military situations which are dealt with it is assumed that the action takes place in a civilized country, and in discussing such subjects as the collection and disposal of casualties, it is taken for granted that the engagement is or has been successful.

The functions of the medical service in the field may be considered under two heads: (1) The military objective; (2) the medical objective. The military objective is: (i) To keep all ranks in as perfect a state of physical efficiency as possible; (ii) to keep as many effective troops in the firing line as possible; (iii) to evacuate the non-effectives with all speed from the scene of active operations; and (iv) to keep up the moral of the fighting troops. The medical objective is: (i) To perform efficient "first aid" with the least possible delay; (ii) to relieve pain and suffering; and (iii) to remove serious casualties to permanent shelter with as little disturbance to the patient as circumstances permit.

An efficient medical organization must, however, combine the principles of both the military and medical objective, always remembering that matters medical must be submissive to military considerations.

Having axiomatically laid down the conditions by which the efficiency of a medical organization may be judged, let us theoretically test certain details of our own medical organization in the field.

The Regimental Medical Establishment.

If we calculate the war strength of a battalion of infantry at 30 officers and 1,022 other ranks, we may roughly estimate according to Cron's formula that the total casualties in any particular engagement will be 63; in round numbers, 12 killed, 6 slightly wounded, and 44 requiring hospital treatment.

The frontage over which a battalion normally operates during an attack may be reckoned at one to three men per yard, and three to five men per yard for the "decisive attack" (Field Service Regulations, Part I, Section 104). During the early phases of the attack when "the advance of the firing line must be characterized by the determination to press forward at all costs" (Field Service Regulations, Part I, Section 105), the troops will come under effective artillery fire at a distance of 2,500 to 4,000 yards and will continue
to press forward until they get within close rifle range at say 600 yards. This means that 63 casualties may be scattered over an area 500 to 600 yards wide and from 1½ to 2 miles deep, with 1 medical officer and 16 stretcher-bearers to perform first aid, get serious cases under shelter, and keep in touch with the fighting troops. Theoretically the task appears impossible if efficient first aid is to be carried out. If this is true, where does the fault lie, and is our medical organization to blame?

We stated just now that matters medical must always be submissive to military considerations; it is therefore out of the question hastily to propose an increase in the personnel of the regimental medical establishment, which would increase the number of non-combatants in the firing line. Can however more rapid and efficient first aid be carried out with the existing organization?

A possible solution appears to be the earlier co-operation of field ambulances and regimental medical establishments. Existing regulations state that it is the first duty of field ambulances to "establish touch by means of their bearer divisions with the regimental medical service of the units in the area assigned to them, and to obtain information regarding the places where wounded have been left under cover" (Field Service Regulations, Part II, Section 90). There is no doubt that the majority of officers commanding field ambulances will place a sufficiently broad interpretation on the regulations to meet most contingencies. On the other hand cases are likely to occur, especially if cover is deficient and the officer commanding the field ambulance has not been kept informed of the military situation, when the bearer divisions will remain with the ambulance until the engagement is over before any attempt is made to get in touch with the regimental medical establishments. It is fully realized that in most engagements the collection of casualties will have to take place after the battle, and often by night, but at the same time there is nothing to prevent individual members of the bearer division, if they take advantage of cover, from advancing in the wake of the fighting troops and ascertaining the locality of regimental aid posts or other collections of wounded, and even rendering some service to cases which have escaped the attention of the regimental medical officer. This would greatly facilitate the collection of casualties by the field ambulance and hasten their evacuation. The point which it is wanted to emphasize is that definite scouting by the bearer divisions is necessary to locate the position of regimental aid posts and other wounded, and that
individual bearers unencumbered by stretchers may be able to afford valuable assistance to casualties which have escaped the regimental medical officer, before any method of removing them from the field can be considered.

THE EQUIPMENT OF THE REGIMENTAL MEDICAL ESTABLISHMENT.

Let us now consider the equipment available for "first aid" in regimental units; but before doing so, it will be well to define "first aid," or rather the principles upon which efficient "first aid" is to be based. Efficient first aid must be carried out as soon as possible after the receipt of the injury, and should include: (i) Some method of skin disinfection in all open wounds; (ii) an application to open wounds of sufficient absorbent material to prevent infection from the outside and to absorb all discharges: the dressing should not require renewing for at least twelve hours; (iii) some support to broken limbs; (iv) the relief of pain.

The question of some quick method of skin disinfection is one that ought to receive very serious consideration in the future first-aid treatment of the wounded. There are no means of carrying this out with the present regimental medical equipment, and I would suggest one of the various alcoholic solutions of iodine as a possible and simple method for adoption.

To refer again to our casualties we remarked that sixty-three might roughly be estimated as the total casualties likely to occur in a battalion in any particular engagement. Fifty at least of these will require the application of some form of dressing. Each man of course carries with him his first field dressing, which would be more accurately styled an "emergency field dressing" as it is quite inadequate for the performance of "efficient first aid" in anything but the slightest of wounds. Roughly speaking, two ounces of wool and two three-inch bandages would not be an extravagant supply of dressings for each wounded man, some will require more, some less. Our fifty casualties will therefore require one hundred ounces of wool and one hundred three-inch bandages or their equivalent for the performance of "efficient first aid"; whilst the total amount of wool and bandages available in the surgical haversack, medical companion, and field medical panniers is only seventy-two ounces of wool and eighty-four bandages. These details may convey a false impression, but it at least appears evident that there is bound to be

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1 Iodine was introduced into our field medical equipment in December, 1912.—En.
a shortage of bandages and wool, which could easily be obviated by providing every other or every third regimental stretcher-bearer with a waterproof satchel containing nothing but compressed wool and bandages, or different sized "first field dressings," which should not interfere with the mobility of the unit or necessitate any increase of transport. A minor point in connexion with these compressed dressings is the difficulty with which the paper covering is removed, especially if one's fingers are at all numb; a simple device for overcoming this is to have a piece of thread embodied in the wrapper which, when pulled, cuts through the paper.

In mentioning the relief of pain as being one of the principles of "first aid," I only want to allude to the question of the administration of morphia. There appears to be a divergence of opinion as to the cases which may or may not be given morphia. Personally I think that all cases, including penetrating wounds of the abdomen, should be given morphia if in any pain. I do not make this statement simply from a humane point of view, but because it appears to me that better results would be obtained by its administration, especially when cases have to lie out in the open for some hours without food. The only serious objection that can be advanced against its administration is the fact that it masks symptoms; but as the effects of the drug will have time to wear off before any special treatment in the way of operation can be thought of, this objection should not hold.

The act of administering morphia hypodermically would be much simplified if some easy method were adopted of carrying a hypodermic syringe ready for use. I have seen a belt designed with this point in view; a large-sized hypodermic syringe with needle fitted ready for use was contained in a cartridge-shaped receiver filled with an antiseptic solution. Morphia in a liquid form was supplied in capsules which fitted in separate compartments round the belt.

Before leaving the subject of the equipment of the regimental medical establishment, I would call attention to the pattern of stretcher supplied to regimental bearers. To perform their duties efficiently, stretcher-bearers should always keep in touch with the fighting troops; this necessitates their moving in "open order," and taking advantage of all available cover, an impossibility if the stretcher is carried. If the stretchers are left in the medical cart they will often be a long way behind when most needed. It therefore seems essential that all stretcher-bearers employed in the firing zone should be equipped with divided stretchers, each carry-
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ing half on his back, the parts of the stretcher being identical and interchangeable. Any two bearers would thus be able to form a complete stretcher.

The Divisional Collecting Station.

The object of the divisional collecting station is to relieve the field medical units from collecting slightly wounded men; care must however, be taken to prevent trivial cases leaving the firing line. Apparently to guard against this contingency the reprint of Field Service Regulations, Part II, for 1913, does not now state that the regimental medical service should direct cases able to walk to the divisional collecting station, and it is therefore left to the personnel of the field ambulances to instruct the wounded on this point. Whether or no this change in the regulations is entirely satisfactory may be a matter for some divergence of opinion. If a slightly wounded case is to remain at a regimental aid post until the bearer division of the field ambulance comes along, the field ambulance medical officer still has the duty of examining this man and classifying his injuries, and at this period of the engagement the divisional collecting station may be farther off than a dressing station.

Whilst fully recognizing the objection to allowing any casualty to take himself off to the divisional collecting station on his own initiative, I think it would be better if the regulation was that no case was to be sent to this collecting station without a written order to that effect from a medical officer. The regimental medical officer would then in suitable cases mark a "D.C.S.," or give the man a specially coloured tally and start him off without delay.

The divisional collecting station is undoubtedly a very important formation, and if properly organized should considerably lessen the difficulties of collecting casualties. The number of slightly wounded that are likely to occur in a division in any engagement may be estimated as over one hundred, a number that is easily calculated to complicate the work of the bearer divisions of the field ambulances if a large proportion happens to occur in one brigade. Having got our hundred or more slightly wounded to the divisional collecting station, what are we going to do with them? Regulations state they should be "treated, fed, and rested before further evacuation or return to their units" (R.A.M.C. Training, para. 185), but no definite personnel is allotted for this duty, although it is stated that a field ambulance "may be ordered to
detail a tent subdivision or other detachment for duty at the collecting station" (ibid.).

What I would emphasize is that the personnel to feed, treat, and keep discipline (an important point) at the collecting station is required before the casualties arrive, and should not be left until the assistant director of medical services has been informed that a number of starving men are clamouring for food and attention, which must happen unless he details a definite personnel before the action starts. Preparations must also be made beforehand for feeding the slightly wounded, and for this purpose extra rations must be indented for, as in all probability they will not be forthcoming if left until casualties have occurred.

THE FEEDING OF CASUALTIES.

The feeding of casualties will always be a matter of some difficulty for the officer commanding a field ambulance to contend with. Fighting troops will generally move off to take up a position for an attack before daybreak, and if brought into action will probably remain for a considerable period without food, with the exception of the unexpended portion of the previous day's ration which each man carries with him. A casualty unable to walk will often have to remain on the field until nightfall, so that when he eventually reaches the dressing station he should certainly feel hungry! How does the field ambulance obtain the necessary supplies to feed him? The contents of the medical comfort panniers will not be of much use to feed a man not too ill to be hungry, whilst his daily ration will be with his battalion and certainly not procurable. Regulations on the subject state "extra rations and additional medical comforts will be obtained on indent in the usual way, or if permissible, by requisition from local resources, as many of the wounded arrive exhausted and in need of a meal" (R.A.M.C. Training, para. 201). The point, however, is, when should this indent for extra rations be made and for how many, to ensure sufficient food being available for casualties at the dressing station and divisional collecting station? It also seems probable that the establishment of cooks in the field ambulance will require some addition if casualties are to be fed with any dispatch, as the personnel of the R.A.M.C. will themselves require food after an engagement, and cooks will also be required for the divisional collecting station.
The transport of casualties from the field ambulance to the clearing hospital and from the clearing hospital to railhead has always been a difficult problem; but with the advent of mechanical transport and improved methods for supplying the troops with food and ammunition the difficulties have increased. The refilling points, where the supplies are transferred from mechanical transport to the supply trains, are situated when troops are moving at the heads of the areas from which the troops marched the same morning. It therefore follows that supply sections of the trains do not move back but are always advancing. "During battle it may be necessary to send back the trains some distance to refill from the supply columns" (Field Service Regulations, Part II, Section 51). After a victorious engagement a rapid advance is likely to follow, which means that the casualties ought to be at the refilling point in time to go back in the empty lorries the morning following the engagement. To do this the supply trains will certainly have to help the field ambulances. The regulations on the subject are very scanty, as follows: "After the trains are refilled, supply columns will, under orders from the inspector-general of communication, return to the railway line, being, however, if the commander-in-chief so decides, used for the evacuation of casualties and sick, who will be handed over to representatives of clearing hospitals sent forward with the supply columns for the purpose. Arrangements to this end will be made between the representatives of the quartermaster-general's branch of the staff and of the director of medical services" (Field Service Regulations, Part II, Section 52). Again: "The necessary transport for conveying the sick and wounded to the stationary hospitals or to the railway will be provided under arrangements made by the inspector-general of communications, co-ordinated, if necessary, by the quartermaster-general's branch of the staff at general headquarters. The empty wagons of supply columns and ammunition parks returning to replenish at the railhead may be utilized for this purpose, sufficient personnel from the clearing hospitals being sent forward with the supply columns, etc., to take over the sick and wounded" (Field Service Regulations, Part II, Section 91).

The difficulties of sick transport in the field are brought forward at nearly all staff tours, and must be fully recognized by the authorities; even the close co-operation of an efficient medical administration with a sympathetic quartermaster-general's branch
of the staff and inspector-general of communications cannot remove
the serious disabilities with which arrangements for sick transport
in the field have to contend. And, moreover, even if the difficulties
mentioned are overcome, and the casualties are got to the refilling
point, there exists no apparatus for rapidly fitting up motor-lorries
for the conveyance of the seriously wounded. Theoretically the only
method of obtaining efficient and rapid transport of casualties from
field units is to be found in a specially organized sick transport
column which should include a good proportion of motor ambulance
wagons. The advantages or disadvantages of such an addition to
the present medical organization should not be considered solely
from the point of view of the medical service, as the more rapid
evacuation of the sick and wounded should materially lessen the
burden of transport by diminishing the amount of food and medical
comforts required for ineffectives in the field.

The Administration of Field Medical Units.

No matter what degree of individual efficiency is attained by
medical units in the field it can be of very little value without
efficient administrative control, whilst efficient administration is
itself dependent on the effective intercommunication of field medical
units and the administrative staff. The assistant director of
medical services of a division is most suitably placed for obtaining
information as to the number of casualties likely to occur, or to be
occurring, in any particular locality; but has he adequate means of
communicating his instruction to medical units, and have medical
units any facilities for communicating with the assistant director?

Divisional headquarters will certainly be in close touch with
brigade headquarters by means of the divisional signal company,
and there is no doubt that the assistant director of medical services
will be able to communicate with officers commanding field ambu-
lances by means of cyclists, etc., in the early stages of the engage-
ment. But whenever an officer commanding a field ambulance
is told to act on his own initiative, which must frequently be the
case, he loses touch with his assistant director and must seek all
information with regard to the engagement from the brigade
headquarters. The field ambulance has no "long distance"
signallers, and the semaphore signallers will be employed in con-
necting up the several parts of the unit; any message, therefore,
must be "hand carried" from brigade headquarters to the officer
commanding the ambulance, which must certainly entail much
delay in delivery. As a result of this, it appears probable that field ambulances will often have to act as brigade units without the advantage of having any brigade administration. Theoretically it appears necessary for an officer belonging to the field ambulance to be located at brigade headquarters whenever an ambulance has to be attached to a brigade, and that he should be in touch with the officer commanding the ambulance, either by signallers or by mounted orderlies.

**Conclusion.**

As previously remarked the writer is well aware of the small value that can be attached to the theoretical criticism of a subject which is essentially practical. The following points, however, may merit further consideration:

1. That modern warfare will require more elaborate "first aid" in the field and more rapid evacuation of casualties.
2. That the "first field dressing" is inadequate for efficient first aid, and additional dressings are required in the field.
3. That the earlier co-operation of field ambulances and regimental medical establishments is desirable.
4. That bearers in the field require divided stretchers.
5. That the medical and surgical equipment of the field ambulance is more than sufficient for the duties required of it, for example, in such articles as operating tables, tents, etc.
6. That definite instructions are required as to the method of feeding casualties by field ambulances.
7. That a brigade administration is necessary for field ambulances attached to brigades.
8. That mechanical sick transport is required between field ambulances and clearing hospitals.