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Field Service Pocket Book

Pamphlet No. 10

1939

MEDICAL SERVICES

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FIELD SERVICE POCKET BOOK
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MEDICAL SERVICES

ORGANIZATION AND RESPONSIBILITY

1. Hygiene

General

1. A high standard of health and a low incidence of sickness are important signs of efficiency, and, to achieve these, the co-operation of every individual is necessary.

In a formation

2. The commander of every formation is responsible for the health of his troops and for applying all measures necessary to that end, and for the prevention and mitigation of disease.

He is also responsible for the sanitary condition of the area occupied by his command, irrespective of the period for which it may be occupied.

In the medical service

3. A field hygiene section is allotted to each division and to corps, army, base and L. of C. areas as required. They are under the direct control of the senior administrative medical officer of the formation or area to which they are allotted.

The personnel of a field hygiene section act as sanitary police and perform duties corresponding to those of sanitary inspectors in civil life. They supervise labour employed in the removal and destruction of excreta and refuse, also the construction by units of sanitary works and appliances, and advise regarding the be

They carry out sanitary measures requiring skilled knowledge beyond that possessed by regimental personnel, *e.g.*, disinfection, disinfestation, bulk purification of water supplies, and they are available to give instruction to units in technical sanitary matters.

The existence of a field hygiene section in a formation or area in no way relieves unit commanders of their essential responsibility in regard to sanitation, nor is it the function of a field hygiene section to carry out for units any sanitary measures within the capacity of regimental personnel.

2. Regimental

1. *Commanding officer.*—Every unit commander is responsible for the cleanliness of his men, for the sanitary condition of the area occupied by his unit and for taking all measures necessary for the well-being and the preservation of the health of those under him, and for ensuring that all orders in regard to health and sanitation are rigidly carried out by the troops under his command.

War establishments provide, for the majority of units, a medical officer and specially trained personnel for water and sanitary duties. Special arrangements are made for units which do not possess this personnel as part of their war establishment.

2. *Officer in medical charge of a unit.*—Advises the C.O. on all matters relating to the preservation of the health of the troops under his command and the prevention or reduction of disease. He is responsible to the C.O. for the efficient performance of their duties by the regimental water duty and sanitary personnel. In technical matters he is under the direct control of the senior administrative medical officer of the formation or area.

Trained subordinate personnel

3. *Water duties.*—Personnel specially trained in methods of purification and protection of water supplies. They have charge of the water vehicles and of any apparatus or chemicals issued for purification of water.

4. *Sanitation.*—Personnel specially trained in sanitary duties to act as sanitary police, and to perform all sanitary duties in the unit, *e.g.* disposal of excreta and refuse, construction of latrines, urinals, soak pits, etc.

5. *Chiropody.*—One specially trained man is allotted to certain dismounted units for the care of the men's feet. His duties are to teach men how to look after their own feet, and to treat such minor disabilities as corns, ingrowing toe nails, blisters and sweaty feet.

All these trained subordinate personnel perform their duties under the orders of the officer in medical charge of the unit. Trained reserves should be maintained in the unit.

3. Medical units of a force in the field

1.—i. *Medical establishment with units.*—Battalions and similar units have a medical officer attached. He is provided with a limited medical equipment carried in a truck or van. A lance-corporal of the unit is provided to assist him. When an action is imminent the regimental stretcher-bearers are placed under his orders. Smaller units to which no medical officer is attached are attended by the medical officer of nearest larger unit, or by the nearest field ambulance.

These smaller units are provided with men trained in first aid as laid down in War Establishments.

ii. *Field ambulances.*—Three to each division and one to each Corps generally. Duties, to collect sick and wounded from regimental aid posts, to provide treatment for slight cases, and to evacuate to casualty clearing stations those requiring further treatment.

iii. *Motor ambulance convoys.*—At least one for each corps. Duties, to collect sick and wounded from field ambulances and to convey them to casualty clearing stations or from casualty clearing stations to ambulance trains or barges.

iv. *Casualty clearing stations.*—G.H.Q. Troops, one for each division. Duties, to receive sick and wounded from field ambulances and local units, to provide surgical treatment and to evacuate casualties to general hospitals.

4. Dental

Personnel of the Army Dental Corps are attached to field ambulances, casualty clearing stations, general hospitals, convalescent depots and hospital ships.

Their duties are (i) to assist in the maintenance of health and reduction of sick wastage by affording all necessary dental treatment (including the supply, renewal and repair of artificial dentures) and (ii) to assist medical officers in the treatment of wounds.

EVACUATION AND TREATMENT

5. Evacuation

Sick are seen by the M.O. of the unit and are, if necessary, detained at the regimental aid post (which is usually at unit headquarters) or sent to a field ambulance for treatment or evacuation. If evacuated from the divisional area they are struck off the strength of their unit.

A wounded man is attended to by the M.O., stretcher-bearers, or medical orderly of the unit, and (unless able to walk to the collecting post for walking wounded) is carried back by the regimental stretcher-bearers to the regimental aid post, and is removed thence by the bearers of the nearest field ambulance, or by field ambulance transport, if possible, to the advanced dressing station, or direct to the main dressing station of the field ambulance. From the field ambulance he is transferred by means of motor ambulance convoy to a casualty clearing station, where, if the military situation permits, all necessary and urgent treatment of his wound is completed before he is evacuated further. If the wound is not of a nature to require his retention, or as soon as he is able to travel, the wounded man is transferred down the L. of C., generally by ambulance train, to a general hospital, and when no further treatment is required, to a convalescent depot.

If evacuated from the theatre of operations he proceeds in a hospital ship; thence he is transferred to a military hospital. Should he require no further active treatment, although still unfit for duty, he is transferred to a convalescent depot; from this he may proceed on sick furlough. When recovered, he is discharged to a military depot for training and hardening until fit for duty again.

6. First field dressing

Every officer and man carries in the field a dressing which is placed in the pockets of the right side of the skirt of the frock. In battle dress it is carried in the pocket at the top of the front of the right leg. It consists of a packet of khaki cotton cloth containing in a linen cover two dressings, each composed of 2½ yards of bandages, some gauze and a safety pin. Simple instructions as to the method of using it are printed on the outer and inner covers. The first field dressing of the wounded man himself and not that of a comrade should always be used.

Field dressings should be inspected frequently, and all ranks instructed and tested periodically by the medical officer in their knowledge of the application of the first field dressing.

7. Treatment of cases of emergency

1. *Gas casualties.*—All gas casualties should continue to wear their respirators as long as they are exposed to gas.

i. *Choking gas.*—The first aid for casualties from choking gas is summarized as:—(*a*) absolute rest; (*b*) warmth; (*c*) no smoking; (*d*) no alcohol; (*e*) transfer to a medical unit.

ii. *Tear and nose gas.*—Casualties from these recover rapidly after a short period of rest.

iii. *Blister gas* (mustard or lewisite).—

(*a*) Eyes contaminated by blister gas (particularly in liquid form) are extremely serious casualties and urgently require medical treatment. The eye should be thoroughly washed out with water (warm if possible) every hour until the casualty is transferred to a medical unit.

(*b*) In all cases it is essential to remove contaminated clothing and equipment at the earliest possible moment.

Skin contaminated by liquid blister gas should be treated with the anti-gas ointment.

Skin contaminated by blister gas vapour should be treated by washing thoroughly with soap and water or, if washing facilities are not available, by the application of anti-gas ointment or bleach cream.

Bleach preparations, *i.e.*, ointment or cream, should not be applied to any part of the body that shows evidence of injury.

2. *Bleeding* may be external or internal (concealed). When internal bleeding is suspected, skilled medical assistance must be obtained with the utmost speed. Do not give stimulants. The signs of internal bleeding are:—

i. Pallor.

ii. Thirst.

iii. Coldness of the body.

iv. Increased rapidity and weakness of the pulse.

v. Gasping for breath and restlessness in severe cases.

External bleeding may be (1) arterial, in which the blood is bright red in colour and spurts in intermittent jets from the wound, or (2) venous, in which the blood is darker in colour and flows in a steady stream. In severe wounds arterial and venous bleeding may be combined.

To treat external bleeding, cut away clothing and expose the wound; do not attempt to wash or clean the wound; apply the first field dressing and bandage firmly and evenly.

In the case of a limb, raise it and keep at perfect rest.

If bleeding still continues, firm pressure with the hand over the dressing may be tried.

If the bleeding is not controlled, direct pressure by the hand in the line of the main artery, between the wound and the heart, should be tried. If this is unavailing, resort should be had to some form of tourniquet.

A tourniquet can be improvised by tying a handkerchief or puttee round the limb between the wound and the heart, and then by introducing a stick under this and twisting until the bleeding ceases. The stick is then secured to prevent untwisting. In all cases, except where a limb has been blown off, it is advisable to loosen the tourniquet every 20 minutes, re-tightening it if bleeding starts afresh.

A tourniquet should only be used as a last resort. If it is left on too long and too tight, the limb below the constriction will die. Consequently, all cases so treated must be got under medical care as quickly as possible. Apply a tourniquet as low down as possible to the stump of a limb which has been blown off.

If the wound is in the neck, direct pressure by the hand over the first field dressing should be employed, care being taken that the pressure does not interfere with breathing.

3. *Burns and scalds.*—Cut off clothes, cover with a first field dressing or cloths soaked in tea (which contains tannic acid).

4. *Drowning.—Restoration by Schafer's method.*—If breathing has ceased, immediately on removal from the water place the patient face downwards on the ground, with the arms drawn forward and the face turned to the side. Prise open the jaws and, dragging forward the tongue, sweep the finger round the back of the throat to remove any obstruction that may have been sucked in.

Without stopping to remove or loosen clothing, commence artificial respiration. To effect this place yourself astride or on one side of the patient's body, in a kneeling or squatting position, facing his head. Placing the hands flat on the small of his back, with the thumbs parallel and nearly touching, and the fingers spread out over the lowest ribs, lean forward with the arms straight and steadily allow the weight of your body to fall on the wrists, and so produce a firm downward pressure, which must not be violent, on the loins

and the lower part of the back. This part of the operation should occupy the time necessary to count slowly one—two—three. By this means the air (and water, if any) is driven out of the patient's lungs. Water and slime from the air passages must also run out.

Immediately after making the downward pressure, swing backwards so as to relax the pressure and allow air to enter the lungs. Do not lift the hands from the patient's body. This part of the operation should occupy the time necessary to count slowly one—two. Repeat this forward and backward movement (pressure and relaxation of pressure) 12 or 15 times a minute, without any marked pause between the movements.

While the operator is carrying out artificial respiration others may, if there is an opportunity, apply hot flannels, hot bottles, etc., between the thighs and to the arm-pits and feet, or promote circulation by friction, but no attempt should be made to remove wet clothing or give restoratives by the mouth till natural breathing has recommenced.

When this has taken place allow the patient to lie on the right side and apply friction over the surface of the body by using handkerchiefs, flannels, etc., rubbing legs, arms and body, all towards the heart, and continue after the patient has been wrapped in blankets or dry clothing. As soon as possible after complete recovery of respiration remove patient to nearest shelter. On restoration, and if power of swallowing has returned, small quantities of warm coffee, tea, milk, wine, etc., may be given. Encourage patient to sleep, but watch carefully for some time and allow free circulation of air around patient.

Note.—Artificial respiration must also be resorted to in cases of suffocation by charcoal fumes or coal gas, mining accidents, hanging, lightning stroke and severe electric shock.

5. *Fractures.*—It is of the utmost importance to protect a fractured limb with some form of splint before moving the patient. This is essential in the case of fractures of the thigh and lower limbs. Any form of unyielding material, such as wood, iron, pasteboard, the bayonet or rifle, may be used for an improvised splint. The splint used should be well padded with clothing, grass or any available soft material. Where there is a wound, the clothing should be cut away and the first field dressing applied. If possible, an assistant should support the limb with steady traction while the dressing and splint are applied. The upper limb may be bandaged to the trunk or the injured leg bandaged to the sound one in the absence of any form of splint. Men suffering from severe injur

d

face downwards with the head hanging over the head of the stretcher to prevent the danger of suffocation due to loss of control of the tongue.

6. *The general principles in all cases of poisoning are as follows:—*

i. Send for medical assistance, stating the suspected nature of the poison. Any receptacle that may have contained the poison, together with any stained clothing or vomit, should be carefully preserved for examination by the medical authorities.

ii. Try to remove the poison or the remains of it from the stomach. Except in the case of corrosive poisons (*see* below), this can be done by tickling the back of the throat with the handle of a tooth brush or the blunt end of a pencil. If the patient is conscious and able to swallow, an emetic can be given. The best emetic is a tablespoonful of mustard or common salt mixed with half a mug or tumbler of warm water. The vomit should be saved for examination. A prompt emetic has saved many lives.

iii. Pain requires the application of warmth. Collapse and shock require covering with warm blankets and giving of stimulants such as hot sweet tea, or coffee.

Artificial respiration (*see* para. 4, above) will be necessary if breathing fails. Thirst requires water or tea. Alcohol or other drugs should never be given without medical sanction.

7. *Poisons are classified as follows:—*

i. Corrosives, (*a*) acids, *e.g.*, strong sulphuric, nitric, and hydrochloric acids, battery and soldering fluids, carbolic acid and lysol.

(*b*) alkalies, caustic (washing) soda, caustic potash, ammonia.

These all cause immediate great pain, redness, discoloration of the mouth, gullet and stomach, early collapse and shock, and later difficulty in breathing.

8. *Treatment of poisoning by corrosives.*

i. *Do not tickle the throat or give emetics.* The effect of the Acid can be minimized by applying warm water, or water to which powdered chalk, magnesia, whitening or powdered ceiling plaster has been added, to the face or lips, or inside the mouth, using linen, lint or cotton wool for the purpose. If the patient is able to swallow, half a mug of the water may be given very slowly. The effects of the Alkali can be minimized by applying vinegar to the face, lips, etc., as above. The other general principles as in para. 6, i to iii, above can be adopted.

ii. *Irritants.—*

These include all kinds of food poisoning, arsenic, phosphorus and other metallic salts, in vermin pastes, fly-papers, sheep dip, weed killers, etc. The symptoms begin after an interval of a few hours with burning pain, nausea, colicky pains, diarrhœa, pallor and collapse. The general principles in treatment in para. 6, i to iii, above, are required.

iii. *General system poisons.—*

These include *narcotics* such as opium, morphine, chloral, bromides, sulphonal, veronal and various sedative tablets; also *convulsants* such as strychnine, and certain vermin killers; also *deliriants* such as belladonna plasters or solutions or belladonna (deadly night-shade) berries. These all require general principles as in para. 6, i to iii, above. A patient suffering from narcotic poisoning should be kept awake by occasional sprinkling of a little cold water on the face, chest or abdomen, and his respiration should be carefully watched.

9. *Snake bite or poisoned wound.—*

Send for medical assistance or arrange to transport the patient to the nearest medical unit—in the meantime immediately apply a tight band or tourniquet above the bite, *i.e.*, between it and the heart. Make two or three half-inch deep criss-cross incisions in the skin at the site of the bite so that the area bleeds freely. Next rub in crystals or solution of potassium permanganate. Give stimulants such as brandy, whisky, sal volatile, hot coffee or tea. Remove the tight band or tourniquet after 10 minutes. If the breathing fails, artificial respiration should be carried out.

MAINTENANCE OF HEALTH

(For further details of the subjects dealt with in this section, *see* the Army Manual of Sanitation.)

8. Cleanliness

1. Cleanliness of person and clothing is of great importance. A hot bath should be arranged for all ranks at least once every 10 days. At the same time clean underclothing should be issued, outer clothing disinfected and soiled underclothing collected for disinfection, disinfestation and washing.

2. When the situation permits, units should make local arrangements for more frequent baths. A sharp watch must be kept for the appearance of lice and for scabies, impetigo and other skin affections. These conditions, which are directly or indirectly attributable to dirt, are most easily and conveniently detected by careful inspections at bathing

parades. The condition of the hair should receive attention at the same time. Special care should be given to the teeth. They should be brushed after meals whenever possible.

Should tooth paste or powder not be available, common salt makes an excellent substitute.

Men suffering from ulceration of the mouth or gums should be seen by a dental officer at the earliest opportunity. Such affections are common under active service conditions, may be highly contagious and, unless promptly treated, are a serious source of sick wastage.

The indiscriminate use of eating and drinking utensils should be forbidden.

3. The following provision should be made for disinfestation, bathing and washing of clothes :—

i. *For troops other than those on L. of C.*—

(a) *Disinfestation.*—Each unit should be provided with an easily portable type of disinfector, which will be operated by the sanitary personnel of the unit.

(b) *Bathing.*—" Six-spray " shower bath apparatus should be provided on the basis of one for each brigade or body of 5,000 troops, held under corps control, and sent forward when required.

(c) *Laundry.*—Mobile laundries should be provided on the basis of one for each 20,000 troops, held on L. of C. and sent forward on demand by army and corps for allotment to divisions.

ii. *For troops on L. of C.*—Suitable disinfestation, bathing and laundry arrangements must be organized.

9. Camps

1. The utmost care will be taken to prevent fouling of ground by excreta and refuse. Urinals and latrines will be made immediately on arrival at a camp or bivouac, and filled in and the site marked when the unit leaves camp.

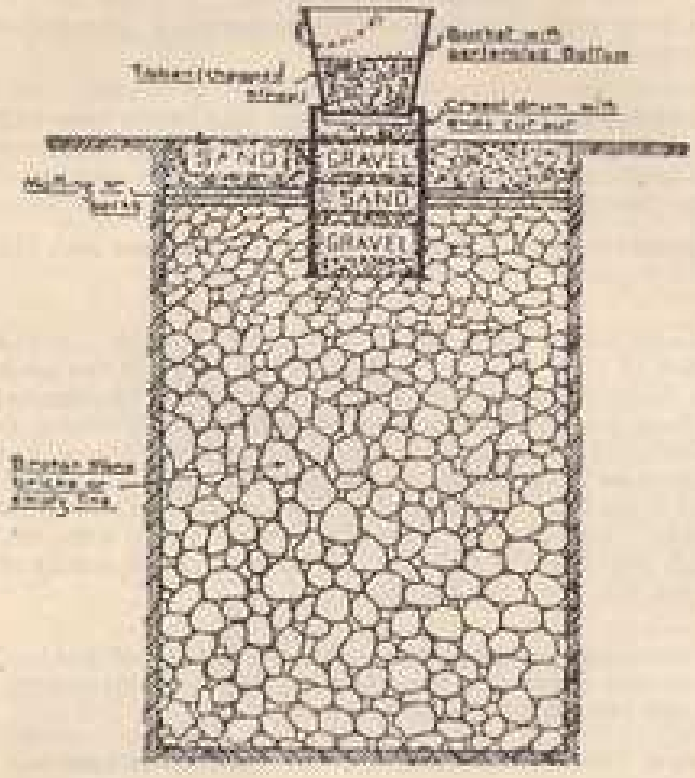
If the camp is to be re-occupied at an early date, and urinals, deep fly-proof trench or bucket latrines have been made, they should be left *in situ* ready for use by the incoming units.

Great attention must be paid to camp kitchens. If the halt is of short duration, kitchen slop water should be filtered into pits through brushwood or straw, which is subsequently burned (Plate 1, Fig. 1). For longer periods grease traps should be installed (Plate 1, Fig. 2).

PLATE 1

GREASE SALVAGE TRAP AND STRAINER

FIG. 1.—GREASE STRAINER AND SOAKAGE PIT FOR TEMPORARY CAMPS



SECTION

FIG. 2.—COLD WATER GREASE TRAP FOR CAMPS

2. Carcasses of animals should be disembowelled, the internal organs buried, and the remainder burned. Stuffing the interior with oily tow or other material assists combustion.

3. To keep tents dry they should be trenched, flies rolled up daily and blankets and kits aired.

4. Latrines, urinals, refuse pits, horse and cattle lines and slaughtering places must be placed as far as possible from the kitchens, food stores, source of water, and to leeward if possible. Slaughtering places should not be near horse lines.

The positions of all old latrines should be marked with the letter "L" made with stones.

5. *Disinfection.*—For general use cresol solution, in the proportion of 4 oz. of cresol to 1 gallon of water, is the most suitable disinfectant. Nuisances, however, should be removed rather than masked by the use of chemicals. Clothing is best disinfected by one of the processes employing steam, but in emergencies boiling may be adopted for small quantities. Dry heat is the most economical for the destruction of vermin in clothing. This may be utilized in ovens, hot-air huts, etc. For small quantities of clothing careful ironing (especially of the seams) will serve the purpose.

6. *Precautions against disease conveyed by food and drink.*—The important diseases in this class are diarrhœa, dysentery, cholera and the various forms of enteric.

The most effective measures against these diseases are:—

i. Prevention and destruction of flies.

ii. Complete and rapid fly-proof disposal of excreta.

iii. Food cleanliness.

iv. A sufficient supply of safe drinking-water.

v. Inoculation.

vi. General hygiene.

vii. No one will be employed in the preparation or handling of food who has suffered from typhoid or paratyphoid fever, or is suffering from or under treatment for venereal disease; persons who have suffered from dysentery will not be employed on these duties until shown to be free from active infection by six bacteriological examinations carried out over a period of one month.

7. *Measures against flies.*—Flies flit from filth to food—human food; therefore cover your food, swat, trap or poison the fly, and also stop it breeding. This it does in:—

i. Dung, human or animal, especially horse.

ii. Decaying refuse.

8. *Disposal of manure and camp refuse.*—All manure must be removed from horse lines daily and disposed of by burning or tight packing.

Tight packing will be carried out as follows:—

A piece of ground 9 ft. wide, and of such a length as may be required, is treated with heavy oil (1 pint to the square yard), or beaten hard and trenches 1½ ft. wide are cut round the plot. Fresh manure is piled on the area and beaten down hard during packing; the top is flattened, the sides and one end sloped down to the trenches, and then the earth dug from the trenches is puddled with water and plastered all over the heap to form a layer 4 to 6 in. thick, beaten down, and allowed to dry. Further additions of manure are placed on the open end and treated in the same way. When the dump reaches a length of 20 yards, a trench is dug across the open end, which is then closed and the whole dump left until fermentation ceases. The dump should be railed off on three sides to ensure that manure is added only at the open end.

9. In hot, dry climates, with the approval of the sanitary officer concerned, the manure may be spread in thin layers over the ground, so that it will dry before flies can breed in it.

10. Manure used for agricultural purposes must be dug in immediately after removal or treated as detailed in para. 8 above.

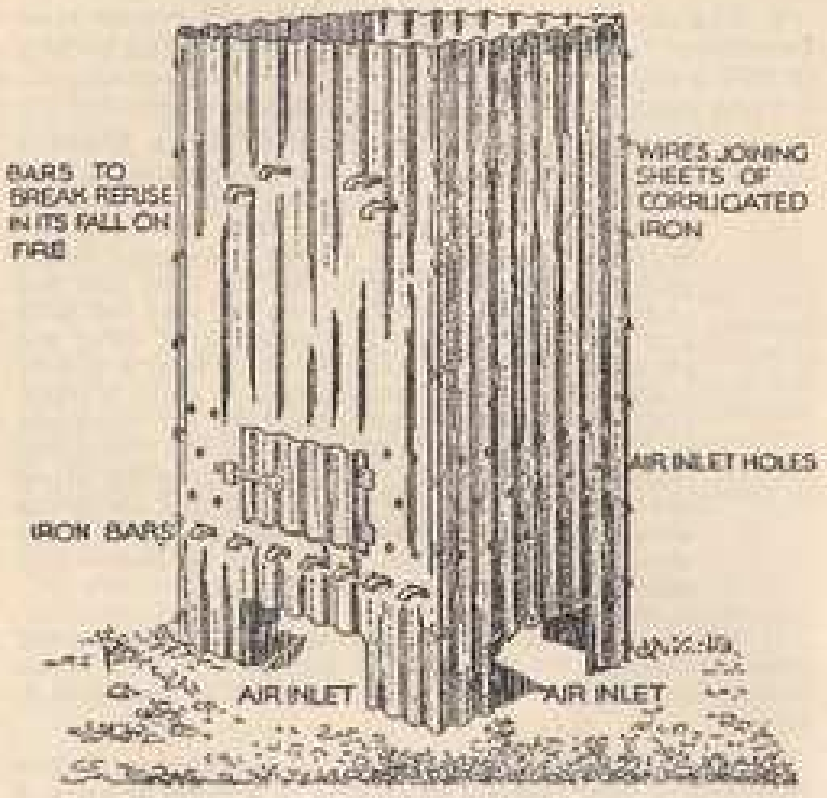
11. Refuse must never be left in open pits. If pits have to be used the contents should be kept covered with a thick layer of earth. Covered receptacles, water-tight and fly-proof, must be used whenever possible, and the contents must be burned daily (*see* Plate II). Where burning is impossible refuse must be buried deeply.

12. Flies in huts, tents, cookhouses, dining shelters, dug-outs, etc., may be killed by spraying with a fluid obtained from the nearest field hygiene section. Spraying should be done in the evening or in the early morning when the flies have settled. After spraying, the flies should be swept up and burned, as all may not be killed outright.

Plate II

REFUSE DESTRUCTOR-INCINERATOR

Vertical Corrugated Iron Incinerator. (4 ft. high, 2 ft. 3 in. wide.)



Perspective Sketch

13. Flies may be trapped by fly-papers, wires or tapes coated with "tangle-foot" or in "balloon" fly traps. Large fly traps are of use if placed outside cookhouses, messes, etc. They should be placed in the sun, out of the wind, and baited. Designs can be supplied by hygiene sections.

14. *Disposal of excreta.*—In no case will open trench latrines be used where it is possible to construct either of the following types:—

Deep trench latrine (Plate III, Fig. 1).

Bucket latrine (Plate III, Figs. 3 and 4).

Plate III

LATRINES

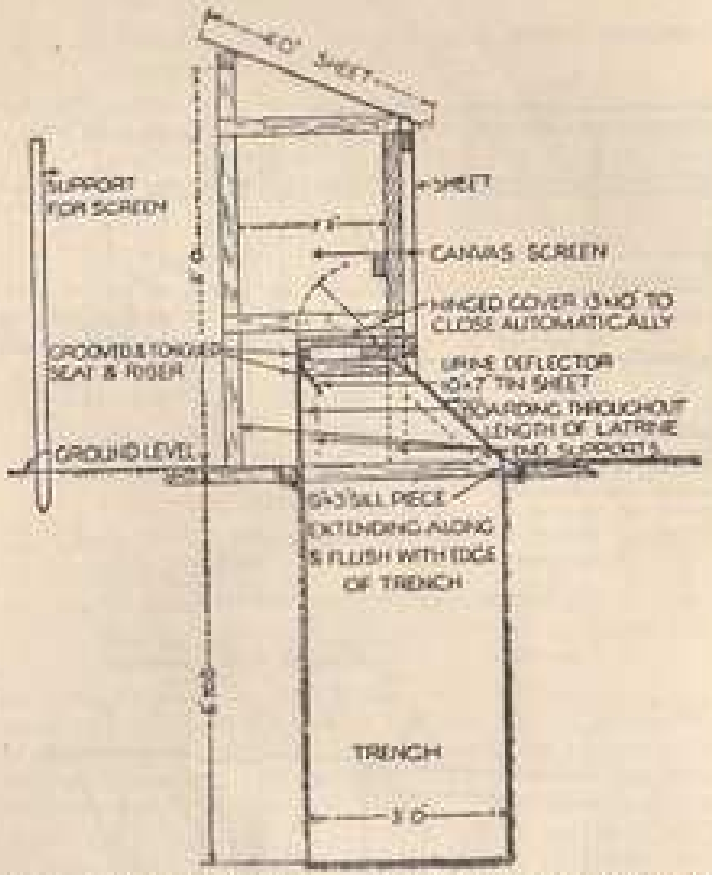
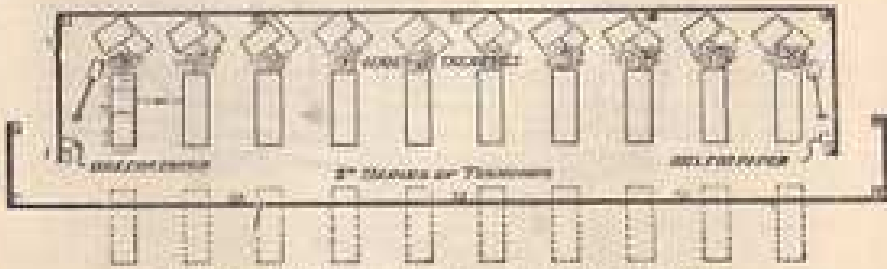


Fig. 1.—Field Latrine. Deep Trench Fly-Proof Type



Trenches—3 ft. long, 2 ft. deep, 1 ft. wide, 2 ft. apart

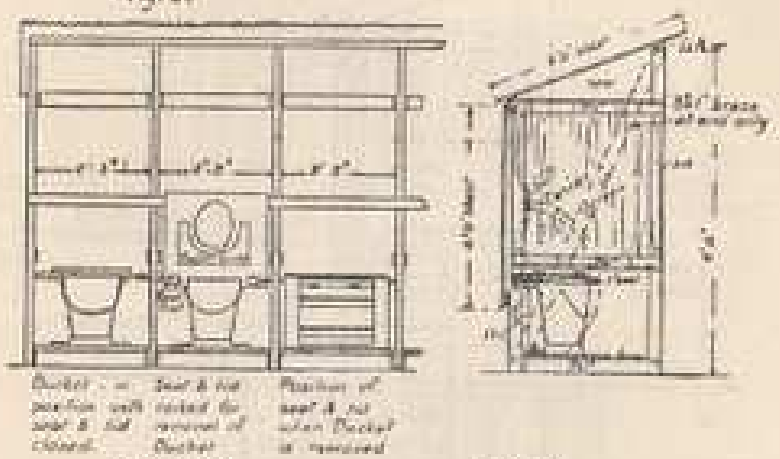
Fig. 2.—Shallow Trench Latrine

PLATE III.—*continued*

LATRINES—*continued*

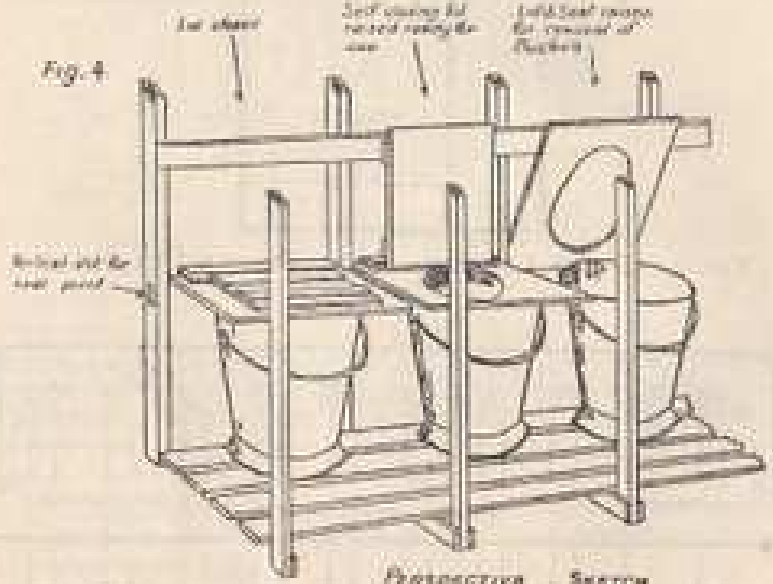
BUCKET TYPE

Fig. 3.



ELEVATION SECTION

Fig. 4



PERSPECTIVE SKETCH

Note. The gunny-bag flaps to Buckets should be so arranged that the seat & lids fit accurately over the Buckets and should be fly proof.

15. Deep trench latrines must be :—

i. Sited so that there is no possibility of contaminating water supplies.

ii. Dug 6 to 8 ft. deep, with the back wall of the trench sloping outwards from the top.

iii. Fly-proof, *i.e.*, provided with boxed-in seats and automatically closing lids, the number of seats being in the usual proportion of 5 per cent. up to 100 men, and 3 per cent. for larger numbers.

iv. Filled in when the contents come to within 2 ft. of the ground surface.

When filling in the trench the earth must be well rammed down, the upper 6 to 9 in. being puddled if the nature of the soil permits, or moistened with heavy oil.

16. Bucket latrines must have :—

i. Fly-proof covers to all receptacles.

ii. Boxed-in seats with automatically closing lids wherever possible.

iii. Three inches of cresol solution (1½ oz. to 1 gallon) in each bucket.

iv. Daily removal of contents and cleansing of receptacles, the inside of the drums or pails being wiped with heavy oil.

The contents of the receptacles will be disposed of by incineration (which is the better method), or by burial in a pit as deep as possible. If by burial, each daily deposit will be covered with a layer of earth 18 to 24 in. thick, moistened with heavy oil and beaten down hard. All proposed sites for burial of night soil will be approved by a medical officer before use. Incinerators for destruction of excreta will be constructed according to designs to be obtained from a field hygiene section.

Shallow trench latrines (Plate III, Fig. 2) will only be used for short halts or for camps not lasting more than a day or two. They should be 3 ft. long, 2 ft. deep, and 1 ft. wide.

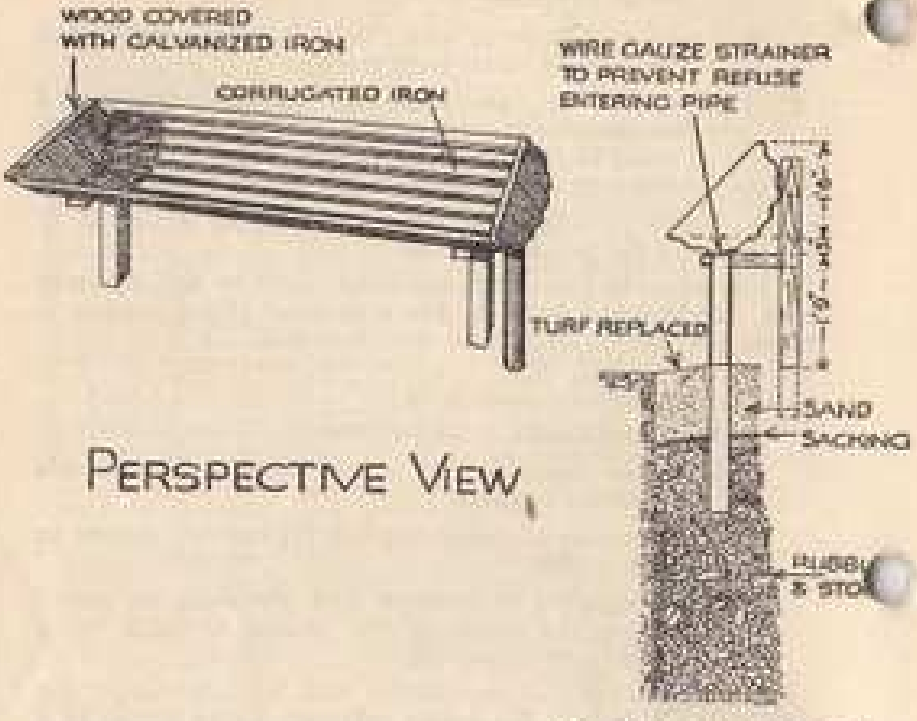
17. *Urinals.*—The best type of field urinal for day and night use is made of plain galvanized iron, and is in the form of a trough with a high back and with a pipe leading from the lower end of the trough to a closed soak-pit (*see* Plate III, Fig. 5).

Whatever type is adopted all surfaces exposed to urine and the inside of all tins will be painted daily with a thin coating of heavy oil. The outsides of troughs or drums will be whitewashed so as to be more visible at night.

PLATE III—*continued*

LATRINES—*continued*

FIG. 5.—URINAL



18. In all types of latrine or urinal :—

i. The floor, when not of concrete, will be of broken stones or gravel well rammed down.

ii. The seats will be scrubbed daily with cresol solution (½ oz. to 1 gallon).

iii. Covered boxes will be provided for latrine paper.

iv. Where shelter from weather is provided, the structure must be well ventilated and the walls whitewashed inside.

19. Fly-proofing of cookhouses is unnecessary. A well-ventilated shelter whitewashed inside, freely open, but with all foodstuffs strictly protected, is the most useful type of cookhouse. If protection from dust is required, light screens should be provided.

20. Cookhouse floors, if not concrete, should have the top 6 in. dug up, treated with heavy oil, and well rammed down so as to obtain as impervious a surface as possible. Shelves and tables should be provided, being improvised if necessary.

21. Dish cloths should be boiled each evening and hung up to dry. Brushes intended for use in cookhouses and dining places, *i.e.*, in connection with food, must not be used for any other purpose. The use of mud or unbaked sand for cleaning knives, forks, kettles, mess-tins, or other utensils is forbidden. Wood ashes from the fire or baked sand may be used for this purpose. Washing-up must be done on a table, not on the ground, and a soakage pit with grease trap is essential.

22. All drain gullies in connection with cookhouses or washing-up places should be cleaned daily and treated by brushing with a mixture of heavy oil and paraffin. When flies are prevalent all grease traps should be provided with fly-proof covers. All refuse must be placed in covered receptacles, the contents removed daily and burned.

23. Nothing unconnected with the preparation of food is permitted in any cookhouse. Clothing or equipment must not be kept there.

24. Meat safes should be provided in all units for the protection of food from flies. These must be kept clean, placed in the shade out of the sun and contain nothing except food.

25. In dining places and shelters cleanliness and precautions against contamination of food are as important as in the case of cookhouses. After each meal all refuse and scraps of food must be swept up and removed. Tables must be used wherever possible so that no food need be placed on the ground. These tables will be scrubbed daily.

26. Cleanliness of person and of clothing is essential in a cook. Canvas or other special clothing and aprons are required, and washing accommodation (including nail brushes) for cooks should be arranged near the cookhouse.

The mouth and teeth must be kept scrupulously clean, and cooks suffering from ulceration of the mouth or gums should be removed from their duty.

27. *Drinking-water.*—In units that have trained water duty men the purification of drinking-water is carried out by them, under the supervision of the regimental medical officer. Trained water duty personnel employed as such must never be used for fatigue or general sanitary duties.

28. All receptacles for the storage or carriage of drinking-water should be regularly inspected and cleaned as follows:—

i. Main storage tanks by arrangement with the engineer officers concerned.

ii. All other tanks, also water vehicles, pakhals or any receptacles used for the conveyance or storage of drinking-water, should be emptied and thoroughly cleaned twice a week. All receptacles except those in which the actual chlorination of water is carried out should also be disinfected, after cleaning, by swilling out with water to which has been added twice the quantity of water-sterilizing powder required for drinking-water sterilization.

iii. All water-bottles should be disinfected once a week. A solution is made by filling a water-bottle with water, adding to this the number of measures of water-sterilizing powder required for the water and mixing well. The bottles to be disinfected are filled with water, a teaspoonful of the above strong solution is added to each, the bottles corked and shaken and allowed to stand for half an hour.

iv. In hot countries adequate measures should be taken to protect water-tanks and other receptacles from the heat of the sun.

10. Water contaminated with mustard gas or lewisite

1. *Introductory remarks.*—Mustard gas is a heavy oily liquid which, when dropped into water, sinks to the bottom and is slowly decomposed into harmless products, one of which reacts to the iodoplatinate test in the same way as the gas itself. A thin oily film may remain on the surface of the water for some time after contamination.

Lewisite is also a heavy oily liquid, but differs from mustard gas in being comparatively rapidly decomposed by water to give arsenical products which are somewhat soluble and very toxic. Sources contaminated with lewisite must, therefore, on no account be used until the necessary chemical treatment has been carried out to free the water from arsenic. A possible exception to this are large reservoirs in which much dilution of the arsenical salts has occurred.

In the majority of cases areas which have been contaminated will be known to the military authorities and water supplies in these areas, *unless under the most exceptional circumstances where no other supply is available*, will on no account be used for any purpose whatsoever.

Neither the cloth nor metal filters using alum or kieselguhr keep back oily globules of mustard gas, if these are present in the water in considerable quantities, and should such globules enter the pipe, they will contaminate the whole system of pumps, filters and tanks, and this will necessitate the condemnation of the water in the vehicle and the complete dismantling and decontamination of every part of the system by a skilled decontamination squad, which will result in the apparatus being rendered unserviceable for a considerable period of time.

It is, therefore, essential that known or suspected contaminated supplies should be avoided.

2. *Measures for the Detection of Mustard Gas and action to be taken if it is found to be present.*—i. Suspected sources and those taken over from the enemy should be tested for the presence of mustard gas and arsenic as well as for other poisons, using the poison test case.

The sample of water should be taken from the sources by means of a tin, bucket or dipper, care being taken that in the case of surface supplies the sampler does not wade into the water for the purpose.

A positive result indicates either the presence of mustard gas or its decomposition products.

ii. If a source is found to be contaminated with mustard gas or lewisite an alternative uncontaminated source must be looked for and if found used.

The contaminated source should be suitably marked with warning signs and fenced in so that it is impossible for men to draw water from it.

iii. It is only in the most urgent circumstances that water contaminated with mustard gas would be utilised.

In no circumstances except possibly in the case of very large reservoirs with consequent great dilution of the poison, would water contaminated with lewisite be utilised, until special chemical treatment to deal with the arsenic had been carried out.

3. In the very remote event of supplies contaminated with mustard gas having to be used the following instructions must be carefully adhered to.

i. *Where the source is deep (i.e. over 4 ft.)*, in which case the water cart, truck, or trailer may be used.

(a) The intake point should be selected where the water is deepest.

(b) The bottom of the source should not be disturbed in any way.

(c) The inlet pipe should be introduced gently into the water so that its opening lies at least 9 ins. below the surface.

(d) Provided that the water has been at rest for two hours, Horrocks' Test followed by super-chlorination should be carried out.

ii. *Where the source is a shallow one* (*i.e. less than 4 ft.*), in which case the water cart, truck or trailer must never be used.

The circumstances must be extremely grave to warrant the use of such water and if it is utilized, it should be carefully removed with a bucket, care being taken not to disturb the bottom.

Subsequent boiling for 30 minutes is essential and will render it safe for consumption.

If boiling is not practicable an alternative method is to filter the water by digging a trench or hole near to the edge of the source if it is a surface supply and allowing it to seep through into the cavity.

The water filtered in this way must then be superchlorinated as in para. 3, i, (*d*), above.

A pump should not be used if it can possibly be avoided, but if it is employed then a double fold of blanket should be wrapped round the end of the inlet pipe. Subsequent boiling for 30 minutes will be required.

It should be realized that in all cases of doubt or difficulty an expert on gas should be called in to advise.

11. Inoculation

1. The inoculation state of every unit should show 100 per cent. of all ranks protected by inoculation against typhoid-paratyphoid fever and tetanus. In the case of typhoid-paratyphoid inoculation the procedure should have been undertaken in the previous 12 months.

2. Commanding officers will use every endeavour to maintain the inoculation state of their units at the above standard, and are responsible that any failure to reach that standard is not due to causes within their control.

3. As a routine measure, after typhoid-paratyphoid inoculation, men should be excused duty for the remainder of the day and for the whole of the following day. In the case of tetanus inoculation no period of excused duty is necessary.

12. Precautions against malaria

1. Malaria results from the bites of infected mosquitoes.

2. Mosquitoes can breed only in water and at least a week must elapse before the life cycle is complete. Therefore all unwanted water should be drained, emptied away or the surface covered with oil at least once a week. Water receptacles which cannot be treated in this manner must be provided with tightly fitting lids or be covered with gauze.

3. Mosquitoes are not naturally infected with malaria. They acquire infection chiefly from natives. Their normal range of flight is half to one mile and during the day they shelter in long grass or undergrowth.

4. Therefore, in selecting camp sites avoid swamps, valleys, jungle and the proximity of native villages.

5. Most malaria-carrying mosquitoes bite only between sunset and dawn. Infection is therefore usually acquired during these hours. See that your men have mosquito nets (Plate IV) and use them properly. Prohibit the wearing of shorts and sleeveless shirts after dusk or in the early morning.

Sentries should be provided with head-nets and gloves or mosquito-repellent cream.

PLATE IV

MOSQUITO-PROOF "DUGOUT"

Fig. 1.

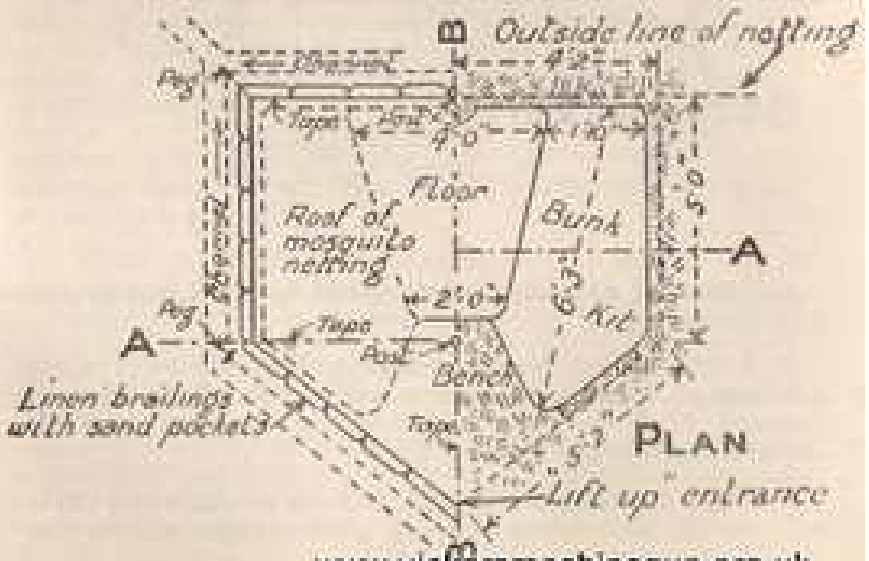


PLATE IV—*continued*

Fig. 2.

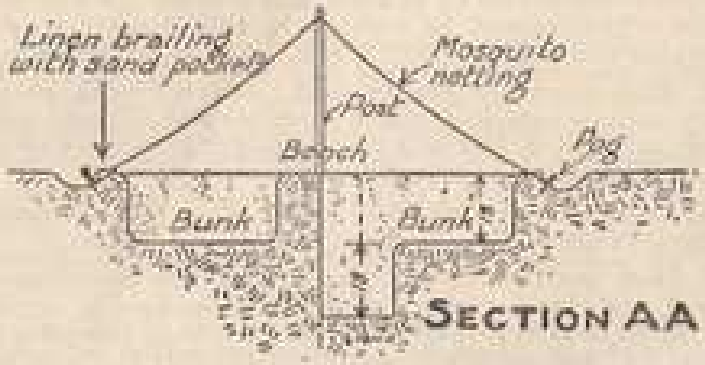
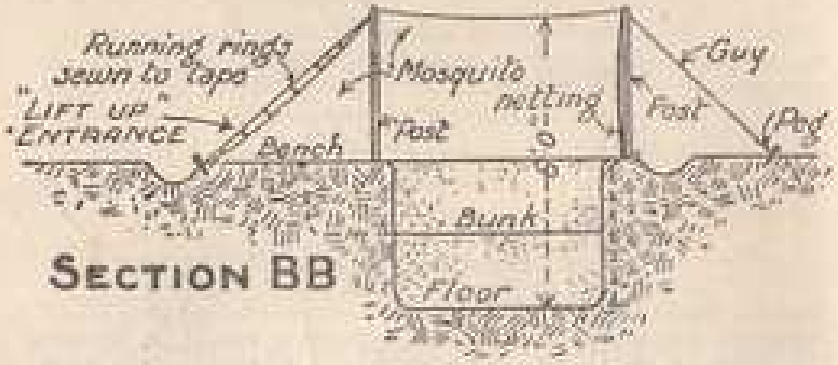


Fig. 3.



6. Camps of native followers should be sited half to one mile from troops.

7. A daily search for mosquitoes in dark corners of tents and huts and the use of swatters and sprays will do much to diminish their numbers. Solution for spraying may be obtained from field hygiene sections.

8. Those liable to suffer from malaria should avoid chills and should wear warm clothing after exercise and in the cool of the evening.

13. Precautions against sand-fly fever

1. Sand-fly fever is conveyed from man to man by the bite of a small midge about the size of a pin's head.

2. The midge breeds in cracks or crevices of buildings, walls and compounds.

3. When occupying localities where sand-fly fever occurs the following precautions should be completed before the advent of the hot weather.

4. Wash down and repaint or limewash all rooms.

5. Survey and if necessary reface, paint or tar all outside walls to a height of 3 ft. and ground surface for a distance of 20 ft. beyond living quarters.

6. During the sand-fly season huts, tents and corners of barracks in which they settle should be sprayed with pyrethrum solution obtained from the field hygiene section or 1 per cent. cresol solution and all refuse and decaying vegetable matter swept up and removed daily. Crude oil should be sprinkled over outlying broken ground for a distance of 50 yards from quarters once a week.

7. Fine mesh sand-fly nets may be issued and are used in the same manner as mosquito nets.

14. Precautions against trench feet and frost-bite

1. True frost-bite is caused by exposure to severe dry cold, especially in mountainous regions. Trench foot is caused by long contact with cold and damp, *e.g.*, by prolonged standing in cold water or mud, or by the continued wearing of wet socks, boots and puttees. The onset of both conditions is much more rapid when the blood circulation is interfered with, *e.g.*, by tight boots, tight puttees or duties requiring men to stand or sit still for a long time, especially in a cramped attitude.

2. These disabilities may occur behind the line as well as in the trenches, for example, in men standing in cold mud or melted snow while signalling, wiring, road-making, on stable guard, piquet, etc., and also in transport personnel, exposed to cold and damp, on duties allowing little or no active exercise to stimulate the blood circulation.

3. *Individual preventive measures.*—When there is likelihood of trench foot or frost-bite occurring, boots must be in good repair and easy fitting and kept water-tight by frequent application of grease or dubbin. They must not be laced tightly, and the laces must not be tied round the ankle. Two

pairs of socks or inner soles should be worn, and to allow of this boots should be large enough to admit of two pairs of socks, and these should be worn at the time of fitting the boots.

4. Before going on duty in wet trenches, in exposed situations or on convoy, the legs and feet, and the hands also in the case of transport personnel, will be washed and dried; warm whale oil will then be thoroughly rubbed in until the skin is dry, and dry socks put on. Puttees must be put on loosely, and it is a good plan to loosen them and the laces of boots one hour after putting them on. A dry pair of socks should be carried in the pocket. Boots, socks and puttees should be taken off at least once in 24 hours (more often if circumstances permit), the legs and feet rubbed dry, and the dry pair of socks put on.

5. When wearing gum boots the socks may be supported by some form of fastening such as a safety pin, but on no account will anything in the form of a garter be worn.

6. The body must be kept as warm as possible by exercise. In the event of frost-bite the part affected should on no account be warmed at a fire, but well rubbed to re-establish the circulation.

7. Commanding officers will ensure not only that facilities for these measures are provided, but also that they are systematically carried out.

8. When the onset of trench foot or frost-bite is probable :—

(i) Whenever practicable, before going on duty in exposed places, men should be given a hot meal. Meals should be regular, and men on duty should have hot food by night as well as by day.

(ii) Tours of duty in exposed or wet situations should be short. As few men as possible should be detailed for duty in wet trenches, braziers being provided for troops to warm themselves and dry their clothes, and arrangements made for socks to be dried and re-issued during the tours of duty.

(iii) Feet inspections must be made daily by platoon and section commanders.

(iv) Men should sleep with boots and puttees off, the feet being wrapped in blankets, newspaper, straw or hay, etc. In any case the boots must not be tightly laced.

(v) At the end of a tour of duty men should be marched to a specially prepared rest station where braziers and fires can be arranged. They should receive a hot meal and then strip, at any rate as regards the legs and feet, and rub down, and while they are wrapped in blankets their clothes are dried.

9. Dry standings should be provided in trenches and other localities.

10. The lining of gum boots gets wet quickly. To dry them they should be hung in a drying-room from racks, feet down, with upper portion kept open by a piece of wood. If hung feet uppermost the process is a much more lengthy one.

11. Transport units will ensure that a shelter of some sort is available for men on return from convoy duty in bad weather, to which they can go and get warmed and dried, have a hot meal, change wet boots, etc., for dry ones, and if necessary rub feet and hands with warm oil.

12. Similar arrangements will be made at rest camps to ensure warmth, hot food and means for drying clothes for parties arriving in bad weather.

13. A warmed dry place should be provided in which the men of guards and piquets can rest when not actually on sentry.