OBSERVATIONS ON MILITARY SANITATION.

By LIEUTENANT-COLONEL B. S. DHONDY,
Indian Medical Service.

It is rightly said that the primary object of all hygiene and sanitation is the preservation of health and the prevention of disease and all methods of organization, administration and practice should concentrate on and lead to that objective.

Let us now take one of the most important subjects of sanitation, either in cantonments or in the field, viz. "disposal of waste products."

Sanitarians tell us that the object to aim at in the disposal of waste products is to render them innocuous, which signifies: (1) that pathogenic germs are eliminated and hence the source of infection is reduced, (2) that its nature is so changed that it no longer allows of the breeding of insects, flies, mosquitoes and other disease-carrying and obnoxious pests, and (3) that it causes no offensive vapour or smells either before or during the process of disposal.

Let us now take step by step the methods advocated and in use in a majority of cantonments and in the field, and examine how far they carry out this object.

**Composition of Waste Products.**

**Solids.**

1. Human faeces.
2. Stable refuse.
3. Slaughter house offal, etc.
4. Camp refuse and kitchen garbage.
5. Cantonment refuse.
6. Carcasses.

**Liquids.**

- Urine, human and animal.
- Kitchen sullage (grease).
- Ablution sullage (soap).

**Methods for the Disposal of Human, Animal and Other Wastes as Practised in Most of the Cantonments at Present and How Far They Attain the Objective.**

1. *Human Excreta.*—Most of the cantonments in India still have open pan latrines for Indians either as group latrines or individual ones in buildings of Saddar bazars and others. The contents of the open pans, as is well known, act as bait and, by the time the excreta are removed by the sweepers, many flies have settled on them, laid their eggs there and carried infection from them to food and water consumed by human beings. The harm done so far cannot be eradicated by any amount of trouble and money spent on the further disposal of human excreta. Thus, the most important and primary object of hygiene and sanitation, viz."prevention of disease" is broken at the very start.

In the sanitary disposal of waste products the object to be aimed at is
"to render the waste products innocuous." The open pan latrine rather than making the excreta innocuous makes them—(1) Act as a source of infection; (2) give out offensive smell and consequently; (3) attract flies who use them as a breeding place and carry disease germs from them to food and drink.

One stage in the disposal of human excreta is their transit from latrines to either the incinerator or the trenching ground. Very little opportunity is offered to flies to settle and lay eggs and carry infection to food and drink during this process.

The final disposal of excreta is either by—(1) incineration or (2) trenching.

The former is gradually being replaced by the latter due to the emanation of acrid odour given out by the burning excreta to those living in the neighbourhood of the incinerator and the increasing difficulty of getting litter for incineration due to recent mechanization of the Army and consequent absence of horses and mules. Though incineration is supposed to be the best form of disposal of human excreta, the way it is carried out in cantonments is far from satisfactory. It is common knowledge that fly breeding goes on near it.

Trenching.—In a very big percentage of cantonments trenching, either by itself or in conjunction with incineration, is the main way in which human excreta are got rid of. Flies will breed out from trenching grounds so long as fly eggs are present in the material trench and no amount of labour and money spent here can prevent it. This source of fly breeding will continue so long as flies are allowed access to human excretion at its source, i.e. latrines.

In the Field.—Shallow trenches and bored hole latrines should not be used as they will breed flies and infection of food and drink will surely take place, as is the case with open pan latrines.

Deep trench latrines with automatic closing lids are best suited for use in the Field. If properly constructed they will not only prevent infection of food and fly breeding but will also do away with the final disposal of excreta.

On the Line of Communication and at the Base.—Fly-proofing of the latrine pan, and composting, to my mind are the most sanitary ways of dealing with human excreta.

N.B.—Composting is an aerobic biological process.

At the base, if hand removal is the method, the most important step is to have automatic fly-proof latrines in which the pan is fly-proofed. The final disposal should be by composting. The latter is by far the most sanitary way of disposing of all human wastes. It makes the compost mass absolutely innocuous in the shortest possible time. It requires a small area for the final disposal of all wastes. It requires an initial small outlay which is amply repaid by selling the proceeds and in a short time not only works on a "no cost" basis but becomes a source of income.

It requires no more supervision than any other known form of disposal
of all human wastes. It is cheap to work and all wastes are disposed of at the same time and place.

It is not necessary to have the composting at a long distance from the camp or cantonment and if properly managed it should be within the cantonment to save cartage.

**Stable Refuse in Cantonments and Stationary Camps.**—This is a very profuse breeder of flies. House flies breed in horse and mule litter and rarely in other cattle droppings.

**In Cantonment.**—Collecting platforms and bins are specially provided for collecting droppings from stables till they are removed, dried on platforms and thence stored for burning in incinerators with night soil.

From the practical point of view leaving a heap of litter exposed to flies on such a platform, so that they may settle and lay their eggs on it, is against the primary principle of good sanitation.

In fact rather than preventing fly breeding it helps it. Does it not seem sound reasoning to keep all fly breeding spots and places from which flies carry infection out of bounds to flies rather than allow them a free entrance to these and, after they have bred and carried infection, to try and destroy them? Could not the large amount of money spent on destruction of flies be profitably utilized on fly proofing these places? I am certain there are a lot of sanitarians who can use their ingenuity in devising such contraptions, the use of which would make all fly breeding spots and places from which infection is carried by them, fly-proof.

For the use of litter an automatic fly-proof box is devised which is cheap to make and sufficient for fly proofing daily litter of 25 animals for a sum of Rs. 10 to 12 at Lucknow. The use of these by a cavalry unit there was effective in stopping fly breeding (a sample could be got from E. O., Lucknow Cantonment). All litter soon after it is evacuated should be put in these boxes so that no flies can get access to it. After a time it should be raked and spread out thinly on any ground exposed to sun. Except in very wet weather the litter dries up within twenty-four to forty-eight hours at the most. Once it is dried it ceases to attract flies and, even if a few maggots have developed in the dried litter, the process of drying having destroyed all pabulum, the maggots would perish from starvation. Once dried the litter could with advantage be either burnt in incinerators or dumped in dry pits and covered up for use as manure later on. This will not breed flies.

Besides exposing litter in collecting pits, (1) dumping fresh litter in pits till they are full for manurial purposes, (2) dumping it round incinerators in fresh condition for use later on for burning purposes, and (3) selling it to contractors, are some of the other common ways in which litter is disposed of in most of the cantonments in India.

In all these it is exposed to flies and breeds them profusely.

In the Field the best way of disposal of litter is by tight packing.

On the lines of communication and base, the use of automatic fly-proof
boxes and drying in thin layers as described above for cantonments brings an income to the unit concerned as well as being the most sanitary way of its disposal.

_Slaughter Houses, Offal, Blood, Etc._—To my knowledge, this is a more profuse breeder of flies than animal litter, and one which could be the most easily controlled of all fly breeding places, nor does it require any ingenuity in providing special contraptions. All that is required is to have trenches always ready in the vicinity of slaughtering places. Animals are usually slaughtered after sunset or even later in most cantonments when the flies are resting for the night. All that is therefore required is to see that the offal, etc., are buried and trenches covered up during the night immediately after cleaning and washing of the slaughter houses. As no eggs are laid, no breeding is possible from it. The same could be done at the R.I.A.S.C. Depots in the Field.

_In the Field_ meat is distributed to units on hoof and units do their own slaughtering. Indian Troops do this during the day. I have tried and found the following method very successful: A trench 2 to 3 feet long 1 foot wide and 2 feet deep is kept ready every day. The animals to be slaughtered are put on the edge with the head and neck overhanging this trench and the animals are slaughtered there, the blood thus falling in the trench. A little earth is sprinkled on top of it to prevent flies settling and laying their eggs till the time when skinning and cleaning is completed. After skinning and opening up the body the whole of the alimentary canal is separated and put directly in the trench and the trench covered up. During the process no time or opportunity is given to flies to settle and lay their eggs, hence there is no breeding.

_Camp Refuse and Kitchen Garbage._—In cantonments open platforms are specially made for these where all the refuse and garbage is collected and exposed to flies, with the evident result, "profuse fly breeding." I have seen at least one cantonment where rubbish is intimately mixed with all night soil of the Saddar bazar and exposed on such open platforms till it is finally disposed of by shallow trenching on grass farms. A sensible way, easy to achieve and most sanitary, is to provide automatic closing bins for this purpose. It would then make it impossible for flies to lay their eggs on refuse and garbage. All this could then be easily composted.

Borrow pits and such like on the outskirts of some cantonments are filled in by this refuse. Though fly breeding from this source is outside the cantonment, flies are carried to it by cattle which go in and out of the cantonment and by dust storms, etc. Within the last year refuse was employed for filling in a huge pit which was breeding mosquitoes profusely right in a first class District Headquarters office compound with the inevitable result that it was converted into a fly-breeding farm. This had to be stopped immediately by having the whole pit emptied again.

If pits are to be filled in by refuse a very safe way is to keep the top
layer of rubbish smouldering night and day till the whole process is completed and then cover it over with at least a foot of earth. The heat will destroy all eggs and maggots and also keep the flies off the mass.

As regards the methods of disposal of carcases, urine, kitchen and ablution sullage now in use no observations are offered as they are satisfactory.

THE DIAGNOSIS OF TRAUMATIC HÆMATURIA AND REPORTS OF CASES.

By MAJOR H. S. SHUCKSMITH, F.R.C.S.,
Royal Army Medical Corps.

TRAUMATIC hæmaturia can present difficult problems in clinical diagnosis. Textbook descriptions of damage to individual components of the urinary system give a multiplicity of signs and symptoms and often an involved classification of the types of damage which may occur, yet out of this wealth of detail it may be difficult to carry a clear picture in mind when confronted with a given case. It is essential to have as simple a classification of traumatic lesions as is consistent with an adequate guide to treatment and to remember the salient clinical features which allow the diagnosis to be established.

The hazards of war present patients with multiple injuries either in multiple bomb splinter wounds or in non-penetrating wounds due to falls of masonry. It cannot be repeated too often that all wounds of the abdomen, buttocks and thighs may involve the bladder and that this viscus is commonly injured in fractures of the pelvis but frequently in cases injured by falls of masonry, even when the pelvis is fractured, the hæmaturia may be the result not of a ruptured bladder but of damage to a kidney.

It is obvious that in operative procedures a well-founded diagnosis is essential when the incision may for example involve exploration from the loin or alternatively laparotomy, but a precise diagnosis is of practical importance also in cases which do not require operation. A ruptured kidney may in months or years become hydronephrotic and its diagnosis at the time of injury may be important for subsequent Medical Boards.

It is not intended to give a recapitulation of the classical descriptions of injuries to individual organs but to present the practical pathological and clinical features which are of paramount importance in diagnosis and treatment.

RUPTURES OF THE PENILE URETHRA.

The classification for practical purposes into complete and incomplete is sufficient. In complete rupture there is blood running from the external urethral meatus, retention of urine, and the central perineal swelling may be relatively large; in incomplete ruptures there is only a spot of blood on the end of the meatus, the patient can pass urine and the perineal swelling is