How to be fit : a lecture to soldiers / by Sir Thomas Peter Anderson Stuart.

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HOW TO BE FIT

A LECTURE TO SOLDIERS

DELIVERED AT LIVERPOOL MILITARY CAMP

BY

SIR THOMAS ANDERSON STUART, M.D., LL.D., D.Sc.

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This Lecture is now published for general circulation in response to many enquiries, and is an exact copy of the booklet issued by the Department of Defence for the use of soldiers. Any profit after paying for the cost of production will be handed to the War Chest Fund.

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HOW TO BE FIT

A soldier should consider it a point of honour to be "fit"—fit to instantly respond to any command, fit to completely carry out anything he may be called upon to do. A soldier not fit to march and fight with the best only keeps the best back, and a soldier who is sick is, for the time being, worse than dead—he is of no use, and uses up the services of other men in looking after him. Next to not getting sick, a soldier's duty is to get well again as soon as possible, so that he may return to duty. Further, while he is "below par," he is exposed to unnecessary risks of infection, etc. Medical officers cannot keep men well unless the man helps, by looking after the condition of his body. I do not forget that the business of a soldier is to fight the enemy, and that everything must give way to this, and anything I say must always be considered as subject to military exigencies. In the field it is probably difficult, but a strenuous effort must be made by every individual soldier to be clean—himself, his clothing, and his surroundings. The value of attending to health matters in the field is shown by these facts:—In the Crimean War, 1854-1856, the French deaths by disease were ten times as many as fell in battle. In the Boer War, 1899-1901, the British deaths were twice as many from disease as from wounds. In the Russo-Japanese War, 1904-1905, a new condition of affairs arises; only one-half as many died from disease as from wounds!

In these pages, culled from many sources, I have dealt with the subject from the men's point of view exclusively, not from that of the O.C. or of the Medical Officer, and every man should make a

loathsome, and may be dangerous. The same remark applies to snot—use a handkerchief, or use a rag or piece of paper. Burn or bury the rag or paper. On dusty marches you may tie a handkerchief over the mouth and nose to keep out dust in the air which is breathed.

Flies: A Nuisance and a Danger.

Every article of food should be kept safe from the visits of flies. Do not eat any food, such as sugar, jam, butter, bread, milk, meat, etc., on which flies have been seen—they are bred in filth, they live largely on filth, and they carry filth around with them. Their feet are provided each with two claws and a multitude of sticky hairs, and they carry the germs of infection entangled in the hairs from any infected material they may have visited to the food on which they alight. If a fly has drowned itself in the milk, leave that milk scrupulously alone. It is not enough merely to rescue the fly or recover its body, for the milk may now be infected and dangerous. Further, watch a fly on a lump of sugar; he cannot bite it as we do, but he vomits a little bleb of fluid on to it, which dissolves some of the sugar, and then he swallows his vomit again, and with it the dissolved sugar. This he does again and again. But he may just have come from the latrine or any other source of infective material, and so flies are potent spreaders of infection. That is why it is so important not to leave excrement uncovered. Many a case of typhoid fever has had such an origin. And the other end of the fly is emitting excreta every few minutes—one sees it in some of the "fly spots" on the window. In any case it is nasty to swallow these, and they may also contain disease germs, *e.g.,* ophthalmia or sandy blight

in the eyes, and typhoid. Remember that in the Boer War one-third of all deaths were due to typhoid. Flies are filthy things, both ends and the middle; assist in every way to keep them down. Never buy meat or other foodstuffs from shops where flies are tolerated. Keep kitchen, mess room, tent, scrupulously clean, free from scraps of food or particles of refuse likely to draw flies. Bury or burn all garbage, trash, filth, food wastes, slops, etc. See that they are covered while being collected, so that they do not feed flies. Excrement is to be covered at once, just as Moses ordered (and cats scrupulously do). Urine, too, may carry disease germs. It very often contains the germs of typhoid fever. Therefore, urinate only into the appointed urinals, pits, trenches, or latrines, even if the night is cold and these places are some distance from your particular tent. You owe it to your comrades, and they owe it to you.

Rest and Sleep.

Rest and sleep are most important—you never know when the emergency will come. Be ready! Aye ready! This is possible only if you are "fit." During a halt on the march loosen the pack and belts, and, if the ground permits and is dry, sit down, or even lie down at your full length, so as to get the most rest. Kneading the muscles of the legs is good—massage—it frees the muscles from waste products and prevents cramp and stiffness. Therefore do it for one another. If the ground is wet, get something between you and it, so that you may not get damp clothes. When in camp rest as much as you can, but do not sleep on the bare ground when you can get anything like hay, straw, ferns, branches, to keep you off it. These protect the angles of the body, prevent damp from the

ground and undue loss of heat, and keep the clothing and blankets off the ground, which may have insects or disease germs. Further, get out of the wind and upon dry ground. In camp or bivouac use the waterproof to sleep on if you have one, and in a bivouac dig a hole for your hip to rest in. With these precautions you will be more comfortable, have a sounder, and therefore, more refreshing sleep, and be more rested, and you will avoid colds, rheumatism, etc. Want of sleep, like privation, exposure, and fatigue of body and mind, greatly lower the power of resistance to disease.

The Skin: The Importance of being Clean.

A dirty surface of the body favours various "itchy" conditions of the skin, dirties the clothes, pollutes the atmosphere, and invites disease generally. The surface layer of the skin is continually scaling, as is seen in the dandruff of the scalp. The sweat dries on it. The oily secretion of the skin is spread all over the surface, and probably the excretions of the body, both excrement and urine, soil the surface, and thus the skin become covered with a layer of dirt which is just the very soil that microbes grow in and that parasites feed on. When wounds are made through such a dirty skin the microbes are carried into the body, for instance, with bullet, bayonet, or bits of clothing. It is for precisely the same reasons that surgeons, in preparing a patient for an operation, invariably scrub the skin with soap and water where the cut is to be made, and with disinfectant, so as to make it germ-free. They do the same with their own hands and instruments. There are often little lacerations of the skin which are not often noticed in ordinary life. These may form the points of entrance of the microbe, and

are, therefore, not to be neglected. Never let anyone tattoo you; tattooers are generally dirty, and the dirty tattooing needle may carry into the body more than the colour.

Common yellow bar soap, such as is used by laundresses, is good for washing clothes, but not for washing the skin, which becomes dry and cracked, owing to the fat of the skin and yolk of the hair being too much removed. When you can get it, use a good toilet soap. Slightly warm water is best for cleansing, but cold water acts as a tonic and braces one up, thus it is good to follow warm water, if possible, by cold water. A warm bath once or twice a week is a great comfort, and should always be taken, if possible; it cleans so much better than the cold water, but the cold bath is a better tonic in the morning, and generally cold water should, as already said, follow warm water whenever possible. If chilly and depressed after a cold bath, give it up and be content with a cold sponge, or take a tepid bath. Where water is scanty, a wet sponge or wet cloth may be used, and on the march, and when much exposed to the sun and dust, a wet sponge or a wet cloth are better than soap and water for the face and hands, since they do not remove the natural oil of the skin. After a march a wet wipe of face, neck, and feet greatly removes fatigue. If no water is available, a good dry rub, with exposure to air and sun, is better than nothing; a rubbing removes the surface scales and with them much of the dirt. Sponges are not necessary; a piece of rough towel or other cotton cloth will act as a rubber, but wash it every time it is used. Do not use too much soap, and remove it all before drying, for if any is left it only irritates the skin. Use your own soap and towel and no other, for obvious reasons.

In the arm-pits, between the legs and buttocks, the

feet and between the toes, around the anus and beneath the foreskin—In all these places the secretions accumulate, decompose, soil the clothing, make the skin sore and chafed. They should, therefore, be washed every day, at any time, so long as it is done daily. A little vaseline applied where there is friction is good. In the case of mounted men saddle-boils are to be guarded against by scrupulous cleanliness about the crutch and inside the thighs, and methylated spirits applied to the skin hardens it, if you can come by the spirits. Never go barefoot—you never know what little wounds of the skin you have, or what you are going to get; the soil may be full of microbes, for instance tetanus or lockjaw microbes, and other organisms, according to the part of the world you are in.

Keep the nails clean; have no "blacks" to be a harbour for microbes. Trim the finger-nails round and the toe-nails square. Avoid hang-nails and little lacerations of the skin about the nails, by occasionally pushing back the skin at the base of the nail where the skin adheres to the nail as it grows. Microbes penetrate there, and may be the cause of sore finger and whitlow. The hands should therefore be kept clean by frequent washing. Very particularly does this apply to men dealing with horses, mules, donkeys, camels, etc. If the hands are soiled when the animal sneezes, coughs, or otherwise, wash them as soon as possible. Glanders is bad in horses—it is worse in men. Always wash the hands after grooming. For similar reasons, after handling pet animals, cats, dogs, immediately wash the hands. These animals can only lick themselves at their toilet, including their private parts. Thus the abundant germs are spread all over their fur, and so the hands become infected. It is best to leave these animals alone.

The Hair.

Keep the hair of the head short. Wash it daily in cold water without soap, but only once or twice a week with warm water and soap. If oftener, the soap takes too much of the yolk out of it and makes it dry and brittle. Do not use water, especially the water you have just washed in, to make the hair lie flat—it decomposes and stinks; use oil or nothing; let the natural fat of the scalp do it. Have your own toilet articles—never use anybody else's if you can avoid it. Keep the comb clean, as well as the brush, by washing in water to which a little washing soda or ammonia has been added. Neither comb nor brush should be so sharp and hard as to scratch the scalp. If you cannot shave, keep the hair of the beard and moustache cut close—long hair may harbour insects.

Eyes, Ears, and Nose.

Do not rub the eyes with dirty hands. If anything gets in, ask the Medical Officer to take it out, if possible; if not, get a comrade with clean hands to pull down the lower eyelid, or, taking hold by the eyelashes, turn the upper eyelid over the end of a match or tooth-pick, or something of that sort, so as to see the lining of the eyelid. If the foreign body can be seen on the inner surface of the lid or on the white of the eyeball, and easily removed, say, by the twisted corner of a clean handkerchief, well and good; but if it be on the clear, glassy part of the front of the eye (cornea), you must be very careful. The Medical Officer should attend to that, though if this is not possible, light a wooden match and let it burn a little, blow it out, rub the burnt end on a clean handkerchief so as to make it smooth, and use that to dislodge any particle which

may be thus removed; but these proceedings are so risky that every effort should be made to get it out by a skilled hand.

Keep the ears clear as far as you can with a damp towel. Once a week or so wrap a piece of cotton-wool or cotton cloth, or something soft, round the end of a wooden match, and gently clean the outer end of the canal of the ear. Do not push the cotton in any great distance, for the dirt tends to collect just within the mouth of the canal, and it is not safe to go too far down. If anything further is to be done report to the A.M.C. Do not pick the nose with the fingers—they may have dirt on them, and the nails may make little sores. If the nostrils get very sore, heated, and dusty, a little vaseline smeared just within them will be a relief.

Bathing and Swimming.

Salt water is best. If it be a river or pond, enter it only if the water be fairly clear, and not likely to contain infectious matters—you might "get something" by the mouth, nose, eye, or by some little wound in the skin not always visible. Do not bathe in cold water when perspiring much, or when chilled, or when exhausted by fatigue, or too soon after eating; the best time is about two hours after a meal. Begin swimming at once—this prevents chill. Come out before being exhausted or cold, or the extremities are numb. Rub and dry the skin thoroughly to restore the circulation and prevent chill.

Care of the Feet.

The care of the feet is most important—the whole efficiency of the infantryman depends upon it, and this even now, with all the assistance of motor vehicles.

It is simply impossible to pay too much attention to the care of the feet. This is obvious when we remember that the chief object of a commander is to get his men to an advantageous position before the enemy gets there.

The feet are soiled very quickly, not only from outside dirt, but from their own sweaty and fatty secretions. The secretions cannot escape from between the toes, and the skin here is very soft, so that corns between the toes are soft, and "soft" corns should be attended to by the Medical Officer. With the scales from the skin, the secretions of the feet make a perfect soil for microbes, and it is due to these that the feet smell in most cases. In certain cases "stinking feet" are a real grievance to the other men in the tent, and require treatment by the Medical Officer. The chafing of the skin between the toes is avoided by some vaseline or other clean grease, or by foot powder.

Wash the feet every morning, and, if possible, after the day's march. Soap makes the skin tender, therefore remove it all after washing. Do not soak the feet; keep them wet just long enough to get the dirt off. If the skin is very tender use cold water only, or even a wet cloth only, so as not to soak the skin. If no water is available to wash the feet after a march, take off the socks and rub the feet dry with a towel, or even with the socks you have just taken off, especially rub dry the spaces between the toes.

Socks.

Always wear thick and ribbed woollen socks to march in; thin socks are useless, and the ribbing makes the sock elastic and better fitting; cottons need frequent changing; and are apt to blister the feet. Select socks two sizes larger than the feet; this allows for

shrinkage in washing, but is probably not so large as to allow of creases when the boot is put on. There must be no compression either by sock or boot, and in this respect the socks are more often at fault than the boots. Nothing must interfere with the free circulation of the blood in the toes. In taking the socks off stretch them to avoid shrinking. Wash them at night and hang them up to dry. Do not rub them or wring them, but move them about in the soapy water, rinse them in cold water, and hang them up to dry without squeezing or wringing. In this way you avoid making them hard, shrunken, and uncomfortable. Before putting them on next morning see that they are perfectly dry. Change wet, creased, or soiled socks. Holes in socks are apt to cause blisters, so also does a lumpy darn. Before sleeping wash the feet and put on dry socks, if sleeping socks are necessary, but never wear during the night socks that have been worn during the day. If the socks have given out, their place may be taken by a triangular piece of any soft material, even greased paper, folded with as few creases as possible around the foot.

On the march, at the halt it is good to change the right sock to the left foot and the left sock to the right foot, especially if there is a hole—thus you avoid a blister. If they are wet with perspiration put on the dry pair you have in your pack, if possible. Smooth out any creases, which will soon chafe the skin. Some people recommend soaping the inside of the socks before the march. It is better to use vaseline or clean grease, especially between the toes. Soap is liable to injure a tender skin, and all that is wanted is a lubricant to avoid friction. After a march, on halting for the day, the first thing to be done is to examine the feet. Exposed and painful surfaces should be greased

with tallow, lanoline, or vaseline, not soap. Soaps are too apt to injure the skin. These painful surfaces may be protected by collodion or pieces of plaster applied before the march. Footsoreness is much relieved by bathing the feet in permanganate of potash solution—the colour of red wine. If very footsore, report to the Medical Officer at once—there is something wrong. Do not open very small blisters, but if they are so large that they would break in walking, prick them with a clean needle inserted through the skin about one-eighth of an inch from the edge of the blister, and gently squeeze out the fluid. To make it quite clean, the point of the needle should be first heated to redness in the flame of a match. Avoid breaking the skin of a blister, and after opening smear with powdered boric acid, vaseline, or clean grease, and put on a piece of cotton or a bandage.

Corns arise from pressure; hard corns may be pared or scraped down very carefully with a knife or piece of glass, or by sandpapering them; but bad corns and soft corns should be reported to the Medical Officer or the chiropodist, if there is one. A very good corn protector is made thus:—Cut a hole somewhat larger than the corn in a piece of plaster, and stick this on around the corn, put a layer of cotton wool in the hole and over the corn, and then a piece of plaster over the whole. Be careful about attending to ingrowing nails yourself—the feet are too important, quite as important as your rifle. Bunions are serious—report to the Medical Officer. Cut the toe-nails square across, the finger-nails round, as already said.

Abrasions, cuts, wounds of the feet, must be very carefully dealt with; avoid dirty cloths, poultices, etc. Keep them clean at any cost, and, if possible, report to the Medical Officer.

Boots.

Boots are of the first and last importance; they should fit, that is, there should be no undue pressure on any point, yet they should not be so loose that there is harmful friction between the boot and the foot; if there is, the feet are sure to be sore on marching. Remember that each foot strikes the ground in marching 18,000 times a day! and that every step we take we spring from one foot. Get a boot that feels comfortable when standing on one foot and carrying a weight of 45 lbs.; thus the lengthening and widening of the feet under pressure are provided for. Fit each foot separately, for the two feet often differ very much in size and shape, and sometimes boots get mixed at the Q.M. Stores. Let the fit be good and snug around the ankle and instep, but loose around the toes, and try the boot with the laces through all the holes and pulled tight. The edges of the leather should then be about half an inch apart. The boot should be rather on the large than on the small side, and have not less than half an inch vacant space in front of the great toe when you press the toe of the boot with the thumb. If the boot be too small, the swelling of the feet at the end of the day or in warm weather will make you suffer horribly. The desire for smallness and "style" is so strong that most men are not to be trusted to select their own boots—an officer should control the operation. If the boot be too large, the foot slides about in it, and gets chafed; besides, it is uncomfortable and fatiguing. If you "break in" new boots by wearing them, do it gradually, and about camp if possible, and avoid marching in them before they are broken in. Never wear any but the military boot. Shun the pointed toe, and remember that a tight boot means a cold foot from interference with

the circulation. If boots as a whole are large enough, but pinch at certain points, get the company shoemaker to stretch them, and thus avoid blisters and corns. It is good to keep two pairs of boots in use, wearing them on alternate days—it eases the feet immensely. Carry extra laces. A loose boot soon chafes and makes you lame. After a wetting never let boots dry on your feet, nor dry them close to the fire—the leather becomes hard and brittle. Keep your boots clean, both inside and out. From time to time wash them out with soap and water; scrape them out sometimes, and grease them inside as well as out. A good time to grease them is when they are warm after a march. Boric acid powder dusted into the boots helps to keep them sweet. Always clean them, if necessary, before entering a tent. Most of the dirt in buildings is carried in by dirty boots; therefore, do not overlook the scraper or the mat. Look after your boots, keep them is as good repair as possible; visit the company shoemaker rather than let them get into disrepair. Keep them soft and pliant by means of dubbing, vaseline, neats-foot oil, etc. Never mind the shine until the campaign is over. Shoes or slippers, if available, in the evening are a great comfort, and ease the feet after a long march.

Clothing and Underwear.

All clothing must fit loosely; it is warmer in winter and cooler in summer; movements are freer; no restraint of movement is permissible—the soldier must be able to march, run, climb, jump, ride, fight, sleep in comfort. On the march too much clothing causes sweating and exhaustion; too little may lead to chill and frostbite. When resting after exercise, or on guard duty at night, put on extra covering. If heated

after exercise remove the pack and belt, but not the clothing until you are cooler. If the clothing gets wet the harm does not arise while you are still active at work. If allowed to dry on you while warm after a march and when you are exhausted, then danger arises from depressed vitality and greater likelihood of catching disease. Therefore, change your wet clothes as soon as possible after the march is over. Keep the clothing in good repair; no holes, all buttons on, etc. Keep all clothing, especially underclothing, as clean as possible, in the circumstances. Dirt gets to the skin from the clothing, and from the skin to the clothing, especially underclothing; that is why this should be washed. Wash your linen whenever you can; thus you minimize the risk of catching disease and of contaminating your comrades; also you diminish the risk of wound infection. If you are wounded, it is not the clean wound that is to be feared, but the dirt from the skin and clothing carried into the wound. Where washing is not possible, all clothing may be greatly cleaned by shaking, brushing, and exposure to sun and air, for sun and air are nature's disinfectants. Do not, if possible, wear the same clothes at night as have been worn during the day. Keep night clothes—and they always come in as a change after a wetting. Woollen or flannel underwear next the skin, both winter and summer, is better than silk or cotton or linen—the wool readily takes up the sweat into its substance and slowly evaporates it on the the outer surface. In tropical climates flannel next the skin is not very comfortable, but people get used to it after a week or two. If necessary, wool flannel may be replaced by cotton flannelette, or, if you can afford it, a silk and wool mixture, such as Anglo-Indian gauze. In any case, the material should never be so thin as to permit chill after sundown. Woollens

best prevent sudden and excessive loss of heat without unduly interfering with perspiration; they are less easily soiled by the excretions, get dirty more slowly, and are more easily cleaned by rubbing, shaking, brushing—that is, without water—than silk, cotton, or linen materials. Silk, cotton and linen easily get wet with sweat, and if next the skin cool it too rapidly, so that too much heat is lost. When lying in bed uncovered and perspiring in tropical climates, the woollen abdominal band or cholera belt may be used—not in the day time, only at night, and only when not under one or two blankets. The object is to prevent the belly from being chilled, for the bowels are close against the belly wall, and they do not stand chill. It leads to diarrhœa and predisposition to other diseases. Many people prefer a sort of apron of two thicknesses of flannel sewn together, tied around the waist with tapes and kept in position below the pyjamas. This is less heating around the loins, where protection is not needed.

Braces are better than a belt—they interfere less with the movements of the waist and belly. If a belt be worn it should be broad.

Do not pinch in the crown of the soft felt hat; keep as much air space inside the hat as possible.

Fresh Air: the Breath of Life.

If any one enters an occupied room or tent, and perceives an unpleasant smell or stuffiness, then the air is impure. The persons who are already there do not perceive it. It has come gradually, and their sense of smell becomes blunted. Even if you smell violets more than a few whiffs, the sense of smell becomes blunted. Ventilation in a tent is much more necessary than in a room, for in a tent there are generally many

men in a small air space. See that there are places open below for the entrance of fresh air and above for the exit of the heated impure air from the breath and from the surface of the body, and this all the more when in wet weather the pores of the canvas are closed by contraction. In a room, open the windows at the top at least 3 inches, and if this is done on one side of the room only, draught is avoided. If there is too much air, try and stand it; perhaps wear a woollen or Balaclava cap. Better too much than too little air; one soon gets used to it. Fresh air and sunlight are, as already said, nature's disinfectants. Rooms should be aired and sunned, and bed clothing and equipment should be regularly shaken out and aired, and, if possible, sunned. It should be understood that this is not merely a matter of an unpleasant smell, for the atmosphere polluted by the emanations from unwashed bodies and clothes, and by foul breaths gradually lowers men's vitality, and lays them open to the attacks of various microbes.

Try hard to breathe habitually through the nose; it catches dust, etc., protects the throat, prevents undue thirst, looks better, and keeps the atmosphere of the tent sweeter.

Drinking Water.

Do not drink water which the Medical Officer says is not safe. If you have no directions and no one to ask, boil the water if possible; to make weak tea of it is even better. Water from wells and ponds is apt to be contaminated. Always investigate cisterns, water coolers, barrels, and if there be anything suspicious, be very careful. "Soft drinks" should be used with discretion; they are seldom quite above suspicion, and are not rarely prepared with bad water and often con-

tain injurious substances, so that when consumed in large quantities or habitually they do harm. Soft drinks offered by pedlars around a train or camp are always best avoided. They have been exposed to dust, dirty hands, dirty dishes, and perhaps disease itself. Before the march have a moderate drink. Be sure that your water bottle is clean and does not leak. Fill it before starting, and fill it only to the shoulder, not to the neck, otherwise it will certainly leak. On the march drink seldom, and only in small draughts till thirst is relieved, not till thirst is quenched; thus you avoid being water-logged, with profuse perspiration, indigestion, weakness, and exposure to heat-stroke and exhaustion. It is said that the water-bottle should not be brought into use until some 7 miles have been covered, that its contents should last through the next 7 miles, and that it should be refilled at the commencement of each 7 miles thereafter. Weak, unsweetened tea or coffee is often better than water—they have been boiled, are slightly stimulant, and less is needed to quench thirst. Many men drink from mere habit, not because of real necessity. The drink from habit is to be fought against on the march, only the drink from necessity should be yielded to, therefore try and keep off drinking till the halt, and then drink only after being somewhat cooled off. Use your own cup and no other.

The great reason for all these directions is again the germ which lives and breeds in impure water—water containing sewer materials and drainage, and from cultivated land. In absolutely pure water germs are starved to death. It is therefore the germ which is the danger; boiling destroys them, proper filtering takes them out. See that only boiled or filtered or pure running water is used to wash crockery, knives, forks, spoons, dishes; dish-cloths should be boiled fre-

quently. If you get into your mind the existence of these disease-carrying particles it will guide you to a correct procedure in most cases. Tea and coffee and chocolate require the water to be boiling; this makes them a very safe drink when the water is not above suspicion. Tea stands dilution better than coffee; very weak tea is still palatable. On the march, cold tea is best when unsweetened. Chocolate is slightly nutritious as compared with tea or coffee; the sugar in it is nourishing. It is good, before going on duty at night or in the early morning, to take a cup of hot coffee or tea; it raises your vitality.

The question when should one drink? has been variously answered—it has been recently determined that it is best to drink towards the end of the meal, and immediately after it.

Food.

Wash your hands before eating; you never really know what you have been touching. Do not eat any food your officers say is not safe. If you have no directions and no one to ask, beware of bad-smelling food; it is probably decomposed and poisonous. The same with food that "looks bad"; also that which has been left behind by the enemy. Milk is extremely apt to go wrong, for it is an ideal soil for the growth of germs. Think how many outbreaks of typhoid, scarlet-fever, and diphtheria you have heard of as due to milk. Ice-creams, which contain milk, are very dangerous; they are so often prepared in filthy surroundings that they are best left alone when from any but the most reliable sources. Food offered by pedlars is always suspect, exposed to dust, handled by no end of dirty, and, it may be, disease-carrying hands, and contained in dirty baskets, dishes, etc. Cooked

food is generally safer than raw— the cooking kills many disease-bearers (germs, worms, etc.) besides, cooked food is more tasty and more tender, and, therefore, more agreeable and more easily digested. But be careful about cold food left over from a previous meal; see that it cannot have been contaminated by flies or otherwise. Remember that uncooked shell-fish, such as oysters, have often conveyed typhoid. Be careful about fruit—unripe it is indigestible, and may cause an irritating diarrhœa, if over-ripe it may cause diarrhœa in another way, and diarrhœa on the march is a catastrophe; it exposes the soldier to many dangers, and invites such diseases of dysentery, typhoid fever, and cholera when they are about. In any case, pare, skin, or carefully wash the fruit; you don't know who has been handling it or what is on it. Always wash in running water any lettuce, celery, tomato, or other vegetable eaten uncooked. You don't know what kind of fertilizer was used!

If greatly fatigued or overheated, it is better to wait a little while before eating; one eats better and digests better when somewhat recovered. Food should be chewed thoroughly before being swallowed; this throws less work on the stomach and in other ways avoids indigestion, for men have no gizzards as birds have. With good digestion and the food as now supplied by the wonderful work of the A.S.C., the men are happier and fitter, march better, fight better, stand cold better, resist disease better, and recover better from wounds than they used to do. An agreeable companion at food is certainly good, it helps digestion—but don't chew too little and swallow too soon in order to have more time to talk. With the food towards the end of a meal drink water, as much as may be necessary to thoroughly soften the food,

and then drink what more may be necessary after the meal has been eaten.

All these precautions may seem excessive—but remember you are out to fight, and to be at your top-notch of fitness, and what you may neglect at home at your ease you cannot afford to neglect on service.

Teeth and Mouth.

The care of the teeth is most important. On them depends proper mastication, digestion, and due fitness; that is why men with bad teeth and insufficient teeth are rejected at the recruiting office. Use a tooth-brush daily, with water about the purity of which you have no doubt. You probably have your own ideas as to tooth powder, but carbolic tooth powder is good, for it is mostly chalk. The brush should not be too hard, for it may lacerate the gum and inoculate it with microbes from the mouth, where the moisture, food, and warmth are just such conditions as are best suited for their growth. Soak a new brush in water for some hours to soften it. Always wash and dry the brush after using it, and see that it is kept clean. Use the brush not only from side to side, but also up and down, so as to clean out between the teeth and don't forget the back teeth because they are out of sight. It is good to use the tooth-brush before going to bed; thus particles of food do not remain to ferment and decay the teeth. Report tooth-ache and decay to the Medical Officer at once. Be careful about toothpicks, lest you wound the gum and convey infection; for the same reason never use a metal tooth-pick and never chew straws. Spongy, bleeding gums are common, and often due to neglect. Cleaning will greatly help the condition. The pollution of the atmosphere from dirty mouths and decayed teeth

is so repulsive and lowering to the vitality that men should see that their comrades do not neglect themselves in this respect. Perhaps the ceremonial presentation of a tooth-brush will convey the hint and be useful. Moreover the man himself is slowly poisoned by breathing through such a mouth, and by swallowing putrid matter from the decayed teeth; he is liable to attacks of "barrack-room sore-throat," tonsilitis, and deafness.

The Bowels and the Urine.

The inside of the body should be kept clean as well as the outside. Evacuation of the bowel should be daily and at the same hour, for a habit of going at the same hour is established, and this greatly helps the process. After breakfast is usually best, the movements of the stomach after breakfast setting up movements in the lower part of the bowel. When the call of nature is felt, answer without delay; carelessness in complying leads to discomfort, indigestion, constipation, piles, and endless other troubles sooner or later. In the field one can only do one's best, but aim at daily regularity, and, if need be, report to the Medical Officer. The kind of food available in the field, the absence of fresh vegetables, tends to constipation; if brown bread is available it is helpful, and a laxative pill or tabloid is very useful—have them handy, but avoid patent medicines.

Always wash the hands, preferably in running water, after attending to the calls of nature, and, as roller towels are not permissible, each man should take his own towel and soap with him to the toilet place. This precaution is necessary, because the microbes contained in excrement are apt to be conveyed by the hands to the surface of the body and to the clothes, and when the surface is wounded they enter the

wound or are carried in by bullets, pieces of shell, and by pieces of clothing carried in with the projectile. The entrance of such pieces of clothing has long been known to be dangerous; we now know why. It is because the microbes are carried into the wound and there multiply. Thus, to insure the utmost safety, one must keep the body and the clothes free from such contamination.

Further, it is now known that persons can convey diseases, especially typhoid fever, who are not themselves ill; they are called "carriers," and in every regiment of apparently healthy men there is sure to be one or more such typhoid-carriers. These microbes are contained, not only in the excrement, but also in the urine, as we have already seen, and, therefore, it is a camp sanitary law of the highest importance never to evacuate in camp except in the latrines and urinals, for fæcal matter and urine are the chief dangers to the health of the soldier in camp. The only safety is to consider all excreta as infected, and deal with them as if they were known to be infected. It is hard to realize these things, but they are true, and safety for one's self and one's comrades lies in paying attention to what is here set down. Even when a man falls out to ease himself on the march he should use his trenching tool to make a hole and afterwards cover the deposit with some earth, for the line of march to-day is the line of communication to-morrow. See that the boots as well as the clothing and skin are not contaminated, and that paper is so secured that it cannot be blown away to become a "camp butterfly." The diseases that are here concerned are typhoid, cholera, diarrhœa, and dysentery. Be careful to report diarrhœa at once; in any form it is serious, in its form of dysentery it is most dangerous, and in any form is apt to be contagious. In the

tropics diarrhœa is apt to follow chill of the belly. When the soldier lies uncovered at night in the sweltering heat he should wear the flannel bellyband, "cholera belt," or apron, already referred to. Diarrhœa from chill is apt to be followed by real dysentery.

Alcohol.

Alcohol in any form, except by the doctor's orders, is best left alone. It mostly does no good, and generally does a lot of harm. Following the short period of stimulation there follows a prolonged period of depression of every activity of the body and mind. In this depressed condition of the body it is much more liable to catch disease of every sort, and the occurrence of heat-stroke and frost-bite are invited. The mind is muddled, the judgment clouded; the man is irresponsible, more or less, and may be the ruin of some military plan and the death of many a brave man. Further, in this condition men do what they are sorry for the next morning; alcohol stimulates the sexual passions, and at the same time lessens self-control, so that alcholic intemperance and sexual debauchery are often closely associated—the one leads to the other. If you *will* drink alcoholic beverages, drink if possible with food, and preferably at the evening meal. The alcohol should not be in the form of ardent spirits, such as brandy, rum, whisky, or gin. Light ales are the lease harmful, especially if accompanied by out-of-door exercise, but if you will drink ardent spirits dilute them thoroughly, the more diluted the better. You should not exceed, say, a glass of whisky or a pint of beer in the 24 hours. No doubt the real danger of alcoholic drinks is the excess, not the strict moderation—but then the craving for alcohol is so easily excited, and so difficult to satisfy, that such beverages

are best left alone. Every prudent man who drinks alcohol in any form should know just what is the most he can safely take so as not to lose his full self-control, and he should never go beyond that amount; but, I repeat, you are safest with tea or coffee or chocolate—you will do more work and better work, you will suffer less from disease, will be less exposed to accident, and will be a better man all round.

Tobacco.

Upon the whole it is best never to have smoked; if you have not begun don't begin, but if begun I cannot say stop it. Only keep it in moderation—rather too little than too much. Every smoker knows that he sometimes smokes too much; let him keep well within his limit of consumption of tobacco. The pipe—each man to smoke his own pipe and no other—is said to be the least harmful mode of using tobacco, though between the pipe and the cigar there is probably not much to choose. It is stated that cigarettes are the worst, but it would be a waste of breath to say anything against these. It is not easy to say why the cigarette is the worst offender—possibly their cheapness, convenience, and rapid combustion lead to too many of them being smoked, so that, while each is small, in the end much tobacco is consumed, and owing to the milder nature of the tobacco smoke this is inhaled into the air passages and spread over a larger absorbent surface. The heart is very vulnerable, especially in the young, so that many candidates are annually rejected from the Navy and Army on account of "tobacco-heart." Athletes know that tobacco "hurts the wind"—that is, a tobacco-heart makes them unable to respond quickly and steadily to an extra call for work. How then can it be good for the

soldier? How can he toss "bundles of hay" out of the Turkish trenches? Tobacco also affects the vision; it becomes blurred and dim; how then can the soldier shoot straight? Tobacco affects the movements; they become unsteady. How then can a soldier take aim with a dim eye and unsteady hand? The tobacco-sot is no good as a soldier! Speaking generally, and especially in the young, it interferes with nutrition, growth, and development; it thus lowers physical and mental vigour; further, once a man begins smoking he is more apt to take to drink. It is, on many grounds, best left alone. Even the smoker should not smoke on the march—it is bad for heart and lungs and produces thirst.

Certain Parasites.

These little animals we don't, as a rule, say much about, but for the soldier in the field they are of serious importance. Getting rid of them is so important that it should generally be attended to under the direction of the Medical Officer.

Lice.—These play a large part in producing the discomforts of an army and in spreading typhus fever. They thrive in dirt, but, like other animals, they spring from parents—the first lice must be introduced, and then they breed. There are three sorts—the body-louse, the head-louse, and the crab-louse. The body-louse, by its hooked legs, clings to the side of the garment next the skin, and sucks blood at least twice a day. Each female louse breeds at least 200 little ones, and then, fortunately, she dies. Irritation from the bites prevents sleep, and thus makes the soldier less "fit"; besides, there is a certain disgust which greatly depresses many men. In the Boer War their prevalence was dreadful; as soon as many regiments halted they stripped and attended to the plague, often picking

them off and putting them on a stone in the sun, where they quickly dried and died. If clothing is continuously worn they go on feeding and breeding. In war one has not always the chance of changing clothes, and that is the one reason why the lice increase so enormously. Thus, if you find one treat it seriously, you will probably soon find others. It is good to avoid sleeping where others have slept before, and don't put your clothing near that of other men. If any piece of clothing becomes verminous, and you have no further use for it, burn, bury, or drown it, for the eggs are more difficult to kill than the lice themselves. Turn the clothes inside out, examine seams and folds carefully, kill by hand, boiling, hot steam, hot flat-iron, petrol, paraffin, wash in sea-water —but rules will be laid down in the camp. For all three kinds of lice "Crude Oil Emulsion" has recently been strongly recommended. It consists of crude mineral oil five and a half pints, soft soap three pounds, water half-a-pint. This is to be used as a soap for washing the body, rubbed into the hair, and then washed off, and it is also to be applied to all parts of the clothing that touch the skin. As it is a sort of soap it may be used for washing clothes—these should be boiled, if possible, or steamed. The emulsion is so harmless to the skin that it may be allowed to dry on the skin and left on indefinitely. Rubbed down the seams of garments. it kills the young lice as they are hatched—it is good to kill them in their infancy. It is well to avoid scratching the irritated part, but that is very difficult to do. The head-louse is not so important as the body-louse, and yet many men shave their heads to avoid it and get sleep at night. Thus, possibly, wigs came into existence at a time when bodily cleanliness was not so easily cultivated as it is now. The small-tooth comb is useful. The crab-

louse is found generally in the hair of the private parts. Cut the hair close and apply the crude oil emulsion, well rubbed in. But dealing with all these pests is so important that they are specially dealt with by the Medical Officer.

The Bed-bug.—Besides being disgusting, they, too, possibly inoculate disease, and if one is found there may be others; examine bedding and clothing carefully, and report their presence immediately. One part of kerosene to five parts of water, thoroughly mixed with the addition of a little soap and applied to all parts of the bed, etc., with a brush, is recommended, also fresh insect-powder may be dusted in the joints, and so forth.

The Flea is not only irritating and annoying, but has been proved to convey disease, notably plague, and this should not be forgotten in the present war where Orientals are engaged. Fresh insect-powder or iodoform sprinkled on the clothing are recommended.

Mosquito.—This insect is the worst enemy of man—next to the devil. It disturbs with its song, and with its sting it irritates and infects with dengue, yellow fever, and malaria, and because of these last it is more important than any other single factor in producing disease. In malarial countries be, therefore, most careful to use the mosquito net; there is no other way to avoid the malarial infection. I am told that this precaution was very generally neglected at Rabaul, with the result that there were a large number of serious cases of malaria.

Sexual Matters.

Self-control—chastity, in fact—is necessary to the soldier, who is to be always "fit." It is not inadvisable even to the unmarried civilian, for sexual inter-

course is not necessary for physical and mental health. Nature has her own way of getting rid of superabundant seed by emissions at night, accompanied generally by dreams; the suggestions of the harmfulness of these are generally nonsense, so long as they do not occur oftener than about once or, perhaps, twice a week. They are not so satisfying as the natural process; they disturb sleep, and make one feel not just all-right next day, but that cannot be helped. The stories one reads in little books written by quacks and furtively handed by touts—who should be at once caught and kicked—are mostly wicked inventions, but they have made many and many a lad miserable for years, until he found out in the smiles of his wife and baby that they were lies—all lies. The foreskin should be regularly drawn back and the secretions carefully removed and washed away—then the parts dried. Unless this is done, the secretions accumulate, decompose, and give rise to a great deal of trouble.

Venereal disease occurs in two chief forms—gonorrhœa or clap, and syphilis. Many men make light of clap, but though one gets over the immediate attack, it may leave permanent results of the gravest kind, and it causes endless grave disorders to the innocent wife and child. A man should invariably report himself for treatment after having had illicit connexion, for one-third of prostitutes are in an infective condition. Immediate disinfection may save him many a pang—blood-poisoning, heart, joints, muscles, eyes, all may suffer.

Syphilis is the gravest disease a man can acquire; it affects and may ruin his constitution for life, and it may be transmitted to his wife and children. Should the sore appear on the private parts, report at once. Immediate treatment is in any case necessary, and

only the Medical Officer can do it. Far better than waiting for something, a discharge, or a sore, to appear, is for every man to report for disinfection at once or early in the day after he has had illicit connexion, for in that case there is a good chance of the infection being completely removed and the attack prevented.

Both these diseases are due to microbes; there is now nothing mysterious about them, and the knowledge that it is the handing on of the microbe from the infected to the healthy may help you to realize the conditions. This knowledge has also made the treatment rational and efficient, so that there is every inducement for the patient to report himself, in order that he may receive the proper remedy. There is every reason why a man who has not been able to control himself should, in calmer moments, try to prevent the possible occurrence of the physical disability which unfits him for duty, and in a large number of cases suitable application made within a few hours after exposure will succeed in preventing disease, but these applications can only be had from the A.M.C.

Before the Battle.

1. Evacuate the bowels and bladder; you are freer and lighter, and in case of wound of the belly are less exposed to danger from escape of their contents into the wound.

2. Have your body and clothes as clean as circumstances permit, thus lessening the chance of wound infection.

3. Fill the canteen with good—boiled, if possible—water, or weak unsweetened tea, and keep it filled

when opportunity offers; you never know when the next opportunity will occur. After bleeding thirst is very great.

4. See that you have the First Aid Packet, that it is in good order, and that you know how to use it; when need arises use it promptly for yourself or a comrade.

5. Wounds are not to be handled, nor touched with anything but the First Aid materials, precautions for using which are on the packet. You must avoid infecting a wound, and make no attempt while on the field to clean it. If gravely injured, or much blood is lost, it is generally best to remain where you fall or at the nearest shelter. Great efforts to walk aggravate the injury.

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