watched and these came away of their own accord, leaving a rose-
coloured base which underwent the same changes as I have described
above. Syphilis having been excluded a diagnosis of gonorrhoeal
keratosis was made, and the following ointment applied—viz., Lassar's
paste with gr. v. of salicylic acid, which was gradually increased
up to gr. xx.; and on March 16th, 1910, his feet were quite normal.

This complication of gonorrhoea is very rare, and as far as I am
aware this is the eighteenth case that has been reported. Quite recently
a case was shown at the Dermatological Society, and a full description
of it was published in the Proceedings of the Royal Society of Medicine
for April, 1910. A good description is also to be found in the British
Medical Journal of January 18th, 1910, under the heading “Epitome of
Current Medical Literature.”

Report.

THE GERMAN CAMPAIGN IN SOUTH-WEST AFRICA, 1904-06.
(Sanitäts-Bericht über die Kaiserliche Schutztruppe für Südwestafrika
während des Herero und Hottentottenaufstandes vom 1 Januar, 1904, bis 31 Mai,
1907. Erster Band. Administrativer Teil.)

By LIEUTENANT-COLONEL C. H. MELVILLE, AND MAJOR C. E. POLLOCK,
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(Continued from p. 240.)

(E) IMPROVEMENTS IN RATION.

In addition to the increase in the amounts of foodstuffs issued already
alluded to, further improvements were made in the ration during the
course of operations.

In December, 1904, in consequence of the appearance of scurvy
amongst the men, an issue of lime juice, cranberries, and preserved
vegetables was sanctioned for the field force. This was followed in April,
1905, by a regulation authorising the issue of unusual articles. For
instance, a monthly issue was made per man of—

Beersalz, or other water

6

Chocolate

6 kilos, (4 lb.)

Cocoa

1 kilo, (2 lb.)

Lime juice

0.15 litre, (5 oz.)

Fruit

0.15 litre, (5 oz.)

One tin unsweetened milk.

Such issues could, of course, only be made when transport conditions
were favourable. With a view to increasing the variety of the vegetable

Note.—On p. 223, vol. xv., last table, tobacco, matches and rum, should be noted
as a weekly issue.
ration, it was ordered in December, 1905, that the following extra issues should be made:—

Vermicelli or lentils .. 1 day a month (in alternate months).
Maccaroni .. .. .. .. 1 day a month.
Preserved vegetables .. .. .. .. 4 days "
Dried .. .. .. .. 2 "
Dried potatoes .. .. .. .. 8 "

(It is not made quite clear in the original report whether this was in addition to, or included in, the much varied diet already described.—C. H. M.)

At the end of 1905 it was ordered that 200 cc. (7 ounces) of red wine should replace the daily rum ration. Subsequently, in January, 1906, the following order was issued, applicable in the first place chiefly to the troops in the northern area: “So long as it is impossible to replace the rum ration by one of red wine, the following issues shall be made, until further notice, in lieu of 0·7 litres (24·5 ounces) of rum, cognac, or arrack:—

(a) To troops immediately in communication with railway depôts: weekly, three bottles of beer and three bottles of seltzer water.
(b) To all troops not included under (a): daily, $\frac{1}{2}$ litre (1·75 oz.) of fruit or lime juice. A corresponding order was made applicable to the troops in the Southern area in March, 1906.

(F) INDIVIDUAL FOODSTUFFS.

(1) Fresh Meat.—As regards fresh meat, this consisted chiefly of beef. Mutton and goat were less frequently procured, and, in limited districts, game. It was found possible to drive cattle along with the troops, but sheep and goats were unable to keep up with a quickly-moving force. Mutton, in fact, was only available when a halt of some length was made in one place. The South African ox (Damara-Rind) is naturally poor in fat; especially bad in this respect were overdriven and badly-fed cattle which were picked up as booty. In addition, out of the looted cattle taken, it was necessary to spare not only the cows, but also to select the youngest and strongest oxen for draught purposes. The cattle procured from Bechuanaland were often suitable only for transport work, the condition of the slaughter cattle having become, owing to long journeys with scanty food and water, very poor. As a result, it was only those oxen which from age or bodily condition were useless for transport that were handed over to the butcher. In consequence, the meat was not only very poor in fat, but also extremely tough, and it was therefore a difficult matter to make it palatable. On this account the issue and increase of the fat ration became an important matter. The beef was fairly often found to contain tapeworms. The mutton was well flavoured and tender; the goats’ flesh, on the other hand, was tough and rank. The fat-tailed sheep were much sought after. The fat of a roasted tail, weighing 5 to 7 lb., tasted very much like goose fat, and was frequently used as
a substitute for butter or lard. The game that was shot provided, as a rule, tasty and tender meat, wanting, however, in fat.

(2) Preserved Meat.—Occasionally fresh meat was made, after the example of the Boers, into Biltong (Dauerfleisch), when there happened to be an excess of meat procurable, and time sufficed. This method, which the peculiar dryness and strong sun of the climate favours, is carried out as follows: Strips about as thick as a man’s thumb are cut, preferably from the loins, well rubbed with salt, and dried in the sun. Owing to the evaporation of the water, the meat dries up into a hard mass, which not only keeps for a considerable period, but owing to its small bulk is readily transportable. Biltong can be cooked after it has been roughly grated or soaked in water. That made from game (Springbok, for instance) was particularly palatable and furnished a good meal. This dried meat has the disadvantage that in consequence of the large amount of salt present it is apt to produce thirst, when it is impossible to soak it sufficiently.

As regards the tinned meats procured from manufacturers and imported into the Protectorate, the same may be said as of the medical stores. Those that came from Germany were better than either the English or American supplies. An exception must be made in the case of corned beef. This was, as a rule, more palatable and tender when procured from American than from German sources. The usual complaint made against English preserved foods was that they were too highly spiced. The supplies procured from the Army Preserved Meat Factories were specially good, and unsurpassed by those of any private firm; admirable samples of preserved meats were, however, procured from many German manufacturers. It was found impracticable to have tins containing more than one to three rations. Under South African campaigning conditions, as, for instance, on patrol, tins of larger size were cumbrous to carry on the saddle, and in consequence the food was consumed too rapidly or else thrown away; while if a tin which had once been opened was carried for any distance the contents rapidly went bad. In consequence a rule was made at the end of 1904 that the meat and vegetable portions of the iron ration should be packed as regards 75 per cent. in single, and the remainder in triple ration tins.

Turning now to particular kinds of preserved meat, corned beef and boiled beef were very little appreciated. This resulted from the fact that in the first year of the war these two forms of preserved meat were almost exclusively issued, and in consequence a distaste was formed for them. In addition they lost much of their value, more particularly in the case of the corned beef, on account of the large amount of fascia, &c., that was present. Corned beef, which in a cold climate is excellent even when eaten cold, acquires a very unappetising appearance in a hot climate, owing to the melting of the fat. Later in the war boiled beef was
never, corned beef only rarely, issued. Strongly pickled meats were
objected to on account of their thirst-producing qualities.

Preserved vegetables did not stand transport as well as preserved
meats. The same was the case with preserved sausages, more especially
blood and liver sausages. When packed in single ration tins they were
liked, and were, as a rule, good; in larger tins they usually went bad,
even when packed in formalin gelatine. Brunswick sausages in 1 kilo-
gramme (2.2 lb.) tins were so highly spiced as to be uneatable alone.
Better and more appreciated were ham sausages (Dauerwurst), also bacon
ham, and smoked meat. The latter, however, were rarely sent to the
front, owing to the risk of their going bad in the heat.

Among the English supplies, preserved fish and sardines in oil were
frequently issued instead of fresh meat. The former were mostly packed
in vinegar, and therefore unsuited for use in large quantities; in addition
they were frequently bad. On the other hand, the latter, owing to their
being packed in extremely handy little tins, did good service in the
provisioning of patrols, and were much sought after on account of the
oil in which they were preserved. As a complete substitute for the meat
ration they are not otherwise of much value. All fish packed in vinegar
stood carriage badly; the constant shaking breaks up the soft fish meat
into fragments.

(3) Mixed Preserved Foods.—These were packed up in one or three
portion tins, and were generally liked, but contained too little meat.
In many the vegetables also were scanty, so that the bulk of the contents
was fluid. When a man, instead of his 233 grammes of preserved meat
and 220 grammes of preserved vegetables (the allowance on the restricted
scale), received a tin reputed to contain 400 grammes of mixed preserves,
and found that these consisted of 100 grammes of meat, with a few
particles of vegetables floating in 300 grammes of fluid, it is clear that the
nutritive value of his ration fell considerably below the average. The
scanty allowance of meat was particularly noticeable in the English
preserved foods (Army rations.) Pork in pea soup was found unsatis-
factory, since the large proportion of fat present made it unappetising in
hot weather.

Experiments were made with tins containing a heating arrangement
(spirit or calorit.) The contents were extremely good, and, in the absence
of fuel, these foods might be of good service. They possess, however, the
disadvantage that only one-third of the weight of a tin represents food.
In the tins containing methylated spirit the amount of fuel supplied was
insufficient, while at the same time it evaporated too quickly.

(4) Flour and Bread.—The flour, which for greater convenience con-
sisted of equal parts of rye and wheat flour, was in general of good quality.
It was found better to pack it in tins than in bags, to keep it dry. The
flour which was imported from Cape Colony, the so-called Boer flour
(Burenmehl) was only issued to the troops under stress of circumstances
and was almost entirely reserved for the natives. It readily acquired an unpleasant smell.

The bread supplied to the troops in the various stations was baked either in portable field ovens or in built ovens. To some extent Peyer's portable ovens sent out from home were used.

In the Herero War the larger detachments were accompanied by field bakery columns, consisting of one portable field oven, one store wagon, and one flour cart, which were a success when it was possible to use them. Unfortunately there were great difficulties in the way of getting them along in the field. Occasionally complaints were made that the bread baked in the field bakeries was burnt outside and dough inside, so that the units requisitioned for flour to bake bread themselves. In the Hottentot War only one field bakery column was mobilised, and this remained at Kub. It supplied the detachment at that place, and all parties passing through. As a rule units baked their own bread.

Bread or flour are the two foodstuffs the lack of which is felt most by men on service. This was more particularly the case on this occasion, since it was impossible to make up the deficiency of starchy foods by means of potatoes.

As a substitute for bread, egg biscuits were much liked, and were eaten after soaking in tea or coffee; on the other hand, hard bread and wheaten biscuits were not cared for. Egg biscuits kept better than these, but often contained weevils. Hard bread was frequently rotten, mouldy, and full of weevils, and of such a stony consistence that it could with difficulty be broken up even with the bayonet; it was, in consequence, rarely issued.

(5) Vegetables.—As already stated, owing to the difficulty of transport, it was impossible to issue fresh vegetables except to troops at the ports of entry on the coast or in the immediate vicinity of the railway. At the same time, in view of the danger of scurvy, the necessity of such a supply to troops in the field was obviously a matter of the greatest importance. Fresh potatoes also could only be supplied in the vicinity of the railway. Those shipped in November and March from Germany were better than the supplies from the Cape. In spite of being packed in metal cases, about half the fresh potatoes were lost by decay. Onions were much appreciated as an adjunct to the inferior meat that was received by the troops, and also stood carriage better than any other vegetable. During the Herero War they were issued dry, but later, as far as possible, in the fresh state.

Indigenous vegetables play a great part in the dietary of the natives, and were occasionally made use of. The "tschamas," or wild water melon, prepared as a salad, or the small onion-shaped tuber of the *Cyperus esculentus* (Linn.), the native name for which is "ointjes," when roasted, were occasionally made use of. They could not, however, be depended on to any great extent in the rationing of the force.
Of the dry vegetables rice was the most appreciated, and was always eaten with relish. It was often issued for weeks at a time, and in spite of this, and its comparatively small energy value, it was never tired of. The great advantage of rice is that it leaves behind it a sense of repletion, and even prolonged use does not breed a distaste. It can be rapidly prepared with field cookery to go with any other form of food. For patrols it was indispensable, and took with them the place of bread.

Groats of various kinds, oatmeal, and sago were not much cared for. They did not keep well, and the last named was difficult to prepare. Vermicelli and macaroni were welcomed so long as they were not issued too often; the latter frequently contained maggots. Preserved vegetables, Erbswurst, &c., had the advantage that they were readily prepared; on the other hand, they were apt to produce thirst, and were rather soon tired of.

The leguminous vegetables (Hülserfrüchte) were difficult to cook, unless they were soaked for twenty-four hours beforehand. Even then prolonged boiling was necessary, which entailed a considerable waste of fuel. They were, in consequence, unsuitable for movable columns.

In the same way dried vegetables were objected to as demanding prolonged soaking. Parsnips, celery, leeks, parsley, and other pot herbs (buntes Huhn), were useless in this form, on account of their insipid taste.

Dried potatoes made an excellent substitute for the fresh article, and lent themselves readily to preparation as "chips." They were, however, rarely procurable by the troops in the field.

As regards mixed vegetables, "sauer kraut" was highly appreciated. Packed in kegs it kept badly, but remained good in tins. The English tinned vegetables were highly spoken of.

(6) Fresh and Preserved Fruits.—The same remarks apply to fresh fruits as have already been made with reference to fresh vegetables. All kinds of preserved fruits, such as dried fruit, fruit syrups, jams, mixed fruits of all sorts, were much relished. In spite of the fact that they added considerably to the weight carried, it was thought desirable to issue them as often as possible, to satisfy the desire for fresh vegetables, which were so much missed and so hard to obtain. Dried prunes eaten raw alleviated thirst. Jams made an excellent substitute for butter, in hot weather more especially, and assisted to make the bread more palatable.

In the case of preserved fruits, it was found that packing in large tins (up to 5 kilogrammes—nearly 11 lb.) was a mistake.

(7) Butter and Lard.—A special “fat” issue was of the greatest importance, since except when fat-tailed sheep were killed the troops were not in a position to provide themselves with this article. This was the more necessary, since the ordinary slaughter cattle were poor in fat, and this ingredient was needed for tasty cooking. On these grounds, and also because the high nutritive value of this principle was recognised,
the ration of fat, which had already been raised to 60 grammes, was further increased to 80 grammes. A decided drawback was the packing of butter and lard in large (1 to 2 kilogrammes—2 to 4 lb.) tins. Small patrols were, therefore, forced to go without the fat ration, and larger detachments, owing to the impossibility of carrying opened tins, had to consume their ration in advance. Tinned butter was occasionally found to be rancid, and was less useful than lard in hot weather, since it melted in the heat and acquired an unpleasant appearance, unless special cooling arrangements were feasible. The lard was, as a rule, good, with the exception of the American hog lard ("Snow drift") imported from the Cape. The greater part of this was rancid and unfit for consumption. Examination of the American lard revealed the presence of a considerable proportion of cocoa-butter.

(8) Sugar.—As in the case of fat, the demand for sugar was so great that even the increased ration of 40 grammes was found insufficient. The chief demand for this article was as an adjunct to tea, coffee, and cocoa. Cocoa especially, when unsweetened, was only occasionally of use. The craving for sugar, which frequently manifested itself throughout the campaign, was not entirely on this account, however. Its peculiar digestibility, and the fact that it is completely absorbed, and can be eaten without any preparation, make it a most excellent food in cases of fatigue, hunger, or malnutrition, conditions that are so frequent on service. In addition, sugar, as long as it is protected from damp, keeps indefinitely, and can be carried by the individual soldier in his haversack. (The Japanese in Manchuria relied greatly on a liberal issue of sugar as a protection against severe cold. It was served out raw, and carried by the men in their pockets.—O. H. M.)

(9) Tea and Coffee.—Coffee was much preferred to tea, since it possessed to a considerably greater extent the property of disguising the taste and appearance of bad water. In addition, tea was much more apt to lose its flavour, if badly packed, than coffee. Tea had also the disadvantage that it was difficult to get rid of the leaves, even if it were allowed to stand for some time, and if this were done it became too astringent, which was not the case with the coffee. Not infrequently there was a tendency amongst the men to make the coffee too strong, and it was considered that this led to cardiac trouble. Since 15 grammes (½ ounce) of roasted coffee gives 0·26 grammes of caffeine, the two-thirds ration of 53 grammes unroasted (= 45 grammes roasted) coffee contained 0·78 grammes caffeine, or one-half the daily maximal dose of 1·5 grammes. At the same time it must be mentioned that unground and, to a great extent even unroasted coffee was issued to an inconvenient extent, and the beans were perforce powdered mostly by means of the gun-butt. Under these circumstances it may be imagined that the resulting decoction did not contain nearly so much of the alkaloid as above stated. Nevertheless, the continual daily use of even this smaller dose of caffeine may quite possibly affect the
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heart. The tea ration contained approximately the same amount of caffeine as the coffee ration. (The above remark as to the powdering of coffee is interesting. The French have a very handy coffee-mill, of which one is carried for every thirty men. If coffee is issued it seems a mistake to carry it under circumstances that preclude its proper use. It seems unnecessary to carry an amount which cannot be completely made use of. Better carry a smaller ration and a coffee-mill. Our own ration of tea is one-half, and the coffee one-third of the German ration. It would be interesting to know if the Colonial contingents, notoriously great tea-drinkers, suffered more from cardiac trouble than our own men in South Africa.—C. H. M.)

Frequently roasting machines were supplied to units. It is worth noting that coffee should be issued to patrols ready ground, and in the case of the iron ration in the form, preferably, of tablets, so-called compressed coffee.

(10) **Cocoa.**—This was not much liked by the men, since it does not possess the stimulating effect of tea or coffee. It does not assuage the thirst like these latter, and cannot be carried in the water-bottle. The greatest objection to it, however, was that it could not be drunk unsweetened, and the sugar ration was insufficient to disguise the bitter taste. It was useful when it was necessary to make brackish water drinkable.

(11) **Chocolate.**—Chocolate, which like cocoa was frequently given as a free issue (freiwilige Gabe), was not of much use on the march (although it was eagerly eaten), because of its tendency to produce thirst, and also because in hot weather it was apt to melt in the haversack.

(12) **Milk.**—Condensed sweetened, and to a certain extent also unsweetened, milk was only occasionally issued to the troops at the front. It was much relished as an adjunct to tea, coffee, or cocoa. For use two small holes were made in the lid by means of a punch. These were covered over with paper or closed by wooden plugs.

(13) **Spices.**—The spice ration of 5 grammes of pepper, cloves, or bay leaves, was too large. Half the amount would have been sufficient. On the other hand, there was a distinct demand for other foodstuffs such as cheese, mustard, curry powder, powdered herbs, and meat extract. These would have helped to render the monotonous diet more palatable. The most useful were mustard, anchovy paste, and meat extract in tubes.

(14) **Alcohol.**—The issue of alcoholic liquors constituted an interesting question throughout the campaign. In considering whether such an issue is advisable or necessary we may approach the subject either from the psychological or the hygienic aspect. In the first place a complete deprivation of alcohol is unnecessary, while the loss of an article of diet to which the men are so accustomed and which they appreciate so much might be followed by unpleasant consequences. Taking the psychological point of view there is no doubt that alcohol has
a beneficial effect on the temperament, and enables a man to face the various inconveniences of field service, monotony, privation, fatigue, discomfort, and other depressing influences, besides putting heart into him, an effect that was frequently shown in South-West Africa. Finally, it is impossible to deny that a complete deprivation of alcohol tends to lead the men into taking every opportunity of obtaining it from the retail dealers, in a form that would undoubtedly be costly and might often be noxious. The rational function of alcohol as a means of warding off the possibly harmful effects of climate and other baneful surroundings lies in its heat-producing powers. The quality that alcohol possesses of producing a feeling of warmth, although this consists largely in a dilatation of the cutaneous vessels, and may be followed by a reactionary increased heat-loss, was invaluable in helping the troops to face unsheltered the bitter cold of the nights during the dry season. (This reactionary cooling effect is always made great use of as an objection to the issue of alcohol. Knowing as we do the great effect that clothing has in preventing the escape of heat on the march, it is obvious that it must have a similar effect on a man whose body temperature is raised by alcohol. A man well buttoned up in a great coat does not suffer much direct loss of heat by radiation from dilated cutaneous vessels, whether the cause of the dilatation be exercise or alcohol. The argument usually put forward in this connection presupposes a state of nudity.—O. H. M.) Here, too, the sleep-producing effect of alcohol was of benefit, since other drinks like tea and coffee, though they may produce an equal amount of warmth, when drunk hot, rather tend to prevent sleep. The warming effect of alcohol was especially of value under conditions when owing to the proximity of the enemy it was impossible to light fires.

It was in addition advisable to provide the men with some means of disguising the taste of bad water, when tea or coffee were not available. The peculiar qualities of alcohol were seen to the best advantage in the Herero War, about the middle of 1904. The troops were exposed to all the discomforts of a prolonged bivouac with insufficient shelter, in extreme cold weather, with scanty food and hard work. Their power of resisting disease was much lowered and dysentery and typhoid fever were prevalent and increasing. An increase in the issue of alcohol was most beneficial. In this connection it must not be forgotten that alcohol in a certain sense is a true food, and as such has under conditions of scanty nourishment a definite place to fill. It has a right to be considered as a foodstuff on account of the rapidity with which it can be oxidised, and it can thus act as a "sparer" of fats and carbohydrates. A certain proportion of the alcohol consumed escapes by the breath and urine unoxidised (the proportion unutilised varies with different observers—Bins says 3 per cent., Strassmann, 10 per cent.). If we take the ordinary ration of rum 100 cc. and allow 6 per cent. for waste we shall get about 42 grammes of alcohol, the combustion of which will produce about 300 Calories,
1 gramme of alcohol producing 7 Calories, and save in this way the combustion of 33 grammes fat, or 81 grammes carbohydrate. Even these small amounts may become of importance when rations are being cut rather fine.

The value of alcohol as a condiment must also not be overlooked. It was of great use in this direction in view of the monotony of the field diet, and the prevalence of dyspepsia. It also came in useful as a substitute for leaven, yeast, or baking powder, and in the cooking of fresh meat.

It must not be forgotten that the good effects of alcohol depend very largely on the degree of concentration. Unfortunately for long periods the ration had to be issued in a concentrated form, rum, arrack, or cognac, on account of their greater portability. To get the best effects out of alcohol and to avoid its dangers it is necessary to choose carefully the time of issue. This should never be during the heat of the day, or before severe exertions. Large quantities also should not be issued at a time. The experiences of the campaign have now taught us that in spite of the advantages that alcohol possesses, some of which are undoubted, though others are not universally accepted as proved, it also has serious disadvantages, which must be taken into consideration. So great are these that it is a serious question whether alcohol is not only not indispensable, but even whether it is beneficial under conditions such as obtained in South-West Africa. The chief difficulty lay in avoiding the misuse of alcohol the result of want of self-control, and the consequent production of poisonous effects. For this reason the opinions held on this subject altered considerably during the course of the war.

In the first place the ration of spirits (100 cc. = 3½ ounces of rum, cognac or arrack) was too high. In addition to the good effects produced, which have already been mentioned, others resulted which were by no means satisfactory, especially on field service. These showed themselves partly in an uncontrollable drowsiness, partly in a tendency to quarrel, and contradict, slackness or refusal to obey orders, occasionally also by violence, more especially when the quality of the liquor was at all in doubt. One fact came out very clearly, and that was, that in addition to those men who possess an inherited or acquired intolerance of alcohol, the conditions of service in South Africa, over-exertion, under-feeding, loss of sleep, hunger and thirst, intestinal and stomachic disorders, and exposure to the sun, all worked together to produce in otherwise healthy men a distinct susceptibility and want of power of resistance to alcohol. The original order by which a weekly issue of 700 cc. (22½ ounces) was made exaggerated the evils of the ration. The possession of such a large amount of spirit led to a considerable number of cases of aggravated drunkenness and violence. The results as regards discipline and efficiency were very bad. Although the mistake involved in the weekly issue was quickly recognised, and the daily ration as far as possible made
the rule, still many conditions, such as the splitting of detachments into smaller parties, and the consequent loss of uniformity of custom, and want of supervision, threw difficulties in the way. Even with the daily issue there were many disadvantages. Individual men purchased the rations of others and thus got the opportunity for transgression. The observation was frequently made that men who previously never touched alcohol, or only to a moderate extent, acquired the drink habit as a result of the daily issue. Whereas the issue of a spirit ration, daily, was still considered a necessity in the cold weather, the opinion gained ground during the campaign that in the hot weather, red wine or some non-alcoholic beverage would be more suitable. The improved health of the men also led to a consideration of the advisability of abandoning or altering the spirit ration. In consequence an issue of 200 cc. of red wine, or 50 cc. of fruit or lime juice, was sanctioned in lieu of the daily rum ration. The difficulty of transport rendered these rules useless except as regards troops near the railway. In the southern area it was possible to procure Cape wines, usually red wines, from English territory. From the beginning of 1906 fruit juice was available everywhere.

Rum, Arrack, and Cognac.—Of the different forms of spirit, rum was preferred, though frequent complaints were made by the troops of its inferior quality. This was more especially the case with a particular brand, issued mostly in 1904, called “Niggertod.” It had a bad taste and smell, contained a large amount of fusel oil, and was unwholesome. The “Cape Top” (sic—? Dop) imported from English territory was also of poor quality. Rum was consumed either raw, or with water, tea, or coffee, or in the form of punch. It was also utilised in baking bread and cooking meat. Arrack was less favoured than rum, and cognac less still.

Cape Wine, Port Wine, Sherry, &c.—None of these played an important part in the provisioning of the force.

Red Wine.—This was as a rule of good quality, and was much liked as a beverage in cases of digestive trouble. In cold weather it was much appreciated when mulled.

Beer.—This was almost entirely bottled beer, of many kinds, and of unequal quality. The experiment of importing beer in barrels from the Cape failed, as it rapidly went bad. Beer was drunk chiefly by troops on the lines of communication and preferred by them to all other beverages. It was much appreciated on the few occasions when it was issued to troops in the field.

(15) Fruit Juice.—The German jams were better than the English, but not always free from adulteration.

Tobacco.—Tobacco was much sought after. It was valued chiefly for its power of allaying hunger and thirst. For many men it formed an absolutely indispensable issue, which they felt the loss of more than the loss of food or drink. In the absence of tobacco, tea-leaves, coffee grounds, or grass, were used as substitutes. The tobacco was chiefly in
the form of sticks, which on account of their convenient shape, and the fact that they were unaffected by heat or drought, were extremely useful under campaigning conditions and highly appreciated. These sticks came mostly from English firms, and were highly flavoured with aromatic substances. The tobacco was very strong and continued use led to digestive and cardiac trouble. Many attempts were made with a view to correcting its unwholesome qualities, by means of boiling and subsequent drying. More than once the opinion was advanced that these sticks contained, in addition to their high percentage of nicotine, other narcotic substances. A chemical research made on this point in the Hygiene Laboratory of the 9th Army Corps, in which several samples of stick tobacco from different German firms were examined, revealed the fact that no other leaves but those of tobacco were present. The nicotine content of the darker sticks varied from 2:62 to 3:25 per cent., that of the lighter ones from 2:14 to 2:64 per cent. In neither the lighter nor the darker was any trace of other alkaloids (morphia, narkotin, codeia, &c.), or of caffein, metals, or salicylic acid found.

The researches of Lehmann show that nicotine is the most important and practically the only poisonous body that need be considered in the case of tobacco. When a pipe is smoked practically all the smoke goes into the smoker's mouth, and the poisonous effects observed after prolonged use of stick tobacco must be connected with the high nicotine content proved to exist by chemical examination.

A better class of cut tobacco was often asked for.

Cigars were plentiful and much liked. They were available in a limited area only, since unless packed in tins, or cigar cases, they are readily dried up and broken to dust.

Cooking and Preparation of Food in the Field.—At fixed posts slaughter-houses, bakeries and kitchens were established under proper supervision. In the field numerous difficulties were met with.

Most of the new arrivals only possessed the very slight knowledge of cooking which they had picked up during peace training. On taking the field they were obliged to do their own cooking under circumstances of great difficulty. The raw material supplied was of different quality to that which they had been accustomed to, cooking utensils were few, water and fuel were scarce, and everyone had to learn afresh how to cook his own food; the majority succeeded in doing so.

The men preferred to form "cooking groups" of from 2 to 4 in each; by dividing the work incidental to cooking, better and quicker results were obtained.

The German cavalry mess-tin "a/A" was mostly employed, and found to be more satisfactory than the English pattern. It was used for carrying the uncooked ration and was suitable for boiling, roasting, baking, and especially for baking bread. Very little fuel was required, as it could be placed on two stones over a small fire.
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Cooking in camp kettles was not always possible, as these had to be carried on the baggage wagons and were frequently not available when meals had to be prepared. They also required a large fire, for which the fuel was not always obtainable, and moreover meals could be prepared in a shorter time by using the mess-tins.

Mincing Machines.—In the field mincing machines proved of the greatest value in preparing food. The pattern which was most generally supplied weighed 25 lb.; its full working capacity was 132 lb. per hour. Its great advantage was that freshly killed meat which was stringy and tough could with little labour and no waiting be made palatable and easily digested even by men with bad teeth; also it enabled the men to prepare fresh blood, liver, or meat sausages, to crush lentils and peas, and so obviate the necessity of prolonged soaking before cooking. Meat when minced could be more easily cooked than when merely cut up, a great advantage when fuel was scarce.

There were several objections to the use of mincing machines; thus a company of 100 men equipped with two machines in good working condition, required twenty-five minutes to mince their ration of 110 lb. of meat, in addition to the time required for cutting up the meat, while owing to the weight of the machines the number could not be increased; as they had to be carried on ox wagons they were frequently not to hand just when required. The machines often became damaged and could not be repaired; owing to the toughness of the meat the knives soon became blunt, which in turn reduced the rate of output.

In the field the meat ration was usually obtained from freshly slaughtered cattle. These were in poor condition and often overdriven. At the higher altitudes the temperature at which water boiled was lowered by as much as 18° F., which also interfered with the proper cooking of the meat. To improve its flavour and tenderness rum was added, or in some cases bicarbonate of soda. Sometimes the meat was first boiled to furnish soup, and then roasted to make it more tender. Another plan successfully employed to make the meat tender was to bring the contents of a mess tin to the boil, and then put on the lid and cover the whole with glowing ashes and earth, thus making an improvised "steamer," in which the toughest meat became tender and palatable in one and a half hours. When time permitted a somewhat similar plan was adopted; the mess tin was filled with cut-up meat and spices, the lid put on, and the whole covered over with glowing ashes and earth for four hours; this method was specially employed at night, the contents being eaten next day.

When halts were very short the meat was cooked by toasting it over the fire on the end of two cleaning rods joined together, or of a long stick; the resulting steak was juicy but very tough and somewhat difficult to masticate. "Hottentot-beef" was prepared by cutting the meat into steaks and laying it in the glowing ashes for ten to thirty minutes; although very unappetizing in appearance, and having a strong burnt
flavour, it was nevertheless a popular form of cooking it. In many cases
the meat was eaten raw, and not uncommonly this practice was followed
by the appearance of tapeworms.

Baking of Bread.—The troops on columns mostly had to bake their
own bread, and to learn how to do this by experience. The preparation
of the dough or "sponge" gave rise to the greatest difficulty, as dried
yeast or baking powder was frequently unobtainable. When time per­
mitted a sour dough was first prepared by making a paste with a little
sugar, stale bread, flour and water, or even plain flour and water, and
standing this in the sun for two to three hours; this sour dough was then
worked up with the rest of the flour, kneaded on the canvas of a tent, and
placed in the sun or near the fire to rise. In order to save time on other
occasions, the men tried to save a portion of the sour dough.

When pressed for time a little rum or vinegar was used in place of the
sour dough, but the resulting bread was heavy.

A mixture of rye and wheaten flour was preferred to pure rye flour, as
it made a lighter bread.

The "sponge" was baked in mess-tins, baking-pans, or the lid of
a mess-tin, the inner surface being first smeared with fat. The baking
was done by placing the lid of the mess-tin on the glowing embers for
twenty minutes, or by placing the covered mess-tin containing the dough
in a hollow surrounded by glowing embers and hot ashes for one and
a half to two hours. When the force remained stationary for any time,
field ovens were built of mud bricks, or the interior of an ant-heap was
adapted for the purpose.

The addition of crushed ration egg biscuit improved the flavour of the
bread. The troops became so expert in baking that they preferred bread
baked by themselves to that prepared in the field bakeries.

Water.—Throughout the colony water was scarce, partly on account
of the great depth of the subsoil water and absence of permanent streams,
and partly because the rainfall took the form of sudden heavy down­
pours. The usual source of supply was from deep wells, many of these
60 to 90 ft. in depth, with a variable and uncertain yield; in other cases
water was obtained from pools or "vleys," frequently, however, they were
brackish and unfit for drinking. All the well-known sources of water
were highly contaminated by natives and animals, and not uncommonly
the corpses of drowned animals had to be picked out of the water.

Purification of Water.—The troops were liberally supplied with
Berke­
feld filters, but they were not found to be satisfactory. The muddy water
speedily choked the candles, and with the rough usage in the field
fractures were constantly occurring, consequently no reliance was placed
on the quality of the filtered water, and it was boiled before use.

Portable Water Sterilisers. — The Rietschel-Henneberg apparatus,
designed to sterilise water on the "heat exchange" principle after pre­
liminary filtration was tried in two forms, one for pack transport and the
other on wheels. Both patterns were found to be too heavy for the transport available with the field force; they were also complicated and liable to get out of order, and required two specially trained men to supervise them. The wheeled pattern was successfully employed on stationary posts. Kade’s apparatus was even less satisfactory.

Use of Alum.—The most satisfactory plan was found to be boiling, followed by precipitation with alum when time permitted this to be carried out. Boiling alone was carried out when practicable; want of fuel and time for cooling sometimes prevented this being done, in which case the men made tea or coffee.

During some of the expeditions water transport columns accompanied the troops, water being carried in barrels, zinc-lined boxes, or any available receptacle. On one occasion, in order to cross a stretch of 125 miles of waterless country, a camel corps was organised for water carriage.

Conservancy arrangements were frequently difficult to carry out owing to the rocky nature of the ground and the scarcity of labour, while the lack of fuel at most of the posts prevented the use of incineration. Various disinfectants, but principally quicklime, were freely used to render the shallow trenches as harmless as possible, and to prevent flies from breeding in them.

General Sanitary Precautions.—On the way out instruction was given to the men on all points concerning the maintenance of their health. At fixed posts a sanitary commission was formed to supervise the sanitation of the station.

(4) Work of Individual Medical Units.—As the campaign progressed, stationary hospitals, native hospitals, and non-dieted hospitals, were gradually organized on the lines of communication, while bacteriological and chemical laboratories were provided at each base.

(5) Transport of Sick and Wounded by Land.—The usual difficulties of conveying patients in a sparsely inhabited country were experienced in full measure. Wheeled transport frequently could not be taken owing to absence of roads, and helpless patients had to be carried by hand for hours over sandy deserts. An interesting description is given of passing a sick convoy by hand across the Orange River, the men having to work for eight hours on end, standing up to their waists in the stream.

(6) Transport Home by Sea.—Elaborate precautions were taken to prevent the introduction of disease into Germany. All men who had suffered from typhoid or dysentery were bacteriologically examined before embarking. A total of 1,944 convalescents from typhoid fever were bacteriologically examined, 57 (= 2.93 per cent.) were found to be carriers. These were treated with calomel and urotropine; the latter drug was found efficacious in banishing the bacilli from the urine.

Among 476 convalescents from dysentery only 3 (= 0.72 per cent.) carriers were found.
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Known carriers were sent home under special precautions to prevent the spread of disease on board ship or after arrival at home.

(7) Voluntary Aid Societies.—The Red Cross Society furnished 92 hospital attendants, while the Frauen-verein für Krankenpflege in den Kolonien sent 31 war reserve sisters. Some of these, in addition to nursing, undertook letter writing for the sick, others superintended the cooking and washing in hospitals, and thus added very materially to the comfort of the sick. The Red Cross Society, in addition to collecting and forwarding gifts for the sick and troops generally, spent some £40,000 in small comforts.

Of the appendices, 2 (A) gives a very full set of hygienic rules as to living on board the troopship, and after arrival in the Colony.

2 (b) is an advice leaflet on typhoid fever.

6 (a) gives the standing orders for the army medical services during the expedition.

6 (b) contains a list of questions on medical and surgical experience, which every medical officer had to fill up before leaving the colony.

Appendices 7 to 18 deal with contents of medical and surgical chests and equipment.

19 details the clothing and equipment of a mounted man of the colonial force.

20 gives a tabular list of water analyses.

22 contains instructions for the guidance of medical officers examining men on their return from South Africa.

This portion of the report is very complete, and contains a mass of information. The experiences of the German expeditionary force were on the whole similar to those which our forces have met with in various colonial wars. No report of any British expedition deals so minutely with the medical problems to be solved under similar conditions. As a work of reference this report will be invaluable for many years to come.

APPENDIX 2a.
RULES FOR THE PRESERVATION OF HEALTH DURING CAMPAIGNS OUTSIDE EUROPE.

(A) On Board Ship.

(1) Want of cleanliness either of the person or clothing may, owing to the necessarily restricted space on board ship, be a cause of sickness.

(2) Daily washing of the whole body with soap should be carried out, followed by careful drying. Washing must only be done in the appointed lavatories.

(3) Special attention should be paid to the cleanliness of the mouth and the teeth should be brushed after each meal, and before going to sleep each night.
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(4) Spitting on deck or other dirty habit is strictly forbidden.
(5) After washing the decks they must be carefully dried.
(6) Troops must only use the proper latrines assigned to them, and be careful not to make any unnecessary mess.
(7) The ventilators must be opened and closed strictly in accordance with the instructions issued.
(8) The feet must be attended to just as much on board ship as on land. Any tendency to excessive perspiration of the feet must be reported to the medical officer for treatment.
(9) Clothing must be worn to suit the prevailing temperature; underclothing should always be worn in very warm latitudes; during hot weather it is wiser to reduce clothing by leaving off outer clothing rather than underclothing. Sleeping on deck may be permitted in special circumstances, troops doing so must bring up their mattresses and wear underclothing as well as a kummerbund. Blankets must be taken on deck and kept handy, but need not be used unless the man wishes. The railings will be protected by canvas to prevent any sleeper from falling overboard; special sentries must also be posted.
(10) Owing to the cramped conditions of life on board ship men will be regularly exercised by means of games, or drills.
(11) Any illness of any kind must be reported to the medical officer at once. By concealing disease on board ship, comrades are much more liable to be infected than on land. This applies especially to bowel complaints and venereal diseases.
(12) When in any harbour the troops are not to have any communication with the native population, and especially not to use any of their eating or drinking utensils. Over-ripe fruit must not be eaten. In countries abroad there is considerable danger from mad dogs; any man sent ashore will, therefore, not go near or pet any dog.
(13) The drinking of strong spirits weakens the body and makes it more liable to infection and must, therefore, not be indulged in. Any alcoholic drink must be taken in small quantities only. Coffee or tea is much preferable as a drink. Lemonade is advised.
(14) Most men not accustomed to sea-travelling must expect to be sea-sick. In this case they should remain in the fresh air on the upper deck, and as near the middle of the ship as possible; they should not look at the deck or at any moving part of the ship, but instead fix their gaze on the horizon. Small quantities of easily digested and stimulating food should be taken frequently.

(B) On Arrival in Foreign Countries.

The different conditions prevailing abroad make the soldier much more liable to illness; he must, therefore, pay special attention to the following points in order to retain his health.
(a) Climate.

(1) Great heat accompanied by moisture has a very relaxing effect on the body. During the heat of the day one should, if possible, rest.

(2) If obliged to undertake severe bodily exertion in a hot, moist climate, heatstroke may result. The symptoms are as follows: Excessive perspiration, the skin then becomes dry, the face red, respiration and pulse become hurried, the temperature rises, there is singing in the ears, the man begins to feel dizzy and finally falls. These cases must be reported to the medical officer immediately; in the meantime, the following points should be attended to: The clothing should be opened up, the man placed in the shade with his head slightly raised, the body should be sprinkled with water and fanned. Should breathing cease, artificial respiration should be begun. Should the man fall asleep, he must be carefully watched, paying special attention to the breathing. By attention to diet, and avoidance of all excesses, the liability to heatstroke is considerably diminished.

(3) If the uncovered head is exposed to the sun, sunstroke will probably ensue; the sun's rays falling on the bare skin will cause a mild burn.

(4) The sharp changes of temperature following sunset are very liable to cause a chill; hence it is important to wear a kummerbund, at least, during the night.

(b) Food and Clothing.

(1) A properly regulated diet is imperative if health is to be maintained. Even during sultry weather, when the appetite is poor, it is highly important that men should not neglect to take a fair amount of food, but fatty articles should be avoided.

(2) In hot countries every kind of excess is to be avoided, and especially strong alcoholic drinks, as these render a man more susceptible to disease.

(3) A suitable selection of articles of diet will be arranged by those in superior authority.

(4) The quality of articles of diet must be carefully watched. Meat or fish which has to be kept must be stored in a place with free access of air.

(5) Articles of food must be properly cooked; this applies to milk, fruit and vegetables. Fish or meat which has become tainted is not to be made use of.

(6) Food left over at any meal is to be thrown away.

(7) Particular attention must be paid to the quality of the water for cooking, drinking and washing. Should this be of doubtful quality it must first be boiled or filtered; the addition of spirits is no safeguard. Muddy water may be clarified by the addition of alum (a handful to sixty gallons) and allowing it to stand. It must be boiled before use. As
boiled water loses its flavour it is preferable to prepare tea or coffee with it.

(8) Men are advised to drink slowly and only in small quantities at a time.

(9) Clothing should be regulated to suit the prevailing temperature.

(10) Underclothing should always be worn during hot weather, the jacket may be left off, but the underclothing should be retained.

(11) Clothing which has become damp by perspiration or otherwise should be changed at the earliest opportunity; in doing so men must be careful not to stand in a draught.

(12) The damp clothing should be hung up to dry; after drying it should be thoroughly shaken or beaten.

(c) Care of the Body.

(1) Physical fitness may be much improved by careful attention to cleanliness of the body.

(2) Cold douches improve the tone of the skin, but must not be indulged in when a man is hot and sweating.

(3) Bathing may only be carried out at appointed places.

(4) The hands are to be washed with soap, more especially after going to the latrine and before eating.

(5) The care of the feet is most important in a hot climate; excessive perspiration requires medical treatment.

(6) Cleanliness of camping grounds is just as important as cleanliness of the body; excrement, urine and filth of all sorts must be removed to the appointed place for destruction.

(d) The more important Diseases.

(1) The following are the most important infectious diseases: Dysentery, typhoid, cholera, yellow fever, plague, malaria, syphilis and gonorrhoea.

(2) These diseases may be acquired in several ways, by direct contact with a sick person, by water and food or by insects, and some of them may easily become epidemic; it is, therefore, important that the very earliest cases should be detected.

(3) Any man suffering from diarrhoea, fever, glandular swelling, pains in his bones, or general feeling of illness must report sick at once.

(4) The above diseases may be largely avoided by attention to the preceding instructions.

(5) The three diseases, typhoid, dysentery and cholera, are most usually acquired by water or food, and also by direct contact with the sick.

(6) Plague may be contracted by breathing the germs coughed up in lung cases, or may be carried by biting insects. The presence of many dead rats must be reported; dead rats, if found, are not to be touched with the bare hands.
Malaria is especially common in hot countries; the germ is carried by mosquitoes, which appear in great numbers after sunset; for camping grounds, an open space should be chosen, at a distance from any undergrowth or swamps, and especially not to leeward of these.

If possible men should not sleep on the bare ground, but should endeavour to obtain some waterproof material or some clean straw to lie on.

Windows of houses should be shut at sunset, unless they have been made mosquito-proof. Lights in a house attract mosquitoes. Camps should not be made near native villages, as these are always sources of infection.

Quinine is the remedy for malaria; malaria appears in the form of a short, sharp attack of fever; any man suffering in this way will report sick at once. In malarious regions the regular administration of quinine will prevent the appearance of malaria.

Men are most earnestly warned that in countries out of Europe syphilis is nearly always an extremely severe or even fatal disease.

In many foreign countries men are liable to suffer from intestinal worms; to avoid these one should never eat uncooked meat or drink unboiled water.

As a safeguard against the bites of poisonous snakes, when moving about in thick undergrowth men are recommended to strike the bushes and to rap on the ground.

APPENDIX 2B.

NOTES ON TYPHOID FEVER FOR THE INSTRUCTION OF THE TROOPS.
(Prepared in the Imperial Health Office.)

(1) Nature of the Disease.—Typhoid fever is an infectious disease caused by the typhoid bacillus; many ill-defined cases of fever are really mild typhoid.

(2) Course of the Disease.—The illness begins gradually with headache, loss of appetite, and general feeling of being out of sorts. Soon after this the man begins to feel feverish and inclined to take to his bed. At the same time diarrhoea with light yellow stools begins; fever increases day by day during the first week of illness. The patient suffers a good deal from thirst, his tongue becomes coated, the lips dry, and sleep is disturbed. Fever remains high during the second week, and the patient becomes weaker and possibly delirious. At this time small rose-coloured spots may appear on his body. There is generally a little congestion of the lungs. About the third week fever begins to fall gradually, and in favourable cases has ceased by the fourth week, but at least another month is necessary for convalescence. In unfavourable cases the fever remains high, the patient becomes weaker and restless, and may die in the fourth or fifth week. The death-rate is from 5 to 15 per cent. Very mild cases may also occur.
(3) Treatment of the Disease.—Men attacked in the above way must report sick at the earliest opportunity. As the disease affects the intestines, the question of diet is of the greatest importance, and only such articles as are ordered by the doctor may be taken. Indulgence in other articles may produce bleeding from the bowel, tearing of the bowel, and even death. This danger is greatest during the period of convalescence, when the patient suffers intensely from hunger. The patient requires careful nursing in order to escape the formation of bedsores. The chances of recovery depend largely on careful nursing.

(4) Mode of Infection.—Germs of typhoid fever are contained in the stools, urine, and expectoration of the typhoid fever patient; a minute quantity is sufficient to cause the disease. If a drop of excretion from the typhoid fever patient happens to soil a healthy man’s underclothing, bedding, or gets into his eating and drinking vessels, or into milk, fruit or salad, it may easily be swallowed by the man. Washing out drinking utensils in water contaminated with the typhoid germ may also cause the disease. Flies may carry the germs. Soldiers attending to typhoid patients may become infected by contact. On the other hand, if the infection gets into general food supplies or drinking water, it may give rise to an epidemic affecting hundreds of men.

(5) Isolation of the Sick.—A typhoid case must not be nursed at home, owing to the danger of infecting others. A typhoid patient should be sent to hospital as soon as possible. Should no hospital be available, then the patient must be placed in a separate room, and no unnecessary persons allowed to approach him. Anyone touching a typhoid patient or his bedding must immediately wash his hands in some disinfectant. The room should be furnished as simply as possible, and the floor should be wiped daily with a damp cloth. Articles of food or drink should never be partaken of in a room in which there is a typhoid patient.

(6) Nursing Personnel.—Men employed in nursing typhoid patients should wear a washable overall; after touching the patient or any of his excretions, the hands must be washed and disinfected in cresol. In washing a patient they must be careful not to splash the water about. They are especially cautioned never to take any food which has been left in the sick-room, or to sit down to any meal without disinfecting their hands.

(7) Disposal of Stools and Urine.—Typhoid patients must not be allowed to use a latrine. Their stools, urine, or any vomited matter must be collected in vessels which can be easily cleaned and disinfected. Before emptying any vessel the contents must be disinfected with quicklime, chloride of lime, or cresol, as laid down. Should no disinfectants be available, stools must be buried as far away from buildings and water supplies as possible, taking great care not to soil the ground. Any cloths used for cleaning utensils must be soaked for at least one hour in cresol or boiled before being sent to the wash. For cleaning the patient’s mouth, nose, &c., it is wisest to use small pieces of lint which can be burnt immediately.
afterwards. It may be noted that men who have recovered from typhoid fever may remain possible centres of infection for a long time; their excretions must be dealt with in the same way as that of a patient until a medical officer says it is no longer necessary.

(8) Care of Bed-linen, Clothing, and Utensils.—Bedding and personal clothing are to be soaked in cresol for one hour or boiled before being sent to the wash. Articles of clothing belonging to patients which cannot be washed are to be disinfected by steam, or if this is impossible well brushed over with dilute cresol solution. Utensils used by patients must be scrupulously cleaned with hot soda solution before being used by healthy men.

(9) Disinfection of the Dwelling.—Any soiling of the floor in the patient's room is to be covered with dilute cresol solution and left for an hour before being wiped up. After removal of the patient, the room and its contents will be thoroughly disinfected under the direction of a medical officer.

(10) Food Supplies.—The preparation, storing, or sale of articles of food in or near the room in which typhoid patients are cannot be permitted under any circumstances. During typhoid epidemics men are strongly recommended not to partake of water which has not been boiled, or of milk, fruit, or vegetables which have not been previously cooked.

(11) Conveyance of Typhoid Patients.—Typhoid patients should, if possible, be conveyed in ambulance wagons. It is not permissible to use public vehicles, trams, cabs, &c., for this purpose; should these unavoidably be made use of, the vehicle must be thoroughly disinfected. Infection may possibly be conveyed by means of the corpse of a patient dying of typhoid fever; the body should therefore be placed in a mortuary at the earliest opportunity.

Notes on Disinfection.

(1) Dilute Cresol Solution.—To prepare dilute cresol solution one part of the ordinary cresol which can be purchased in any chemist shop is mixed with 19 parts of water (that is, 4 tablespoonfuls to a litre of water). To disinfect vomited matter, stools, or urine, add an equal quantity of dilute cresol solution, thoroughly mix, and allow it to stand for one hour.

(2) Milk of Lime.—To prepare this, take one part of freshly burnt lime, well broken up, with 4 parts by measure of water, and mix them in the following way: Place the lime in a large vessel and add three-quarters of its bulk of water, stirring it continually. When the lime has taken up the water the remainder of the water is to be added and well stirred. If the milk of lime is not used at once it is to be kept in a closed vessel and well stirred up before use. As a disinfectant an equal bulk of milk of lime will be added to the contents of the receptacle and allowed to stand for one hour.

(3) Chloride of Lime.—Chloride of lime is only effective when freshly prepared, and must be stored in closed vessels; when in good condition
it emits a strong smell of chlorine. For use as a disinfectant two heaped-up tablepoonsfuls are to be added to each pint of fluid to be disinfected, and well mixed by stirring with a stick; after twenty minutes, disinfection is complete. For disinfection of bath water four heaped-up tablepoonsfuls of chloride of lime are to be stirred into the bath and allowed to stand for half an hour.

APPENDIX 6A.

MEDICAL STANDING ORDERS DURING THE CAMPAIGN:

(1) Administration of the Medical Service.—The medical service in South-West Africa will be administered according to Army Medical Regulations, except as otherwise directed in these orders.

(2) Control.—The whole military medical service will be controlled by the D.M.S., who will replace the former S.M.O. The Director of Medical Services is immediately subordinate to the general officer commanding the forces; he is the commanding officer of the whole official and medical personnel of hospitals, with the attributes of an Administrative Medical Officer of an army corps. In matters affecting the honour of a medical officer he has the same authority as an A.M.O. of a division or army corps. His office will be called "the Sanitätsamt," and is the headquarters for all medical and sanitary work in connection with the troops. The naval medical personnel will also be placed under his command.

(3) Director of Field Hospitals.—The Director of Field Hospitals will, in the absence of the D.M.S., act as his deputy. He is subordinate to the Inspector-General of Lines of Communication and D.M.S. of the forces. He is responsible for the construction of stationary hospitals, and will, if possible, supervise this work in person; he is responsible for the distribution of sick, and under instructions from the Inspector-General of Lines of Communication he will inspect the stationary hospitals on the lines of communication and be responsible for the sanitation in this area. He is not to be employed otherwise except under orders of the Inspector-General of Lines of Communication with the concurrence of the D.M.S.

(4) Hospitals on Lines of Communication.—Hospitals in existence before June 1st, 1904, will be classed as hospitals Lines of Communication, and will be under the command of the Inspector-General of Lines of Communication and the Field Hospital Director. The convalescent home in Abbabis will be classed as a hospital Lines of Communication.

(5) Field Hospitals.—Field hospitals will be numbered consecutively and will retain their number even in the event of their becoming stationary
hospitals. They are under the command of the General Officer Commanding and the D.M.S. They will be employed as detailed by the General Officer Commanding on the advice of the D.M.S.

(6) When established as stationary hospitals the field hospitals will come under the control of the Inspector-General of Lines of Communication and Field Hospital Director.

(7) Non-dieted Hospitals at Fixed Posts.—Non-dieted hospitals will be established where required. They will be under the charge of a medical officer with medical personnel, and will be under the command of the local commander. They may be established by any unit of the force, or by the Field Hospital Director, but this fact must be notified immediately to the Inspector-General of Lines of Communication and D.M.S. They will be withdrawn by order of the Inspector-General of Lines of Communication on the recommendation of the Field Hospital Director, and the fact reported to the D.M.S.

(8) Chief Medical Officers.—Each hospital will be controlled by a Chief Medical Officer, who will have the disciplinary powers of a company commander over the whole personnel, including patients, but not sick officers. The Chief Medical Officer of hospitals on the Lines of Communication will be subordinate to the local commandant, with the exception that should the commandant be junior in rank to the chief surgeon, then the local commandant shall not exercise any disciplinary control over the Chief Medical Officer.

(9) Interior Economy of Hospitals.—The interior economy of hospitals will be arranged by the D.M.S., if possible, in consultation with the supply officer. Hospitals will communicate directly with the D.M.S.’s office and the Supply office. The interior economy after July 1st, 1904, will be carried out in accordance with the medical regulations. Should local conditions render it necessary to make any modifications, it will be notified in the monthly report to the D.M.S.

(10) The medical reserve depots will furnish hospitals and troops with medical supplies; requisitions will always be sent to the nearest hospital direct.

(11) Staff-Surgeons.—In Swakopmund, Karabib, and Okahandja, staff-surgeons will be appointed. They will be responsible for the hygienic condition of camps and quarters occupied by the troops and civil population in their stations. They will also undertake the treatment of all the military personnel not in hospital, except those belonging to regular units to which a medical officer has been attached, as also any civilian employees entitled to free treatment. They will also treat the natives living in their station. They are directly subordinate to the local commandant and Field Hospital Director, provided the commandant is of senior rank.

(12) Medical Service on the Railway.—The railway line will be divided into four sections, to each of which a medical officer will be appointed.
These medical officers are to supervise the supply of drinking water and the latrines, and to treat any military personnel or natives employed on the line; they are also directed to be on the alert for native women suffering from venereal disease, and arrange for their treatment.

(13) Medical Personnel and Equipment with the Troops.—Medical officers and subordinates are detailed to each unit. In the event of any of these becoming disabled, the fact is to be reported to headquarters, which will arrange for his relief. The equipment for the troops has been fixed on a special scale. In addition, filters and mobile water sterilisers have been supplied and are always to be made use of.

(14) Health of the Troops.—It is strictly forbidden to drink unboiled water. Filters must always be used, but can only be relied on to clarify water, and it is essential that the filtered water be boiled before use. If possible washing water is also to be boiled. The disease most to be feared is enteric fever, and medical officers must make a point of instructing the men and doing all in their power to prevent its occurrence.

(15) Transport of Sick and Wounded.—Sick and wounded will, as far as possible, be conveyed in ambulance wagons and not in supply wagons. They are to be provided with their own blankets, and, if necessary, with hospital blankets as well; a transfer certificate is to accompany each patient. If possible, some of the medical personnel will be entailed to accompany the convoy.

(16) Selection of Men for the Campaign.—No one is to be enrolled in the forces who has not been medically examined and found fit for tropical service.

(17) Discharge from the Force.—Men who become unfit for service in consequence of sickness or wounds are to be discharged as soon as possible. Sick and wounded who are not likely to recover in South Africa, but who would benefit by a change to Europe, are to be sent home. This does not apply to men whose permanent place of residence is in Africa. In the case of these men the procedure detailed in orders of February 1st, 1894, is to be carried out, and a certificate from the medical officer is to be furnished to the Principal Medical Officer's office. In the case of men sent out from home, it is sufficient to certify the necessity for sending them home, the proceedings being completed at headquarters. The certificate will show the following particulars: Serial number, name, corps, disease, and time in hospital, reason for sending home, any remarks. The certificate is to state whether the man is totally unfit for active service, or fit for service on the lines of communication. In sending men home a transfer certificate is sufficient. These cases will be reported to headquarters.

(18) Admission and Discharge Books.—Every company, battery, or other unit is to keep up an out-patient attendance book, as laid down in Appendix IV. of the Medical Regulations.

(19) Periodical Returns of Sick and Wounded.—On the 10th, 20th,
and last day of each month, telegraphic reports of the number of men actually sick on that day, with their units or in hospital, is to be furnished to the Principal Medical Officer’s office, giving merely the actual numbers in the following order:—

1. Total number of patients.
2. Number of wounded.
3. Number of typhoid fever patients.
4. Number of malaria patients. The detachment commander’s name.

Manuscript reports will be sent in as soon after as possible, showing admissions and discharges during the preceding ten days. These reports will give each man’s name and full particulars, extracted from the admission and discharge books.

The telegraphic reports must be furnished by:

(a) All hospitals and rest posts.
(b) The medical officer in charge of each detached party.
(c) Every staff surgeon.

The Principal Medical Officer’s office will compile these reports, and furnish a telegraphic report of the total number to Headquarters of the force. At the beginning of each month the Director of Medical Services will furnish a medical report on the events of the preceding month to headquarters for transmission home.

20. Deaths, Epidemic Reports, Fights, or any Special Circumstances.

Every death is to be immediately reported by telegraph to headquarters, giving the christian and surname, corps, place of birth, and nearest relative, as well as the cause of death. In case of death from disease the primary cause of illness is to be given. Any epidemics are to be reported by telegraph to the Director of Medical Services. As soon as possible after any fight the medical officer is to furnish a written report of the number of wounded, showing the nature of the wounds, treatment given, and disposal of the wounded. Any suggestions for the improvement of medical or sanitary matters, and medical equipment are to be furnished without further orders to the Director of Medical Services.


Although special medical officers are told off to each unit, any man asking for medical advice from any surgeon, other than his own, is to receive it.

22. Morning Sick and Health Examinations.

The sick will be seen each morning. Sick will usually be seen by junior medical officers. Staff surgeons will see morning sick in their own stations unless an assistant is detailed. In every corps and garrison health inspections will be held three times in each month. At these inspections the men will be entirely stripped.

23. Treatment of Convalescents.

Families of soldiers belonging to the Colonial force, as also any Government servants, are to be treated free of
charge. Such persons can only be admitted to military hospitals if there
is room to spare.

Okahandja, 1894.

Slight modifications were introduced from time to time, but did not
materially alter the above instructions.

(Sd.) VON TROTHA,
Commander-in-Chief.

APPENDIX 6a.

SCHEDULE OF QUESTIONS ON MEDICAL OFFICERS' EXPERIENCES.

The officer's name, rank, and the appointment held in the force when
the following observations were made are to be filled in.

Observations in Reference to :

I. Accommodation, Food, and Clothing of the Troops.
   (a) Accommodation.—Suitability of various kinds of tents in use,
   construction of huts or shelters by means of stones, boards,
   or other materials.
   (b) Water Supply and its Sterilisation.—Suitability for field service
   and capacity of yield, in the case of sterilising apparatus
   and Berkefeld filters, both for pack and wheeled transport,
   also clarification by alum and boiling water.
   (c) Feeding.
   (d) Clothing.
   (e) Latrines, Conservancy, Disposal of Dead Animals.

II. Equipment of the Troops with medical personnel and material.
    On the number of medical subordinates which should be provided
    for each detachment. Special observations in reference to the subordinate
    personnel, e.g., N.C.O.'s of the reserve, ward attendants, &c. :
    (a) Accommodation of Sick.—Buildings, tents, houses constructed
    by the troops, or temporary shelters; lying-down accommo-
    dation and the methods of improvisation employed.
    (b) Dieting.
    (c) Supply of Medicines.—Field medical panniers, boxes, the
    number, size, weight, and transport, packing, and contents,
    dressings, supply of instruments, thermometers, &c.
    (d) Transport of Sick.—Ambulance wagons, G.S. wagons, ox
    wagons, improvised methods of carriage, stretchers.

III. Infectious Diseases.
    (a) Typhoid.—Method of spread and infection, result of preventive
    measures, e.g., change of camping ground, &c., anti-typhoid
    inoculation in relation to number and severity of attacks.
    (b) Malaria.—On the institution and results of quinine prophylaxis.

IV. Any other Observations or Suggestions.
APPENDIX NO. 22.

EXTRACT FROM THE DETAILED INSTRUCTIONS FOR MEDICAL OFFICERS APPOINTED TO EXAMINE MEN SENT HOME FROM SOUTH AFRICA.

When considering the question of invaliding it must be remembered that most of the men returning from South-West Africa have already spent a considerable time in hospital there; in addition to which, they have had a four weeks' comfortable sea journey which should have tended towards their recovery. It may, therefore, be assumed that any disability which is found to be present on the man's arrival in Germany is of a chronic nature from which he is not likely to recover soon, and will probably require at least one year for rest and treatment. When considered advisable these men may be sent to watering-places. In the case of senior N.C.O.'s who wish to continue to serve, treatment in hospital may be tried, provided there is a reasonable prospect of success. Men who are entitled to a special furlough of four months should not be finally disposed of till the expiration of this time, as there is a great probability of marked improvement taking place in their condition.

Men are not to be sent to watering-places unless there is a reasonable prospect of their deriving benefit from this treatment. Suitable cases are those requiring treatment by medico-mechanical means for disability following wounds or chronic rheumatism. When possible a watering-place will be chosen near the man's home. Cases of tubercle or suspected tubercle are to be invalided at once, and should be instructed to apply to their district commandant for admission to a sanatorium.

Men who have recovered from their disability are to be shown as fit for field service, if necessary, after a certain period of rest. In cases of heart affection, it must be remembered that these men have had at least four weeks' rest, and it is, therefore, probable that any existing lesion would be aggravated by hard work. It is, therefore, wiser to invalid these men out of the service at once.

Men suffering from the milder forms of organic heart disease may be dealt with at once, but it is important that these men should not undertake heavy work immediately; accordingly, in estimating their disability for earning a livelihood in civil life a liberal view is to be taken.

Men requiring dental treatment are only to be recommended for it when it is clearly shown that they have lost a number of teeth during the campaign and that treatment is absolutely necessary in order to restore the power of mastication. Artificial dentures are only to be recommended in exceptional cases, the man is to be advised to go to a dentist at his own expense, but may, however, apply to have a portion of the cost paid out of expeditionary funds. In every case in which payment is made from imperial funds, the man is to be given a copy of the circular "Teeth instruction," given below.
R. J. Blackham

Instruction for Dental Treatment.

For (Name) who requires dental treatment and artificial teeth.

(1) Within eight days after arrival at his home he is to report to the appointed dental surgeon at..................................................

(2) This dentist is to furnish an exact estimate as to cost of the necessary work, using the cheapest material and quoting the lowest rates shown in circular of May 15th, 1896, for contract dental work. If the man desires to have more expensive work put in he must pay the difference himself. This estimate, together with this instruction leaflet, is to be transmitted immediately to the headquarters of the colonial troops in Berlin.

(3) The dental treatment is to be undertaken as soon as permission has been given from headquarters, and should be finished in as short a time as possible. The bill is to be sent by the dentist to the Imperial Colonial Office.

(4) The dentist must give a guarantee that the work has been properly done.

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Travel.

THE NORTH-WEST FRONTIER OF INDIA.

By Major R. J. BLACKHAM.

Royal Army Medical Corps.

The north-west corner of the Indian Empire is a part of the world to which most of the officers of the Corps find their way at one time or other during their service; some to obtain medals and honours, others to merely bear the heat and burden of the day.

In many ways it is the most important area in our great overseas Empire, yet although information with regard to several Indian cantonments has been published from time to time, no account of the frontier has yet appeared in these pages.

As the Travel Section of the Journal and the proposal to prepare a Corps Gazetteer have always been attractive to the present writer, he ventures to offer a brief description of that portion of the Indian border, which is occupied by the premier division of the Indian Army, in the hope that it may not be without interest. He is