SESSION II.
1918.
NEW ZEALAND.

NEW ZEALAND EXPEDITIONARY FORCE.

HEALTH OF THE TROOPS IN NEW ZEALAND FOR THE YEAR 1917.

Laid on the Table of the House of Representatives by Leave.

NEW ZEALAND EXPEDITIONARY FORCE.

HEALTH OF REINFORCEMENTS IN NEW ZEALAND FOR THE YEAR 1917.

Strength.—The total number of officers and men who have been present in the training-camps during the year 1917 equals 36,191. The average strength was 9,991.

Admissions to Hospitals.—The total number of admissions to hospital was 4,104, giving an admission-rate per thousand of 410 and a constantly-sick rate of 12·49, as against 1,023 and 19·59 in 1916. In the Imperial Army in 1913 (the last statistics available) the admission-rate was 437 per thousand and the constantly-sick rate 23·53.

Deaths.—There were 30 deaths from disease, of which 15 were in camp hospitals and 15 were in civil institutions elsewhere. In addition there were 7 deaths from accidents, of which 5 occurred out of camp, and 8 from suicide, of which 2 occurred out of camp. The total number of deaths in and out of camps of men on the strength of the Expeditionary Force was therefore 46, equal to a death-rate of 1·2 per thousand on the total numbers and 4·6 on the average strength. The Assistant Director of Medical Services (Sanitary), however, estimates the death-rate at 3·8, for reasons noted in his attached report, with which I agree. The deaths of males between ages 20 and 40 in New Zealand in 1913 was 4·02 per thousand.

The prevailing disease was influenza, but only to a moderate extent. The disease which caused the chief mortality was cerebro-spinal meningitis—9 deaths—one a case which had remained over ill from 1916. Pneumonia caused 1 death. The disease in this case, however, was contracted in Wellington, and the man died there.

Health of Camps.—As regards the four camps, the admissions and constantly-sick rates, based on the average strength, with the number of deaths, were as follows:—

Camp.	Average Strength.	Admissions.	Admissions per Thousand.	Constantly Sick.	Constantly Sick per Thousand.	Deaths in and out of Camps.		
						Disease.	Accident.	Suicide.
Featherston ..	6,474	2,296	354	65·10	10·05	17	5	7
Trentham	3,015	1,622	504	53·81	17·84	10	2	1
Narrow Neck ..	212	61	287	3·53	16·65	1	..	..
Awapuni	226	112	495	1·82	8·05	1	..	..
Rotorua	41	3	73	0·17	4·14	1	..	..
Hanmer	23	10	434	0·36	15·65	..	..	..

Thus Trentham had a higher admission and constantly-sick rate than Featherston. And whilst Awapuni had a higher admission-rate than Narrow Neck, it had the lowest number constantly sick of the four camps. At Rotorua and Hanmer are stationed N.Z.M.C. camp men on duty, and the statistics refer to these, and not to the sick and wounded in the hospitals and convalescent homes there.

It will be noticed that under all headings the numbers show a great improvement on those of the previous year, and compare favourably with the Imperial Army in time of peace.

With reference to the deaths, 24 deaths occurred away from camps, but are entered as against the camp on the strength of which the men were when they died, but this does not necessarily imply that the disabilities which caused the deaths were contracted in the camps.

Venereal Disease.—There were 340 cases (of which 308 were admitted for gonorrhœa, 26 cases for syphilis, and 6 for soft chancre) during the year, as against 372 the previous year. This shows a total admission-rate of 34 per thousand for the year.

In this connection it must be noted that all recruits who on examination are found suffering from venereal disease are not rejected, but are brought into camp and treated either in camp or at Quarantine Island.

The admissions for the various camps were as follows:—

Camps.	Gonorrhœa.	Syphilis.	Soft Chancre.
Featherston	144	8	2
Trentham	155	18	4
Narrow Neck	9	...	...
Awapuni	...	...	...

The ratio per cent. on the average strength of the camps is—Trentham, 5·8; Narrow Neck, 4·2; Featherston, 2·3; and Awapuni, nil.

The admissions for venereal disease compare favourably with those of the Imperial Army in peace-time. The last available statistics in 1913 show the admission-rates per thousand in the largest stations of the British Army as follows: United Kingdom, 50·9; India, 52·5; South Africa, 70·7; Straits Settlements, 93·8; Egypt, 117·7; Ceylon, 121·2.

In no cases have the complaints in this country been of a severe nature, and, taken early as they are and treated according to the most modern methods, the diseases are arrested and a recovery assured.

No prophylactics are issued in this country, but arrangements are made in the camps and on board ships whereby men who have exposed themselves to infection have every facility for protecting themselves against the consequences of their actions.

Influenza was again the chief cause of sickness in camps, but in a greatly diminished ratio from the previous year. In Featherston it accounted for 889 out of a total of 2,296 admissions from all causes; in Trentham, for 244 out of 1,622; at Narrow Neck, for 13 out of 61; and at Awapuni, for 10 out of 112. The disease was most prevalent in September and October at Featherston, and occurred chiefly amongst recruits, who brought it in with them to Tauherenikau.

Measles.—Thanks to the Tauherenikau Camp and the prompt segregation of all contacts, there were only 54 cases of measles, of which 15 were of the mild type known as "German measles." Featherston had 28 admissions and Trentham 26. There were no cases in Narrow Neck or Awapuni Camps.

Cerebro-spinal Meningitis.—There were 9 cases admitted to hospitals in camp during the year—2 at Trentham and 7 at Featherston. In addition there were 4 cases on the strength of the camps admitted to hospitals while on long leave—2 at Invercargill, 1 at Dunedin, and 1 at Masterton. One case remaining in hospital at Timaru from the previous year died. Altogether 13 cases were admitted amongst men on the strength of the camps, with 5 recoveries and 8 deaths.

The Assistant Director Medical Services (Sanitary) has written a special note on the disease as it affected soldiers on the strength of the camps, which is attached.

Further experience and investigation seem to point to the fact that the organism which causes the disease exists in the throats of a certain number of people who may be quite healthy, but is apt to take on malignant qualities when conveyed to the throats of others whose bodily resistance is lowered by influenza and measles under conditions of cold, damp, and crowding together. Hence the importance of segregating new arrivals during the winter months away from the main body of troops until the incubation-periods of measles and influenza are over, and all carriers, after careful examination, have been eliminated.

In this connection the bacteriological laboratories at Featherston and Trentham under Lieutenant Ross and Lieut.-Colonel Leahy have done work of the greatest value, involving a great deal of labour. Not only have all the recruits on arrival been examined, but also all civilians working in and about the camps and all Reinforcements before embarking. The Wellington Bacteriological Laboratory, under Major Hurley, has also been of the greatest service not only in examining throat-swabs, but in supplying vaccines and serums for inoculations.

The spraying-chambers have again demonstrated their great usefulness.

Diphtheria.—13 cases—Trentham, 7; Featherston, 4; Awapuni, 2—with no deaths. All cases were brought into camp, were promptly detected and dealt with, and contacts isolated. It is a tribute to the vigilance of the Medical Officers that this disease did not spread. The same remarks apply to *scarlet fever*—4 cases (Trentham, 2; Featherston, 2) and no deaths.

Pneumonia.—14 admissions, as against 91 the previous year: Trentham, 3; Featherston, 8; Narrow Neck, 1; Awapuni, 2. One death occurred in Wellington of a man on the strength of the camps, who contracted the disease, which was complicated by alcoholism, in Wellington.

Paratyphoid Fever.—One death occurred at Featherston, being a case which had remained over from the previous year.

Alcoholism.—86 admissions, as against 91 in the previous year.

Other General Diseases.—One death from pernicious anæmia, at Wellington Hospital—a home-service man. Three deaths from cancer; all died in civil hospitals—1 at Napier, 1 at Auckland, and 1 at Wellington (home service).

Nervous System.—148, of which 36 were cases of epilepsy. Two deaths occurred of cerebral hæmorrhage, 1 a home-service man in Wellington, and 1 a Maori at Te Kao; and 1 death of paraplegia occurred at Trentham.

Mental Cases.—31 cases, with 2 deaths—1 from mania, at Porirua, and 1 from alcoholic insanity, at Trentham.

Diseases of the Circulatory System.—104 admissions, with 5 deaths. Valvular disease, 3 admissions and 2 deaths—1 at Featherston, and 1 home-service man at Awapuni. Fatty heart, 1 death, at Featherston. Syncope, 1 death, in Wellington. Thrombosis of the arteries, 1 death, at Featherston.

Digestive System.—501 admissions and 5 deaths: Featherston, 287; Trentham, 194; Narrow Neck, 5; Awapuni, 14; Hanmer, 1. A large number of admissions were on account of gastritis of a mild form. In 1916 the disease had been very prevalent at Featherston, in the early part of that year 334 men having been admitted on account of it. This year there were only 88 cases, thanks to the cleanliness of the camps. These cases were chiefly due to errors in diet.

The deaths occurred from (*a*) appendicitis—2, in Wellington (1 an officer on home service after operation); (*b*) intestinal inflammation and obstruction—1, at Trentham; (*c*) enteritis—1, in Auckland; (*d*) abdominal abscess—1, at Taihape.

General Injuries.—Effects of heat: 3 cases due to burns and scalds, 12 to effects of sun whilst training; none serious. Other cases 10, including 7 deaths from accidents out of hospital; 1 concussion, due to fall from a horse in Trentham; 1 fell off a train at Lower Hutt; 1 run over by a train at Hamilton; 1 run over by a motor-car at Featherston; 1 run over by a train at Papakura. 2 cases of drowning—1 at Napier and 1 at Gore.

Local Injuries.—Sprains and contusions accounted for most. There were 191 admissions at Featherston and 133 at Trentham.

Poisons.—One admission (from formalin), who recovered.

Suicides.—There were 8: Cut throat, 5 (Featherston 3, Papawai Camp 1, and Christchurch 1); gun-shot, 1, at Papawai; strangulation, 2 (Silverstream 1, Featherston 1).

Health of Various Reinforcements.

The Reinforcements which had the largest amount of sickness were the 32nd, with an admission-rate of 78 per cent. and constantly-sick rate of 7·32; the 31st, admission-rate 66 and constantly-sick rate 7·23; and the 30th, admission-rate 63 and constantly-sick rate 11·03. The healthiest troops were—the Field Artillery, admission-rate 26 and constantly-sick rate 10·13; the 23rd Reinforcements, admission-rate 31 and constantly-sick rate 3·8; and the Maori Reinforcements, admission-rate 31 and constantly-sick rate 3·17.

The C1 camp had an admission-rate of 47 and constantly-sick rate of 3·17, and so compares very favourably with the others.

The months which showed the largest and least numbers of admissions were:—At Trentham: largest—September, 157; October, 268; November, 163; in all of which influenza was the main factor in causing the admissions. The least numbers were in December, 85; March, 102; April, 104. At Featherston: largest—September, 382; October, 206; November, 212; influenza being the prevailing disease. The least numbers were in December, 91; April, 147; and February, 151.

The largest and least numbers in hospital on any one day of the year were:—Trentham: largest, 119, on the 6th November; least, 6, on the 3rd January. Featherston: largest, 162, on the 24th September; least, 7, on the 23rd December.

Officers.—The health of the officers has been very good. The average strength was 362, with only 55 admissions to hospital, equal to a ratio of 152 per thousand, and 1 death, equal to a rate of 2·7 per thousand. In the Imperial Army in the United Kingdom in peace-time the ratio per thousand of admissions of officers was 295·4, and the death-rate 3·41 per thousand.

The chief causes of admissions were influenza (14) and gastric complaints (11). One death occurred as the result of an operation for appendicitis in the case of a home-service Medical Officer.

General Remarks.

A marked feature in the life of the camps during the year has been the absence of diseases of an epidemic nature such as caused a large amount of sickness in 1916. This has been due chiefly to the segregation camp formed at Tauherenikau, where during the winter months each fresh monthly Reinforcement was segregated for a month on arrival until the incubation-period of all infectious diseases was over. In this camp the recruits from each district were further divided into four small camps according to districts, and these camps were as far as possible kept separate.

In addition, a case of infectious disease occurring in a tent was at once transferred to the infectious hospital, whilst the other occupants of the tent were placed in a special isolation camp.

The inhalation-chambers both in Featherston and Trentham were also of great value in clearing up throats, and the new infectious hospitals enabled all infectious cases to be at once isolated for treatment under the most favourable circumstances.

As regards the prevention of cerebro-spinal meningitis, in addition to the bacteriological examination of the throats of all recruits and the isolation and spraying of all suspected carriers, Lieut.-Colonel Robertson, Principal Medical Officer, Featherston Camp, introduced a system of inoculation with antimeningococcal vaccine in the case of all men admitted to hospital, and he considers that the fact of no case of cerebro-spinal meningitis developing in hospital during the year may have been the result of this precautionary measure.

The throat-examination of all recruits, and also of all Reinforcements prior to embarkation, involved an enormous amount of work on the Wellington Bacteriological Laboratory, as pointed out by Lieut.-Colonel Makgill in his report, and also on the camp laboratories at Trentham and Featherston, and too much credit cannot be given to the officers in charge of these institutions for the successful results of their efforts.

The high standard of cleanliness maintained throughout the year in the camps, and the absence of flies, have been great factors in the prevention of dirt diseases such as enteric fevers, diarrhœa, and dysentery, and credit must be given to the Medical and Sanitary Staff for their efforts in this direction, and for the support given them by the Camp Commandants and their officers.

In this direction the work of the Dental Officers must be noted, as by cleaning up the men's mouths and ensuring the healthiness of their gums and teeth they have undoubtedly raised the general standard of health of the troops.

During the summer months the Tauherenikau Camp was utilized as a graduated-training camp for insufficiently developed men to join the Expeditionary Force, more than 50 per cent. of those so trained having since been added to the Reinforcements; whilst the Heretaunga Camp at Trentham was used to segregate the new Reinforcements, and this procedure will be continued during the winter months.

Experience has now proved that abundance of fresh air, plenty of space to live in and consequent avoidance of overcrowding, ample hospital accommodation and facilities for isolation, with good drainage and avoidance of damp, are essentials to secure healthy camps.

R. S. F. Henderson, Surgeon-General,
Director-General of Medical Services.

REPORT OF ASSISTANT DIRECTOR OF MEDICAL SERVICES (SANITARY).

REPORT ON SANITATION OF THE MILITARY CAMPS FOR 1917.

Memorandum for the Director-General of Medical Services.

I have the honour to submit the following report on the sanitary condition of the military camps in New Zealand during the year 1917. It is satisfactory to be able to point to a very marked reduction in the sickness-rate, in the numbers of infectious diseases reported, and in the general death-rate during the year as compared to previous years. The chief factor in this reduction has been the elimination of widespread epidemics of measles and influenza. That the death-rate should be reduced by the elimination of these simple diseases is due to the fact that the majority of the deaths in 1915–16 were caused by meningococcal infections—cerebral or pulmonary—arising as sequelæ of either measles or influenza, more particularly measles. The close relationship between catarrhal diseases and meningococcal infections demonstrated in previous years made it obvious that our chief efforts should be towards combating the spread of catarrhal epidemics, whether measles, influenza, or allied naso-pharyngeal infections, and there is little doubt that the satisfactory statistical records for 1917 are a result of the efforts made along these lines. The measures adopted were briefly as follows:—

(1.) Segregation of recruits in camps apart from other units and under conditions offering the largest amount of open air and the least degree of crowding possible to troops undergoing military training.

(2.) The routine examination—clinical and bacterial—of all recruits entering camps, of civilians employed in the camps, of all cases reporting sick with catarrhal conditions of the throat, and of all cases of any kind entering the hospital wards.

(3.) The isolation of all "suspects," which means cases shown by these examinations to be carriers of catarrah-producing organisms, whether meningococcal or otherwise. The term "carrier" has been applied to any person whose throat-swabbing showed any abnormal bacterial content.

(4.) The free use of the recently introduced steam-inhalation method of treatment for all these "suspects" or "carriers." Indeed, this treatment was sometimes extended to larger bodies of men without troubling as to the bacterial contents of their pharynges, if for some reason they might be regarded as "suspect." In order to protect the troops living in the necessarily crowded conditions on the transports a final bacterial examination has been made of all troops prior to embarkation.

(5.) The usual methods of disinfection of the huts, canteens, and other places and their contents following the detection of any case of infection.

Details as to how these measures were carried out will be found in the annual reports of Principal Medical Officers of the two chief camps, which I append. The work thus devolving on the medical staffs has been very heavy, but it has been most systematically and thoroughly carried out, and the results seem to justify the outlay of energy. Another point to be recognized is that all this isolating and parading for examination has of necessity interfered with the hours of training; but, after all, it does not greatly profit an army if after he is fully trained the soldier dies of some preventable disease.

The amount of bacteriological work entailed has been enormous, and Major Hurley at the central laboratory is to be congratulated on so systematizing the work that he has with a comparatively small staff been able to cope with the huge increase in his duties. It is no small feat to be able to examine and report on over two thousand swabbings within three days. The bacteriological laboratories at Trentham and Featherston have greatly relieved the strain on the central laboratory, and have done excellent work in spite of the somewhat primitive conditions under which they labour.

Of the preventive measures sketched above I think the free use of the steam-spray treatment must be given the chief credit for the stoppage of epidemics, for the segregation of recruits was not fully in play till the Tauherenikau Camp was opened in June. Yet the epidemics of measles and influenza which in 1916 were marked in the early months of the year were conspicuously absent from February onward in 1917.

Although the spray treatment must be given priority as an effective measure, the value of the segregation camp has been demonstrated repeatedly. The Principal Medical Officer, Trentham, quotes one case in which a possible epidemic of measles was checked, and many others could be given. It must be obvious that if a man be in a state to transmit infection he is less likely to do harm where but five tent-mates are in contact with him than if he were in a hutment with thirty others.

The absence from these segregation camps of large rooms where men can crowd together must also be given due credit. In last year's report it was shown that meningococcal infections were spread by men in social contact rather than by the conditions of military routine. Particular attention, therefore, was paid to the institutes at Tauherenikau Camp, which were constructed on the principle of the open-air structures used in consumptive sanatoria. It is to be feared that in cold, stormy weather they could not be held up as examples of comfort, yet they were habitable even under the worst conditions, and, though they could not be classed as "snug," often a room so described would be more truthfully called "stuffy." At any rate, the statistical records for Tauherenikau Camp show that no ill effect followed the absence of "snug" retreats, for the sickness-rate was, if anything, lower than at other camps, despite the fact that new recruits were involved.

How far the immunity of the camps to infection from measles and influenza can be attributed to a general cyclical fall in prevalence it is difficult to judge. I am not inclined to lay much weight on such an explanation, since we were dealing with the same class of youth as in previous years, unprotected by exposure to previous infection, and brought together under artificial conditions. Cyclical rise and fall in spread of infection is found in stable populations, but the conditions giving rise to such fluctuations do not obtain in moving populations such as are formed by men passing through training-camps. And again, though measles and influenza, not being notifiable diseases, do not yield actual statistics, there is no reason to believe that these diseases were less prevalent among the civil population than in 1916.

One disease which was extremely prevalent in the civil population in 1917—namely, diphtheria—scarcely touched the camps. It is certain in this connection that our efforts against pharyngeal infections in general succeeded in preventing outbreaks of diphtheria.

General Sanitary Measures in the Camps.

The sanitary work in the camps is set out in detail in the special reports attached. The various improvements made represent sanitary progress, but with three exceptions we cannot attribute to the accomplishment of these measures the very greatly improved health of the camps in 1917. The three exceptions are—(1) The provision of the inhalation-chambers; (2) the establishment of the segregation camps at Heretaunga and Tauherenikau; (3) the increased accommodation in the hospitals at Featherston and Trentham.

I have already commented on the probable influence which the free use of the inhalation treatment as a prophylactic has had.

The segregation camps enabled us to separate out the carriers of disease before they had a chance to infect other units, and the open-air conditions in the camps prevented the spread of disease among the recruits. The Heretaunga Camp has been greatly improved by the tent-sites and roads being made up and graded, and with a few additional accessories this camp may be regarded as a healthy and convenient one. The somewhat limited area and the proximity to the main camp, however, made it advisable to utilize the Tauherenikau Camp during the winter months, when the danger was greatest. Tauherenikau is an ideal camp-site, the only drawback being the damage done to the tents by high winds. The water-supply was obtained from a race which was roughly purified in a filtration-bed of somewhat novel design, but which on the whole gave satisfaction. The water even before treatment could not be regarded as other than pure, and the filtration was necessary chiefly on account of silt and so forth when the river was in flood. The ample space available in this camp makes it very easy to avoid crowding, and to this, and the absence of dining-rooms and halls where large numbers can be in close contact, we can attribute much of the good health enjoyed by the troops in their first month of training—the period during which in previous years the highest sick-rate obtained. The canteen and such institutions as were provided were all constructed on open-air principles and crowding prohibited. The value of the increased hospital accommodation as a preventive measure was not so apparent this year, since the other measures so reduced the epidemics that at no time were the hospital wards filled. Doubtless, however, the absence of serious results from the brief epidemic of influenza which occurred in September was in part due to the fact that, close contact between patients being avoided, an infectious organism had little chance to increase in virulence by rapid transference from case to case.

In the establishment of these hospitals special word is due regarding the type of construction. The design chosen by Lieut.-Colonel Frengley was of the simplest type of pavilion, subdivided into three sections so that each can be administered separately and so allow of classification of cases. The execution of the design at the hands of the Director of Works Department has established something of a record in the matter of cost. That a hospital comprising a complete unit should be constructed at the rate of £100 per bed was regarded as utopian even before the war; but that it should be accomplished now, when cost of material and labour is so

high, has come as a surprise and a lesson to those interested in such matters. The buildings are, of course, plain, but leave nothing to be desired in the way of efficiency and comfort; and it is to be hoped that the achievement of the Director of Works and his staff may leave a permanent mark in the history of hospital construction in the Dominion. In this, as in other questions of sanitary construction of military buildings, the economic side has been given due attention by the constructional staff, and thus work has been possible which would otherwise have been inadmissible owing to the cost.

STATISTICAL.

DEATH-RATE.

It is not possible to give an accurate death-rate for moving bodies of troops—a rate which can be compared to that of a fixed population. If the rate be calculated by comparing deaths to total strength which passed through the camp the figure is too low, because the total strength did not remain for one year in the camp, but on an average only four months. To calculate the rate of deaths to average strength, on the other hand, gives too high a result, since it is based on the death-rate of series of men newly arrived in camp. In each successive batch will be some who will succumb to illness from the unusual environment, and some of these may prove fatal. Experience has shown that the highest sick-rate is among the recruits during their first month of training. It is reasonable to suppose that if one Reinforcement were to remain a full year in camp their sick-rate and resulting death-rate for the total year would be less than that for the first four months. It is evident that we have no data on which we can calculate a death-rate giving a true indication of the influence of camp conditions comparable to an average civilian population; but one can arrive somewhere near accuracy by supposing that had the total strength remained a full year in camp the number of deaths would have been, roughly, three times the actual deaths, since the average stay of troops in camp is four months. Calculated thus we get a ratio of 3·8 per thousand for all the Expeditionary Forces in New Zealand in 1917. This again may be too high, since some of the occupants of the camps—the permanent staff—actually did remain for the year, and as many of these are elderly men on home service their death-rate should naturally be higher than that of the others. Multiplying the deaths among these men by three would exaggerate the calculated number of deaths. However, the correction for this error is a small one, and therefore 3·8 may be regarded as approaching accuracy. The death-rate among males between 20 and 40 in New Zealand in 1913 was 4·02 per thousand, so it is probable that the death-rate in camps was lower than it would have been in a civilian population of like age. In 1916 the Expeditionary Force death-rate so corrected would have been 7·3 per thousand, or the same as that for males in England between 20 and 40, but much above that for New Zealand. This higher rate was due to the epidemics of cerebro-spinal infection and pneumonia in that year. The actual deaths in New Zealand among men attached to the Expeditionary Force during the last three and a half years is—

Year.	Deaths.
1914 (4½ months)	6
1915	61
1916	104
1917	46
Total	217

These figures for the last two years include deaths among men on home service but not actually living in a camp. The actual deaths among home-service men were—

Year.	Deaths.
1916	6
1917	7
Total	13

For the year 1916 3 of these deaths occurred out of camp hospital and 3 in. For the year 1917 3 occurred in civil hospitals, 1 in private hospital, and the remaining 3 were sudden deaths occurring outside of hospitals.

The following table shows the total deaths among all branches of the service in New Zealand for the last two years :—

Camp.	Disease.		Accident.		Suicide.		Total Deaths.	
	1916.	1917.	1916.	1917.	1916.	1917.	1916.	1917.
Trentham	46	10	6	2	1	1	53	13
Featherston	44	18	2	5	2	7	48	30
Awapuni	..	1	..	..	..	..	..	1
Narrow Neck	3	1	..	..	..	..	3	1
Rotorua	..	1	..	..	..	..	..	1
Totals	93	31	8	7	3	8	104	46

It will be seen that the deaths from disease in 1917 were only one-third of those for 1916.

Sickness.

Hospital Admissions.—In the following tables an attempt has been made to construct a comparative record of the ratio of sickness in the various units and camps. The hospital admission-rate was chosen because it eliminates variations due to unimportant causes.

Return by Quarters showing Weekly Ratio of Admissions to Hospital by Units in Featherston and Trentham Camps for the Year 1917.

(Ratio per 1,000 of average strength.)

Unit.	Featherston Camp (including Tauherenikau).					Trentham Camp.				
	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	Average Weekly Ratio per Year.	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	Average Weekly Ratio per Year.
Infantry ..	8·0	6·0	7·0	6·4	6·8	8·4	11·2	12·9	12·8	11·3
Permanent Staff (including A.S.C. and N.Z.M.C.)	4·6	6·0	6·6	3·6	5·2	4·4	2·1	5·8	6·4	4·7
Details ..	11·7	4·8	6·0	2·5	6·2	..	12·8	17·8	15·4	15·3
Engineers ..	..	..	..	5·0	5·0	..	7·4	8·6	5·4	7·1
Mounted Rifles	6·8	5·0	10·4	5·2	6·9	..	..	..	..	..
Field Artillery ..	4·7	4·0	7·4	3·2	4·8	..	..	..	..	..
C1 Camp ..	..	..	..	9·1	9·1	..	..	..	..	..

Comparative Return by Quarters showing Weekly Ratio of Admissions to Hospitals from Featherston, Tauherenikau, Trentham, Awapuni, and Narrow Neck Camps for the Year 1917.

(Ratio per 1,000 of average strength.)

Camp.	First Quarter.		Second Quarter.		Third Quarter.		Fourth Quarter.		Average Weekly Ratio per Year.
	Average Strength.	Weekly Ratio.	Average Strength.	Weekly Ratio.	Average Strength.	Weekly Ratio.	Average Strength.	Weekly Ratio.	
Featherston ..	6,315	7·0	4,485	6·6	4,704	9·0	5,424	6·1	7·2
Tauherenikau ..	(Not stated)	..	1,800	4·1	1,800	8·8	1,800	6·4	6·4
Trentham ..	3,893	6·3	2,946	9·5	2,617	13·3	3,101	13·0	10·5
Awapuni ..	202	8·6	212	4·7	230	8·9	261	13·1	8·8
Narrow Neck ..	231	14·6	271	1·7	246	1·7	180	2·2	5·0

Note.—The average strength, Featherston and Tauherenikau, is approximate for the second, third, and fourth quarters.

The hospital admission-rate is low throughout and fairly even, the only unit showing a high rate being the Details at Trentham, which includes men being held back for embarkation from sickness, and therefore naturally a considerable proportion would go to hospital. This brings up the ratio for Trentham somewhat unduly. The lowest average is found in the Artillery and Permanent Staff. This is not surprising, as the Artillery are reported by the Sanitary Officer to be the unit which pays most attention to cleanliness and sanitation, while the Permanent Staff are in a measure seasoned men.

In the second table it will be noticed that in the larger camps there was a slight deterioration in health in the third quarter. This we can attribute to the winter conditions, and to the outbreak of influenza which visited the camps in September.

As regards the camps it is of interest to note that the troops at Tauherenikau show a ratio which was slightly below that of Featherston. This is probably due to the open-air conditions at Tauherenikau checking the sickness-rate. The low admission-rate is very satisfactory, considering that it was wholly a winter camp. The more primitive conditions obtaining at this camp have certainly not acted adversely on the health of the men.

The presence of the C1 camp at Featherston raised slightly the return during the fourth quarter. The figures for the two smaller camps cannot be regarded as very accurate owing to the small numbers dealt with. A few cases of sickness more or less unduly influence the ratio.

Infectious Disease.

The attached table gives the cases of infectious disease occurring in the men attached to the various camps in 1917, with comparative figures for 1916. Pneumonia has been included owing to the presence of an infective type in 1916.

Return of Infectious Diseases among Soldiers attached to the Camps of the Expeditionary Forces in New Zealand for the Year 1917, with comparative Figures for 1916.

Disease.	Featherston.		Trentham.		Awapuni.		Narrow Neck.		Totals.	
	1917.	1916.	1917.	1916.	1917.	1916.	1917.	1916.	1917.	1916.
Cerebro-spinal meningitis	10	24	3	35	..	..	..	..	13	59
Measles	28	1,521	26	836	..	21	..	16	54	2,394
Diphtheria	11	4	8	3	2	..	..	..	21	7
Enteric fever.. ..	1	..	1	3	..	..	1	2	3	5
Scarlet fever ..	2	4	2	5	..	..	..	7	4	16
Chicken-pox	2	..	3	7	..	..	..	..	5	7
Erysipelas	1	2	1	2	..	..	..	..	2	4
Simple pneumonia ..	7	..	4	12	2	..	1	8	14	20
Malignant (post-measles) pneumonia	..	19	..	31	..	..	..	..	..	50
Totals.. ..	62	1,574	48	934	4	21	2	33	116	2,562

Infectious Diseases contracted in and out of Camps in 1917:

——	Featherston.	Trentham.	Awapuni.	Narrow Neck.
Contracted in camps	42	30	4	1
Contracted out of camps	20	18	..	1
Totals	62	48	4	2

It will be seen that, except in the case of diphtheria, all diseases show a satisfactory diminution. As regards diphtheria, the increase is not surprising when we consider that in the civil population a very widespread epidemic existed throughout the year, 5,458 cases having occurred, as compared to 2,376 in 1916. In 4 of the cases the disease was contracted and developed out of camp. At no time was there anything approaching an epidemic, and the infection in the majority of the cases was contracted by men while on leave. The comparative immunity of the camps was no doubt due to the careful examination and treatment of suspected throats. Many carriers were detected and treated, some showing great resistance to all methods of inhalation or swabbing.

The complete disappearance in all camps of the malignant type of pneumonia which in 1916 caused 35 deaths is very satisfactory. Of simple pneumonia only 1 case was fatal, the illness and death occurring out of camp—an alcoholic patient.

Cerebro-spinal Meningococcal Infections.

Incidence.—Thirteen cases of meningococcal infection occurred in 1917, as against 109 (of both types) in 1916. The attached table shows the seasonal distribution in the two camps and the incidence of associated diseases:—

Month.	Featherston.			Trentham.		
	Cerebro-spinal Meningitis.	Influenza.	Measles.	Cerebro-spinal Meningitis.	Influenza.	Measles.
January	..	30	16	1	6	12
February	..	19	14	..	8	4
March	..	29	4	..	2	2
April	1	28	..	..	12	..
May	..	31	1	..	23	..
June	1	19	3	..	19	1
July	2	28	..	..	10	1
August	..	43	..	..	6	..
September	3	233	..	..	54	..
October	3	72	..	1	77	..
November	..	57	..	..	21	4
December	..	27	..	1	7	2

It will be seen that this year Featherston suffered much more than Trentham, due doubtless to the fact that the troops underwent the first part of their training at the former camp, and, as in previous years, the majority of the cases arose during the first six weeks of training. Of the 3 cases at Trentham, one shown as occurring in January properly belongs to the epidemic in the previous year, since the patient had left Trentham for Christmas leave and developed the

disease at Invercargill on the 1st January. One death from cerebro-spinal meningitis which occurred in Timaru is not included in the returns, as the patient, who was shown in the tables for the previous year, died after a very prolonged illness beginning in October, 1916. Of the 13 cases in 1917, 4 occurred in civil hospitals outside the camps, in men absent on leave. The first case occurred in April, but, as in previous years, the bulk of the cases—9 out of 13—occurred in the four months July to October.

Mortality.—Of the 13 cases 8 died, giving a case mortality of 61 per cent., which is exactly the same as last year. The deaths occurred as follows:—

	Trentham.	Featherston.
Cases	3	10
Deaths	1	7

One death occurred in a civil hospital—Dunedin.

Age-incidence.—The following table shows the distribution by age:—

	Under 20.	20 to 24.	20, 21, 22, 23, 24.	25 to 29.	30 to 34.	35 to 39.	40 and upwards.
Cases		2, 0, 1, 1, 1,	5	2	1	3	2
Deaths		1, 0, 1, 1, 1,	4	..	1	1	2

As regards variation in mortality according to age-grouping we find the following:—

Under 25: 5 cases, 4 deaths. Case mortality, 80 per cent.

Ages 25 to 34: 3 cases, 1 death. Case mortality, 33·3 per cent.

Ages 35 to 45: 5 cases, 3 deaths. Case mortality, 60 per cent.

There were an unusual proportion of cases among the older men. The figures are too small to give reliable percentages of mortality, but the extremes of age appear to have suffered most, as has been found in epidemics elsewhere.

Association with Other Diseases.—Measles in the past year has had no influence on the appearance of meningococcal infection, and the absence of malignant pneumonia also may be noted in connection with this fact. The slight epidemic of influenza in September and October probably had an influence, as 7 of the cases of cerebro-spinal meningitis occurred during those months. The experience tends to confirm the conclusion arrived at last year as to the influence of catarrhal epidemics.

Distribution by Unit.—Among 31st Reinforcements 3 cases occurred in September and October. All belonged to separate companies, and came from different localities. In the 33rd Reinforcements 2 cases occurred in October, and 1 in December. They belonged to different companies, and no connection between the two could be traced. No other Reinforcements had more than one case. Three cases occurred among the Mounted Rifles at Featherston on the 27th September and 5th and 6th October. They belonged to separate Reinforcements and came from separate districts, but there may have been contact in these cases.

Influence of Occupation.—As in the previous year, those men who had followed outdoor occupations suffered most, 8 of the 13 being farmers or farm labourers; 9 out of the 13 were employed in the country.

Influence of Locality from which the Patient was recruited.—It was shown in last year's report that at various periods the epidemic was prevalent among men from one district, although they might belong to separate units. To a much less extent the same feature was noticeable in the earlier part of this year, when of the first 6 cases 5 came from the Otago-Southland District. Thereafter it became more generally distributed. During the year 5 came from Auckland Province, 6 from Otago-Southland, 1 from Canterbury, and 1 from Nelson. None came from Wellington or Hawke's Bay Districts. Regarding the prevalence among men from Otago and Southland, some evidence was obtained as to the influence of travelling, since in 3 cases the disease developed a few days after the men had arrived at their homes while on leave. The close association together of a number of men in railway-carriages must give more than at any other time an opportunity for the carrier to distribute infection, while those constitutionally susceptible might readily be made more receptive by the development of catarrhal conditions which are so apt to be contracted in railway journeys, and more especially, doubtless, among men accustomed in camp to an open-air life and freedom from ill-ventilated conditions.

Influence of Carriers.—In the report for 1917 of the Local Government Board evidence is adduced that the organisms of meningococcal type found in the throats of non-contact carriers, who do not subsequently develop the disease, differ in no recognizable way from the organisms from the throats of patients suffering from meningococcal infection. The conclusion seems to follow that the organism has a saprophytic as well as a parasitic existence, and that certain external circumstances—climatic, overcrowding, and so forth—may work up the virulence of the saprophyte till it becomes infective to certain susceptible individuals. They further show that as high as 10 per cent. of an ordinary population may be carriers of the saprophyte. It is

obviously impossible to attempt to deal with such carriers in ordinary civil life. In the precautions taken in camps these carriers were dealt with, although on a broad basis. No attempt was possible towards separating out the true meningococcal carrier from carriers of allied organisms. All suspicious throats were regarded as possible carriers and treated accordingly, and the result justified this simple method of dealing with the problem. In one case at least the influence of the carrier was demonstrated in the case of a man, "G.," in the 35th Reinforcements, who was found to be a carrier on mobilization, when he was isolated, and the throat apparently cleared up on treatment. A month afterwards he developed a bad cold, and four days later "M.," the man who slept next to him in the hut, developed cerebro-spinal meningitis, from which he died. Two other men in the same hut were found to be carriers. All were isolated and treated, but "G.'s" case was a very obstinate one and resisted all applications. He was finally discharged as a chronic carrier. It is interesting to note that "G." and "M." were tent-mates, yet "M." suffered no harm till "G." developed a severe cold. This case seems to bear out the conclusion shown in the Local Government Board report that the organism borne by the carrier may be a harmless saprophyte until some circumstance, such as the development of a catarrhal complaint in the carrier, may raise its virulence to a harmful extent.

Some attempt was made to ascertain from which districts the suspected throats came. The results were too few to be conclusive, but in general it appeared that "dirty throats" were more common among troops who had recently undergone a long railway journey, when doubtless the crowded conditions would lead to infection being spread. It was noticed that during the influenzal epidemic carriers were not more common than at other times. If this were confirmed by wider observation it would go to support the idea that the effect of influenza was indirect, not increasing the carriers, but making existing ones more dangerous and susceptible persons more easily infected. Everything which our experience in the past year has taught, and which recent reports from other places show, confirms the opinion developed last year that the first step towards combating meningococcal outbreaks is the avoidance of overcrowding, and of all conditions leading to catarrhal infections.

R. H. MAKGILL, Lieut.-Colonel,
Assistant Director of Medical Services (Sanitary).

REPORT OF PRINCIPAL MEDICAL OFFICER ON PREVAILING DISEASES AND SANITARY MEASURES IN TRENTHAM MILITARY CAMP.

I took over the duties of Principal Medical Officer from Lieut.-Colonel Andrew on the 12th November, 1917.

During the year 3,073 T.A.B. inoculations of soldiers were performed. 35,423 throat-swabbings were taken and slides examined microscopically. Of these, 944 were classed "suspect," and the men were sent into isolation camp for treatment by spraying twice daily. The average time required before the throat-swabbings became "clean" was three days. The great majority of these cases were "suspect" through organisms resembling meningococci being present in the naso-pharynx. Eighteen cases were definitely proved to be diphtheria-carriers. Spray treatment was not so effective in clearing away diphtheritic micro-organisms as in the former class. The duration of the isolation-period in cases of diphtheria-carriers varied from 14 to 183 days, the average being 51·56 days; the test of freedom from infection being two negative cultures shown at intervals of a week.

Seven cases of Vincent's angina were also isolated and subjected to spray treatment with little benefit, the topical application of organic arsenic compounds—viz., Atoxyl and Galyl—being more effective.

Spray treatment has been in daily use all the year for various conditions. Cases of "sore throat" of any kind have all been sprayed at once whatever the subsequent treatment might be. All measles and C.S.F. contacts were treated by spraying, and on several occasions a whole Reinforcement has been put through spray-rooms. Using our permanent spray-room with temporary rooms, and allowing ten minutes for time of spraying, a thousand men can be treated in five hours. The treatment is very effective in catarrhal conditions, and seems of great value in cases of diseases likely to be spread by naso-pharyngeal infection.

All Reinforcements as soon as recruits come into camp have post-nasal swabs taken and suspects treated by spraying. Swabs are also taken on sick-parade as considered necessary, and in all cases admitted to hospital. Immediately prior to embarkation each Reinforcement is swabbed, and suspects treated by spray and not allowed to embark if the microscopical examination still shows them suspect. It seems justifiable to credit to a large extent the reduction in the numbers of cases of infectious diseases in 1917 as compared with 1916 to the general use of the spray. Chloramine solution was sometimes used, but the routine solution was 2 per cent. sulphate of zinc in the solution-bottle of the spraying-apparatus.

New medical offices were finished and occupied at the end of February. A small laboratory was arranged by erecting a partition at one end of the Medical Record room, and work was commenced in May. The work done is outgrowing the accommodation, increase of which will have to be considered. Besides throat-swabs examined the following work was done: Pus-examinations, 227; bacterial cultures made and examined, 709; sputum-examinations, 69; bacteriological examinations of urine, 56; blood-examinations, 17.

The new fever wards were occupied in March, and have already proved their value and their necessity by the suitable accommodation they have afforded in cases of various infectious diseases.

The Wellington Racing Club Ward was opened in May, and is a convenient and satisfactory addition to the hospital buildings.

An operation-room was arranged and put into working-order; it has been in use when needed since the 20th September, and all operations required are now done in camp. Special furniture has been ordered, and delivery is expected at any time. The trustees for the late Colonel Hope Lewis donated the use of a splendid lot of surgical instruments to the hospital—a most generous and valuable gift.

Many improvements have been effected in the grounds of the hospital compound, and the fine garden has been a great pleasure to patients, visitors, and occupants of the camp generally. Improvements are still going on to render the hospital surroundings as beautiful and attractive as possible.

The various members of the Medical Corps did excellent work during the year, and though there were many changes in the personnel of officers, N.C.O.s, and men, all worked with a good will, and were not found wanting when at times duties were extra arduous and work very strenuous.

J. P. D. Leahy, Lieut.-Colonel, N.Z.M.C.,
Principal Medical Officer.

20th January, 1918.

REPORT OF PRINCIPAL MEDICAL OFFICER ON PREVAILING DISEASES AND SANITARY MEASURES AT FEATHERSTON MILITARY CAMP.

Preventive Measures.

Civilian.—All civilians working constantly in camp or coming into camp for temporary work have to be passed by the Medical Officers, and their throats swabbed, before starting. They attend weekly parades, and their living-quarters in camp are kept under close observation. The above routine has proved its value; we have discovered meningococcal and diphtheria carriers amongst them.

Military.—All recruits on arrival are closely examined and their throats swabbed, all carriers going to isolation till cleared. All men going into hospital have their throats swabbed and examined, measures being taken to isolate all carriers. All troops in camp are examined regularly each week for infectious and contagious disease. All men on sick-parade with any suspicion of sore throats go through a course of vapour treatment in the inhalation-room, there being one at each camp attached to Featherston Military Camp. Some 75 to 80 is the daily average under treatment, zinc sulphate or Chloramine T being used. The value of this cannot be overestimated. A close watch is kept for infectious disease on all men reporting on sick-parade. At the same time any thought advisable are swabbed. In this respect the work of the Camp Bacteriologist is invaluable, he being on the spot. Urgent work is not delayed.

All men returning from leave of any kind have to be passed by the Medical Staff before returning to their lines. Suspects, contacts, and carriers all go to isolation until proved ready for release.

Prevailing Diseases.

Influenza.—This was combated by extensive use of the inhalation-chamber, the use of a detention ward, the reduction in numbers of men living in huts from 24 to 20, sleeping head and feet alternately, and of those in tents from 8 to 6, in addition to ordinary medicinal treatment and the prevention of visitors to the influenza ward, where patients were segregated.

Pneumonia.—Of this disease we had only 8 cases for the year, and none of the meningococcal type, which formed a complication of measles in 1916.

Cerebro-spinal Meningitis.—Seven cases were admitted to hospital, against 24 for 1916. Men living in huts are more prone to develop the disease than those in tents. Men aged 20–21 in their first three weeks of camp life are much more liable than their older comrades, though one of our cases was 41, this being exceptional. The disease this year did not assume the very severe malignant type characteristic of previous years, 2 only of our cases being of a malignant nature, and there has been a gratifying decrease during the current year.

Venereal Disease.—Provision is made for prophylactic treatment of venereal disease in camp. This has been made use of, and the amount of venereal disease in camp has been relatively very small, as per return elsewhere. Lectures on venereal disease are being given by Captain Pettit, N.Z.M.C., to all units in camp, and are of great value.

Inoculation, Vaccination, &c.—All this is done in the first ten days of the recruit's entry into camp, so that when completed he can be handed over to the Training Staff unreservedly.

(*a.*) Whenever possible the T.A.B. inoculation is done in two stages of ten days' interval; if not, in one double dose, a subsequent forty-eight hours excused duty being the rule.

(*b.*) *Antimeningococcal Inoculation.*—It is a routine in our hospitals here for all men admitted to be given a dose of A.M. vaccine. It is significant that no case of cerebro-spinal meningitis has developed this year in hospital during convalescence. This was the rule during previous epidemics of cerebro-spinal meningitis, measles and influenza being the particular diseases involved. Also, all recruits coming directly into Featherston Military Camp into huts and not going into

Tauherenikau tents are given a single dose of A.M. vaccine. This apparently gives but little constitutional reaction, a local one of a curiously bluish bruised appearance about the needle-point of entrance alone being noticed.

(*c.*) *Vaccinations* of all Mounted Rifle units and others going to the eastern theatre of war has been done, also of one Infantry unit—the 34th Reinforcement—that responded very actively to the operation.

Tauherenikau Camp.

The use of this camp for the first four weeks of a recruit's camp life may justly claim to be a preventive measure. Here the practical isolation and segregation of troops during a period that has been proved to be a recruit's most trying time as regards health, and one that covers the incubation-period of any infectious disease he may have brought in with him, has proved of very great value. The camp is ideal in location, site, and general suitability. Its distance from large centres, and the comparative absence of general leave, are potent factors also to be considered. The roads have been formed, pathways laid out, and the tent-sites graded.

Buildings.—The plan of the camp is in four sections, each having a cookhouse, ration-store, ablution-stand, latrine, drying-room, and showers, making each section self-contained and complete. There is a medical hut, with rooms for medical inspection, inhalation, chiropodist, dispensary, dressing-room, orderly-room, and a two-bed ward for urgent cases, the outside portion forming a veranda for troops to wait in during sick-parades. The Dental Corps have their hut fitted up for all dental work, with workroom, waiting-room, store, &c. Hot and cold water is laid on to all lavatories and sinks. Headquarters, Camp Quartermaster's store, officers' mess, canteen, United Institute, Salvation Army, and Church of England Institutes, together with shops, are the only remaining buildings.

The institutes are open on the east side, and allow for the free passage of air, so that the atmosphere of the room is always fresh. This camp is essentially a canvas segregation camp, the idea being for all troops immediately after mobilizing from the four districts to remain one month under close observation for infectious disease, chiefly cerebro-spinal meningitis, our experience being that the third week shows the maximum amount of sickness among the troops. On the north-west and west sides of the tent-sites breakwind screens of manuka have been erected, and check to a great extent the heavy winds which are prevalent from this quarter.

It has separate hospital accommodation at Tauherenikau Racecourse. It has more than justified its existence, having borne out all the expectations formed of its advisability and its operations, and the health of the troops occupying it has been better even than of those in the main camp.

Sanitary Measures in Camp.

(*a.*) The health of the troops has been exceptionally good, no epidemics occurring. Constant inspection of all buildings by medical authorities has raised the standard of cleanliness throughout the camp, and owing to the well-made roads and concrete surface channels all heavy rains are quickly drained off, leaving roads and paths clean.

(*b.*) The district one mile from the camp has been made by legislation a sanitary area, under the direct control of the Camp Commandant and medical authorities. All dwellings, farms, whares, &c., are visited constantly by the Sanitary Officer to see all buildings and surroundings are kept in a clean and sanitary condition. A water-service is laid on from the camp supply to No. 1 area, close to the camp, whilst the Featherston town supply is connected up with No. 2 area, which is close to the town boundary, thus giving a pure water-supply to the inhabitants. There are approximately 130 dwellings, with a population of over 500, in the mile area, ranging from the modest tent to a three- or four-roomed cottage. Arrangements have been made whereby the nightsoil is collected twice each week, and all rubbish is disposed of by burning.

(*c.*) *Fly Campaign.*—This is carried on by Professor Kirk and a special fly squad under the Sanitary Officer. The work of fly-control proceeds upon ordered lines. The main underlying ideas are two: to prevent flies breeding, and to kill all flies that invade the camp. In the realization of the former idea every piece of sanitary work done in and about the camp is an important factor, especially the systematic removal of all breeding-material. Special work in this connection consists in the regular stacking of horse-manure, and the treatment of the stacks by a modification of Rouband's method, which involves the use of the fermentation heat of the stack. This plan, if properly followed out, suffices to prevent all fly-breeding at the stacks.

To bring about the realization of the second idea—the killing of flies that find their way into the camp—a systematic endeavour is made to render the whole camp a dangerous place for flies, and to render particularly dangerous the places that are most attractive. Most of the garbage-bins are provided with fly-traps; wires coated with "tanglefoot" are hung in twos or threes or dozens in cookhouses, mess-rooms, and other buildings; troughs are placed in windows in many parts of the camp; manure at the horse-lines awaiting removal is sprayed with an arsenical mixture, and the same mixture is placed in the latrine-pans. If the latrine attendants do their duty no fly survives a meal taken on their premises, and the fact that the latrine-floors become littered with dead flies on hot days shows the efficacy of the method.

Dead sheep, horses, and cows in the neighbourhood of the camp have to be sought out and burnt, and a beginning is now being made to use these carcases, before burning, as bait for enormous traps for blow-flies. The patrol of the mile area around the camp falls in great part to the fly squad, whose members have much other work to do.

The fly curve, based on counts taken at five fixed stations in the camp, shows certain very satisfactory features. For instance, the highest point of the curve last summer was reached in

December, not in February, as would have been the case had no anti-fly measures been in force. The curve shows further that the density of the perishing fly population in December, 1917, was not more than 10 per cent. of the density in the previous December. Manure now goes to the stacks comparatively free from eggs and maggots, showing that most flies are killed without a chance to visit the horse-lines to breed.

(*d.*) The whole of the water-supply is drawn from the new filter-beds, which were put into use in February, and the old water-service and well dispensed with. The supply is taken from the water-race which comes from the source of the Tauherenikau River, and has always been ample for all needs. It is of good quality, and samples taken periodically for chemical and bacteriological tests have proved satisfactory for drinking purposes. The area surrounding the filter-beds and the portion of water-race are well fenced to prevent pollution by cattle, and the whole of the water-race is constantly policed in order to keep it clean and free from any contamination. With the alteration to the water-supply all ablution-stands are now supplied with filtered water, which adds much to the comfort of the troops using same.

In the bakehouse improvements have taken place in the handling of the bread, whereby the loaves are baked in batches of six on shallow tin trays, and can be easily handled. The bread is distinctively marked to show the day it is made, and this assists in the proper distribution of bread.

Visits are paid periodically by the Sanitary Officer to the farms supplying milk to the camp, when samples are taken and tested. Two prosecutions took place as the result of adulteration with water. Samples of other foods are taken when new stores arrive, and forwarded to the Dominion Analyst for analysis. The refreshment-rooms at Kaitoke Railway-station and the premises of the mineral-water manufacturers supplying drinks to the camp have also been inspected, and recommendations made accordingly.

(*e.*) As previously stated, every building, including shops, is fumigated periodically according to the need. Kits of all troops leaving for embarkation, kits of contacts with infectious cases, kits of venereal-disease patients, and kits of all absentees are fumigated. Infectious kits, together with hospital linen and blankets from detention, are put through the steam-disinfector. From April to December, 4,502 kits, 1,553 buildings, 295 tents were fumigated, and 1,362 articles passed through the steam-disinfector.

External Aids.—Fortnightly reports from the Public Health Department are of great use as indicating the incidence of infectious disease throughout New Zealand, this bearing on the disposition of troops, their leave and their incoming—that is, we can watch for any particular infection of troops coming in or returning on leave from a district in which such infection is prevalent. One near-by town in the Wairarapa was declared out of bounds to troops owing to the presence of a scarlet-fever epidemic. Also, reports from Assistant Director of Medical Services of Military Districts, from hospitals, and through Public Health Departments, of any admissions for infectious disease assist greatly.

General.—The camp laboratory is self-contained, all bacteriological work in its many ramifications being done there, save Wassermann examinations. This is an immense advantage, saving time, labour, and expense. The accompanying report of work done by our Bacteriologist will show the extent and scope of his work, and bears its own evidence as to its value.

Great practical value has been found from the emptying of the camps of troops for practically a fortnight at Christmas-time.

C1 Camp, Tauherenikau.

Mention must be made of the camp established for the purpose of training C1 men up to the standard of physical fitness required for fit A men. This camp, initiated on the 25th September, 1917, was for a month in Canvas Camp, Featherston, and later migrated to Tauherenikau. On arrival the men are classified into three classes by the C1 Medical Officers, an X Class, Y Class, or Z Class, in that order of fitness. For four or six weeks each class goes through special and modified training by a specially selected staff of instructors to fit it for the higher class. Each man is then boarded either fit A, or, if not likely to become efficient, C2. This training is done under the personal supervision of the Medical Officers. The health of the camp has been excellent.

Papawai Camp.

The troops being in camp for short periods, no sickness of any degree has taken place. The standard of cleanliness is good, and a large amount of work has been carried out to make up roads and paths. Various improvements have been made to the existing buildings, and a new building erected for the officers' sitting-room. The water-supply has been laid on from Greytown town supply, and has given every satisfaction.

Isolation Camp.

This camp is situated on the south side of the Tauherenikau Road, to the south-east of Tauherenikau Camp, and is a well-laid-out site, having gravel paths and I.P. tents with boarded sides, together with inhalation-tent, dispensary, cookhouse, and latrine. During the year 641 troops have passed through the camp, and on no occasion has any infectious disease developed among them during the time of isolation.

Racecourse Hospital.

This camp is complete in that it has permanent buildings, efficient water-supply, good drainage, hot-water supply, and a hot-water radiator system in the hospital ward, and is satisfactory in every way.

REPORT OF THE BACTERIOLOGICAL LABORATORY, FEATHERSTON MILITARY HOSPITAL, FOR THE YEAR ENDING 31ST DECEMBER, 1917.

Swabs—	
Reinforcements	8,634
Miscellaneous	1,097
Diphtheria	167
Isolation	301
Sputums	147
Urines	214
Pus	42
Cerebro-spinal fluids	18
Blood counts	13
Blood, for typhoid	1
Fæces	3
Test meals	2
Hair (ringworm)	1
	10,640
Autogenous vaccines prepared	13
Cerebro-spinal meningitis vaccine prepared	500 c.c.

H. GRAHAM ROBERTSON, Lieut.-Colonel, N.Z.M.C.,
Principal Medical Officer.

TABLES.

TABLE I.—SHOWING THE HEALTH OF THE TROOPS FOR THE YEAR 1917.

Average annual strength	9,991
Admissions to hospitals	4,104
Average number constantly sick	124·79
Average sick-time to each soldier (days)	4·56
Average duration of each case of sickness (days)	11·10

Deaths.

In camp: From sickness, 15; accident, 2; suicide, 6: total, 23.
Out of camp: From sickness, 15; accident, 5; suicide, 2: total, 22.
Total deaths, 45.

Diseases.	Admitted to Hospital.	Died.	Average Number constantly Sick.
General Diseases.			
Group A—			
Cerebro-spinal fever	9	9	0·57
Chicken-pox	5	..	0·26
Cow-pox	19	..	0·33
Diphtheria	13	..	1·26
Enteric fever	1	..	0·29
Enteritis, infective	2	..	0·01
German measles	15	..	0·54
Measles	39	..	1·46
Influenza	883	..	18·49
Mumps	9	..	0·42
Paratyphoid A	..	1	0·25
Scarlet fever	4	..	0·16
Group B—			
Dysentery	3	..	0·02
Dengue fever	1	..	0·02
Group C—			
Malaria	2	..	0·03
Group D—			
Pyrexia of uncertain origin	19	..	0·60
Group E—			
Major septic diseases	1	..	0·02
Minor septic diseases	134	..	4·80

TABLE I. *continued.*

Diseases.	Admitted to Hospital.	Died.	Average Number constantly Sick.
General Diseases—continued.			
Group G—			
Pneumonia	14	1	0·66
Rheumatic fever	84	..	3·53
Sore throat	73	..	1·74
Tonsilitis	146	..	3·23
Group H—			
Tubercle of lung	15	..	0·42
Group I—			
Gonorrhœa	308	..	13·75
Syphilis	26	..	1·19
Soft chancre	6	..	0·29
Alcoholism	86	..	1·55
Other intoxicants	1	..	0·02
Scabies	62	..	2·32
Other parasitic diseases	38	..	0·95
Debility	23	..	0·74
Other general diseases	33	4	1·32
Local Diseases.			
Nervous system—			
Nervous	148	3	4·54
Mental	31	2	0·52
Eye	37	..	1·18
Other organs of special sense	31	..	0·60
Valvular disease of the heart	10	2	0·21
Other diseases of the circulatory system	94	3	2·95
Diseases of the respiratory system	219	..	6·70
Hernia	16	..	0·54
Other digestive diseases	485	5	14·24
Lymphatic system*	4	..	0·07
Urinary system	69	..	2·32
Generative system (except soft chancre)	133	..	4·62
Myalgia	74	..	2·18
Other diseases of organs of locomotion	170	..	6·50
Connective tissue*	4	..	0·22
Skin*	96	..	3·15
Injuries.			
Sunstroke	7	.	0·13
Other general	12	6	0·35
Local	350	1	11·92
Poisons	1	..	0·01
Effect of anti-typhoid vaccine	17	..	0·26
No appreciable diseases	22	..	0·34
Suicides	..	8	..
Totals	4,104	45	124·79

* Except those included under the heading of "Minor septic diseases."

ABSTRACT OF TABLE 1, SHOWING THE ADMISSIONS INTO HOSPITALS, DEATHS, AND AVERAGE CONSTANTLY SICK AMONGST THE TROOPS IN THE VARIOUS CAMPS AND STATIONS FOR THE YEAR 1917.

Camp or Station.	Featherston.			Trentham.			Narrow Neck.			Awapuni.			Hanmer.			Rotorua.		
Average strength	6,474			3,015			212			226			23			41		
Average sick-time to each soldier (days)	3·67			6·51			6·08			2·49			5·71			1·51		
Average duration of each case of sickness (days)	10·34			12·10			21·12			5·93			13·14			20·68		
Diseases.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.
General Diseases.																		
Group A—																		
Cerebro-spinal fever	7	8	0·55	2	1	0·02	..	..	..	..	..	..	..	..	..	..	..	..
Chicken-pox	2	..	0·10	3	..	0·16	..	..	..	..	..	..	..	..	..	..	..	..
Cow-pox	19	..	0·33	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheria	4	..	0·26	7	..	0·99	..	..	..	2	..	0·01	..	..	..	..	..	..
Enteric fever	..	..	..	1	..	0·01	..	..	0·28	..	..	..	..	..	..	..	..	..
Enteritis, infective	..	..	..	..	..	..	..	..	..	2	..	0·01	..	..	..	..	..	..
German measles	..	..	..	15	..	0·54	..	..	..	..	..	..	..	..	..	..	..	..
Influenza	616	..	11·65	244	..	6·35	13	..	0·31	10	..	0·18	..	..	..	..	..	..
Measles	28	..	1·14	11	..	0·32	..	..	..	..	..	..	..	..	..	..	..	..
Mumps	1	..	0·01	7	..	0·36	1	..	0·05	..	..	..	..	..	..	..	..	..
Paratyphoid fever A	..	1	0·25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Scarlet fever	2	..	0·10	2	..	0·06	..	..	..	..	..	..	..	..	..	..	..	..
Totals	679	9	14·39	292	1	8·81	14	..	0·64	14	..	0·20	..	..	..	..	..	..
Group B—																		
Dysentery	2	..	0·01	..	..	..	..	..	..	1	..	0·01	..	..	..	..	..	..
Dengue fever	..	..	..	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..
Totals	2	..	0·01	1	..	0·02	..	..	..	1	..	0·01	..	..	..	..	..	..
Group C—																		
Malaria	1	..	0·02	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..
Totals	1	..	0·02	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..

Group D—																			
Pyrexia of uncertain origin	4	..	0·15	8	..	0·23	5	..	0·19	1	..	0·01	..	..	..	1	..	0·02
Totals	4	..	0·15	8	..	0·23	5	..	0·19	1	..	0·01	..	..	..	1	..	0·02
Group E—																			
Major septic diseases—																			
Erysipelas	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Minor septic diseases—																			
Inflammation of lymphatic glands	5	..	0·14	3	..	0·07	1	..	0·02	..	..	..	..	..	..	..	..	..
Inflammation of lymphatic vessels	2	..	0·10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of connective tissue	11	..	0·27	22	..	0·63	3	..	0·13	1	..	0·01	..	..	..	..	..	..
Abscess of connective tissue	33	..	1·00	10	..	0·37	2	..	0·84	3	..	0·06	..	..	..	..	..	..
Boils	4	..	0·07	5	..	0·23	..	..	..	..	..	..	..	..	..	..	..	..
Carbuncle	..	..	..	2	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..
Onychia	5	..	0·12	..	..	..	..	..	..	1	..	0·00	..	..	..	..	..	..
Ulcer	7	..	0·32	9	..	0·23	..	..	..	1	..	0·01	..	..	..	..	..	..
Whitlow	1	..	0·01	..	..	..	2	..	0·09	..	..	..	..	..	..	..	..	..
Suppuration of lymphatic vessels	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	69	..	2·04	51	..	1·60	8	..	1·08	6	..	0·08	..	..	..	..	..	..
Group G—																			
Pneumonia	8	..	0·34	3	1	0·25	1	..	0·06	2	..	0·01	..	..	..	..	..	..
Rheumatic fever	79	..	3·28	1	..	0·15	..	..	..	4	..	0·10	..	..	..	..	..	..
Sore throat	41	..	0·88	29	..	0·79	1	..	0·02	2	..	0·05	..	..	..	..	..	..
Tonsilitis	90	..	2·03	52	..	1·12	..	..	..	4	..	0·08	..	..	..	..	..	..
Totals	218	..	6·53	85	1	2·31	2	..	0·08	12	..	0·24	..	..	..	..	..	..
Group H—																			
Tubercle of lung	3	..	0·07	12	..	0·35	..	..	..	..	..	..	..	..	..	..	..	..
Totals	3	..	0·07	12	..	0·35	..	..	..	..	..	..	..	..	..	..	..	..
Group I—																			
Gonorrhœa	144	..	7·64	155	..	5·33	9	..	0·78	..	..	..	..	..	..	..	..	..
Syphilis	8	..	0·32	18	..	0·87	..	..	..	..	..	..	..	..	..	..	..	..
Soft chancre	2	..	0·10	4	..	0·19	..	..	..	..	..	..	..	..	..	..	..	..
Totals	154	..	8·06	177	..	6·39	9	..	0·78	..	..	..	..	..	..	..	..	..

ABSTRACT OF TABLE I, SHOWING THE ADMISSIONS INTO HOSPITALS, DEATHS, AND AVERAGE CONSTANTLY SICK AMONGST THE TROOPS IN THE VARIOUS CAMPS AND STATIONS FOR THE YEAR 1917—*continued.*

Diseases.	Featherston.			Trentham.			Narrow Neck.			Awapuni.			Hanmer.			Rotorua.		
	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.
Intoxications—																		
Alcoholism	22	..	0·48	62	..	1·06	..	..	..	2	..	0·01	..	..	..	..	..	..
Tobacco poisoning	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	23	..	0·50	62	..	1·06	..	..	..	2	..	0·01	..	..	..	..	..	..
Effects of parasites—																		
Ascaris lumbricoides	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pediculus capitis	..	..	..	1	..	0·02	..	..	..	1	..	0·02	..	..	..	..	..	..
Pediculus vestimenti	18	..	0·19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Phthirius inguinalis	..	..	..	11	..	0·40	..	..	..	..	..	..	..	..	..	..	..	..
Ringworm	2	..	0·17	3	..	0·12	1	..	0·02	..	..	..	..	..	..	..	..	..
Scabies	22	..	0·65	38	..	1·62	..	..	..	2	..	0·05	..	..	..	..	..	..
Totals	43	..	1·02	53	..	2·16	1	..	0·02	3	..	0·07	..	..	..	..	..	..
Other general diseases—																		
Debility	..	..	..	21	..	0·70	..	..	..	2	..	0·04	..	..	..	..	..	..
Anæmia	17	..	0·60	1	1	0·07	..	..	..	..	..	..	..	..	..	..	..	..
Exophthalmic goitre	..	..	..	1	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..
Gout	1	..	0·06	2	..	0·06	..	..	..	..	..	..	..	..	..	..	..	..
Fibroma	..	..	..	1	..	0·03	..	..	..	..	..	..	..	..	..	..	..	..
Papilloma	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Carcinoma and malignant endothelioma	..	1	..	1	2	0·22	..	..	..	..	..	..	..	..	..	..	..	..
Cyst	5	..	0·10	3	..	0·09	..	..	..	..	..	..	..	..	..	..	..	..
Totals	24	1	0·78	30	3	1·24	..	..	..	2	..	0·04	..	..	..	..	..	..
Diseases of the Nervous System.																		
Nervous—																		
Neuritis	1	..	0·04	13	..	0·39	..	..	..	1	..	0·00	..	..	..	1	..	0·12
Hæmorrhage, membrane of brain	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..

Anæmia of brain	3	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Paraplegia	..	..	..	1	1	0·05	..	..	..	..	..	..	..	..	..	..	..	..	..
Local paralysis	2	..	0·18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Facial spasm	1	..	0·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Torticollis	3	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Convulsions	2	..	0·09	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Epilepsy	28	..	0·62	7	..	0·16	..	..	..	1	..	0·01	..	..	..	..	..	..	..
Vertigo	2	..	0·04	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..
Headache	4	..	0·08	5	..	0·11	..	..	..	..	..	..	..	..	..	..	..	..	..
Tetany	1	..	0·08	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Neuralgia	24	..	0·98	6	..	0·05	1	..	0·02	..	..	..	..	..	..	..	..	..	..
Hysteria	5	..	0·10	3	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..	..
Neurasthenia	19	..	0·53	12	..	0·64	..	..	..	..	..	..	1	..	0·08	..	..	..	..
Totals	95	1	2·85	48	1	1·46	1	1	0·02	2	..	0·01	1	..	0·08	1	..	0·12	
Mental—																			
Mania	3	1	0·05	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..
Melancholia	3	..	0·04	2	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..
Mental stupor	6	..	0·09	..	..	..	..	..	..	1	..	0·01	..	..	..	..	..	..	..
Delusional insanity	2	..	0·03	9	..	0·13	..	..	..	..	..	..	..	..	..	..	..	..	..
Confusional insanity	..	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..
Alcoholic insanity	1	..	0·07	2	1	0·05	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	15	1	0·28	15	1	0·23	..	..	..	1	..	0·01	..	..	..	..	..	..	
Diseases of the Eye.																			
Conjunctivitis	16	..	0·44	7	..	0·22	1	..	0·05	1	..	0·00	..	..	..	..	..	..	..
Keratitis	..	..	..	1	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..	..
Ulcerative keratitis	2	..	0·04	5	..	0·18	..	..	..	..	..	..	..	..	..	..	..	..	..
Iritis	2	..	0·11	1	..	0·08	..	..	..	..	..	..	..	..	..	..	..	..	..
Hæmorrhage of retina	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	21	..	0·61	14	..	0·52	1	..	0·05	1	..	0·00	..	..	..	..	..	..	
Diseases of the Ear.																			
Inflammation of external meatus	1	..	0·03	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of middle ear	1	..	0·02	3	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..	..
Tinnitus	..	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	2	..	0·05	5	..	0·09	..	..	..	..	..	..	..	..	..	..	..	..	

ABSTRACT OF TABLE I, SHOWING THE ADMISSIONS INTO HOSPITALS, DEATHS, AND AVERAGE CONSTANTLY SICK AMONGST THE TROOPS IN THE VARIOUS CAMPS AND STATIONS FOR THE YEAR 1917—*continued.*

Diseases.	Featherston.			Trentham.			Narrow Neck.			Awapuni.			Hanmer.			Rotorua.		
	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.
Diseases of the Nose.																		
Nasal deformity	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of soft part of nose	..	..	..	9	..	0·18	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of naso-pharynx	8	..	0·09	3	..	0·09	..	..	..	..	..	..	..	..	..	..	..	..
Hypertrophy of pharyngeal tonsil	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Epistaxis	..	..	..	2	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..
Totals	10	..	0·12	14	..	0·34	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Circulatory System.																		
Endocarditis	..	..	..	..	..	..	..	..	..	2	..	0·03	..	..	..	..	..	..
Valvular disease	2	1	0·04	6	..	0·09	..	..	..	1	1	0·02	1	..	0·06	..	..	..
Hypertrophy of myocardium	1	..	0·06	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Excessive growth of fat	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Effects of strain	1	..	0·08	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Syncope	14	..	0·28	5	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..
Disordered action of heart	33	..	1·02	25	..	1·03	..	..	..	..	..	..	..	..	..	..	..	..
Thrombosis of arteries	1	1	0·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Varix	3	..	0·05	2	..	0·10	..	..	..	1	..	0·00	..	..	..	..	..	..
Dilation of myocardium	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Septic heart-failure	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Phlebitis of veins	2	..	0·06	1	..	0·02	..	..	0·07	..	..	..	..	..	..	..	..	..
Thrombosis of veins	2	..	0·06	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	60	3	1·69	39	1	1·29	..	..	0·07	4	1	0·05	1	..	0·06	..	..	..
Diseases of the Respiratory System.																		
Asthma	19	..	0·42	22	..	0·46	1	..	0·01	1	..	0·01	..	..	..	..	..	..
Inflammation of larynx	7	..	0·27	4	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..
Bronchitis	53	..	1·32	25	..	1·18	..	..	..	8	..	0·15	..	..	..	1	..	0·03
Hæmorrhage of lung	8	..	0·22	7	..	0·18	..	..	..	..	..	..	..	..	..	..	..	..
Broncho-pneumonia	..	..	..	1	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..
Phthisis	4	..	0·14	3	..	0·11	..	..	..	2	..	0·02	..	..	..	..	..	..
Pleurisy	36	..	1·38	13	..	0·55	..	..	..	..	..	..	..	..	..	..	..	..
Adhesions of pleura	4	..	0·11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	131	..	3·86	75	..	2·62	1	..	0·01	11	..	0·18	..	..	..	1	..	0·03

Diseases of the Digestive System.																				
Inflammation of mouth	..	..	..	..	..	..	1	..	0·03	..	..	..	..	..	..	..	..	..	..	..
Ulceration of mouth	..	..	1	..	0·01	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..
Disorders of dentition	..	..	5	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of dental periost	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Abscess of dental periost	..	..	..	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..
Ulceration of periost, gums, &c.	..	..	4	..	0·06	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hypertrophy of tonsils	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of salivary glands	..	..	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of pharynx	..	..	5	..	0·08	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of stomach	..	..	88	..	2·83	35	1	1·43	..	..	..	3	..	0·04	1	..	0·01	..	1	..
Ulceration of stomach	..	..	3	1	0·08	2	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..
Hæmorrhage of stomach	..	..	5	..	0·18	2	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..
Mechanical affections of stomach	..	..	1	..	0·08	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Indigestion	..	..	16	..	0·66	31	..	1·19	1	..	0·01	..	..	..	..	..	..	..	..	..
Vomiting	..	..	9	..	0·48	14	..	0·55	..	..	..	2	..	0·02	..	..	..	..	..	..
Gastralgia	..	..	2	..	0·02	..	..	..	..	..	..	1	..	0·01	..	..	..	..	..	..
Heartburn	..	..	..	..	..	1	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..
Enteritis	..	..	8	..	0·19	13	1	0·46	..	..	..	..	..	..	..	..	..	..	..	..
Appendicitis	..	..	68	1	1·53	27	..	0·61	..	..	..	..	..	..	..	..	..	..	..	..
Colitis	..	..	..	..	..	3	..	0·11	..	..	..	..	..	..	..	..	..	..	..	..
Hernia	..	..	4	..	0·07	8	..	0·38	3	..	0·08	1	..	0·01	..	..	..	..	..	..
Diarrhœa	..	..	11	..	0·19	5	..	0·09	..	..	..	1	..	0·04	..	..	..	..	..	..
Constipation	..	..	5	..	0·07	6	..	0·16	1	..	0·01	..	..	..	..	..	..	..	..	..
Paresis	..	..	..	..	..	1	..	0·02	..	..	..	2	..	0·01	..	..	..	..	..	..
Colic	..	..	13	..	0·27	16	..	0·46	..	..	..	2	..	0·03	..	..	..	..	..	..
Enteralgia	..	..	1	..	0·01	2	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..
Periproctitis	..	..	..	..	..	2	..	0·03	..	..	..	..	..	..	..	..	..	..	..	..
Fissure of the anus	..	..	1	..	0·02	1	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..
Fistula in ano	..	..	..	..	..	4	..	0·09	..	..	..	..	..	..	..	..	..	..	..	..
Piles	..	..	19	..	0·33	13	..	0·58	..	..	..	1	..	0·01	..	..	..	..	..	..
Congestion of liver	..	..	..	..	..	..	..	..	..	..	..	1	..	0·02	..	..	..	..	..	..
Hæmorrhage of rectum	..	..	..	..	..	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..
Jaundice	..	..	7	..	0·33	4	..	0·14	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of gall-bladder and duct	..	..	1	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Biliary colic	..	..	3	..	0·09	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of peritoneum	..	..	1	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Adhesion of peritoneum	..	..	3	..	0·11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	..	..	287	2	7·90	194	2	6·58	5	..	0·10	14	..	0·19	1	..	0·01	..	1	..
Diseases of the Lymphatic System.																				
Hypertrophy of lymphatic glands	..	..	..	..	..	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..
Totals	..	..	..	..	..	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..

ABSTRACT OF TABLE I. SHOWING THE ADMISSIONS INTO HOSPITALS, DEATHS, AND AVERAGE CONSTANTLY SICK AMONGST THE TROOPS IN THE VARIOUS CAMPS AND STATIONS FOR THE YEAR 1917—*continued.*

Diseases.	Featherston.			Trentham.			Narrow Neck.			Awapuni.			Hanmer.			Rotorua.		
	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.
Diseases of the Thyroid Gland.																		
Inflammation of thyroid gland	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Goitre	2	..	0·03	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	3	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diseases of the Urinary System.																		
Acute nephritis	7	..	0·18	4	..	0·25	..	..	..	..	.	..	..	..	..	..	..	..
Chronic nephritis	1	..	0·06	1	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..
Pyelitis	..	..	..	1	..	0·10	..	..	..	..	..	..	..	..	..	..	..	..
Nephralgia	1	..	0·04	2	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..
Renal colic	7	..	0·15	3	..	0·08	..	..	..	..	..	..	..	..	..	..	..	..
Stricture of ureters	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of bladder	4	..	0·17	2	..	0·13	..	..	..	..	..	..	..	..	..	..	..	..
Irritability of bladder	..	..	..	1	..	0·01	..	..	..	1	..	0·01	..	..	..	..	..	..
Retention of urine	12	..	0·21	2	..	0·10	..	..	..	1	..	0·03	..	..	..	..	..	..
Incontinence of urine	1	..	0·05	7	..	0·24	..	..	..	..	..	..	..	..	..	..	..	..
Hæmaturia	3	..	0·09	2	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..
Glycosuria	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Albuminuria	2	..	0·05	2	..	0·18	..	..	..	..	..	..	..	..	..	..	..	..
Totals	40	..	1·03	27	..	1·25	..	..	..	2	..	0·04	..	..	..	..	..	..
Diseases of the Generative System.																		
Urethritis	5	..	0·24	3	..	0·19	..	..	..	1	..	0·01	..	..	..	..	..	..
Gleet	15	..	0·63	32	..	0·87	..	..	..	..	..	..	..	..	..	..	..	..
Stricture of urethra	5	..	0·13	15	..	0·41	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of prostate	..	..	..	2	..	0·09	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of prepuce	..	..	..	2	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..
Phimosis	3	..	0·10	3	..	0·18	..	..	..	2	..	0·01	..	..	..	..	..	..
Œdema of penis	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Inflammation of glands of penis	2	..	0·02	8	..	0·28	..	..	..	..	..	..	1	..	0·04	..	..	..
Abscess of scrotum	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hydrocele of cord	1	..	0·03	4	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..
Varicocele of cord	1	..	0·01	1	..	0·15	..	..	..	..	..	..	..	..	..	..	..	..
Orchitis	15	..	0·74	..	..	..	2	..	0·11	..	..	..	..	..	..	..	..	..
Epididymitis	1	..	0·05	6	..	0·17	..	..	..	..	..	..	..	..	..	..	..	..
Torsion	1	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	51	..	2·03	76	..	2·42	2	..	0·11	3	..	0·02	1	..	0·04	..	..	..
Diseases of the Organs of Locomotion.																		
Osteitis	..	..	..	1	..	0·03	..	..	..	..	..	..	..	..	..	..	..	..
Periostitis	1	..	0·03	3	..	0·33	..	..	..	1	..	0·00	..	..	..	..	..	..
Caries of bone	3	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Necrosis of bone	2	..	0·05	1	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..
Hypertrophy of bone	1	..	0·03	..	..	..	..	..	..	2	..	0·03	..	..	..	..	..	..
Inflammation of joints	55	..	2·06	7	..	0·17	..	..	..	2	..	0·15	..	..	..	..	..	..
Psoas and other abscesses	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ankylosis	..	..	..	1	..	0·10	..	..	..	..	..	..	..	..	..	..	..	..
Dislocation and fracture dislocation	1	..	0·03	..	..	..	..	..	..	..	..	..	1	..	0·08	..	..	..
Inflammation of muscles	..	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..
Contraction of muscles	3	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Myalgia	18	..	0·45	47	..	1·60	6	..	0·07	3	..	0·06	..	..	..	..	..	..
Inflammation of fasciæ	..	..	..	16	..	1·11	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of tendons	2	..	0·13	3	..	0·18	..	..	..	..	..	..	..	..	..	..	..	..
Contraction of tendons	..	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of sheaths of tendons	..	..	..	40	..	1·22	..	..	..	..	..	..	..	..	..	..	..	..
Ganglion	..	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..
Inflammation of bursæ	5	..	0·16	1	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..
Bunion	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Flat-foot	1	..	0·01	1	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..
Deformities of toes	4	..	0·12	7	..	0·18	..	..	..	..	..	..	..	..	..	..	..	..
Totals	98	..	3·22	131	..	5·08	6	..	0·07	8	..	0·24	1	..	0·08	..	..	..
Diseases of the Connective Tissue.																		
Œdema	4	..	0·22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	4	..	0·22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

ABSTRACT OF TABLE I. SHOWING THE ADMISSIONS INTO HOSPITALS, DEATHS, AND AVERAGE CONSTANTLY SICK AMONGST THE TROOPS IN THE VARIOUS CAMPS AND STATIONS FOR THE YEAR 1917—*continued.*

Diseases.	Featherston.			Trentham.			Narrow Neck.			Awapuni.			Hanmer.			Rotorua.		
	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.	Admitted.	Died.	Average constantly Sick.
Diseases of the Skin.																		
Erythema	4	..	0·14	9	..	0·33	..	..	..	1	..	0·01	..	..	..	..	..	..
Urticaria	3	..	0·03	7	..	0·11	..	..	..	..	..	..	..	..	..	..	..	..
Eczema	8	..	0·30	17	..	0·79	..	..	..	1	..	0·01	..	..	..	..	..	..
Impetigo contagiosa	6	..	0·28	2	..	0·06	..	..	..	..	..	..	..	..	..	..	..	..
Impetigo herpetiformis	..	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..
Herpes	5	..	0·12	4	..	0·13	..	..	..	..	..	..	..	..	..	..	..	..
Dermatitis herpetiformis	1	..	0·10	2	..	0·11	..	..	..	..	..	..	..	..	..	..	..	..
Psoriasis	..	..	..	5	..	0·09	..	..	..	1	..	0·00	..	..	..	..	..	..
Pemphigus	..	..	..	1	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..
Lichen	..	..	..	..	..	..	..	..	..	1	..	0·00	..	..	..	..	..	..
Corns	..	..	..	..	..	..	..	..	..	1	..	0·02	..	..	..	..	..	..
Dermatitis exfoliativa	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ichthyosis	..	..	..	1	..	0·04	..	..	..	..	..	..	..	..	..	..	..	..
Seborrhœa	1	..	0·02	2	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..
Subaceous cyst	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dermatitis seborrhœica	..	..	..	2	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..
Acne	1	..	0·02	2	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..
Rosacea	2	..	0·07	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Folliculitis	..	..	..	3	..	0·16	..	..	..	..	..	..	..	..	..	..	..	..
Totals	33	..	1·10	58	..	2·01	..	..	..	5	..	0·04	..	..	..	..	..	..
General Injuries.																		
Effects of heat—																		
Burns and scalds	1	..	0·06	1	..	0·12	..	..	..	1	..	0·01	..	..	..	..	..	..
Heat-stroke	5	..	0·09	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sun-stroke	6	..	0·12	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..
Effects of irritants and corrosives	..	..	..	3	..	0·06	..	..	..	..	..	..	..	..	..	..	..	..
Suffocation from submersion	..	2	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..
Shock	..	3	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Totals	12	5	0·27	6	1	0·20	..	..	..	1	..	0·01	..	..	..	..	..	..

Local Injuries.																				
Burns and scalds	..	..	..	..	..	..	..	3	..	0·20	..	..	..	..	..	..	..	..	..	..	..
Effects of irritants and corrosives	..	..	..	..	..	..	..	1	..	0·03	..	..	..	..	..	..	..	..	..	..	..
Abrasion	..	..	..	..	..	..	..	4	..	0·10	1	..	0·04	1	..	0·01	..	..	..	..	..
Bruise or contusion	..	..	..	..	40	..	1·02	21	..	0·80	..	..	..	3	..	0·07	3	..	0·08	..	..
Wounds	..	..	..	..	23	..	0·72	11	..	0·44	1	..	0·13	..	..	..	..	..	..	..	..
Wounds, gun-shot	..	..	..	..	1	..	0·01	4	..	0·12	..	..	..	1	..	0·01	..	..	..	..	..
Sprains and strains	..	..	..	..	100	..	2·72	68	..	2·63	4	..	0·14	6	..	0·10	..	..	..	..	..
Displacement or dislocations	..	..	..	..	3	..	0·22	1	..	0·10	..	..	..	1	..	0·07	..	..	..	..	..
Rupture of soft parts	..	..	..	..	..	..	..	2	..	0·04	..	..	..	..	..	..	..	..	..	..	..
Fractures	..	..	..	..	16	..	1·05	10	..	0·69	..	..	..	2	..	0·08	2	..	0·02	..	..
Stretching of a nerve	..	..	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Compression	..	..	..	..	1	..	0·02	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Displacement of intra-articular cartilage			..	..	1	..	0·02	..	..	..	..	..	..	1	..	0·00	..	..	..	..	..
Concussion of brain	..	..	..	..	3	..	0·10	2	1	0·01	..	..	..	..	..	..	..	..	..	..	..
Internal derangement of knee-joint			..	..	..	..	..	2	..	0 05	..	..	..	..	..	..	..	..	..	..	..
Effects of foreign bodies	..	..	..	..	2	..	0·02	4	..	0·05	..	..	..	..	..	..	..	..	..	..	..
Totals	..	..	..	..	191	..	5·91	133	1	5·26	6	..	0·31	15	..	0·34	5	..	0·10	..	..
Effects of anti-typhoid vaccine		..	..	..	13	..	0·23	..	..	..	..	..	..	4	..	0.03	..	..	..	..	..
Poisons: Formalin	..	..	..	..	1	..	0·01	..	..	..	..	..	..	..	..	..	..	..	..	..	..
No appreciable disease		..	..	..	8	..	0·08	14	..	0·26	..	..	..	..	..	..	..	..	..	..	..
Suicides*	..	..	..	..	..	7	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
Grand totals	..	..	..	..	2,296	22	65·10	1,622	12	53·81	61	1	3·53	112	1	1·82	10	..	0.36	3	1	0·17

*The number of suicides is not included in the grand totals.

TABLE 2.—SHOWING THE AVERAGE STRENGTH, SICKNESS, AND DEATHS AMONG OFFICERS DURING THE YEAR 1917.

Average strength, 362. Admissions, 55 (ratio per thousand, 152). Death, 1 (ratio per thousand, 2·7).

Diseases.	Attacks of Illness.	Died.	Average Number constantly Sick.
General Diseases.			
Group A—			
Chicken-pox	1	..	0·08
Diphtheria	1	..	0·08
Influenza	14	..	0·84
Group C—			
Malaria	1	..	0·01
Group E—			
Minor septic diseases	1	..	0·07
Group G—			
Sore throat	5	..	0·29
Tonsilitis	6	..	0·36
Local Diseases.			
Eye	1	..	0·08
Circulatory diseases	1	..	0·08
Digestive system	11	1	0·64
Generative system	1	..	0·02
Organs of locomotion	5	..	0·23
Injuries.			
Local	6	..	0·35
Poisons	1	..	0·08
Totals	55	1	3·21

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