

AWM4
Australian Imperial Force unit war diaries,
1914-18 War

Medical, Dental & Nursing

Item number: 26/80/5

Title: 5th Australian Sanitary Section

December 1917



AWM4-26/80/5

SANITARY SECTION
 5th
 AUSTRALIAN DIV.
 No.
 Date

WAR DIARY
 or
INTELLIGENCE SUMMARY.

(Erase heading not required.)

Instructions regarding War Diaries and Intelligence
 Summaries are contained in F. S. Regs., Part II.
 and the Staff Manual respectively. Title pages
 will be prepared in manuscript.

Place	Date	Hour	Summary of Events and Information	Remarks and references to Appendices
LINDENBROEK.	Dec 1st 2nd 3rd 4th 5th 10th 12th 13th 15th 17th 22nd 23rd 24th		<p> PROVISIONS Strength of Unit. 27 OR. 5 supernumerary 6 men attached water battery (3. 14th Field Amb 3. 15th Field Amb.). Outbreak of Diphtheria in 30th Batt. ADMS 5th Div. asked for recommendation for syllabus of Divisional School of Sanitation. O.C. 9th Corps Sanitation school interviewed. Recommendation for Div. School of Sanitation forwarded ADMS 5th Div and Div Snowing. First list of wells tested forwarded to ADMS 5th Div 16th Base Sect. definitely withdrawn from northern portion of area. Arrangements made for disinfection of all quarters, dugouts, fuelboxes etc. occupied by Diphtheria patients & contacts 30th Batt. A.I.F. C.O. on leave to Paris. Capt. Kinty from 15th Fld Amb acting i/c. Disinfection completed 8th Fld Amb. Kandahar Farm (measles) Ration 1-40 Biscuit boxes for constructional purposes from Corps Troops Supply Column. Section and attached vote on the Compulsory Service Referendum Ration 1-36x C.O. returned from Paris leave. 1st Aust Division taking over from 5th Div. Ration 1-38. Change ration dump drawing off. Snowing Pte Daniels on special leave to UKingdom Samples of water taken from front-line and sent to No 4 Mobile Laboratory Goods bought for Christmas dinner from canteen profits Total 487 for 85 cents S/Sgt Melville returned to unit from 1st Anzac Corps School </p>	

WAR DIARY

or

INTELLIGENCE SUMMARY

(Erase heading not required.)

Army Form C. 2118.

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Instructions regarding War Diaries and Intelligence Summaries are contained in F. S. Regs., Part II. and the Staff Manual respectively. Title Pages will be prepared in manuscript.

SANITARY SECTION.
5th
AUSTRALIAN DIV.
No.....
Date.....

Place	Date	Hour	Summary of Events and Information	Remarks and references to Appendices
December. LINDENHOEK.	25		Samples of water taken from front line and sent to No 4 Mobile Laboratory The Moreland to Fld. Amb.	
	26		Canteen profits transferred to Regimental Funds. £17 2 deposited with 1 st Aust Div Paymaster	Div Paymaster
	27		The Watts O. No., The Hearne Co. taken on strength from 8 th Aust Fld Amb.	
	28		Two cases of dysentery reported from 1 st A.D.M.S. at 5 th Aust Inf Bty.	
			Using the previous sample bottles having been broken owing to cold two samples again taken from Pull Box Dump Ward & Verne Dump. and sent to No 4 Mobile Laboratory for analysis.	
	30		Bottles notified again broken.	
	31 st		Strength of Unit 1 Off - ORs. - attached ORs. Regimental Funds Total £33-13-11 -	
			Attached. A. Copy Monthly Report.	A
			" B. & C. " Canteen Returns	B & C.
			" D Diagram. " Method of Stacking Manure for large horse lines	D.
			" E. " "Universal Seat."	E.
			" F. " "Grease Trap."	F.
			" G. " Booklet "Notes on Sanitab. for Medical Officers of Units" & Duplicates	G.

Monthly Report of 5th Australian Trench Mortar Section

Period Ending 31st Dec. 1917.

SANITARY SECTION.	
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During month. Area was occupied by 5th Aus. Division and later by 1st. Aus. Division

Ridgely and other Quarrels. - As in last report.

Water Supply. - As in last monthly report.

(a) Nature of Supplies. - As in last monthly report.

Attached. "A" - method of supply of water in Area forward of trenches. Wycheston, redys.

Attached. "B" - List of wells tested and inspected during month.

(b) Chlorination. - All points labelled, and Chlorination

done only at water points. Most water points

picqueted

Attached. "C" - List of points without picquet.

(c) Inspection of water carts. - Carried out as routine by water inspectors

(d) Food and cooking. - Quality and variety satisfactory. Test as in last monthly report.

(e) Baths. - As in last monthly report. Nothing further to report.

(f) Candies. - As in last monthly report.

(g) Disinfection. - As in last monthly report.

(h) Latrines and urinals. - As in last monthly report.

Plans mentioned in last report, forwarded during month. Bucket seat system installed along whole of front line. S.Y. Jan

(i) Refuse disposal. - As in last monthly report.

(j) Stables and Horse Banding.

(a) General condition. - Satisfactory.

(b) Disposal of manure. - Units are being taught by inspectors to stack manure in cubes. This is being done by most units. Manure in many cases is being carted from cubes to fields.

(c) Anti-louse Scabies measures. - method of prevention and change of clothes, Sterilization of underwear

12. Instruction in Sanitation - Nil
13. Infectious Diseases - The following cases reported by A.D.C.'s 1st. Aus. Division
 2nd Aus. Division group. - 2 Cases 5th. Battalion
 General Remarks. Nil.

Unhappy. 2nd
 O.C. 5th Aus. Laundry Section.

(all map locations given are from Sheet 28)

1. Left Brigade Sector.

A. Extreme Left Battalion.

- i. Headquarters draw water from points No 99 and 100 at O 14 C 4.6 and O 14 C 6.6 Requested by Battalion Both points require cleaning of tank and repairs
- ii. Company Headquarters. Denny's Wood. Dull box at O 9 d 55.45. Concrete well with central iron pipe Gives 800 to 1000 galls. per 24 hours. Depth. 3. feet. Sample sent to N.4. Laboratory. (mobile) for Analysis
- iii. Forward water supply. was being taken from running stream connecting shell holes. O 10 d 10.50 on the map. This source is unsatisfactory for the reason that the course of the stream is unfavourable and insanitary and secondly that it may be contaminated by shell gas. The C.O. 7th Battalion promised to have water carried from Dull box at Denny's Wood. It is recommended that if possible a well should be put down in the vicinity of O 10 d 10.50

B. Left Centre Battalion.

- i. Headquarters water supply. 2 old brick wells - civilian at O 20 a 8.7. and O 20 a 2.4.
- ii. Forward water supply at Verue Dump O.21. Central. from Wambuck Stream (connecting shell hole arising in Leg. Cope. Sample of this water taken and sent to N 4 mobile Laboratory. for Analysis.

C. Right Centre Battalion.

- i. Headquarters water supply. Point No. 93 at O 20 d 2.3. Notice 2 measures. Request should be placed on this point by the Battalion
- ii. Forward water supply same as Left Centre Battalion. It is recommended if possible that the Wyt-schaats. line be continued past. W.S. 93. Loozen. Dam. to establish a point ~~at~~ at about. O 21 Central. Verue Dump. The nature of the country in this area would not prevent such a line being laid. Look from O. 21 position 2 Battalion front line areas

1. D. Extreme Left. Right Battalion.

i Headquarters draw water at point 93. at 0 20. d. 2. 3

ii Forward water supply taken from stream at 0 27 0 4.
This water is boiled for 20 minutes before use. by the order of the Medical Officers of the unit.

Sample of water taken from this stream and tested requires 1 measure B.P. per 100 gallons.

2. G. Right Brigade.

i Left Forward Battalion.

Headquarters draw water from running stream.
Blauwepoortbeek at about 0 34 5. 2st

ii ~~Head~~ Forward water supply sent up by cooks in hot boxes. taken from wells in the vicinity of measure

Location about 0 33. 0 8. 8

Right Forward Battalion.

B: Headquarters draw water from stream running through D & E. and the river Douve.

ii All water consumed by front line companies drawn from drinking team and River Douve.

Full particulars are not yet available of this supply, but there is a good well situated at U 7 a 45. 65, requiring 1 measure B.P. per 100 gallons.

C: Remaining two Battalions of Right Brigade are using water points in vicinity of Wulvergham. Tank situated at 0 33 d 40 85 is unfit for further use owing to action of shell fire.

Wells on water map. 28 in 0. 35 and U 5. Cannot.

so far be traced. but efforts are being made to locate them

M. J. J. J.

Capt.

C. B. 5th Aust. Sanitary Section

Wells Tested during the war

13

<u>Location</u>	<u>Measurements</u>	
M. 31. a. 2.9	1	
Q. 20. a. 4.4	1	
M. 19. d. 4.8	1	
M. 26. a. 1.9	1	
M. 31. e. 2.6	1	
M. 31. e. 3.7	1	
M. 31. a. 1.9	1	Spring
T. 10. a. 8.3	1	
M. 32. b. 2.2	1	
M. 32. d. 8.1	1	
M. 20. d. 5.1	1	Spring
M. 34. a. 1.6	1	
M. 29. b. 7.7	1	
O. 31. a. 4.3	1	
O. 32. a. 1.8	2	
U. 3. b. 2.8	}	Destroyed by shell fire
U. 3. b. 9.2		
U. 3. b. 8.2		
M. 31. b. 4.8	1	Spring
U. 2. b. 4.2	1	
U. 2. b. 3.7	1	
U. 2. a. 6.4	1	
U. 2. b. 3.9	}	Destroyed by shell fire
U. 7. a. 5.7		
U. 7. a. 5.1		
U. 7. b. 4.8	1	
U. 1. b. 5.9	1	Pond
M. 33. b. 4.1	1	Spring
U. 8. a. 5.5	1	River House
U. 9. a. 3.3	1	
U. 9. a. 5.5	1	
M. 13. d. 8.5	1	
M. 21. a. 5.0	1	Spring
M. 20. d. 3.3	1	
M. 20. d. 5.4	1	
U. 3. d. 2.4	1	Pond
U. 3. b. 2.6	1	
M. 21. c. 4.3	1	
M. 14. a. 6.1	1	

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Continued.

<u>Location</u>	<u>Measures B.P.</u>
N. 19. a. 9.2	1 Spring.
N. 19. a. 6.9	1 "
M. 18. a. 1.6	1
N. 21. c. 9.9	1
N. 20. h. 3.9	1 Spring
M. 18. d. 4.1	1
N. 31. b. 2.2	1
N. 21. c. 6.7	1
V. 7. b. 9.5	1 River Bouwe.
O. 25. a. 8.2	1 Spring.

B

W. H. P. H. M.
 Capt.
C. O. 54. Aust. Sanitary Section.

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Australia Corps. Left Forward Area

(3)

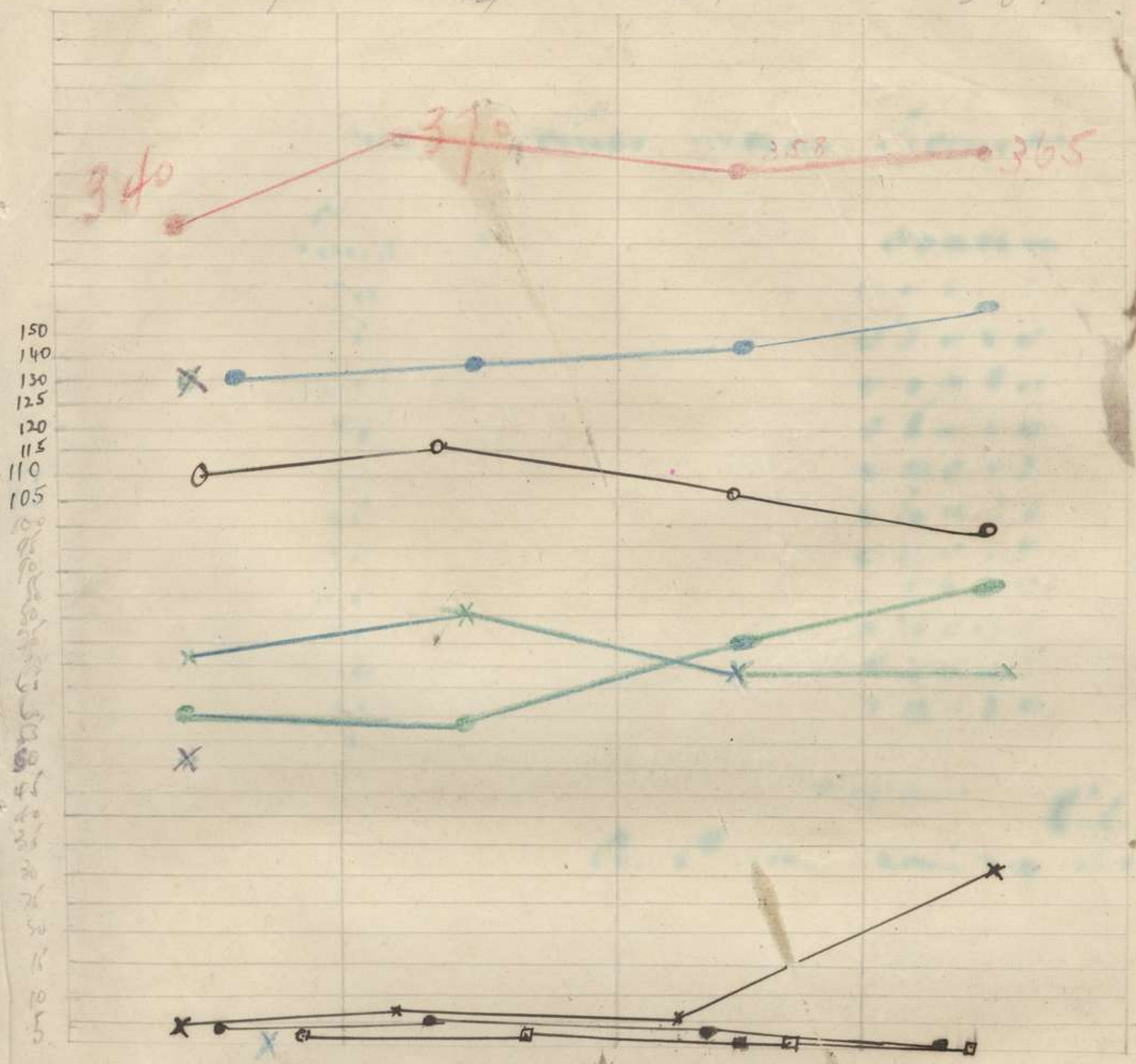
Week ending Dec

7

14

21

28



- Bullets inspected ● — ●
- Alpha axes ✕ — ✕
- Large trip axes ● — ●
- House line map ○ — ○
- Water points ● — ●
- Ramp etc ✕ — ✕
- Notice Board ● — ●
- Other the way ✕ — ✕
- Incurator axes □ — □



water. Points without Picquets

APPENDIX, A

(2)

Tank. No.	Location
29	U 7 b 0 2.
?	U 2 d 2 4
28	U 1 b 6 4
71	S 6 a 8 9
92	O 19 c 8 2
93	O 20 d 2 3
94	O 25 c 5 7
105	O 8 b 8 5
90	N 23 c 9 5
89	N 35 d 4 5
88	T 12 a 2 9
?	

~~Voloffmann.
 Co. 5th Aust. Railway Section
 Capt.~~

Area occupied by 5th and 1st Aust. Divisions for month ending December 1919

Work done carried out by and under the supervision of the 5th Aust. Sanitary Section

Situation	Latrines completed	Urinals erected	Septic tanks dug or in course of digging	Incinerators erected	Refuse dumps dug	Excavation and latrine pits constructed	Recesses constructed	Latrine pits dug	Water supply	Other	Notes
1799	179	43	51	22	Nil	77	65	daily	47	7	No record taken

3rd Australian Sanitary Section

Work in progress month ending December 1919

Situation	Latrines	Urinals	Excavation	Incinerators	Other
	3-4 Seats 4-2	Nil	4	5	7

W. Williams
Capt
5th Aust. Sanitary Section

5th Australian Sanitary Section Canteen

Cash Book to 31/12/1917.

Receipts.

Payments.

Date 1917	From whom	On what account	£	s	Date 1917	To whom	On what acc	£	s		
Nov 18 to Dec 31.	Takings		15	631	25	Nov 18 to Dec 31 st	To 5 Divi Canteen E.F.C. Baillett " Steenworks. Bravery, Dranoubre & Sundries as per Receipts				
" 26	From Reg. Funds	(10 of P.M. Refused by Cashier)	13	60	Dec 30	H. Rousselle Comquette.	Goods	127	52 70		
					Nov 20	5 Divi Canteen	Lamps etc	28	50		
					" 22	" "	off acc.	50	00		
					Dec 12	" "	off acc	50	00		
					" 9	" "	off acc	270	00		
					" 16	Regimental Funds of	off acc	234	40		
					" 25	" " "	Canteen Profits	300	00		
					" 26	" " "	Xmas Dinner	487	85		
						" " "	Canteen Profits	480	00		
						Balance of Cash in Hand		991	4		
Total for			15	644	85	Total for			15	644	85

SANITARY SECTION.
5th
AUSTRALIAN DIV.
No.
Date

Maloff
5th Aust San Sect

Checked and found correct
E.O.E.

H. Q. Aust Canteen
H. Q. Aust Canteen

7/1/18

APPENDIX B
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5th Australian Sanitary Section CANTEEN

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Balance Sheet to 31/12/1917

Liabilities	Frs	Cts	Assets	Frs	Cts
Unpaid Bills as under:-			To Cash in Hand as per Cash Books:-		
To Draught Brewery, 3 Barrels			Petty & Receipts	582	00
Beer Total 35 1/2 Litre @ 1 1/2 Lbs	409	40	Held by Q.M. for ap (Beer)	409	40
Deposit from 2 nd Aust & Amb. in 1 Barrel	60	00	To Cash held on 2 Barrels by us.		
			(2 nd Aust & Ambulance)	60	00
			Stocks on Hand, Approx.	400	00
			Sections Debt on Credit Books	246	00
			Deposit held by Draught Brewery	40	00
Balance	2522	65	Amount to Regimental Fund ap	1254	25
Total	2992	05	Total	2992	05

Checked and found correct

C. O. E.

Elfdun Capt 7/1/18

H. R. Aust Capt

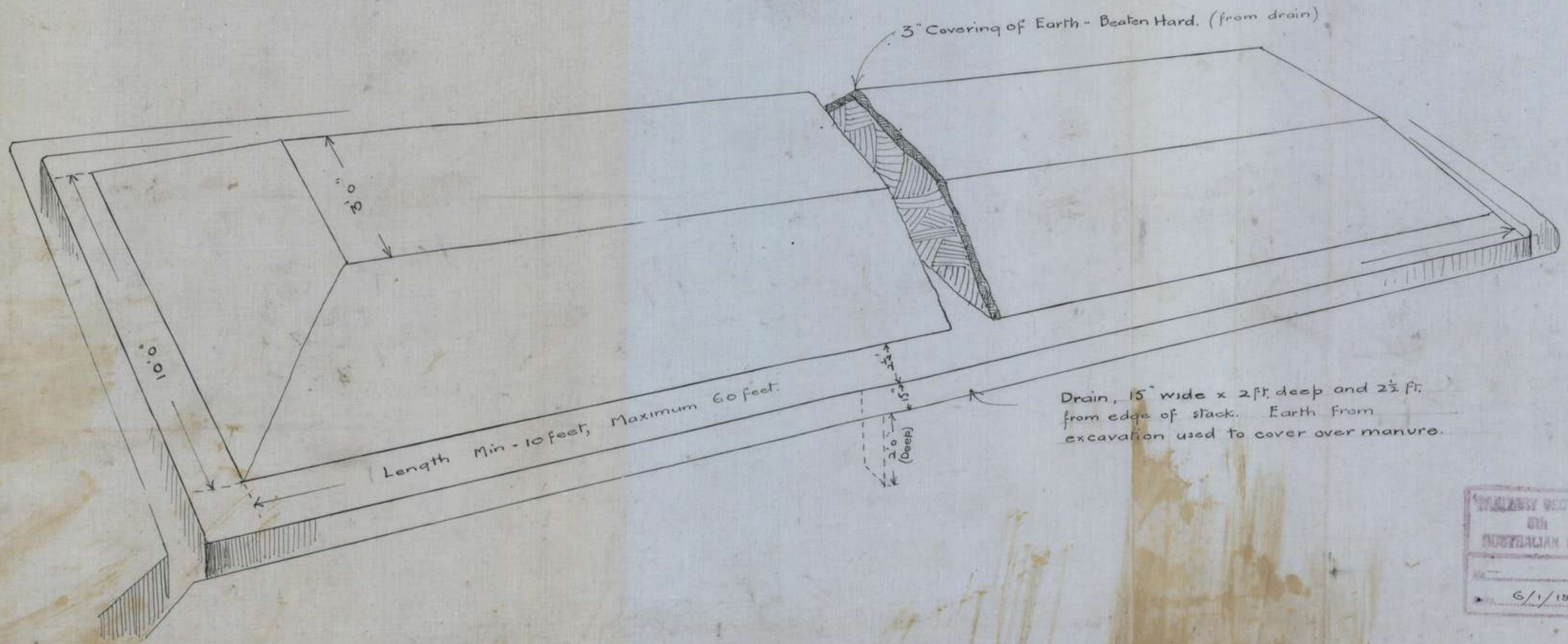
Muloff
5th Aust Sanit Sec.

SANITARY SECTION. 5th AUSTRALIAN DIV.
No.
Date.

APPENDIX

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SKETCH SHOWING REGULATION METHOD OF STACKING MANURE

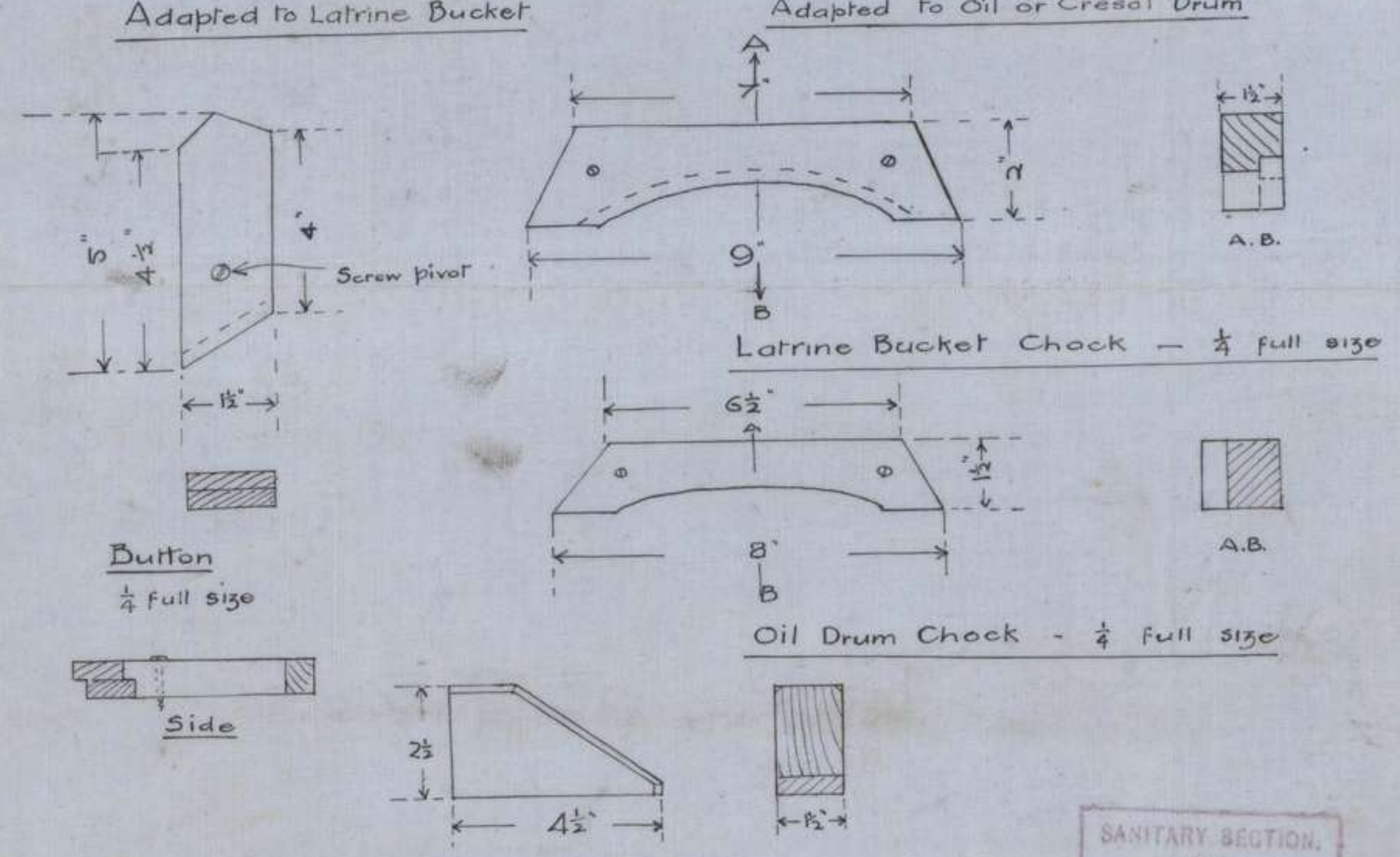
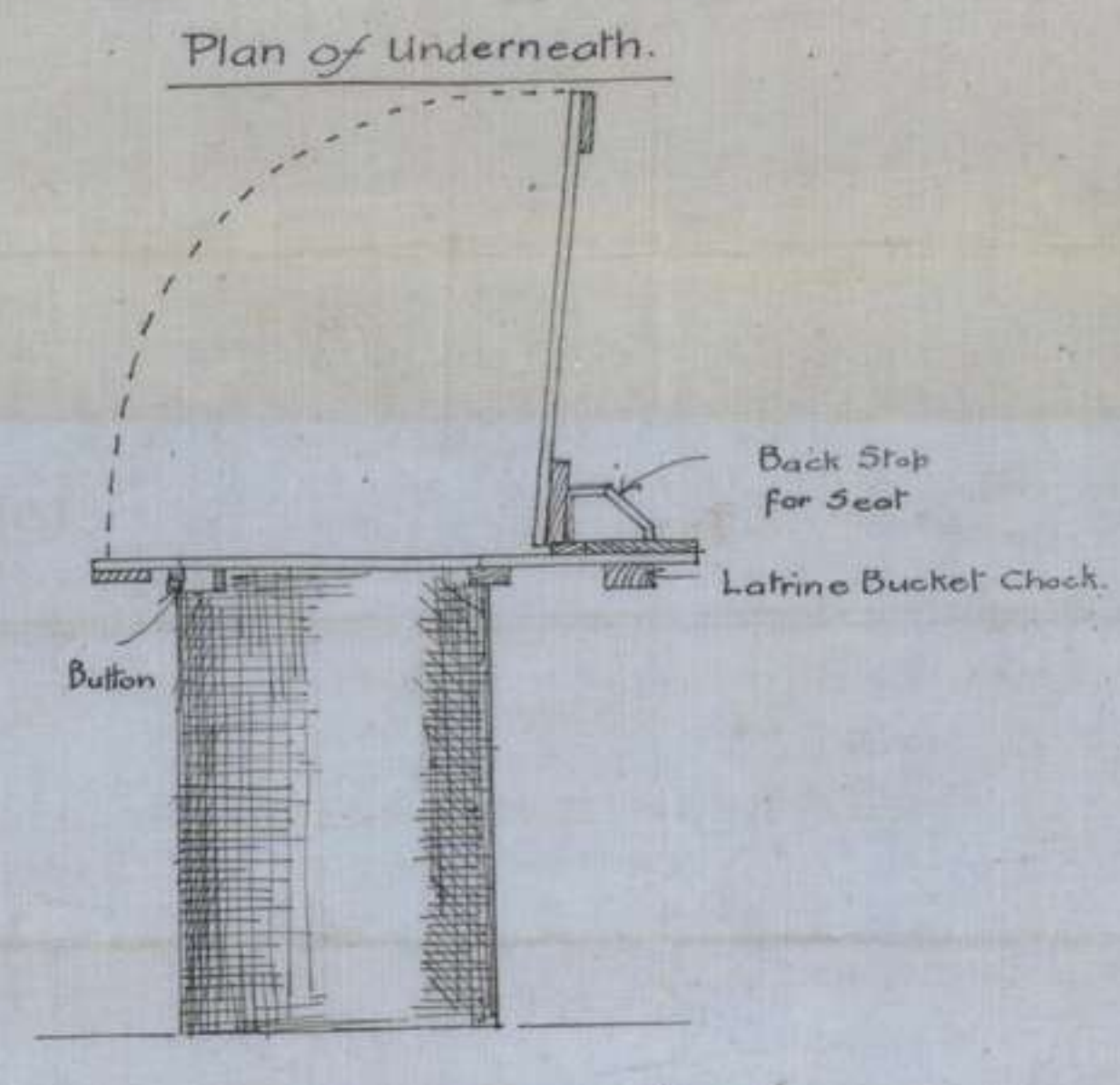
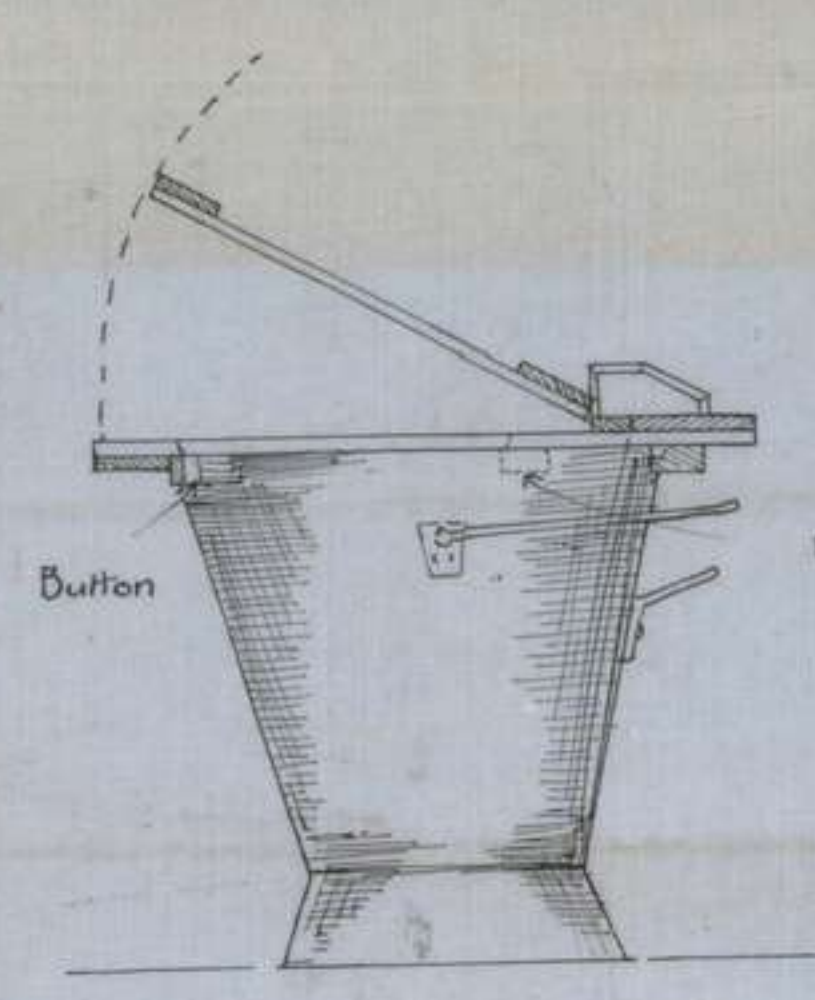
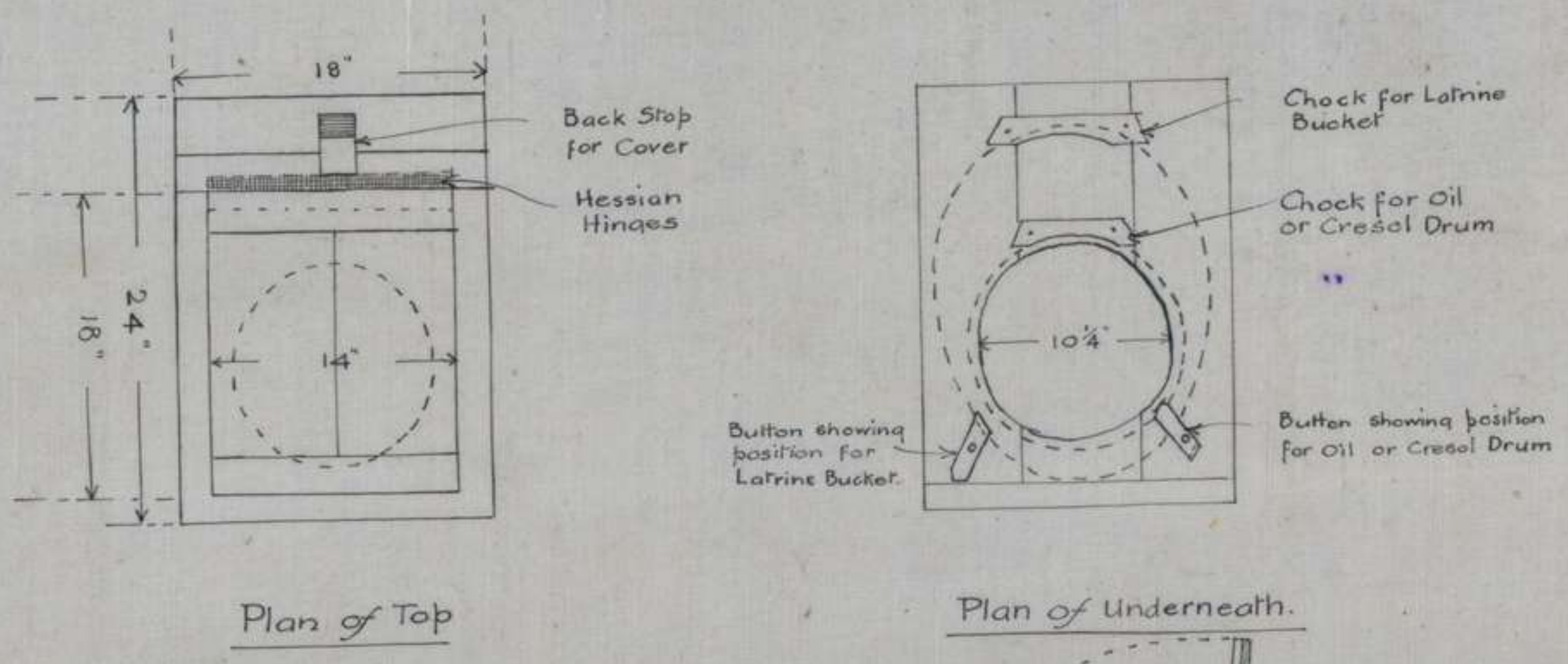


HEALTHY SECTION
 OF
 AUSTRALIAN DIV.
 6/1/1918

UNIVERSAL LATRINE SEAT.

for Front Line Trench System, adaptable to Standard Latrine Bucket and Oil or Cresol Drum

Scale 1" = 1 foot.



SANITARY SECTION,
5th
AUSTRALIAN DIV.
Date 9/1/1918

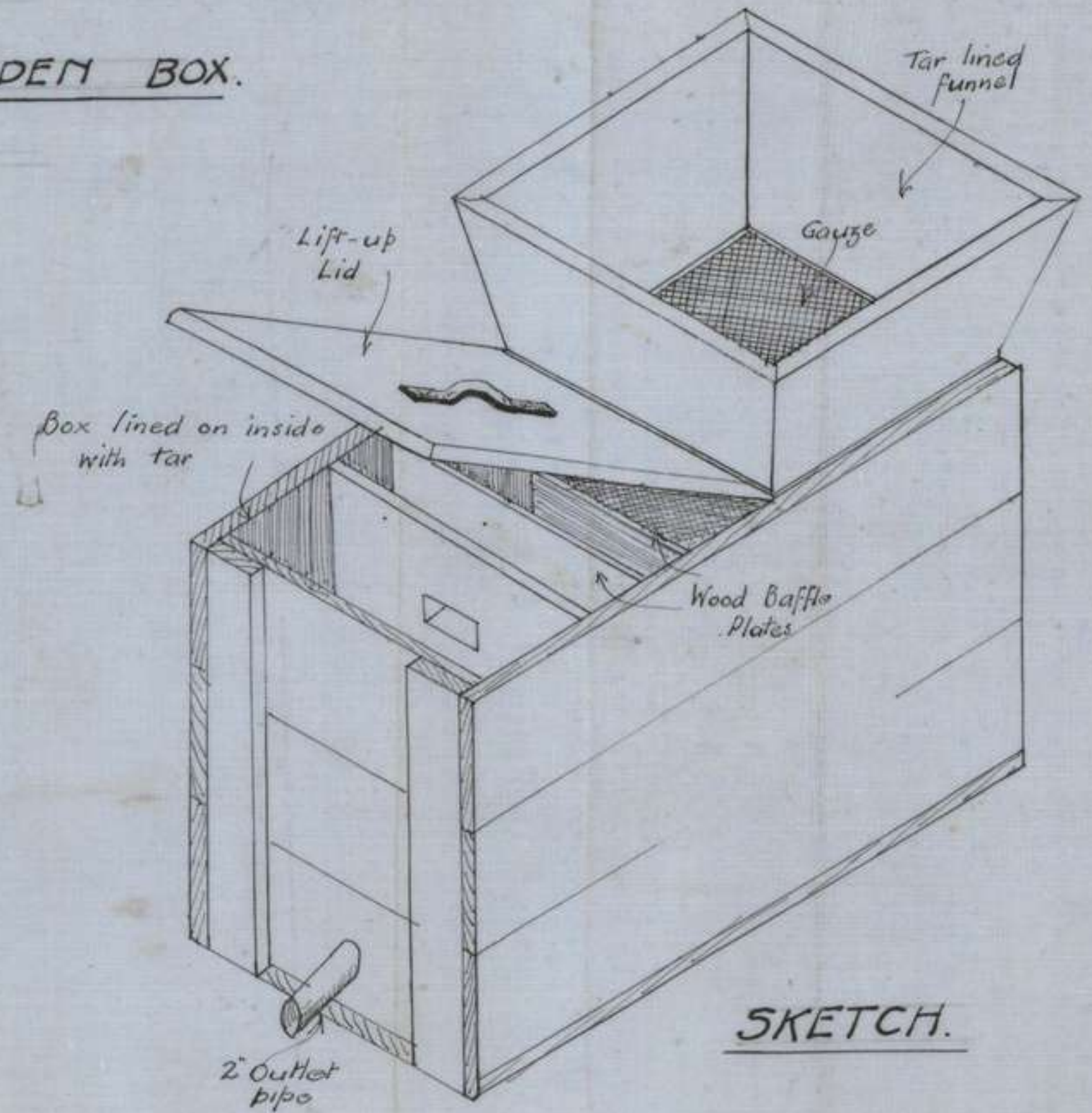
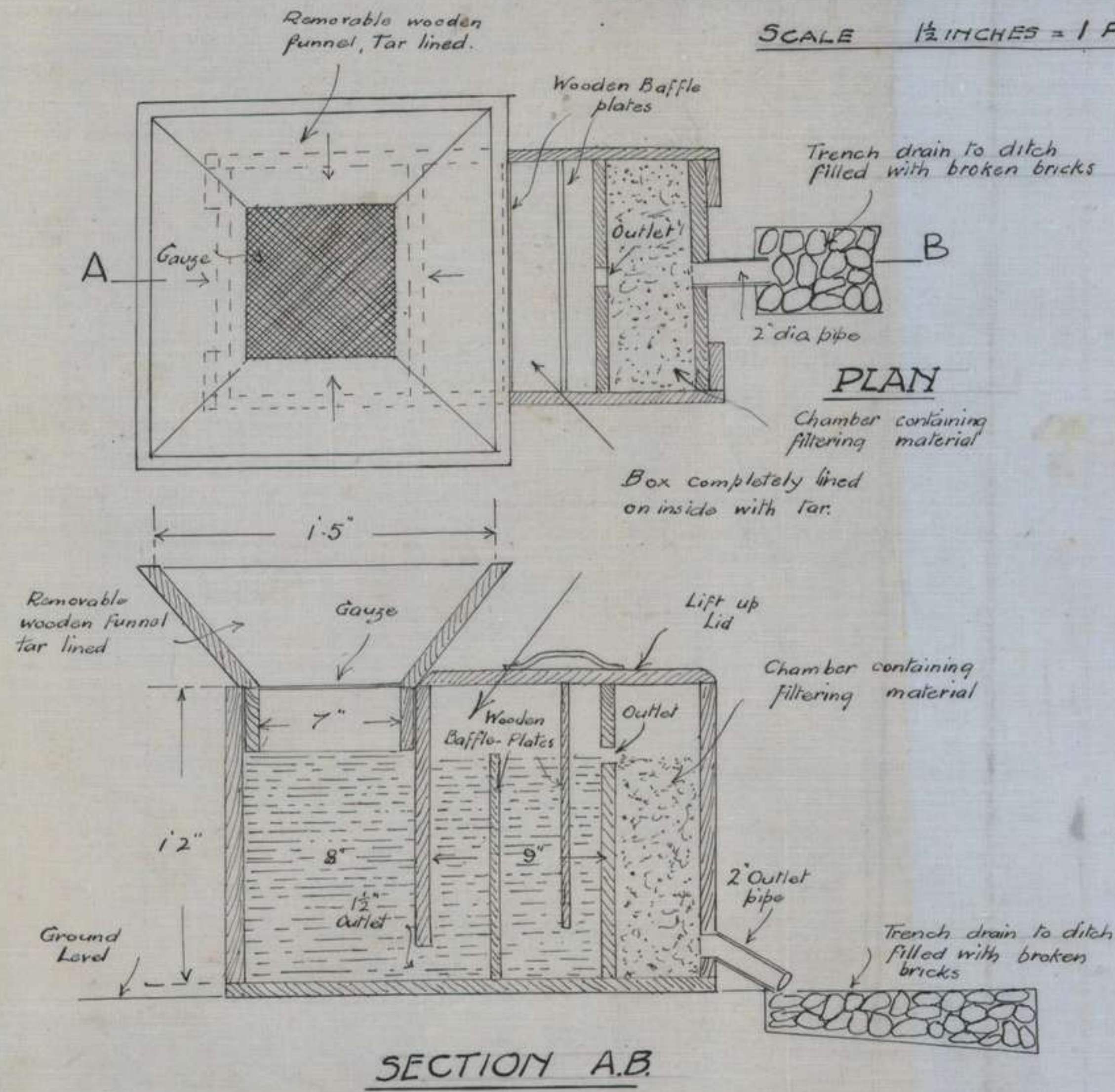
Appendix E.

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GREASE TRAP

CONSTRUCTED OUT OF A WOODEN BOX.

SCALE 1 1/2 INCHES = 1 FOOT.



NOTE:- GREASE TRAP SHOWN ON THIS DRAWING IS ADAPTED FROM A 50 L.B RATION BISCUIT BOX.

SANITARY SECTION.
5th
AUSTRALIAN DIV.

No.

Date 9/1/18.

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Appendix 4

SANITARY SECTION.

SIR

AUSTRALIAN DIV.

S.S. 158.

O.B./1782/A.

FOR OFFICIAL USE ONLY.

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**NOTES ON RECENT OPERATIONS
ON THE FRONT OF FIRST, THIRD,
FOURTH AND FIFTH ARMIES.**

(ISSUED BY THE GENERAL STAFF.)

Issued down to—Squadrons,
Batteries,
Companies.

May, 1917.

ARMY PRINTING AND STATIONERY SERVICES A-5/17-S966-

Appendix G.

S.S. 158.]

[O.B./1782/A.

**NOTES ON RECENT OPERATIONS
ON THE FRONTS OF THE FIRST,
THIRD, FOURTH AND FIFTH ARMIES.**

The following further lessons drawn from the experience gained from recent operations in trench, open, and village fighting, deserve careful study.

It is worthy of note that a study of all actions substantiates the soundness of pre-war methods.

Artillery.

(a) It has been proved that, with deep objectives and a tendency on the part of the enemy to employ his batteries at long ranges, strong and continued support of the attacking Infantry can best be ensured by having the greater part of the Artillery, both field and heavy, placed well forward so that the utmost value can be obtained from its range. The importance of the principles laid down in Artillery Notes No. 4, Section IV. (3) has been emphasized again and again.

(b) It is essential to arrange for co-operation between Corps Artilleries, so that every opportunity for enfilade fire, both in wire-cutting, trench destruction and in counter-battery work, may be fully exploited.

Barrages and wire-cutting should overlap at the junction of Corps for about 100 yards.

(c) Harassing fire by day on unseen communications has proved to be of great value. (Artillery Notes No. 4, Section V. (2).)

(d) The importance of good counter-battery work cannot be over-rated. Early location of hostile batteries, destruction during the period of preparation, and neutralisation at the moment of assault, are the main essentials.

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The value of gas shells for neutralisation is undoubted, and no opportunity for their employment against an enemy who is trying to move his guns must be lost.

(e) The importance of the most careful calibration cannot be overstated.

(f) The necessity of care of buffers needs to be constantly emphasized.

(g) Knowledge on the part of junior officers as to how, what, and when to report, is much needed. The necessity for early and accurate information from F.O.O.s cannot be too strongly emphasized.

(h) Whenever an advance is contemplated, early reconnaissance of possible routes off the roads should be made. Careful plans must be made for crossing our own and the enemy's trench systems; special parties must be detailed for the work of preparation. The importance and difficulty of a rapid advance are not yet fully realised.

(i) In any battle where a deep advance is looked for, there should be one or two Brigades R.F.A. per Division, ready to move forward at the earliest possible moment.

(j) It has been found to be advantageous in the first stages of an advance to make use of single guns, or sections, with limbers and teams up with them.

Difficulties of supply, chiefly in the matter of ammunition and water, will usually prevent the similar use of larger units.

(k) Battery Commanders (R.F.A. in particular), must pay more attention to the use and value of direct observation, and of control of their batteries by voice or through a short telephone line. There is a tendency to place batteries in fully concealed positions and then to wait while the F.O.O. gets out a long telephone line.

(l) As the enemy is driven back from his prepared trench systems, where the general lines of defence have become familiar to our artillery and are accurately marked on our trench maps, the importance of careful study of air photos increases. The enemy dig rapidly and well, and the defences of positions which we are going to attack

Appendix 4

grow quickly day by day. Unless the most recent air photographs are constantly and carefully studied before artillery tasks are allotted, there is the danger that a vital portion of the enemy's defences may be neglected by the artillery, with serious consequences to the infantry assault.

Royal Engineers.

(a) One or more sections of Royal Engineers should move with the Advanced Guard to remove obstacles and to effect such minor repairs as can be carried out with the stores and tools carried in Section Tool Carts. In addition, mounted reconnaissance parties of Royal Engineer Officers and N.C.O.s should be pushed well forward to report on the nature and extent of damage of a more serious nature, to deal with which necessitates special arrangements being made.

(b) In country where the wells were normally of great depth, the employment of helical chain or canvas band pumps has been found of great value.

Infantry.

Patrols.—The enemy frequently employs strong patrols. These attack or attempt to cut off our patrols, if weak, and retire before strong ones. The use of strong patrols (10 to 20 men) is, therefore, indicated. Such patrols should be plentifully provided with S.A.A., and bombers, rifle bombers, and a Lewis gun should be included in these numbers.

A patrol which has succeeded in penetrating the enemy's line, should establish a post on the enemy's line of retreat.

Advanced posts gained and established by day are often heavily shelled. It has, therefore, been found advisable generally to reconnoitre by day and gain ground by night.

The normal formation and movements of patrols should be constantly practised. Front flanks and rear must all be guarded, and movements must be made by BOUNDS. All ranks must be taught to realise that

Appendix 4

information must be got back to the proper quarter no matter how heavily the patrol may become engaged. Relay posts should be formed if necessary.

A valuable lesson is brought home by the difference in conduct, and consequently in casualties, of two patrols, each of 12 men, when held up by machine-gun fire:—

In one case the men lay down when fired upon, and the Lewis gun was used to cover the operations of the remainder of the party. The movement of the Lewis gun detachment was then effected under cover of rifle fire. Casualties, 2.

In the other case the patrol made no attempt to open fire, and ran for shelter to a trench. Casualties, 10.

Outposts.—For outposts low trip wire is preferable to high wire.

It is often advisable after a post has been dug and wired, to place the garrison by day in a fold of the ground some little way off.

Infantry weapons.—The value of the use of fire to cover movement from the various weapons at the disposal of Infantry has received still further emphasis. As regards the individual weapons:—

The rifle.—Full use is not being made at present, in many cases, of the rifle. It is necessary constantly to impress upon troops that the rifle is their principal weapon and must be regarded, and used, as such.

Rifle bombs.—These have been found an efficient auxiliary in dislodging the enemy from behind cover, and in street fighting. Their moral effect is great. It is recommended that half the bombs carried in the mobile reserve of units should be rifle bombs.

The Lewis gun has been found invaluable as part of the platoon. It may be used to engage the enemy while his flank is being turned, or if he opens fire unexpectedly. In some cases it has proved a useful reserve of fire power for the Platoon Commander. With patrols its effect is hard to over-estimate.

Appendix 4.

Machine guns.—Every opportunity of overhead, enfilade and cross fire by machine guns must be seized. The effect of such fire is so great that it outweighs the risk of causing casualties to our own men.

Sub-sections should not be allotted to lower formations than a Battalion. When so allotted, the Officer in command should keep in close touch with the Battalion Commander, to ensure co-operation, and to look after the arrangements for the rations, supply, and comfort of his own men.

Machine Guns should move forward by BOUNDS, some being ready at all times to assist the Infantry by their fire.

The 3" Stokes mortar.—This has been found most useful against strong points or against enemy in buildings. Arrangements should be made for ammunition to be carried either by pack or by a special allotment of transport. In some cases a sub-section of machine guns and two Stokes Trench Mortars were allotted to Advanced Guard Battalions. It was found satisfactory in such cases to detail a limbered G.S. wagon from the Machine Gun Company to carry Stokes Trench Mortar ammunition.

House-to-house fighting.—In house-to-house fighting where cellars of houses are connected underground, parties must be told off—

- (a) For underground work;
- (b) To search houses;
- (c) To move along outside the houses, both front and back;
- (d) To deal with the outhouses.

When saps run out from cellars under a road, it is necessary to establish blocks at the junction.

Where resistance is met with in houses, cellars are usually barricaded.

Lewis or Machine guns should be posted to cover the streets and fire on any enemy emerging from houses or cellars.

Appendix 4.

In street fighting the clearance of each house may constitute a BOUND.

Movement to forming-up place.—Where no natural features or trenches exist on the ground selected as the forming-up place for an attack, the line should be marked out by tapes.

The movement of troops up to the taped line must vary according to circumstances. In some cases movement in single file, in others in artillery formation, has been found to be the best.

Negotiating hostile barrage.—The formation to be adopted for passing through a hostile barrage must be suited to the conditions on the ground. On one occasion two Battalions passed through in file with few casualties, on another a Battalion passed through in artillery formation with equally few casualties.

Moppers up.—It is more difficult to "mop up" in a village or wood than in an attack on a position in the open, but it is equally important.

Village and wood fighting.—To delay in a wood or village is dangerous. Provided sufficient "moppers up" are detailed, the assaulting troops should pass through and get well clear of the wood or village as quickly as possible.

Unless the position selected for consolidation is well beyond the far edge of the wood or village, adequate artillery support cannot be given.

Use of reserves.—It is cheaper to employ troops in sufficient depth in an initial operation than to have to repeat it in consequence of failure. When the reserve units have passed through the original assaulting units, steps must at once be taken to re-organise the latter as quickly as possible and form them into reserves.

Intercommunication.

The use of Visual and Wireless signalling, including the power buzzer, has been much neglected, but where full use has been made of these means, important results have been obtained.

APPENDIX *G*

When Signallers have been detailed beforehand to work with advanced troops, Visual signalling, both with flag and lamp, has been successfully employed.

When new Headquarters have been established, runners should not be sent always to the same destination. It is essential they should eventually obtain a general knowledge of the geography of the occupied area, and not only of one particular run.

It is part of the duty of Signalling Officers to pass on information; this has been frequently neglected.

Very incomplete reports have frequently been received. A card on the lines of Appendix I., S.S. 148, is being printed and will be issued shortly. It is necessary continually to insist upon the importance of early and accurate information.

The various means of communication with aircraft require to be practised with greater frequency than at present.

Emphasis must again be laid on the necessity of carrying out the instructions for the use of telephones.

It must not be imagined that because we have driven the enemy from his front trench systems he can no longer make use of Listening Sets. The contrary is the case: it is easier for him to tap telephone conversations than it was, since many of his old buried cables run from the area now occupied by us into his line.

Aeroplane Contact Patrols.

These were found most useful, working with both the infantry and mounted troops. They assisted materially in reconnaissance, and were able to give valuable information as to the enemy's strength and position. Messages with this information were dropped at Battalion, Brigade, and Divisional Headquarters.

Care must be taken to ensure that infantry and mounted troops carry flares to assist these contact patrols, and understand how and when they should be lighted.

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In the pursuit, if the weather is favourable, these patrols should have many opportunities of harassing the enemy with bombs and machine gun fire.

Transport.

Pack transport is often necessary, but it must be remembered that this method is wasteful and entails a greater strain on animals than on wheeled transport for moving the same quantity of material.

Traffic Controls should be got forward on the battlefield as soon as possible, but Officers Commanding Transport are responsible for regulating the march of their own transport.

An order of precedence for horsed and motor transport should be laid down according to the state of the roads, *i.e.*, if roads are bad, horse transport should be given precedence; if roads are good, motor transport, so as to get it off the roads sooner and leave them free for horse transport.

When ground has been gained a forward turning point for all transport, including lorries, must be established as soon as possible.

Supply.

The following allotment of pack transport was found to work satisfactorily in one Division:—

Pack animals were used almost entirely to feed the troops in the front line, both before and after an attack.

After one attack, rations and water were taken up by pack animals to within 200 yards of the front line.

Practically all the pack animals were mules: very few horses were used.

The number of pack animals per battalion was made up to 30.

APPENDIX *9*

For one attack these animals were loaded as follows with a view to establishing a forward dump as soon as the objective was gained:—

	Animals.
100,000 rounds S.A.A. 50
200 petrol tins 25
1,440 Grenades No. 5 20
4 boxes Very Lights 1" 2
4 boxes Red flares 2
200 Rifle Grenades 5
5,000 Sandbags 10
Spare 6
	120

These were divided into 4 Sections, each Section under a Battalion Transport Officer, the whole being under the Brigade Transport Officer.

Each Section was further sub-divided into four sub-sections under an N.C.O.

The same organisation was employed for the carrying of rations, and worked well.

The saving of carrying parties by using pack animals is very great, and increases the fighting efficiency of the units considerably.

Each Brigade had the same number of animals, which worked only for their own Brigade. In this way both men and animals got a rest when its own Brigade was out of the line.

These animals went up at dusk. The column which is given in detail above were held ready to move up during the morning if the attack was successful and circumstances demanded their doing so.

About 40 men were required for loading mules, but in consequence of this use of pack transport carrying parties were few and small.

~~APPENDIX~~ 4.**REPORTED TACTICS AND METHODS OF THE ENEMY.**

Retirements have generally been carried out by the enemy between 3 a.m. and 5 a.m. Previous indications have been given by fires and explosions. An unusual number of Very lights has often shown when withdrawal was being effected.

Artillery fire has usually increased before withdrawal commenced, presumably to use up the ammunition with the gun.

Field guns and howitzers have often been posted in small posts in advance of the main positions.

Enemy batteries appear to have little cover for their guns, but good cover for their men and ammunition.

Trees are again being largely resorted to for O.P.s.

Thick belts of wire are often erected all round a battery's position.

Machine guns are handled very boldly. The detachments have appeared suddenly from cover, mounted the gun, fired, and then returned to cover.

In open fighting machine guns have often been found in sunken roads and behind fallen trees. In the defence of villages they have normally been placed well clear of the buildings.

Instances have occurred of the fire of enemy machine guns being withheld till our troops have passed them, but in the majority of cases machine guns have opened fire as soon as they have obtained a target.

MISCELLANEOUS.

(i.) Old enemy Headquarters should be avoided. They are generally heavily shelled.

Officers should not crowd together in the same house or cellar.

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(ii.) A plentiful supply of name boards for use in occupied enemy trenches is most necessary and should be prepared in advance.

(iii.) Arrangements should be made to send hot food up to troops in the front line, if possible once a day.

(iv.) In open fighting, a continuous line of defence is not only unnecessary but impossible. It is essential therefore to study and to practise the method of holding mutually supporting tactical points.

(v.) Each body of troops is responsible for its own protection. Flanks and rear, as well as front, must be watched, however small the unit.

(vi.) The usefulness of tanks is that of auxiliaries, not principals. Reliance on assistance from them must not form the foundation of any proposed operation.

(vii.) Medical Officers should carry labels to show whether wells, etc., that they test are fit for use or not.

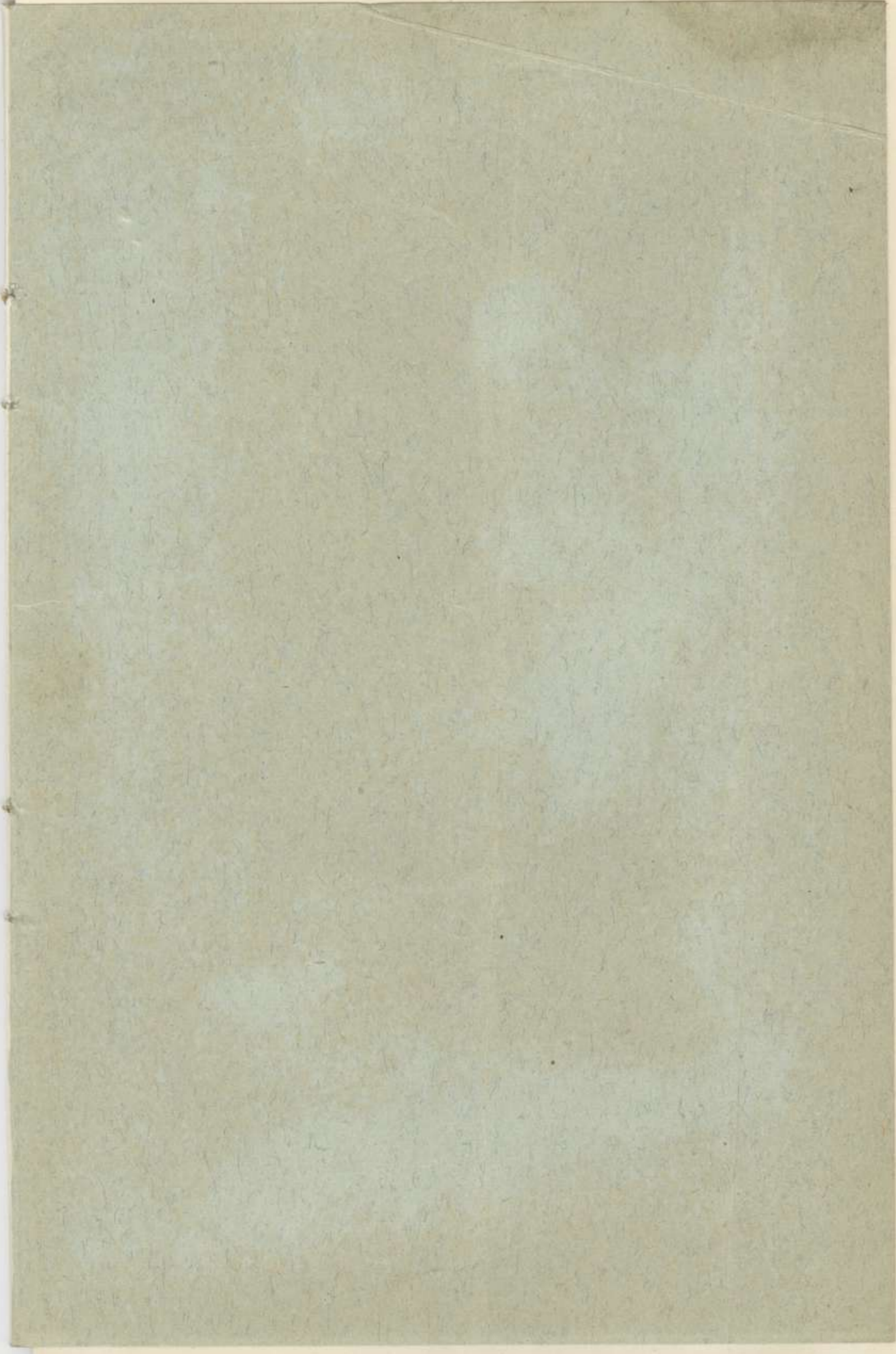
(viii.) No preparation for an attack is complete which does not include the steps to be taken to meet the enemy's counter-attacks that will almost invariably follow any success on our part.

(ix.) Both field glasses and compasses are part of an Officer's kit, and are essential for operations.

(x.) Mounted Officers must make use of their horses, both to save time and their own and other peoples' legs.

(xi.) As soon as one objective has been gained, reconnaissance and preparation for what is likely to be the next objective must commence at once. If this is done, there will generally be ample time for final preparations when orders are received.

(xii.) Guides to take troops to the place of deployment should, whenever possible, belong to the unit going up. They should have previously made certain of the road and marked it out with tape or other means. Troops marching, especially at night, should send ahead to prevent checks, etc., and to arrange for the removal, if possible, of any obstacles which are likely to delay them.



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**NOTES ON SANITATION FOR
MEDICAL OFFICERS OF UNITS.**

Appendix *L***NOTES ON SANITATION FOR
MEDICAL OFFICERS OF UNITS.**

It is the duty of medical officers of all ranks to relieve, as much as possible, General and Commanding Officers of anxiety in connection with the care of the wounded and the prevention of disease.

The efficiency of a regimental unit depends very much on how these important duties are carried out.

It is hoped that these notes will prove to be a guide and of assistance to medical officers in charge of regimental units.

The experience of the present war in various parts of the world emphasizes the paramount importance of strict attention to good sanitation, and to the various measures bearing on health and the prevention of disease.

The A.D.sM.S. of divisions and D.D.sM.S. of corps, or their D.A.D.sM.S., are, in circumstances of difficulty or emergency, always available for advice and consultation on technical subjects; similarly, the D.A.D.M.S. (Sanitation), Fourth Army, or officers commanding sanitary sections, can be consulted on sanitary questions.

Working drawings of sanitary appliances will be found in Fourth Army Standing Orders, Part II.

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Director of Medical Services, Fourth Army.

H.Q., FOURTH ARMY.

22.8.17.

Appendix 4.

NOTES ON SANITATION FOR MEDICAL OFFICERS OF UNITS.

1. The duties of medical officers in respect of sanitation, as laid down in regulations, are given in the following extracts:—

(a) The medical officer will recommend to the O.C., verbally or in writing, whatever he may consider necessary for protecting the health of the troops, whether as regards the abatement or removal of local causes of disease, or as to any alteration of diet, clothing, drills or duties.

(Regs. for Army Medical Service 1906, para. 141.)

(b) The medical officer of a unit is responsible to its commander for the efficient performance of the work of the regimental sanitary detachment. The commander is responsible that all ranks render a loyal and intelligent assistance to the medical officer in the performance of his duties, and that the efficiency of the unit is not impaired through neglect or non-compliance with sanitary rules.

(Field Service Regs., Part II., Sect. 84, para. 2.)

(c) The duties of the sanitary personnel of the detachment are, generally, to act as sanitary police in order to prevent soil-pollution, and, in detail, to supervise:—

(i.) The preparation and care of latrines and urinals, including filling in and marking old sites.

(ii.) The systematic collection, removal and disposal of refuse, by burning or other method.

(iii.) The construction of ablution-places and the disposal of waste water.

(iv.) The sanitation of cooking-places, horse and mule-lines, and slaughtering-places in the area occupied by the unit.

(Field Service Regs., Part II., Sect. 84, para. 4.)

Appendix A

GENERAL.

2. Standing Orders dealing with sanitation are in force, *vide* Fourth Army Standing Orders 600-663, but, as these orders cannot be sufficiently detailed to cover all possible circumstances, it is the duty of the M.O. to fill in the details, by his advice to his C.O., and to ensure that the spirit of the orders is obeyed.

3. Those units which have a medical officer attached should always maintain themselves in as good a sanitary condition as circumstances permit, and should not require to be supervised by sanitary sections already fully occupied in their primary duty of maintaining continuity of sanitation, and in assisting and advising those units which have no medical officer. Units which have a medical officer are, however, frequently found in a very insanitary condition.

This is often due to the fact that the medical officer does not realise how much he can and should do to improve matters, and that the preservation of the health of the troops is his first duty.

4. In ordinary times, when his unit is not heavily engaged, the medical officer generally spends only a short time each day in disposing of his sick and wounded; the rest of his time he should devote to the prevention of sickness, *i.e.*, sanitation. As a doctor, he may feel that work of such tiresome and apparently trivial detail is unworthy of him, but he is best fitted to do it, and could not be more usefully occupied.

ORGANIZATION.

5. The prevention of insanitary conditions requires, first and foremost, organization.

6. The medical officer should make sure that everyone under his medical charge understands the rationale of all the sanitary measures that are necessary, and what is required of him in relation thereto. This applies especially to all officers and N.C.O.s, who must be responsible for the sanitation of their respective commands. Only thus can the medical officer provide for the sanitation of the regimental transport section, outlying posts and others whom he can but seldom visit.

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7. He must also ensure that the men of the sanitary detachment, and the water-duty men, are carefully selected and thoroughly trained, and that their duties are clearly defined.

8. The lecture outlined in the appendix has been found very useful; and it is recommended that the theoretical training of the sanitary detachment should also follow the lines indicated therein.

9. In lectures and instructions, the medical officer must constantly insist upon the importance of the proper disposal of excreta and refuse, and the protection of food and water. These measures have practically eliminated the great group of enteric diseases from civil life, and they must also tend to do so in military life.

10. Simple arrangements for the current sanitation of the unit must have precedence over everything else, both on the march and on arrival at fresh billets or the trenches. Even though conditions may be bad in times of stress, though everyone be overworked, and sickness already rampant, it should never be forgotten that whatever measures can be taken, however simple and imperfect, will inevitably result in a saving of men.

11. If, during his inspections, a medical officer discovers an insanitary condition, such as exposed faeces, a dirty cookhouse or billet, men drinking dirty water, refuse thrown into a hole, or very lousy men, he should not content himself with given orders or seeing that they are given for the correction of the defect—he should, instead, ascertain who was responsible and so thrash the matter out that the defect is not likely to occur again. The results thereby gained are well worth the trouble entailed.

FIELD SANITATION.

12. A unit should be so organised that, when taking up a new position, it automatically and rapidly provides itself with temporary latrines and urinals, soak-pits at the company and other cookhouses, and one or more incinerators. As the stay is prolonged, ablution-benches with soap-traps and soak-pits, receptacles for refuse, urine-pails,

Appendix 4.

and grease-traps at kitchens are added, and the temporary latrines, urinals and incinerators are replaced by more permanent structures.

13. Once the camp is completely fitted up, the unit has only to keep it clean and maintain the appliances in good order and repair, which is a relatively light task.

14. Every unit must try to leave each camp, etc., in a better sanitary condition than it found it.

15. One of the chief duties of the men of the sanitary section of a district is to explain to each unit, as it comes into billets, the plan upon which the sanitation of the camp is being developed, and to indicate the most pressing needs of the moment.

16. Both temporary and permanent sanitary appliances are described below. It is of the greatest importance that the construction and use of temporary appliances should be practised whenever possible, in readiness for an advance.

LATRINES.

17. The site should be chosen for convenience, provided that there is no risk of fouling water-supplies. Well-kept latrines are harmless anywhere; badly kept latrines are as dangerous 100 yards away from the cook-house as they are 50 yards away. The number of seats required is 5 per cent. for small numbers and 4 per cent. for large numbers.

18. *Temporary Latrines.* Shallow or straddle trenches should be 3 ft. long, $1\frac{1}{2}$ to 2 ft. deep, and as narrow as they can conveniently be dug. It is impossible with breeches down to straddle them if they are more than 1 foot wide, and hence if they are too wide they are improperly used. The trenches should be dug in a neat row, at the far end of the ground chosen, leaving 2 ft. 9 in. exactly between each, so that the second row can be cut in the interspaces. The latrines are used till they are full to within 6 in. of the top, when the second row is dug in the interspaces. The third row is dug leaving exactly one clear foot of ground between it and the front of the first and second rows, and so on. The broken earth

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should be piled neatly behind each, and as close to it as possible. One or two spades or improvised shovels are required at each latrine to cover excreta.

19. Each man must be made to cover his own excreta. This is difficult at first, and necessitates the posting of a sentry, but men can be trained to use properly this essential type of latrine.

20. Straddle latrines, if correctly used, are very satisfactory. They are rapidly prepared, there are no seats to soil and carry infection, and the site changes frequently. Moreover the faeces disintegrate very rapidly, and there is little likelihood of fouling water-supplies.

21. It is sometimes urged against the use of straddle trenches :—

- (a) That they take up too much ground ;
- (b) That it is impossible to get the excreta covered.

As regards the first objection, except in the middle of towns or large villages, there is nearly always plenty of ground, provided that the latrines are dug systematically and neatly. As regards the second objection, it is admittedly difficult to get them used properly, but, since there is practically no alternative, the difficulty must be overcome, as stated, by posting a sentry until the men can be trusted to use them properly without being watched.

22. The deep, long trench, with a pole for a seat, cannot be kept in a sanitary condition, and should never be used. The pole and the ground at the front and back of the latrine are constantly soiled with faeces and urine, and it is almost impossible to cover the excreta at once so that flies cannot get to it.

23. If straddle trenches cannot be used, some form of flyproof trench or bucket-latrine must be rapidly improvised on the lines described below. If vessels or buckets are available, the use of plenty of dilute cresol or of a small quantity of paraffin in the vessel will keep flies off to a large extent.

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24. *Flyproof, permanent Latrines.* These are fitted over deep trenches, or over buckets, and are of many and various types. The essential point, as the name implies, is that they keep flies from getting in and out. If the size of the house-fly, and the great attraction which fresh excreta exercise upon it, be taken into consideration, the rest is common sense. It should be impossible to visit "flyproof" latrines and find large holes in the structure, or lids missing from the seats.

25. Flyproof covers of satisfactory type, both for deep trenches and for buckets, can be seen at all sanitary section workshops. The medical officer should familiarise himself with these; and it is important that all large units should have some pioneers or carpenters who have learned to make and mend them, and that the sanitary detachment should know how to fit and clean them. This necessary teaching can be done at a school of sanitation, or by arrangement with the O.C. sanitary section at the section workshop. It has the desirable result that the unit becomes independent of the help of the sanitary section. The same applies to all other permanent sanitary fittings of a camp, such as food-cupboards, urinals, grease and soap-traps, ablution-benches, field-ovens, incinerators and refuse-boxes.

26. When inspecting bucket-latrines of all types, it should be noted whether the bucket is set accurately under, and close up to, the seat. Neglect of this, and consequent fouling of the latrine floor, is frequently noticed.

27. *Trench Latrines.* In trenches and forward positions the proper disposal of excreta is more difficult than it is in camps and billets. If buckets are used, great care is necessary to ensure that they are emptied regularly into specially dug trenches, and that the excreta are then and there covered with earth. Deep pits (with fly-proof covers) can only be used in suitable soil, and great care is necessary to ensure that no urine or water is poured into them, and that they do not fill with water during wet weather. It has repeatedly happened that trenches have been flooded with filth, owing to lack of foresight in this respect.

Appendix G.

28. The supervision of front-line sanitation generally, and especially of the arrangements for the provision of material, vessels and disinfectants for latrines and urinals, is one of the most important duties of the sanitary officer (D.A.D.M.S.) of a division. Medical officers of units in the line should lose no time in making their wants and difficulties known to him.

URINALS.

29. It is necessary to have a sufficiency of urinals as accessibly and conveniently placed as possible. They should be screened and marked by direction-signs.

30. Urinals require constant attention. A bad urinal, where each man must soil his boots with the mixed urine of many others, is worse than none at all. A urinal must have a dry floor. This can be attained by careful attention to the type of receptacle used, and the raising and sloping of the floor.

31. *Temporary Urinals.* These consist of:—

(a) V-shaped gutters, 1 ft. wide, sloping to a covered pit. [Men should be taught to stand astride these gutters: hence they must not be made too wide];

(b) Oil-drums, or buckets, with handles.

32. *Permanent Urinals.* Some form of receptacle is needed—such as a bent sheet of corrugated iron or an oil-drum with the bottom knocked out, from which the urine is led into a soak-pit. Many good types are in use and can be seen at the sanitary section workshops.

33. In trenches it is generally best to use improvised buckets at the latrines and other selected spots.

34. *Night Urine-buckets.* These should be provided as soon as possible for each billet or group of billets, and should be placed each evening at recognised spots, emptied each morning into the urine soak pits, swilled with disinfectant, and stacked by day near the latrines serving the billets concerned. Oil-drums or 4-gallon petrol tins make good urine-pails. Biscuit tins are hardly strong enough for the purpose. A large "U," or some other clear

Appendix A

marking, will be painted upon the pails in order to prevent them from being used to draw water from wells, or taken for other purposes by troops or civilians.

SOAK-PITS.

35. Soak-pits are used for the disposal of urine and of waste water. A large pit, say 4-ft. cube or more—according to the nature of the ground and the purpose of the pit—is dug and filled to within 6 in. of the top with burnt tins, rubble, brushwood, or any other similar material. Burnt tins from the incinerators are particularly useful for this purpose. The pit is then covered in with a wooden cover, or with earth and turf resting upon a supporting layer of tins or brushwood. The fluid to be disposed of is led by a pipe, tin or oil-drum drain, through the cover of the pit on to the tins or broken material. The material in such a pit becomes covered with deposit from the liquid, thus protecting to a considerable extent the sides and bottom of the pit, and facilitating the soaking away of the fluid. It is advisable to place the pit so that men do not trample over it.

36. In the case of cookhouse and ablution water soak-pits, the water should be poured through a grease or soap-trap, which retains all large solid particles and a varying amount of grease and scum.

DISPOSAL OF REFUSE.

37. *Refuse Collection.* Receptacles for refuse must be provided. For cookhouses and messes, boxes and tins should be watertight, and should have covers to keep off flies. For use in billets—boxes, bags or improvised wire baskets are suitable. These should be placed by the sanitary detachment at definite marked spots near cookhouses, messes and billets, to take the refuse collected in those places by the cooks, mess and billet orderlies, who are responsible for their cleanliness.

38. All premises occupied should be thoroughly cleaned out daily. If they are merely "tidied up," the amount of refuse to be disposed of on the last day is overwhelming in amount and productive of much nuisance and annoyance, both to the unit itself and to its successors.

Appendix G

39. *Refuse Removal.* The collection of the refuse and the cleaning of the receptacles is carried out once or twice daily by the sanitary detachment, or under their supervision. The time and manner of collection—by hand-carriage or by cart—vary with circumstances, but must be definitely arranged. Refuse thrown into the incinerators, or on to the ground, by unauthorised persons invariably gives rise to nuisance. In making the collection, the contents of grease and soap-traps should not be forgotten.

INCINERATORS.

40. Incinerators should be approximately cubic in shape. They are commonly made too squat—too wide and too broad in proportion to their height. They are frequently made too large; 2 ft. 3 in. cube gives 11 cubic ft.—ample for a company incinerator. Three ft. cube is generally quite sufficient for a battalion.

41. The cleaning, lighting and stoking require constant care and attention, and must be undertaken only by men detailed and trained for the work. It must not be possible for wet refuse to be dumped casually into an empty or choked incinerator. When brought to the incinerator, refuse must not be dumped anywhere on the ground, but at one selected spot, which may, with advantage, be fenced on two or three sides, floored with iron sheets and roofed to keep off rain.

42. Each day's refuse must, as far as possible, be burned on the day of collection. Any that remains should be neatly stacked, and, if possible, sprayed with cresol solution. Neglect of this leads to great fouling of the ground, and makes the neighbourhood of the incinerator one of the chief fly-breeding areas of the district.

43. Burnt tins should not be buried; they should be neatly stacked near by and are useful for many purposes.

44. *Temporary Incinerators.* One of the most efficient and rapidly constructed incinerators is the "bank" incinerator, illustrated in Part II. of Fourth Army Standing Orders. If a suitable bank can be found no material is required beyond the few bars necessary for a grid, and if these are not to be found, then empty tins placed at the

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bottom of the hole serve the purpose very well. If no bank is available, a roughly cubical structure should be made of bricks, turf, tins filled with clay, or corrugated iron. Sufficient draught-space and a grid, or empty tins, must be provided.

45. *Permanent Incinerators.* There are many good types, the construction of which is taught by sanitary sections. The "bank" incinerator, mentioned above, is also excellent for prolonged use.

46. The main points of a good incinerator are:—

A good grid, with a sufficient air-space beneath it.

Removable bars, or, if the bars are fixed, large raking-out holes just above the grid level.

Feeding-hole or the top, in the case of an open incinerator, not more than 3 ft. 6 in. from ground-level.

47. *Excreta Incinerators.* Special types, with an upper tray for fæces, are designed for this purpose. Any good incinerator, however, will burn excreta, if a good, careful stoker is in charge. Working pay of 4d. per day should be obtained for him, *vide* G.R.O. 2428. As a rule extra fuel is not necessary if all the refuse of the unit is available and is kept dry.

48. Incinerators intended for excreta-burning must be provided with a proper soak-pit for excess fluid, and a mixing floor of iron or concrete. Very careful supervision of the process, and constant disinfection of the surroundings, are essential.

FOOD.

49. The sanitary measures that have been found necessary in connection with the storage, cooking and serving of foodstuffs, are fully detailed in Fourth Army Standing Orders 624 to 632.

50. Whenever possible, it should be arranged that separate dining accommodation is provided for the men, apart from their sleeping-rooms, and that only sufficient food is issued for each meal, the remainder of the rations

Appendix 4

being stored in bulk and protected in company stores. If each man keeps the whole of the day's issue of bread, cheese, jam, etc., in his billet, its protection is a matter of great difficulty.

51. Satisfactory flyproof cupboards, and other methods of protecting food, can be seen at sanitary section headquarters.

WATER.

52. The medical officer must satisfy himself that the men who are detailed for water duties are properly trained in the methods of chlorinating water, and of keeping the cart clean and in proper condition.

53. It is the duty of the medical officer to inspect the source of the water-supply, and to test for the amount of bleaching-powder necessary. Water which requires only one scoopful should, if possible, be brought into use; and in no case is it advisable to use water which requires three or more scoopsful.

54. In areas that have been occupied by British troops for some time, a list of water-points, with details of amount of bleaching-powder required, etc., can be obtained from the sanitary sections, through the A.D.M.S. of the division.

55. *Water-carts.* Every water-cart is provided with Army Forms G.1096-31, which set out the spares, bleaching-powder, alum, etc., to be carried on the cart. A regular inspection of the carts should be made, to see that these spares are complete and in good condition, that the tank is clean, and that the water is properly chlorinated.

56. The covers for the clarifying reels should never be carried wrapped on the reels. After use they should be removed and washed, boiled, dried, and carried in a dry state in the sterilising kettle, and packed in such a way as to ensure that they will not rub against the side of the kettle and be damaged.

57. The pumps should be kept in proper working order. The washers must be periodically examined and treated with vaseline, and a proper supply of spare washers must be carried and kept in good order.

Appendix *L*

58. The rubber washers at the end of the clarifying reels are liable to perish, and should be examined frequently. If these washers are in the least defective, proper clarification of water cannot be carried out. Spare rubber washers should be carried in French chalk, which can be obtained on demand. These washers should not be allowed to lie loosely amongst other spares.

59. There are three brushes carried on the cart—washing brush for cleaning filter-cloths, water-carriage brush for the cart, and tank-brush. The tank-brush should be carried in the sterilising kettle, with the filter-cloth. It should be dried after use. Without this brush, thorough cleansing of the inside of the cart is impossible.

60. To cleanse the tank, four scoopsful of bleaching-powder are added to about 20 gallons of water in the tank. The inside of the tank is next thoroughly scrubbed with the tank-brush, and allowed to stand for half an hour. The tank is then swilled out with fresh clean water. This should be done twice a week.

61. The store-boxes, in which the spares are to be carried, are very liable to become damp and dirty.

62. Bleaching-powder and alum-tins should not be carried loose in the store-box, owing to the tendency of the tins to become dirty, rusted and perished. Some type of box, which is provided with a deep lid, should be employed to carry the bleaching-powder. Constant and careful supervision is necessary to ensure that the powder that is in use is of proper strength.

63. Water-duty men are often very careless in dealing with bleaching-powder :—

- (a) By careless opening of tins, thereby rendering them not air-tight;
- (b) By having several tins in use at the same time;
- (c) By faulty method of adding the powder.

64. Water-duty men should be instructed to open and replace gently the lids of the bleaching powder tins. Before taking a scoopful they must see that the scoop itself is free from lime. The scoopful should then be

Appendix 4

added to a small quantity of water, thoroughly mixed so that all lumps are broken up, and added to the water in the cart when the latter is about half full.

65. The water should be frequently tested with the iodide and starch solution to see that chlorination is being carried out.

66. When the cart is filled by means of the pump, the water has to be pumped through the cylinder. If clarification is necessary, the filter-cloths should be placed in position before the pump is brought into use. If clarification is not necessary, the cloths should not be placed on the reels.

67. *Wells.* If the only water-supply is drawn from wells by bucket and windlass, the medical officer should select one or several of the best as the only authorised sources of drinking water, and should advise, if necessary, that sentries be mounted over these with instructions to prevent fouling by dirty buckets, washing near the well-mouth, etc. The R.E. should be asked to mend copings and erect superstructures as required, and a wooden chute if needed, to facilitate the filling of carts. The surroundings of all wells should be kept as clean and dry as possible.

68. *Supply of Water in the Trenches.* In the trenches drinking and cooking water is frequently supplied in petrol-tins, which are brought up full each night by the regimental transport, when a corresponding number of empty ones are taken back.

69. The water-duty men of the battalion should be responsible for the filling of these tins each day. The water must be drawn from a recognised source, and chlorinated either in the water-carts or in tanks at the water-point before being put into the tins.

70. These tins get contaminated in the trenches, and should be washed out daily before refilling. The chief reason for this contamination is that the screw-tops are nearly always lost. The best way of dealing with this difficulty is to provide wooden stoppers tied to the handles of the tins.

71. All tins used for water should be plainly marked with a large "W" to prevent confusion with those

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containing petrol or anti-gas solution. As the medical officer is in the trenches with his battalion, he cannot supervise the washing and filling of the tins. The quartermaster or transport officer should be responsible that the washing and filling are carried out satisfactorily.

72. The provision of an ample supply of water is most essential, as without this it is almost impossible to prevent men taking water from unauthorised sources. Every effort should, therefore, be made to keep a sufficient supply of petrol-tins available. The remnants of petrol can be removed from new tins by washing out the latter with very hot water.

73. If there is a good well close to the line, a tank should, if possible, be placed at the well-head. The water must be chlorinated in the tank before use. This task should be allotted to some of the regimental water-duty men. If men are allowed to draw direct from the well, it usually becomes more and more contaminated; and efforts to chlorinate water in petrol-tins are often unsatisfactory.

74. *Water Sterilising-Tablets.* A reserve supply of these should be kept in the quartermaster's stores. Bottles should be issued to the N.C.O.s and, if sufficient are available, to the men before an attack, when it is uncertain from what source they will draw their next supply of water. Men should be told that two tablets added to a water-bottle full of almost any water will make the water safe to drink in half an hour. If the water is allowed to remain in the bottle for more than twelve hours, it acquires a very unpleasant taste from the action of the chemical on the metal of the bottle.

FLIES.

75. The medical officer should be familiar with D.G.M.S. Memorandum No. 8, which deals with the subject.

76. He should report to his O.C., and, if necessary, to the A.D.M.S., if existing orders relating to measures directed against flies and to the disposal of manure are not being carried out, or if, as it may seem to him, they cannot be carried out.

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77. The disposal of manure especially requires much attention. It is absolutely necessary that the O.C. and the officers and N.C.O.s of the unit should be persuaded of the necessity and practicability of the measures recommended. Demonstrations of eggs, larvæ and pupæ in the manure of the unit are a help to this end.

78. Flies' eggs are laid on fresh manure. If this manure is not dealt with within a short time, the eggs hatch into maggots which can crawl and escape the effect of any measures adopted. It is, therefore, necessary during dry warm weather, when flies frequent horse-lines in large numbers, and when the development of fly-larvæ goes on rapidly, to deal with fresh manure as soon and as vigorously as possible.

79. The easiest and most effective way to dispose of fresh manure during hot weather is to burn it.

80. The easiest way to burn it is as follows:—A fire of wood, paper, etc., is lighted on a bundle of wire, if obtainable. The fire, when well alight, is covered with an even layer of manure about two inches thick. As this layer burns through, another similar layer is spread over the heap. The fire is built up in this way by the addition of several layers each day. Care must be taken not to disturb the core of ashes in the middle of the heap. No attempt must be made to rake away the ash. Big masses of manure, bagful or barrowsful, must not be thrown on to the top or the sides of the heap.

81. Arrangements should be made to have one fire for each group of 20 or 30 horses, as close to them as possible so as to reduce the labour of carriage.

82. When the method is in good working order, and the heaps have grown large (several feet high and several yards across), each fire will, on dry days, destroy the manure of 20 or 30 horses, as it is produced, with a minimum of labour and a maximum destruction of flies' eggs.

83. It is impossible to burn the large amounts of mixed mud and manure which are scraped from open horse-lines during wet, cold weather. This harmless stuff should be carted away and not taken to the fires at all.

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84. Men should be specially detailed to stoke the fires. If the manure is brought to the fires, the stoking is an easy matter requiring little time and labour.

85. When well established, the heaps will continue to burn through ordinary rainy weather, if stoked with fresh manure taken from covered standings or picked up free from mud.

86. Well established burning heaps are so effective and useful during dry weather, that time is well expended on keeping them going on wet days.

87. It is useless to dump large quantities of manure on the ground or on incinerators, and to light the heaps on the outside. Even if these heaps eventually burn through, the flies will have bred out and escaped.

88. Burning, close-packing and burial are only effective if carried out on manure that is quite fresh. To treat old manure is, as a rule, a waste of labour.

PERSONAL HYGIENE AND INSPECTION OF MEN.

89. Under this heading are included the duties of the medical officer with regard to clothing, cleanliness, presence of vermin, scabies and skin disease, and the presence of sores and abrasions especially on the feet.

90. It is very important that the medical officer should inspect his men frequently and regularly in order to keep himself informed on the above points. Company and platoon officers should, if possible, be present when their men are being inspected. The best opportunity for doing this is at the baths. It not infrequently occurs, however, that intervals of more than the regulation fortnight occur between baths. Under such circumstances the medical officer can nevertheless arrange to examine a company or a platoon at a time, and so pick out men who require immediate treatment, as, for example, cases of scabies or extreme lousiness.

91. There is a tendency to discourage men with minor ailments from reporting sick, which is apt to lead to the concealment of slight or early cases. Medical officers should remember that their aim is to increase the

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efficiency of units by the prevention and treatment of sickness. The only way to reduce the sick parade is to hold it at a time when it does not keep men from other duties, though this may entail early rising on the part of the medical officer.

92. *Clothing.* The medical officer may, under certain circumstances, be able to give very valuable advice on this point. It occasionally happens that the health of the men suffers from too little or too much clothing in spring and autumn. The medical officer should bear this in mind, and if he considers, for instance, that the blankets of the men should not be taken away on the date proposed, it is his duty to make the necessary recommendation.

93. *Cleanliness.* The medical officer should constantly try to get ample washing and bathing facilities for his men, and also to get, as frequently as possible, clean underclothes for them.

94. In nearly every unit there is a certain number of men who make very little effort to keep themselves clean. These men are usually well known to the medical officer, as they constantly report sick with sores from scratching themselves. They are a continuous source of infection to their companions, and disciplinary action is advisable in some of these cases.

95. *Scabies.* A careful watch should be kept for cases of this tiresome complaint, which in many formations has been far too prevalent. Cases, however mild, should always be evacuated for treatment, as it is not practicable to treat them in their unit. All kit and blankets must be sent with the patient for disinfection, and contacts of the case should be paraded and carefully examined. It is also recommended that men, especially contacts, should occasionally use flowers of sulphur (obtainable from the A.S.C.) as a dusting-powder on their clothes and blankets.

96. *Lice.* The medical officer should be thoroughly familiar with D.G.M.S. memorandum on "Preventive Measures against Lice," and he must see that the measures therein recommended are carried out as fully as possible.

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97. A careful watch should be kept for cases of heavy infestation. It sometimes happens that men miss their baths and changes of clothing, and also that men may harbour lice in enormous numbers without suffering any irritation. Such cases should always be dealt with as soon as possible. There are generally disinfecting stations available in neighbouring medical units, or at baths, to which the men can be sent. If no station is available, the cases must be dealt with in the unit, as advised in the memorandum mentioned in para. 96.

INFECTIOUS DISEASE.

98. Special orders are issued in most formations as to the steps to be taken by a medical officer who diagnoses a case of infectious disease. In general it may be laid down that the case, whether definitely diagnosed or only suspected, should be isolated at once, and evacuated with all kit and blankets as soon as possible. The contacts should be sought out and dealt with according to any instructions that may have been issued with regard to the particular disease in question. In any case they should be isolated, except for work in the open, and directed to report daily for observation during the incubation period of the disease. The billet involved should be thoroughly cleared out and washed or sprayed with a disinfecting solution.

99. Most cases of infectious disease are not definitely diagnosed before they leave the unit. In the case of major infectious disease of the enteric group—dysentery, paratyphoid, typhoid—several weeks may elapse before the case is definitely reported to the medical officer. He should, therefore, aim at keeping the sanitary condition of his unit so good that these diseases are not likely to spread within it, and he should always regard the occurrence of serious cases of fever and diarrhoea as a danger-signal.

100. The medical officer should keep a diary of his daily sick, and may be able to render valuable assistance in tracing the source of infection of cases, and in discovering carriers. This diary should give the number, name, company, and platoon of patients, the diagnosis of each

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case, and the situation of the unit. If he suspects that the case may turn out to be one of major infectious disease, he should make a few extra notes before he sends the man away—such as what the man himself thinks made him ill; what the medical officer thinks; what particular place the man was in; what special duty he was on; whether inoculated, and so on according to the nature of the case.

101. The medical officer should be familiar with the names of any men who suffer from recurrent diarrhœa. If cases of the enteric group of the disease are occurring in his unit, he should arrange, through his A.D.M.S., for these men to be examined by a bacteriologist as opportunity occurs.

CIVILIANS.

102. When units are billeted in villages behind the lines, the medical officer is often faced with problems arising from the presence of the civilian inhabitants.

103. *Infectious Disease.* The medical officer should enquire from the *maire* of the place as to any recent occurrence of infectious disease in the commune, and he should take steps to put "out of bounds" any infected premises. He may also, in the course of his civilian practice, discover fresh cases. These, whether definite or suspected, should be at once reported to the A.D.M.S., and to the *maire*, and the necessary steps must be taken to protect the troops.

104. *Civilian Sanitation.* This is often dangerously primitive. Estaminets should be inspected and controlled as regards cleanliness, water-supply, method of washing glasses, etc. The medical officer can advise his C.O. to put the place "out of bounds" for his men unless his recommendations are carried out. Mention of this to the proprietor will usually suffice.

105. Other grossly insanitary or dangerous conditions should be reported to the C.O. and to the A.D.M.S., and dealt with as far as possible.

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Appendix.

**SUGGESTED LECTURE TO OFFICERS
AND N.C.O.s ON PREVENTION OF
INFECTIOUS DISEASES.****THE WHY AND THE WHEREFORE OF SANITATION.**

Importance of the subject. History of previous wars—high sick-rate (generally greater than wounds-rate)—examples in recent wars.

The present war—the relatively satisfactory position in France—why? . . . Three reasons:—(1) Inoculation; (2) Sanitation; (3) Good fortune?

Gallipoli—the part played by disease. The increased danger in France—causes.

The causation of Infectious Disease. Sixty years ago and now. The discovery of germs—what they are—emphasis on size—by 1,000 to see at all—their universality—wherever there is life—examples of germs—those first discovered. Manufacture of vinegar, beer, bread, cheese—everyday demonstrations of germs—mouldy bread, cheese, stinking fish, decomposition generally—what you see through a microscope.

The study of germs—the rapid development and extent of the science of bacteriology. What we now know—classification of the kinds—thousands of kinds of germs—useful, indifferent or harmless, harmful. The germs which cause disease—most studied, of course—how they cause disease—as parasites—other parasites—compare parasites on plants and insects (trees, bees, etc.).

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The relative perfection of our knowledge of disease-germs—so complete that a trained man can recognise with certainty, despite small size, as an ordinary man recognises a lion, rat, or louse.

Each separate disease caused by one distinct, definite germ, only and always found in cases of that disease. Names—typhoid germ, dysentery germ, diphtheria, etc.

Classification of Infectious Diseases into three groups:—

1. *The Enteric or Bowel Group*—why so called; typhoid — the paratyphoids — the dysenteries—cholera—other infectious diarrhoeas. The most important group—why? . . . refer to examples.

2. *The Respiratory Group*—where the parasite grows in, or enters the body by, the breathing apparatus; influenza—a bad cold—measles, diphtheria, scarlet fever, consumption—also, meningitis, and probably small-pox and chicken-pox.

3. *The Vermin Group*—where the parasite is carried from man to man by vermin—malaria, mosquitos (Salonika); relapsing fever, bugs and lice (Egypt, Russia and France); plague, rat-fleas—typhus, lice (Serbia, Germany)—very possibly trench fever, lice—Weil's Disease—rats?

No. 1. "*Bowel*" Group. Describe a case of typhoid fever from the bacteriological point of view—the germ, size, shape, movement, manner and rate of growth or division. The eating of the germ—one or more—how?—on dirty food, dirty water, dirty hands; the multiplication of the germ—in the bowel—in the blood, before patient begins to feel unwell: patient "full" of germs—millions—whose poison makes him feel unwell; the illness—destruction of parts of the lining of the gut by the germ-poison; possible deaths — perforation — hæmorrhage; convalescence — duration.

Emphasize the escape of millions of germs from the patient—before, all through, and after the illness—in excreta—in urine (*via* kidneys from blood).

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Emphasize again how patient gets the disease—by swallowing the germs—and how he passes it on.

Other diseases of the group—how caught and spread. Describe briefly the germs, and touch on main differences in the effect of their poisons.

Lessons to be learned—leave until last, as most important.

No. 2. "Breathing" Group. Describe one, *e.g.*, diphtheria, influenza, tuberculosis—from the germ point of view. The germ—the breathing in of the germ—its settling, and incredible multiplication during the incubation period—the illness.

The escape of the germ in the sputum—its inevitability—coughing, nose-blowing, sneezing, even talking loudly. Describe the spray-droplets, often invisible, carrying samples of whatever germs are there.

The diseases are caught by breathing in another man's sputum.

Lesson. Why overcrowding and lack of ventilation are bad; always spread men out as far as possible.

No. 3. "Vermin" Group. Describe briefly malaria, relapsing fever, typhus from germ point of view. Possible danger on this front—typhus, trench fever—caught by being bitten by another man's lice.

Lesson. An additional reason for doing all that is possible to get rid of lice—men who do not notice lice—thousands, and not a mark on the skin—necessity for inspection, etc.

The Lessons of No. 1 Group. The problem how to prevent the swallowing of excreta—why perfect latrines and latrine-discipline is nine-tenths of the battle—the obvious dangers of excreta—carriers—early cases, missed cases, slight cases. Describe bad latrines, promiscuity, and show how easily infection occurs—treading filth into billets, etc.—importance of urine—exposed excreta in summer—flies, the fly in detail, life history, habits, etc.—why fly-proof latrines, covered food, clean kitchens, treatment and destruction of horse manure, refuse disposal, necessity for incineration.