

Bulletin

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This Bulletin is issued to every unit of the Canadian Army Medical Corps. It will be passed for reading, and will be initialled by all Officers. After return it will be kept on file by the Officer Commanding for further reference.

SOME ASPECTS OF THE FOOD PROBLEM IN CANADIAN MILITARY HOSPITALS IN ENGLAND.

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The problem of administering food supplies in military institutions is, at the present time, beset by three main difficulties:—

- (a) The provision of an attractive variety of balanced diets affording ample nutrition without waste, based on
- (b) The utilization of such food-stuffs as may be found readily available after release by the Ministry of Food, and
- (c) The reduction in the consumption of imported food-stuffs now being placed on the British market in limited quantities under traffic arrangements, controlled by the Ministry of Shipping.

In order to meet this situation numerous changes have been necessary, from time to time, in the methods employed in assembling and administering raw food-stuffs.

HISTORICAL.

The problem of feeding Canadian patients in military hospitals in this country first presented itself in 1915. At that time there was no centralized control of the purchasing of food; nor was there any definite limit placed upon the quantities of food-stuffs which might be issued by Canadian hospitals for the dieting of patients. In a broad way issues were restricted to the quantities laid down in Regulations for the Allowances of the Army, and supplies were purchased locally by the hospital authorities at the best rates that could be obtained in nearby markets.

The institutions then in operation at Taplow, Bromley, and Monks Horton purchased such supplies as were deemed necessary, and forwarded tradesmen's accounts, at the month end, direct to the Chief Paymaster, by whom the bills were paid. This procedure continued in force until the end of 1915, when a Hospital Supply Department was established at Shorncliffe, under the supervision of the Director of Supplies and Transport. At the same time a Purchasing Department was set up, and these two departments, with the active co-operation of the Medical Service, devised a system for the centralized control of food purchases. In consequence the privilege of purchasing food-stuffs in local markets was either withdrawn or greatly limited, and from the beginning of 1916 hospitals obtained the necessary supplies in part from the nearest Army Service Corps Depot, whether British or Canadian, and in part from the food supply warehouse established at Shorncliffe.

During this period officers in charge of hospitals were encouraged in the economical administration of food; but no control was exerted by the Hospital Supply Department

in so far as laying down scales of diets or supervising the conservation of waste was concerned.

In the early spring of 1917 the increasing difficulty of accumulating sufficient quantities of food by purchasing in the open market became acute, and beginning February 1, 1917, the entire supply of food-stuffs, with the exception of a few staple commodities, such as bread, meat, sugar, tea, bacon, and milk, became the responsibility of the Army Canteen Committee, an organization under War Office control, with powers of commandeering quantities up to the total visible supply of any food commodity urgently required for military purposes.

With some modification the Hospital Supply Department continued to supervise the administration of food supply machinery for hospitals. This department maintained a cost record of hospital dieting, but beyond calling attention to excessive cost made no effort to interfere with the administration of the food supplied once delivery had been accepted by the proper hospital authorities.

At the end of June, 1917, the duties of the Hospital Supply Department, in so far as accounting and the general supervision of supply administration were concerned, became a responsibility of the Medical Services. Provision was immediately made for a survey of the situation, with the result that a series of helpful, periodic inspections were begun, resulting, through the co-operation of hospital authorities, in a vast improvement in the efficient and economical administration of food supplies within the hospitals.

During the remainder of 1917 great improvement was effected in the cooking and serving of attractive diets, allowances still being governed by Army Regulations which had been more or less carefully followed since the beginning of the War. A series of weekly dietaries, based on Army Regulations, was periodically submitted by the hospitals, and the careful examination of these reports, with attendant criticism and discussion, resulted after a time in the standardization of an ordinary diet without a sudden drastic revision likely to disturb feeding arrangements in any hospital.

During 1917 and the early part of 1918 the problem of accumulating sufficient quantities of food-stuffs became more and more acute. The first step to meet this situation, in so far as the dieting of hospital patients was concerned, was taken by the British medical authorities, resulting in the promulgation of an Army Council Instruction (A.C.I. 159 of 1918).

DIET SCALES.

Reduced minimum and maximum scales were made applicable to the feeding of patients in hospitals, and "in view of the urgency of the food problem" it was considered that food consumption could be regulated within the limit provided by these scales, below or above which it was not desired to go. The scales were as follows:—

TABLE I.
REDUCED BRITISH HOSPITAL DIET.
(Authority: Army Council Instruction No. 159 of 1918.)
Scales of quantities sufficient to feed 100 patients for one day.

Commodity	SCALE A. (Minimum.)				SCALE B. (Maximum.)					
	Lbs.	Protein grms.	Fat grms.	Carbo-Hydr. grms.	Calories	Lbs.	Protein grms.	Fat grms.	Carbo-Hydr. grms.	Calories
Meat	31.25	1,856.25	3,535.69	—	39,937	31.25	1,856.25	3,535.69	—	39,937
Fish	18.75	851.25	84.37	—	4,275	18.75	851.25	84.37	—	4,275
Bacon	12.50	537.50	3,402.50	—	33,850	12.50	537.50	3,402.50	—	33,850
Bread and Flour	69	2,451.24	147.93	17,056.80	81,361	75	2,664.40	160.80	18,540.00	88,436
Sugar	9	—	—	4,000.50	16,398	9.50	—	—	4,222.70	17,309
Edible fats (Margarine)	6.50	—	2,463.50	—	22,912	6.50	—	2,463.50	—	22,912
Potatoes	50	397.00	23.00	4,763.00	21,350	70	555.80	32.20	6,668.20	29,890
Fresh vegetables	25	86.25	17.00	452.50	2,375	35	120.75	23.80	633.50	3,325
Cocoa	1	90.66	117.86	192.80	2,258	1	90.66	117.86	192.80	2,258
Milk (pints)	80	1,463.80	1,619.20	2,144.00	30,000	130	2,386.80	2,631.20	3,484.00	48,750
Syrup and Jam	5	7.00	—	1,567.00	6,450	5	7.00	—	1,567.00	6,450
Cereals	7	354.20	60.90	2,354.10	11,669	20	1,012.00	174.00	6,726.00	33,340
Eggs (number)	40	204.00	162.00	—	2,340	50	255.00	202.50	—	2,925
Tea and Coffee	1.50	—	—	—	—	2	—	—	—	—
Cheese	3	340.20	408.00	33.90	5,331	3	340.20	408.00	33.90	5,331
Total		8,644.35	12,041.95	32,564.60	280,506		10,677.61	13,236.42	42,068.10	338,988
Average per capita		86.44	120.42	325.65	2,805		106.78	132.36	420.68	3,390

An endeavour was made to apply these scales of diet to patients in Canadian hospitals. The instruction issued by the Army Council was a complete departure from regulations which had previously been in force. Instead of considering

the individual requirements of each patient in drawing up a scale of issues, it was held that, in the feeding of sick men, the average requirements of large numbers furnished a safer basis of computation. Carrying out this idea allow-

ances were fixed at sufficient quantities to meet the average requirements of one hundred patients, on the understanding that issues would be made by the steward in bulk, and that distribution would take place in the main diet kitchens and in the seriveries.

STANDARD MENUS.

On investigation it was found that, in so far as active treatment hospitals were concerned, about 11 per cent. of all cases were on milk diet. An effort was then made to divide the allowance per hundred patients in such a way that approximately 90 per cent. of the patients would consume the entire meat allowance, while the other 10 per cent. would have a sufficiency of milk and milk puddings. This resulted in the drawing up of a standard menu, which became effective early in April, 1918. This menu was based on both Scales "A" and "B" of the Army Council Instruction, and was sufficiently under the maximum allowance to provide for a limited issue of ward extras, as well as a margin of safety to prevent, where possible, an over-issue of the maximum allowance.

In comparison with the maximum laid down in Scale "B," the per capita value of the ordinary diet was as follows:—

TABLE II.
FUEL VALUE OF STANDARD MENU.

	Protein Grms.	Fat Grms.	Carbo-Hydrates Grms.	Calories
Standard Menu ...	100.99	118.30	407.19	3,266
Reserve ...	5.79	14.06	13.49	124
Maximum allowance	106.78	132.36	420.68	3,390

The standard menu provided considerable variety, but was subject to adverse criticism on the following grounds:—

- (a) Deficient meat content.
- (b) Too many fish meals.
- (c) Too many cereal dishes.
- (d) Shortage of sugar and jam.

The shortage of meat was generally remarked, but gave the greatest cause for complaint in hospitals where the majority of patients were walking about or engaging in physical exercises. The objection to so much fish and cereals in the menu was to some extent anticipated, for previous experience in the feeding of Canadians had demonstrated that neither of these foods is popular as a main article of diet. This had been found to apply not only in the feeding of sick men, who might be expected to offer some objection, but to the personnel of staff messes as well.

Unsatisfactory methods of preparation employed in hospital kitchens were to some extent responsible for the complaint, but even when these difficulties had been overcome it was still reported that the standard menu gave cause for adverse criticism on the grounds of deficient nutrition. For the purpose of testing the truth of this complaint, seventeen patients at one hospital were kept under observation, twelve of them for a period of fourteen days from date of admission, and five of them for a period of twenty-one days from date of admission. At this hospital they underwent special treatment, and in addition to ordinary ambulatory exercise they were placed on a course of light calisthenics, with the result that all but two of them lost weight.

These patients were under observation during the period April 11 to May 13, 1918. They were carefully weighed on admission, and again at the end of the period of observation, the results being as follows:—

TABLE III.
EFFECT OF REDUCED DIET.

	Section 1.			
	Weight on admission	Weight at end of 14 days	Loss	Gain
A. ...	144.25	141.5	2.75	—
B. ...	164	162.5	1.50	—
C. ...	154.5	156	—	1.50
D. ...	154	153	1.00	—
E. ...	126	125	1.00	—
F. ...	156	152.5	3.50	—
G. ...	141	140	1.00	—
H. ...	132	131	1.00	—
I. ...	135	133	2.00	—
J. ...	141	136.75	4.25	—
K. ...	167	162.50	4.50	—
L. ...	140	136.50	3.50	—

	Section 2.			
	Weight on admission	Weight at end of 21 days	Loss	Gain
A. ...	142	144	—	2.00
B. ...	154	151.25	2.75	—
C. ...	152	150	2.00	—
D. ...	137	136	1.00	—
E. ...	142.5	141.5	1.00	—

Further examination of results obtained confirmed the contention that the standard menu provided a deficient diet for ambulatory and convalescent patients. All hospitals co-operated in giving this reduced dietary a fair trial during April, May, and June. The conclusion was then reached that, while the maximum scale laid down in the Army Council Instruction might be sufficient for bed patients, averaging ten hours asleep and fourteen hours awake in bed each day, the caloric value of the diet was not sufficient to meet the requirements of ordinary routine in Canadian hospitals, where a large percentage, even in active treatment hospitals, were able to be up and about the wards and grounds.

In the case of convalescent and special hospitals engaging in physical or remedial exercises the diet laid down was admittedly too low. The opening of a special hospital for the treatment of tuberculosis called for special consideration. As a result three scales of diet, based on the average requirements of one hundred patients for one day, were made effective from the first of July. These scales are now in operation, and during the past three months have given satisfaction.

The three scales of issues were made applicable as follows:—

- Scale A.—Maximum diet. Tuberculosis patients.
- Scale B.—Full diet. Convalescent and special patients undergoing physical training.
- Scale C.—Reduced diet. Patients undergoing active treatment in primary and special hospitals.

The quantities considered sufficient to feed one hundred patients for one day with the nutritive ratio and caloric value of the component parts in each class of diet will be found in the following table:—

TABLE IV.
CANADIAN HOSPITAL DIETS.

(Authorized from July 1, 1918, by D.M.S.C./L. No. 31 of 1918.)
Scales of quantities sufficient to feed 100 patients for one day.

Commodity	Lbs.	SCALE A.			Calories
		Protein grms.	Fat grms.	Carbo-Hydr. grms.	
Meat ...	75.00	4,455.00	8,481.06	—	95,850
Fish ...	18.75	851.25	84.37	—	4,275
Bacon ...	15.00	645.00	4,083.00	—	40,620
Bread ...	100.00	3,552.52	214.40	24,720.00	117,914
Sugar ...	17.50	—	—	7,778.75	31,885
Margarine ...	6.25	—	2,368.75	—	22,031
Other Fats ...	4.75	—	—	—	—
Potatoes ...	70.00	555.80	32.20	6,668.00	29,890
Fresh Vegetables ...	35.00	120.75	23.80	633.50	3,325
Milk (pints) ...	400.00	7,344.00	8,096.00	10,720.00	150,000
Syrup ...	1.75	19.05	—	550.10	2,327
Jam ...	10.75	15.05	—	3,369.05	13,867
Cheese ...	5.00	567.00	680.00	56.50	8,885
Cereals ...	35.00	1,771.00	304.50	11,770.50	58,345
Tea and Coffee ...	2.50	—	—	—	—
Cocoa ...	2.00	181.33	235.73	385.60	4,517
Eggs (number) ...	250.00	1,275.00	1,012.50	—	14,625
Total ...	—	21,352.75	25,616.81	66,652.20	598,356
Daily average per patient ...	—	213.52	256.16	666.52	5,983

Commodity	Lbs.	SCALE B.			Calories
		Protein grms.	Fat grms.	Carbo-Hydr. grms.	
Meat ...	50.00	2,970.00	5,654.04	—	63,900
Fish ...	18.75	851.25	84.37	—	4,275
Bacon ...	12.50	537.50	3,402.50	—	33,850
Bread ...	75.00	2,664.40	160.80	18,540.00	88,436
Sugar ...	9.50	—	—	4,222.70	17,309
Margarine ...	4.18	—	1,584.22	—	14,734
Other Fats ...	3.62	—	—	—	—
Potatoes ...	70.00	555.80	32.20	6,668.20	29,890
Fresh Vegetables ...	35.00	120.75	23.80	633.50	3,325
Milk (pints) ...	130.00	2,386.80	2,631.20	3,484.00	48,750
Syrup ...	1.00	10.88	—	314.34	1,330
Jam ...	4.00	5.60	—	1,253.60	5,160
Cheese ...	3.00	340.20	408.00	33.90	5,331
Cereals ...	35.00	1,771.00	304.50	11,770.50	58,345
Tea and Coffee ...	2.00	—	—	—	—
Cocoa ...	1.00	90.66	117.86	192.80	2,258
Eggs (number) ...	50.00	255.00	202.50	—	2,925
Total ...	—	12,559.84	14,605.99	47,113.54	379,818
Daily average per patient ...	—	125.59	146.05	471.13	3,798

Commodity	Lbs.	SCALE C.			Calories
		Protein grms.	Fat grms.	Carbo-Hydr- grms.	
Meat ...	45.00	2,673.00	5,083.36	—	57,510
Fish ...	18.75	851.25	84.37	—	4,275
Bacon ...	12.50	537.50	3,402.50	—	33,850
Bread ...	75.00	2,664.40	160.80	18,540.00	88,436
Sugar ...	9.50	—	—	4,222.70	17,309
Margarine ...	4.18	—	1,584.22	—	14,734
Other Fats ...	3.62	—	—	—	—
Potatoes ...	70.00	555.80	32.20	6,668.20	29,890
Other Vegetables ...	35.00	120.75	23.80	633.50	3,325
Milk (pnts) ...	130.00	2,386.80	2,631.20	3,484.00	48,750
Syrup ...	1.00	10.88	—	314.34	1,330
Jam ...	4.00	5.60	—	1,253.60	5,160
Cheese ...	3.00	340.20	408.00	33.90	5,331
Cereals ...	30.00	1,518.00	261.00	10,089.00	50,010
Tea and coffee ...	2.00	—	—	—	—
Cocoa ...	1.00	90.66	117.86	192.80	2,253
Eggs (number) ...	50.00	255.00	202.50	—	2,925
Total ...	—	12,009.84	13,996.81	45,432.04	365,093
Daily average per patient ...	—	120.09	139.96	454.32	3,650

As already mentioned, these scales became effective at the beginning of July when complaints of deficiency in the allowances ceased.

RETURNS OF ACTUAL CONSUMPTION.

A system of weekly returns of actual consumption in all hospitals was then instituted, and while a few commodities were at first found to be issued in excess of the scale, it was noted that the tendency in all hospitals was to under-issue the maximum quantity allowed. Representative hospitals operating under each scale of diet were kept under close observation, and it was found at the end of August that the average of actual issues showed considerable reduction in hospitals subsisted on Scale "A" and Scale "C," while hospitals engaged in physical training under Scale "B" closely approximated the maximum allowance.

A comparison of authorized and actual consumption during the period of observation per patient per diem is as follows:—

TABLE V.

AVERAGE CONSUMPTION PER PATIENT PER DIEM.

	SCALE A.			
	Protein Grms.	Fat Grms.	Carbo- Hydrates Grms.	Calories
Maximum allowance	213.52	256.16	666.52	5,983
Actual consumption	168.35	210.86	609.23	5,142

	SCALE B.			
	Protein Grms.	Fat Grms.	Carbo- Hydrates Grms.	Calories
Maximum allowance	125.59	146.05	471.13	3,799
Actual consumption	118.68	148.64	450.77	3,710

	SCALE C.			
	Protein Grms.	Fat Grms.	Carbo- Hydrates Grms.	Calories
Maximum allowance	120.09	139.96	454.32	3,650
Actual consumption	106.98	138.57	408.87	3,398

It was considered that Scales "A" and "B" afforded ample allowances for the purpose intended. The dieting of patients in active treatment hospitals, however, was believed to merit special attention. It was noted that in the actual carrying out of the dieting of patients under Scale "C" an under-issue of protein and carbohydrates had resulted in the loss of approximately two hundred and fifty calories per patient per diem.

After Scale "C" diet had been in operation for nearly two months, the question of arriving at an optimum diet for patients in Canadian active treatment hospitals was discussed with the Royal Army Medical authorities. Based on the metabolic requirements of patients subsisted in our primary hospitals on war-time food-stuffs, as calculated in the laboratories of the Royal Army Medical College, it was considered that the dieting needs of the average patient of this class were being met. The maximum daily requirements suggested by the dietetic adviser to the British Medical Service had been very closely approximated in Canadian hospitals subsisting patients under Scale "C" diet. The comparison computed at the daily requirements per patient is as follows:—

TABLE VI.

	COMPARISON OF ACTIVE TREATMENT DIET.				
	Protein Grms.	Fat Grms.	Carbo- Hydrates Grms.	Calories	
British ...	108.75	139.46	414.23	3,443	
Canadian ...	106.98	138.57	408.87	3,398	

SERVING AND SERVERIES.

In providing for the efficient feeding of hospital patients many contributing factors have been considered. It is, of course, essential that food should be thoroughly cooked, attractive in appearance, and served quickly at a proper temperature. Steps were taken to standardize the work of the serveries. In some instances, where large numbers dine together in a common hall, difficulty was experienced in placing hot food on the patient's plate.

The solution of this problem was found in the use of a specially designed self-serving tray. Patients were seated at small tables in groups of six or eight, and practically the entire meal for each group was served in one large water-jacketed container, divided into five compartments, holding soup, meat, potatoes, a second vegetable, and pudding. This tray was supplied with a lid and the necessary serving utensils. It was found that hot food could be kept at a proper temperature for one hour from the time that each tray was filled and the lid fixed in position, thus making it possible to place hot food on each group table before the patients were admitted to the dining hall. As soon as they were seated, one of the patients in each group would serve the soup and the other courses in succession, each article of the diet being placed on the patient's plate at practically the same temperature at which it had left the servery thirty minutes before.

An effort was made to increase the general attractiveness of dining halls. It was suggested that use should be made of decorative plants and flowers, and that the introduction of water-jugs and glasses would prove a welcome innovation, particularly at the midday meal, when no hot beverage is served. The changes effected resulted in a very noticeable improvement in the feeding of patients. The dining rooms were made bright and cheery; confusion in the seating and serving of patients was eliminated; food was placed on the tables in an attractive and appetizing manner, and the patients ate well.

Both the constitution of diets and the control of diet distribution have a direct bearing upon an important aspect of the food question not previously mentioned—that is, the question of eliminating wasteful practices.

Economy in the consumption of hospital food supplies is governed chiefly by the dietetic requirements of the patients fed. There is another consideration, however, which must not be overlooked, and that is the proper supervision of feeding cost. Under the system of centralized buying now in force, it may be assumed that hospitals are receiving food-stuffs at the lowest price compatible with good quality and availability of supply. Economy in the cost of accumulating food-stuffs need not then concern the Medical Service. There is, however, an opportunity for the introduction of many economies in the administration of food-stuffs after delivery to the hospital.

To make this possible there must be close co-operation between the administrators and the distributors in each institution. The administrators are the Officer Commanding, registrar, adjutant, quartermaster, and matron. The distributors are the medical officers and nursing sisters. The administrators lay down certain rules and regulations for the guidance of the distributors. When these regulations are carried out to the letter economies do take place; when they are ignored economies are impossible.

The attitude of the distributors, particularly towards the Quartermaster or the Messing Officer, has too often made the economical and efficient administration of food supplies a very uncertain business. From experience it is found that frequently medical officers leave the prescription of diets very largely to the nursing sisters, and, in turn, the nursing sisters refer the matter for final decision to the patient himself. It has been most difficult in some cases to persuade a medical officer that the prescription of a diet is as much his responsibility and as essentially a part of the treatment of the case as the prescription of medicine or massage.

It has been very clearly laid down in regulations governing procedure in the wards that the medical officer is charged with the responsibility of investigating the daily food requirements of all patients under his care. For the convenience of other departments of the hospital, it has been pointed out that the prescription of the necessary diet should be, in so far as the daily time-table is concerned, a first charge upon the professional attention given by the medical officer to his patient. On the occasion of his early morning survey the medical officer is required to prescribe a definite diet which he wishes each patient to receive on the following day, either re-affirming or revising the instructions issued by him on the morning before. This is done by inserting any changes, obliterating all unnecessary blank spaces, and then affixing his initials to the patient's individual diet and extra sheet.

In one instance it was discovered that a medical officer had initialled a diet and extra sheet for thirteen days in advance, leaving the extra columns blank, to be filled in as desired by someone else. Many abuses of a less pronounced character have also been discovered. In a surgical ward it was found that large quantities of eggs, milk, and other extras were being ordered day after day on a ward extra sheet headed "T.B. Extras," whereas no patients even suspected of suffering from tuberculosis had been admitted to that particular ward for months. These "T.B. Extras" were in addition to extras ordered for individual patients on their own diet and extra sheets, and the use to which these excess issues had been put was neither satisfactorily recorded nor explained.

The necessity for issuing such special commodities as chickens, puddings, and stout is considered to merit the careful consideration of medical officers. Special diets are not to be considered as a reward, although some instances have been discovered where ordinary diets have been modified with this idea.

In cases where patients were not eating well, a bottle of stout has been ordered for daily issue in the ward prior to the midday meal. In a few days the patient becomes accustomed to hospital routine and manifests an increasing interest in the meal hour. Instances have been noted where this improvement has apparently been ignored and patients have been issued with a bottle of stout daily for week after week, and, in some cases, for month after month. As far as can be determined from records examined, there is no evidence that any patient has actually continued to draw stout after being discharged from the hospital, but individual diet sheets would tend to show that in some instances the last issue must have been made as the patient was going out through the hospital gate. These are a few of the practices which unnecessarily increase the expense of hospital administration, raising the cost without increasing the efficiency of feeding.

COST.

The cost of feeding patients in Canadian hospitals during the four months ending with the August period of this year are set out below:—

TABLE VII.

CANADIAN PATIENTS' FEEDING COST.

Average Daily Cost per Capita—May to August, 1918.

(Figures represent pence, computed to three places of decimals.)

SCALE A.

	May	June	July	August
Lenham ...	45.822	42.597	51.596	51.206

SCALE B.

	May	June	July	August
Bromley ...	24.070	20.751	24.091	24.782
Bearwood ...	20.859	20.644	21.247	21.239
Matlock ...	24.442	25.645	25.038	25.772
Monks Horton ...	18.030	17.144	16.995	—*
Witley ...	24.174	24.559	26.558	26.106
Epsom ...	15.250	15.752	16.017	16.500†
Bexhill ...	15.216	15.720	16.239	16.500†
Total ...	142.041	140.225	146.215	130.889
Average ...	20.292	20.032	20.888	21.817

*Closed July 31st, 1918.

†Full messing allowance subject to reduction.

SCALE C.

	May	June	July	August
Basingstoke ...	18.789	19.173	24.036	26.905
Kirkdale ...	23.121	16.137	19.180	21.156
Moore Barracks ...	23.122	24.926	26.551	26.441
Bramshott ...	17.152	17.571	20.051	22.720
Eastbourne ...	17.905	18.437	20.430	23.153
Taplow ...	22.039	22.246	23.794	25.123
Orpington ...	19.110	22.829	21.645	23.140
Bushey Park ...	17.995	18.008	19.380	20.779
Buxton G'ville ...	17.221	19.639	21.226	24.043
Buxton Red Cross ...	18.269	21.679	23.867	25.348
Westcliff ...	20.644	22.334	23.795	23.333
Etchinghill ...	14.702	16.042	18.154	20.209
Hastings ...	21.497	22.185	26.054	26.494
Total ...	251.566	261.206	288.163	308.844
Average ...	19.351	20.093	22.166	23.757

The increase in the cost of July over June was due to the introduction of expanded scales of diets in the latter month. The increase in August over July was not due to this cause, nor was it due to any appreciable increase in market prices. An explanation must be looked for in the larger demands placed upon the hospitals concerned by the distributors. This is not a comparative table, hospitals being grouped according to the scale of diet issued.

DIETS OF PERSONNEL.

The problem of feeding both soldier personnel and women employed in hospitals has merited special attention. It is to be noted that a large number of the soldiers now comprising the staffs of hospitals, both non-commissioned and other ranks, are low category men who have been returned to this country after employment, and, in many cases, after experiencing disablement to some degree in the fighting zone. These men are subsisted on a scale of rations which approximates the allowance to British soldiers in home areas, and is slightly below Scale "B," authorized for convalescent patients undergoing physical training. This allowance is known as Scale "D," and has a gross value as follows:—

TABLE VIII.

GROSS VALUE OF PERSONNEL RATION.

	Protein grms.	Fat gms.	Carbo-Hydr. grms.	Calories
Daily value per capita	108.84	121.10	430.25	3,328

In the feeding of members of the Q.M.A.A.C., V.A.D., and other women's organizations, the daily per capita allowance has been based upon the scale of issues laid down by the British military authorities. This allowance has a daily fuel value as shown in the following table:—

TABLE IX.

GROSS VALUE OF WOMEN'S RATION.

	Protein grms.	Fat grms.	Carbo-Hydr. grms.	Calories
Daily value per capita	92.96	99.31	397.98	2,931

These ration allowances have been in operation for three months and are giving satisfaction.

CANADIAN AND OTHER DIETARIES COMPARED.

Compared with the training camp diet of the principal Allies, soldier personnel in Canadian hospitals in this country are, it is considered, receiving a sufficient ration.

TABLE X.

COMPARISON OF PERSONNEL RATIONS.

	Calories
Canadian hospitals in England	3,328
American home training camps	3,963
British home areas	3,400
French home areas	3,300
Canadian troop ration in England	3,200
Italian home areas	2,500

These values represent the estimated gross caloric value of foods as purchased, and are all considered subject to a reduction of 7 per cent. to 10 per cent. on account of unavoidable waste in preparation and cooking. The cost of feeding hospital personnel is approximately 1s. 6d. per capita per diem.

The computation of nutritive ratios and caloric values contained in the foregoing tables was based on figures

recently tested in the laboratories of the Royal Army Medical College. It is considered that these values more nearly represent the present fuel value of war-time food-stuffs than earlier figures obtained from the calorification of pre-war foods.

A FURTHER REPORT UPON DIPHTHEROID INFECTION OF WOUNDS.

With a Note upon the Frequency of Diphtheroid Bacilli in Cases of Urethritis and Prostatitis.

By R. M. JANES, M.B.Tor., Captain, C.A.M.C.,

AND

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Buxton, Derbyshire.

ABOUT four months ago a routine investigation of wounds infected with diphtheroid organisms was begun here, with a view to corroborating, or otherwise, the combined report of Canadian pathologists recently published, in June, 1918, in the *Bulletin* of the Canadian Army Medical Corps, and then undergoing publication. This report was compiled as a result of an article which appeared in the *Journal* of the American Medical Association for September of 1917 by Majors J. G. Fitzgerald and D. E. Robertson, of Toronto, Canada. In view of the fact that practically all of the cases sent to this hospital showing open wounds had some bone injury, and had, in many cases, undergone prolonged treatment in primary hospitals before being sent here, it seemed that we were dealing with a type of cases not available for investigation in most military hospitals. It is also of interest that these are the cases which are being returned to Canada while their wounds are continuing to discharge, and that they are, therefore, much the same type of case as those reported on by the Toronto investigators, and perhaps differed somewhat from the cases examined by the investigators of the combined report.

The following technique was employed: A sterile cotton swab was rubbed well over the surface of the wound and sent to the laboratory by the medical officer in charge of the case. This swab was planted on a tube of Loeffler's blood serum, and the inoculated tube incubated for a period of eighteen hours. Smears were then made from the growth obtained and stained with methylene blue, as well as by Gram's and Neisser's methods. This was carefully searched under the microscope for Gram-positive bacilli showing diphtheroid arrangement. If diphtheroid organisms were found, a loopful of growth from the original culture at a place where the majority of the colonies were of the character of those produced by diphtheroids was emulsified by thorough shaking in a tube containing about 4 c.c. of bouillon. A loopful of this broth was then smeared on a plate of neutral nutrient agar, which was incubated for twenty-four hours, when suspicious colonies were fished. If no likely colonies appeared the process was repeated, and this time a loopful was also smeared on a plate of Loeffler's blood serum, as *B. diphtheriæ* are occasionally hard to grow on agar. The agar was used as routine because, being a transparent medium, it is easier to fish the colonies, and, moreover, the diphtheroids grow quite well on it. Any suspicious colony was inoculated on a tube of Loeffler's blood serum and the tube incubated. This growth was next day examined for purity, and, if pure, the sugar tubes inoculated from it. Sugar reactions were always carried out on Hiss's serum water, to which 1 per cent. of the desired sugar was added. Before the sugar reactions were finally read each tube was planted again on agar, in order to ensure that latent contamination had not occurred. Sugars were incubated for four days before final readings were taken. It was found by experience that this time was quite sufficient.

CHARACTERS OF GROWTHS.

On plain agar diphtheroids produce in twenty-four hours small pin-head colonies, translucent and lenticular on naked-eye examination, under the low power of the microscope appearing finely granular, with a slightly irregular margin. On Loeffler's blood serum colonies have the same general

characteristics, but grow somewhat larger. Colonies always tend to remain discrete.

Pure cultures of diphtheroids on serum slants are more profuse than the growths ever obtained with true Klebs-Loeffler. Cultures kept at room temperature develop the creamy appearance noted by Captain Adams in the combined report. The growth is moister than that of Klebs-Loeffler, and in some cases, where heavy, becoming almost slimy. Cultures of *B. diphtheriæ* kept under similar conditions do not lose their characteristic appearance. Similar to Klebs-Loeffler cultures, those of diphtheroids can be kept for at least four months, and at the end of that time good growths are obtained on subculture.

We have been unable to detect any consistent difference between the morphology and staining of diphtheroids and true Klebs-Loeffler bacilli. All strains of the former encountered by us stain well by Neisser's method, although usually the granules are larger. Generally speaking, diphtheroids are shorter than *B. diphtheriæ*. Grown on different media, they show the pleomorphism so characteristic of Klebs-Loeffler.

All the diphtheroids which we have isolated from wounds have produced acid from dextrose, lactose, saccharose, maltose, levulose, galactose, and have failed to ferment dextrin and mannite. Acid production in lactose is somewhat slower than in the other positive sugars. They may all be considered as falling under the *B. hoagi* type (Morse, 1912). One diphtheroid isolated from an acute otitis media complicating a case of influenza during the recent epidemic showed the sugar reactions of true *B. diphtheriæ*. On animal inoculation it proved avirulent, and belongs, therefore, to the class of *B. quasi-diphthericus* (combined investigation). Sugar reactions have been controlled on each batch of sugar media prepared by cultures of Klebs-Loeffler isolated from the throats of clinical cases of diphtheria. These have always fermented all the above sugars with the exception of saccharose and mannite.

For animal inoculation a twenty-four hour neutral broth culture has been employed. Guinea-pig No. 1 was inoculated in the subcutaneous tissue of the abdomen with 2 c.c. of the culture. Guinea-pig No. 2 was similarly inoculated with 2 c.c. of culture, which, however, had remained in contact with 1,500 units of diphtheria antitoxin at room temperature for a period of one hour. In the case of wound diphtheroids of a few pigs, No. 1 showed slight œdema after twenty-four hours, amounting to a tumour as large as a bean. But no general reaction was observed in any case. At the end of three days this local reaction had always subsided. In the case of true *B. diphtheriæ*, death of pig No. 1 occurred in from twenty-four to seventy-two hours. Pig No. 2 showed no local or general reaction. Autopsy findings were in all cases typical. Virulent Klebs-Loeffler was in one case isolated from the pleural fluid of a pig which had received *B. diphtheriæ* isolated from a wound. (It may be noted that the pleural effusion consisted of clear, straw-coloured fluid, not bloody fluid, as reported by some observers.)

In all we have examined swabs from one hundred and twenty-nine cases, eighty-two of which, or 63.5 per cent., showed diphtheroid organisms. Of these thirty were isolated in pure culture at intervals during a period of four months. Three of these proved to be true Klebs-Loeffler, and twenty-seven wound diphtheroids—that is, 10 per cent. of the isolated organisms were *B. diphtheriæ*, and assuming that this is a fair proportion, 6.4 per cent. of the wounds were infected with *B. diphtheriæ*.

We give below brief clinical notes on the three cases infected with *B. diphtheriæ*, and on three infected with wound diphtheroids.

Case I.—No. 1005736 Pte. T. Wounded, Passchendaele, November 11, 1917. Shrapnel wound, outer surface of left arm. Wound excised and dressed at C.C.S. the same day. Although the original wound was small, it continued to discharge until March, 1918, when it healed, leaving the arm apparently well in every way. About the first week in May, 1918, wounded area became swollen, red, painful, and tender. Swelling incised, much pus freed, and a piece of shrapnel came away in the dressing. The wound continued to discharge, and considerable sloughing took place, leaving a dirty ulcer. A swab taken May 20, 1918, shows the Klebs-Loeffler bacillus. The following note was made on his Medical

History Sheet one week later: "Ulcer slightly larger than a half-crown, with a granulating, red base. Slight purulent discharge, slightly offensive; edges of wound are overhanging, but healthy. There is no local tenderness, pain, or redness. Epitrochlear gland is swollen and tender. General condition of patient good." This patient was returned to Canada, being on his way before the organism was proved.

Case II.—Pte. S. Following shell wound right leg, at Passchendaele, October 10, 1917, laid out in "No Man's Land" for five days. He contracted trench feet, and later gangrene of the right leg and toes and heel of left foot occurred. Right leg and four toes of left foot were amputated November 11, 1917. In February, 1918, remaining toe was amputated and stumps of toes and left heel cleaned. The wound continued to discharge, and heads of metatarsal bones of third and fifth toe were removed on March 5, 1918. Up to this time eusol and Carrel-Dakin fluid were used for dressing. On March 13, 1918, swab from wound showed diphtheroid bacilli, later proved to be true Klebs-Loeffler, along with streptococcus and staphylococcus. At this time the following description of the wound was entered: "Copious quantity of yellowish-white pus discharging, and wound shows definite membrane, swelling and oedema extends beyond the ankle. Patient complains of very little pain." Dressings were now changed to flavine three times a day, with bichloride baths. 5,000 units of diphtheria antitoxin was administered, followed, however, by rather severe anaphylaxis. No sensitizing dose was given in this case. Progress under this treatment was rapid, and on April 30, 1918, the following note was made on his Medical History Sheet: "Very slight discharge; healthy granulations cover the base of the wound. Epitheliation is proceeding rapidly along the margin." Progress was marked to complete healing.

Case III.—No. 790639 Pte. C. Received shrapnel wound of right forearm, with comminuted fracture of the ulna, on February 13, 1918. Progress of the wound was, apparently, slow. On May 5, 1918, had operation, with removal of scar, sequestra, and shrapnel fragments. Wound stitched, and an iodoform gauze drain inserted. Five days later a note on Medical Case Sheet states: "Wound healing nicely. No purulent discharge (except where drain is applied)." Progress was rapid for about three weeks, when healing slowed up. On June 21, 1918, a swab from wound showed diphtheroid bacilli, later proved to be true Klebs-Loeffler. At this time wound had progressed to a superficial ulcer, which showed a definite firm membrane, and exhibited no tendency to heal. Flavine dressings three times a day were now instituted, and 6,000 units of antitoxin administered, three days later 5,000, and two weeks later 10,000 units. (A sensitizing dose of one-half cubic centimetre of serum was administered before the first dose of 6,000 units. No anaphylactic reactions were obtained.) The membrane showed some tendency to loosen after each dose of antitoxin, but healing was slow, and swabs from the wound taken at intervals up to the time when complete healing occurred on July 21, 1918, showed pure cultures of *B. diphtheriæ*.

Case IV.—No. 781344 Pte. McD. Sustained shrapnel wounds at Passchendaele, October 26, 1917, affecting anterior aspect left shoulder and left side of neck; the damaged tissue was excised at C.C.S., and later, after removal to base, some necrotic bone taken from head of humerus, and free drainage of pus established, which had collected in lower angle of scapula. At this time contracted erysipelas in left arm, but following this wounds began to improve gradually.

On admission to the hospital May 7, 1918, the shoulder wound extended from below middle of clavicle to the outer part of the upper third of arm, with some discharge. X-ray report indicated shrapnel fracture involving head of humerus, with some fragments in this region and in soft tissues about glenoid. Entry of June 8, 1918, on Medical History Sheet states wound has unhealthy look, with greyish, dry membrane covering same. On this date we had occasion to examine this wound, and found the membrane to be rather firm, thick, and extending practically over the entire wound. Several swabs were taken from the edges of the membrane, cultures of which revealed streptococcus and an organism typically Klebs-Loeffler in morphology and staining. Pure cultures of the latter gave sugar reactions of wound diphtheroid and not *B. diphtheriæ*. Wound treated with flavine, the membrane later coming off with the dressing, leaving a sound, granulating base. Patient later invalided to Canada.

Case V.—No. 719696 Pte. S. Flanders casualty of October 26, 1917, by rifle bullet. Wound of entrance 2 in. below head of right fibula, and of exit inner side of upper third of adjoining bone. These were cleaned and bones set in C.C.S. Later, at base, wounds incised for free drainage of pus and splints applied, leaving window for dressings. On reaching this hospital patient had a discharging wound on inner side of head of tibia, 2½ in. below knee-joint; X-ray revealed cavity in inner surface, upper end of tibia. Wet bichloride dressings and rubber drainage applied. On June 19, 1918, developed scarlet fever. Bacteriological examination of wound swabbed at this date showed staphylococcus and a diphtheroid. Pure culture of latter proved to be a true wound diphtheroid. Wound healed later, and general condition of patient much improved.

Case VI.—No. 215679 Pte. N. Received gunshot wound, left leg, November 10, 1917, with fractures of the tibia and fibula. The leg was opened and drained and shrapnel removed at C.C.S. Wound apparently never completely healed, and on March 14, 1918, a note on Medical Case Sheet says: "Middle portion of wound on anterior surface of leg still discharging." X-ray report a few days later says: "Areas of rarefactions, sequestra, and shrapnel dust still present." It was not thought wise to attempt operation, because the wound showed a tendency to flare up every few days. On April 4, 1918, scar tissues were dissected away, necrosed tibia curetted, and several small sequestra removed. A swab from wound on May 5, 1918, showed diphtheroid bacilli; later proved to be true wound diphtheroid. At this time there was a scar 7 in. long on antero-internal surface of left leg, with a small unhealed portion in the centre, from which a sinus led to another opening on the antero-external surface. There was a slight purulent discharge. Flavine dressings three times a day were instituted, and the progress of the wound was satisfactory.

It will be seen from a summary of the above case reports that wounds infected with diphtheroids differed in no wise clinically from those from which true *B. diphtheriæ* was obtained, except that they were, perhaps, more amenable to treatment. It will be noted that membranes were found in both types of cases. The three cases of diphtheroid infection are reported as a fair representation of all the cases we have examined.

During the conduction of a large number of bacteriological examinations for the venereal clinic here we have been struck by the large number of chronic cases of urethritis, litritis, and prostatitis, showing diphtheroid bacilli as the predominant organism.

Of one hundred and eighty cases examined, one hundred and five, or 58 per cent., showed diphtheroid bacilli. We have isolated seven cultures from the above, and these show the same morphological staining and cultural characteristics, also sugar reactions, as the wound diphtheroids. We have seen at least a few cases of acute urethritis due to diphtheroid organisms, and are of the opinion that in chronic infections of this locality these organisms are extremely important. It is also of interest in suggesting a possible source of at least some cases of diphtheroid infection in wounds. The first, to our knowledge, who called attention to the existence of urethral diphtheroids was Hine in 1913,* but we were unprepared by anything we have encountered in the literature to find them so common in the male genito-urinary tract.

SUMMARY.

- (1) 63.5 per cent. of open wounds examined in this hospital have shown diphtheroid organisms.
- (2) Judged from those cases in which pure cultures were obtained, 6.4 per cent. of open wounds in this hospital show infection with *B. diphtheriæ*.
- (3) Clinically, it is impossible to diagnose between diphtheroid and true diphtherial infection of wounds. A membrane does not necessarily indicate the presence of *B. diphtheriæ* in wounds.
- (4) It is not possible to distinguish between diphtheria bacilli and wound diphtheroids by morphological characters.
- (5) Only by sugar reactions obtained from pure cultures can diphtheroid organisms be distinguished from true Klebs-Loeffler, and only after positive animal inoculation is it advisable to diagnose diphtheria in wounds.

* *Journ. of Pathol. and Bact.*, 1913, 18, 75.

(6) Flavine appears to have given better results than any other form of local treatment used here.

(7) It is advisable to administer diphtheria antitoxin in cases of diphtheria in wounds; here the importance of giving a sensitizing dose in cases of war wounds due to their having received previous injections of serum is emphasized. If this rule is not followed severe anaphylactic reactions will occur in some cases.

A FEW UROLOGICAL CASES ILLUSTRATING WHAT CAN BE DONE WITH SPECIAL APPLIANCES.

By G. S. GORDON, M.D., C.M. McGill, F.A.C.S., Captain, C.A.M.C., Officer-in-Charge G.U. Surgery, XI Canadian General Hospital.

EXPLORATORY operation is now seldom warranted in urological surgery. Such mutilation is not often necessary, for diagnosis can be made much more accurately in other ways. Moreover, quite a number of minor operative procedures can be carried out with appropriate armamentarium and will give better results, as curative measures, than corresponding major operations.

The following case reports, culled from the urological data of the XI Canadian General Hospital, are illustrative of these broad statements.

JANET'S FILIFORMS AND FOLLOWERS.

Very few cases of stricture of the urethra are sent to this clinic unless the ordinary type of sound will not pass. Yet we have found urethrotomy seldom required, and gradual dilatation is the procedure of choice. The difficulty is to get started. One of the most useful instruments we have is Janet's filiform, in which is a wire, bendable at the tip, and at the other end a screw to attach it to metal followers of all calibres. Once such a filiform is passed, the follower takes on the dilatation with assurance against old or new false passages.

Lieutenant X, 43 years old, R.A.M.C., had V.D.G. twenty-one years ago. Ten years later the stream was notably smaller than normal. In September, 1915, he had chills, fever, and his water could be passed only as a dribble. In January, 1916, suprapubic cystotomy and internal urethrotomy were done, followed in five days by external urethrotomy for secondary hæmorrhage. The suprapubic wound closed, but the perineal remained open. In September, 1916, under chloroform, sounds were passed. Double epididymitis followed, and the perineal fistula remained the same. April 6, 1917, he was sent by M.B. to this department. About one-third of his urine passed through his fistula. A Lister sound would not track all the way into the bladder; the filiform passed, however, and gradual dilatation began. On April 16, 1917, a 30 French follower passed. This calibre was maintained by passing the follower every third day, and on May 1, 1917, the fistula ceased to leak. It stayed closed till October, 1917, with dilatation once a fortnight, but then broke open again and a funnel-shaped diverticulum from the posterior urethra, lined with urethral epithelium and surrounded by dense scar tissue, was dissected out. Convalescence was uneventful, and the perineum is now solid, but the calibre of his stricture still has to be maintained by an occasional full-sized sound; and, as the roof of the posterior urethra has been cut and furnishes no guide to the internal sphincter, the only safe dilator is the Janet follower.

CYSTOSCOPIC DIAGNOSIS—YOUNG'S PUNCH.

Almost all our patients are young men, and so Young's punch comes in useful, only for fibrous median bars resulting from inflammation about the outlet of the bladder. In certain cases it is useful not only to remove obstructing tissue, but also to open up what remains of such tissue to drainage—as if one cut off a slice instead of incised.

Private G., 29 years old, has had attacks of marked frequency of urination, hypogastric pain on over-holding urine, and increased pain during the act. The stream required forcing, and was small and dribbly. For two years

he had been thus afflicted. He enlisted a year ago, and in France in May, 1917, during an acute exacerbation, bilateral ache across the kidneys with intimate copious hæmaturia supervened, which kept him four days at Rouen. His M.H.S. says he arrived at St. Bartholomew's suffering from "great frequency of urination and hæmaturia—staphylococci present, cystoscopy showed no growth or stones—not improved with treatment." He was in various hospitals from May, 1917, to October 19, 1917. His notes say "No improvement." He was transferred to this hospital on the later date when his urine was cloudy amber, acid of a specific gravity of 1024, and contained albumin ++, polymorphonuclears +, red blood cells +, G.U. system negative to inspection, and palpation throughout, except that both vasa deferentia seemed larger and denser than normal near either epididymis; the prostate seemed slightly adherent to the left side of the pelvis, and there was marked fulness of the median sulcus at the base of the prostate. To cystoscopy there was four ounces of residual urine. The bladder was coarsely and deeply trabeculated. Under the trigone, more marked to the left, were some large tortuous veins. The vesical outlet was raised by a distinct median bar. Wassermann, Schwarz (complement fixation), and O.T. tests were negative, and there was no suggestive history. On November 16, 1917, the median bar was removed under chloroform with an imperfect Young's punch through the unopened urethra. Laboratory report on the specimen removed. "Prostatic tissue not definitely adenomatous. Round cell foci of inflammation under epithelium. Numerous blood spaces almost amounting to hæangioma."

December 6, 1917, cystoscopy; vesical outlet almost level with bladder floor. Some lumpiness of sphincter to the left. He felt so well he would like to be discharged to lines. Sent to convalescent home with good stream, but pollakiuria still.

February 12, 1918, pollakiuria still. Stream is smaller, he says, but not markedly so. Sent to Canada for further care.

DIAGNOSIS OF STONE BY WAX-TIPPED CATHETER. URETERAL MEATOTOMY.

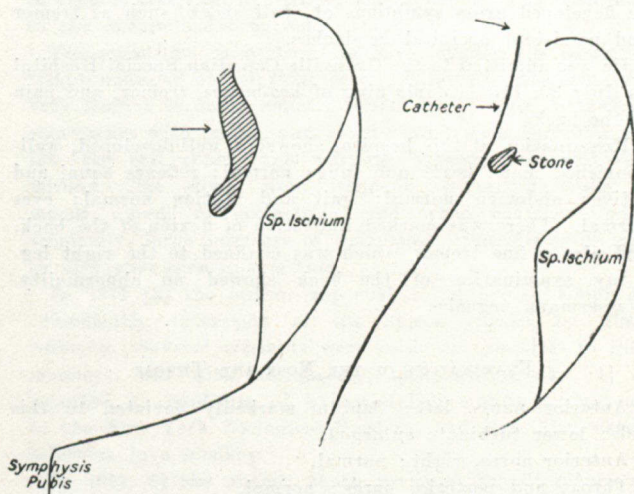
Captain M. had painless hæmaturia in 1915. In October, 1916, after five weeks of pleurisy at Etaples, he was invalided to Moore Barracks Hospital for pleurisy. There the urinary tract seems to have become suspect. The urine contained microscopic blood and occasionally hyaline casts. Pulse, temperature, and respirations were normal. The X-ray revealed a normal alimentary tract with bismuth, but failed to show any opacity suggestive of urinary calculus.

Over a year later, in January, 1918, he was seized with his first attack of frank renal colic. There was pain in the left groin, which, however, did not radiate in any direction, tenderness in left scrotal sac, vomiting, sweating, undue frequency of urination, and intimate hæmaturia. This passed, and he felt "fit" for a week or so, when a second attack, similar in all respects, except that the pain was located lower in the groin, but also in the left posterior renal area as well. He was in the middle of his third attack when sent to this clinic March 1, 1918. This differed in no way from the two previous, except for the location of his pain, which for the third time changed position, and was in the left posterior renal region only. His family and personal history suggested nothing pertinent. His urine contained a few red blood cells, but also a few polymorphonuclear cells. He gave no reaction (local, focal, temperature, or general) to O.T. 1/10 mg. The X-ray report was negative to suggestive opacities. On March 20, 1918, cystoscopy was done. The bladder was found normal, ureteral spurts normal. A wax-tipped catheter, however, went up the left ureter only 3 cm., and on withdrawal (after rotating it on its axis) well-defined scratches were found. The old X-ray plates, on second study, were suggestive, and another plate, taken with a very small diaphragm, quite definitely revealed an opacity at the site indicated.

March 30, 1918—Through a cystoscope the left ureteral orifice was examined again; the stone was seen bulging the ureter, and a specialist's scissors passed through the cystoscope was used to do a ureteral meatotomy. Next day, without further symptoms, an irregularly oval, brittle, crystalline, pure oxalate stone passed per urethram, and the patient was discharged to convalescent hospital.

THORIUM X-RAY REQUIRED TO CORRECT AN OPAQUE CATHETER X-RAY.

Lieutenant W., now in this hospital for ureteral calculus, has had colic for two years, at first diagnosed as appendicitis. The X-ray revealed a small opacity in the right ureteral area low down. A stereoscopic X-ray demonstrated that the opacity was external and posterior to a wired catheter introduced into the right ureter, and the inference was that the opaque body was not in the ureter. A thorium X-ray, however, showed that the ureter was pouched and a stone was in the pouch. Major Pirie, to whom I am greatly indebted for unvarying courtesy and suggestions, located this stone as 1 cm. inwards, $\frac{1}{2}$ cm. downwards, and $\frac{4}{5}$ cm. forwards from the spine of the right ischium, with the bladder empty, so that the stone cannot be far away from the ureteral meatus. An attempt will be made to get it through in the same way as in the case above detailed. It will probably be necessary to dilate the ureter with bougies as well. Relation of stone to opaque uretral catheter:—



Pouch revealed by thorium injection.

INSTRUMENTATION TO REMOVE FOREIGN BODIES FROM THE BLADDER.

Soldiers do not belong to the class of men who introduce foreign bodies into their bladders. At least only one such case has presented itself at this clinic. In the centre of a vesical phosphatic calculus, which was removed suprapubically (before we had lithotrites) was found chewing gum. Before enlistment I had three such cases in which the cystoscope and lithotrite were the only instruments called on. Almost all other foreign bodies can be removed through an operating cystoscope with very little trouble.

LITHOTRITY.

Since the arrival of lithotrites at this clinic no suitable cases have presented themselves for this simple method of removing calculi, except one, and he refused operation either by knife or lithotrite. Usually vesical calculi are easily diagnosed and easily removed suprapubically, and are therefore not sent here. A disadvantage of cutting operations is illustrated in the case above referred to as having a calculus with a chewing gum nucleus. In that case, after suprapubic removal, the only method by which "pain in the scar" could be eliminated was a frank avowal of my knowledge of what the stone contained. He professed surprise, of course, and remarked that he did not chew gum, but he apparently did not care to stay under my care and observation, and so the pain disappeared.

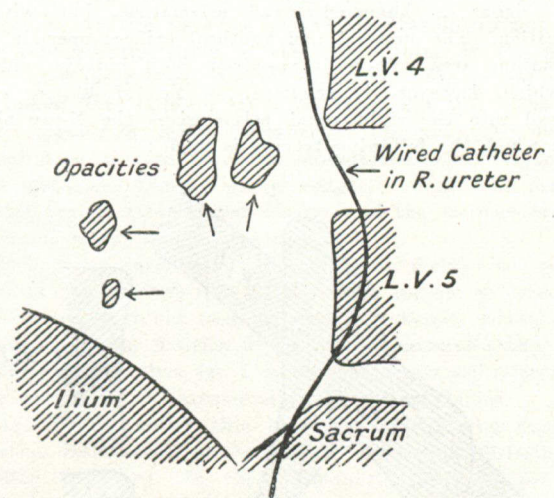
We have considerable wealth of obscure kidney and ureter disabilities from which to choose. In addition to the usual catheterization of ureters, &c., radiograms of the renal pelvis and ureters distended by opaque fluids have been found valuable. Radiograms of the course of an opaque catheter in the ureter have their uses also, but to a more limited extent.

OPAQUE CATHETER USED TO DEMONSTRATE EXTRA-URETERAL OPAACITIES.

Private D., 28 years old, has had nocturnal enuresis since

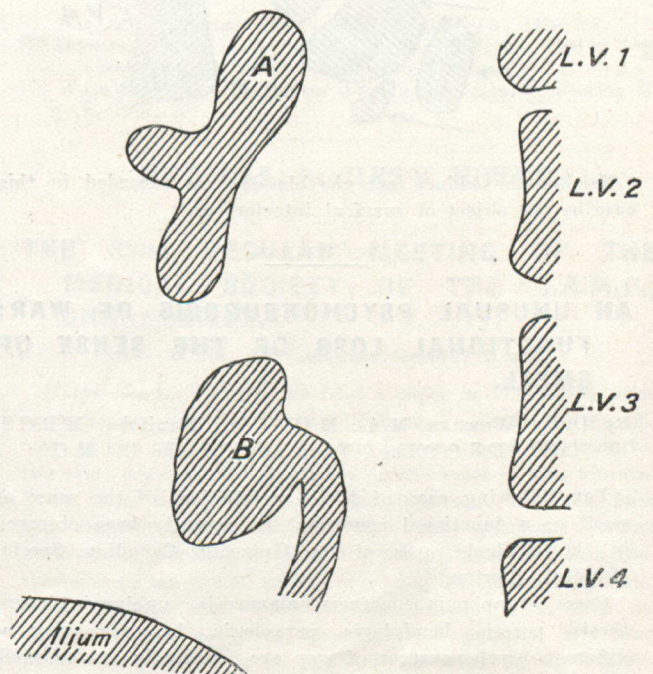
childhood. He enlisted twelve months ago, but has never been sent overseas on account of incontinence. Moreover, he usually rises four or five times at night to urinate, and has frequent urgency by day when, if no urinal is handy, he occasionally wets his clothes. The urine is normal in every way, except that it contains calcium oxalate crystals. On cystoscopy the bladder capacity is 16 oz. and no abnormalities are found. The X-ray reveals four opaque bodies above the crest of the right ilium, which are extra ureteral, as demonstrated by their relation to the opaque catheter. A rough tracing of the X-ray plate demonstrates that the ureter is deflected from its course, presumably by a mass of tubercular inflammatory tissue, part of which is calcified.

The symptoms are due to this:—



SLIGHT HYDRONEPHROSIS DEMONSTRATED BY ARGYROL X-RAY.

Corporal B., 26 years old, injured his back in a railroad wreck four years ago, following which he passed blood in his urine, and has subsequently had an ache over the right kidney at times and passed urine like café-au-lait. For a year and a half he has had pollakiuria, which is now of marked degree by night and day, and he has occasionally enuresis, and when unable to find a urinal he sometimes wets his trousers. His urine is normal. Bladder normal to cystoscope. Both ureters are easily catheterized, but the urea content of right and left urines is as 1 to 13. 7 c.c. of 40 per cent. argyrol injected into the renal pelvis gives these tracings, which show a range of movement of $1\frac{1}{2}$ in. and a renal pelvis deformed by back pressure.



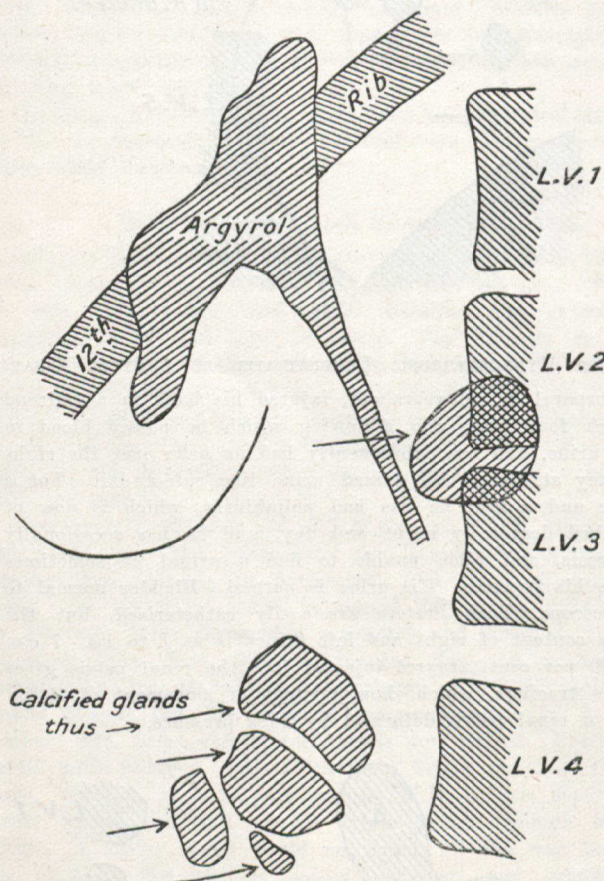
Composite tracing of renal pelvis.
"A"—with expiration.
"B"—with deep in-piration.

November 21, 1916.—Kelly's operation for fixation of the kidney was done. Many dense adhesions were present.

November 30, 1916.—All symptoms were completely relieved. He has, however, some discomfort in the right groin. Perhaps the ilio-hypogastric is involved in the scar.

PYONEPHROSIS CONSEQUENT ON OBSTRUCTION OF THE URETER BY A TUBERCULAR MASS, DEMONSTRATED BY ARGYROL X-RAY.

Sergeant H., 26 years old, in civil life a locomotive fireman, has never felt ill except eight years ago, when he had copious, intimate hæmaturia, and again quite recently when he has felt quite "ailing," and wants to pass his urine very frequently on account of pain over the bladder when a small amount of water accumulates. His urine is pyonephrotic. His bladder capacity is 6 oz. The whole roof of the bladder to the right is congested and studded with minute ulcers. The trigone is hummocky and œdematous, but without ulceration. The ureteral and urethral orifices open in this œdematous area. There is pus from both kidneys, culture of which, however, is negative. 10 c.c. of 40 per cent. argyrol into the right renal pelvis gives the X-ray plate, from which the following tracing is made:—



Neither the kidney nor the bladder are regarded in this case as the object of surgical interference.

AN UNUSUAL PSYCHONEUROSIS OF WAR: FUNCTIONAL LOSS OF THE SENSE OF SMELL.

By DIGBY WHEELER, M.A., M.D., C.M., Manitoba, M.R.C.S. Lond., L.R.C.P. Eng., Temporary Captain, C.A.M.C.

THE following case of the complete loss of the sense of smell as a functional condition has recently been observed in the medical wards of the Granville Canadian Special Hospital, Buxton.

Cases of aphonia, deafness, amaurosis, amblyopia, anæsthesia, paresis, hemiplegia, paraplegia, &c., appearing as different psychoneuroses of war are frequently encountered. I have not as yet seen a case reported in any of the literature of the functional loss of the sense of smell.

To physiologists this anosmia is interesting, because it demonstrates very clearly the four primary tastes. Thus a man with the loss of the sense of smell can only recognize things as acid, salt, bitter, or sweet. He is quite incapable

of recognizing any of his food—in fact, has lost that fine differentiation with which *taste*, and not *smell*, has usually been credited.

718108 Pte. P., 15th C.B., arrived in France September, 1916. Carried on without any trouble until buried by high explosive shell on April 27, 1917. He was unconscious for three hours, and recovered as they were digging him out. He was sent to the Casualty Clearing Station by the M.O., after having requested to be allowed to carry on, because he was told he was "shaky." At the base hospital on April 30, 1917, he noticed that he could not smell anything, and his meals tasted as if he were eating so much "pine wood." May 15, 1917, he was sent back to his unit, but his M.O. would only allow him to carry on at the kitchens. Here he went out one morning with two other men to bury some decayed meat. While digging the pit they uncovered two dead Germans. The others left because of the offensive smell, but he was able to stick it out and finish the job without any discomfort.

He was sent again to the Casualty Clearing Station June, 1917, diagnosed trench fever. While at hospital this time he developed gross symptoms of shell shock, such as tremor and persistent occipital headaches.

He was admitted to the Granville Canadian Special Hospital on July 30, 1918, complaining of headaches, tremor, and pain in the back.

Examination at this hospital showed a well-developed, well-nourished man; heart and lungs normal; reflexes equal and active; abdomen normal; gait and station normal; eyes normal. There was marked limitation of flexion of the back, and also a fine tremor which was confined to the right leg. X-ray examination of the back showed no abnormality. Wassermann negative.

EXAMINATION OF THE NOSE AND THROAT.

Anterior nares, left: Septum markedly deviated to this side; lower turbinate enlarged.

Anterior nares, right: normal.

Throat and posterior nares: normal.

EXAMINATION OF THE SPECIAL SENSES OF TASTE AND SMELL.

The examination was carried out with the eyes bandaged. He was given the following to taste:—

- Sodium chloride, which he recognized as salt.
- Syrup, glucose, which he recognized as sweet.
- HCl dil., which he recognized as acid.
- Syrup. quassia, which he recognized as bitter.

A number of volatile substances were given to smell, such as amm. fort., ether, oil of lemon, hydrogen sulphide, aqua rosæ, ol. menth. pip., none of which he recognized.

Also a selection of different articles of foods were given to taste, such as cheese, butter, cabbage, potato, beef, jam, mutton, none of which he recognized.

METHOD OF TREATMENT.

August 17, 1918.—A weak faradic current was applied to the muscles of the lumbar region. Practically full voluntary flexion was restored in two minutes.

August 19, 1918.—A considerable time was spent with the patient explaining his condition to him and assuring him that his sense of smell would be restored.

A strong faradic current was applied to the back of the neck, and at the same time amm. fort. was held under his nose, and he was instructed to tell what it was. At the end of one minute he recognized it as "ammonia," and was highly pleased with himself. He next recognized oil of lemon with the aid of a weaker current.

The substances as used in the testing of his sense of smell were given again to the patient that he might identify them without the aid of the current. He identified each substance immediately.

The foods, as given in testing his sense of taste, were given again to the patient that he might identify them without the aid of the current. He identified each food immediately. The different foods were administered in combination, and the patient was able to tell accurately what he had been given.

A FATAL CASE OF BALANTIDIOSIS.

By F. B. BOWMAN, M.B.Tor.; Major, C.A.M.C.;

Late Specialist Bacteriologist, Italian Expeditionary Force.

DURING the present War no fatal cases of balantidiosis have been reported, and no mention has been made in the literature of the disease as occurring among troops, although the organism has been reported present in the faeces at different times.

A short résumé of the literature on the subject is here given with notes of a fatal case seen by me while on duty in Italy, and engaged in the routine study of a large number of faeces from British West Indian soldiers for parasites.

In 1904 Strong [1] reviewed the literature on the subject and collected 127 cases in all up to that date, and in 1906 reported on the subject again, describing minutely the extreme ulcerative colitis at autopsy, with invasion of all the layers of the bowel by the organism. The caecum was affected particularly. In 1909 the author reported two fatal cases of balantidiosis [2]. Both of these showed the same picture as described by Strong, and in one of them perforation of the caecum had occurred.

The organisms were shown to have invaded the mesenteric lymph nodes in one of these cases. Clinically, the cases were very similar to acute amœbic dysentery. There was extreme emaciation with pallor, and blood examination showed a very low red cell count, this varying between two and three million. The stools were frequent, contained blood and mucus, shreds of epithelium, and when examined microscopically, large numbers of balantidia. Sometimes as many as fifty were seen in one field.

In 1911 [3] the author reported a fatal case which had coincidentally infarction of the spleen caused by filarial embryos. Several attempts were made at this time to infect monkeys, but with no success, although Brooks [4] had reported an epidemic of balantidial dysentery among apes in the New York Zoological Gardens, and Noc [5] a natural infection in a monkey.

In 1911 [6] the author again reviewed the literature and discussed the treatment, including injections of various substances and the taking of thymol-coated ipecacuanha pills. These treatments had no permanent effect. It was shown that the disease was rare, as only three cases of balantidiosis were found in an examination of 4,000 specimens of faeces. In 1913 E. L. Walker [7] reported on the disease, and emphasized the number of latent infections where no symptoms occurred. In 1911 ten cases occurred in Bilibid Prison (Manila), and in 1911 and 1912 only eight cases occurred in the Philippine General Hospital. He showed that silver nitrate is balantidicidal in a dilution of 1:25,000. Arsenic, antimony, aniline dyes had little or no effect. Mercuric iodide in a dilution of 1:1,000 had a rapid action. Ipecac. and emetin were only feebly effective.

The following are brief notes on the case seen by me:—

Case.—Pte. —, 10th B.W.I., aged 24, physically well-developed.

Complaint.—Abdominal pain, diarrhoea, and fever.

History.—Patient gives no history of remote illnesses having any relation to his present condition. While in France he was in hospital for six and a half weeks with "bowel trouble." Until the present illness he had been in good health since coming to this area. Five days ago he began to have "cramps" with diarrhoea and tenesmus. He reported sick and was admitted to hospital.

Physical Examination.—Patient appears drowsy, seems to be in what may be described as a "typhoid state." The eyes are half closed. He speaks slowly and answers questions hesitatingly. The scleræ are distinctly yellow-tinged. The lips are covered with sordes, the breath heavy, and the tongue furred. Pulse 104, full, and distinctly dicrotic. The heart sounds are clear, the second pulmonic sound is somewhat accentuated, otherwise normal.

Respirations are normal, and lungs on both sides seem quite normal.

Abdomen.—Appears somewhat distended and is quite tense. There is a bulging area just below the costal margin on the right side. It is about 7 cm. from the mid-line, and extends towards the mid-line. On palpation this area is found to be very tender. No spots can be detected on the abdomen or chest.

Blood Examination.—Leucocytes, 10,500; red blood cells, 4,000,000.

Urine.—Albumin and bile both present in large amount. A few granular and hyaline casts.

Blood cultures and cultures from the faeces were always negative, although done repeatedly.

Treatment.—The patient was treated first of all with injections of emetin for eight days, with no result.

He had an average of ten motions in twenty-four hours, always containing blood and mucus, and sometimes quite watery in character.

Then, acting on Walker's suggestion as to the use of silver salts, the patient was given twice daily high rectal injections of warm 10 per cent. protargol solution. In a short time the parasites disappeared, and the patient appeared to improve. At this time the author was transferred and could not continue the study of the case. Later on the patient died, and for a brief note regarding the autopsy findings he is indebted to Captain R. P. Weldon, R.A.M.C. The colon was a mass of ulcers, answering apparently the classical description of that found in balantidiasis. In the common bile duct was found tightly wedged a dead and partially disintegrated *Ascaris lumbricoides*, and the extreme jaundice was apparently due to this fact.

It is to be noted that later on Captain Weldon saw another case of balantidiosis in a British West Indian, so apparently the condition would seem to be not unknown among them. I am not in the position to make an exhaustive study of the literature, but thus far I have come across no reference to the occurrence of balantidiosis in the West Indies.

As already noted this case was encountered during a routine examination of the faeces of men of the British West Indian Regiment. In that examination over 90 per cent. were found infected with some parasite, and over 50 per cent. had hookworm disease. With other parasites present in large numbers, it may be suggested that the balantidium is commoner than the findings here indicate.

It deserves note that Walker [7] has identified the human balantidium as being the same parasite as that found commonly in the hog.

A further trial with dilute solution of organic silver salts, both in the above infection and in amœbic dysentery, is suggested.

REFERENCES.

- [1] STRONG, R. P. Publications of the Bureau of Government Laboratories, Manila, No. 26, 1904 (with illustrations).
- [2] BOWMAN, F. B. *Philippine Journal of Sciences*, Section B, 4, 1909, 417-423.
- [3] BOWMAN, F. B. *Ibid.*, 6, 1911, 147-153.
- [4] BROOKS. *New York Ann. Bull. Med. Science*, 1902 (January).
- [5] NOC, F. *Comptes rendus. Soc. de Biologie*, 1908, 64.
- [6] BOWMAN, F. B. *Journ. Amer. Med. Assoc.*, 1911, 1814 (December 2), (with illustrations).
- [7] WALKER, E. L. *Philippine Journal of Sciences*, Section B, 8, 1913, No. 5.

MEDICAL SOCIETY NOTES.

THE 32nd REGULAR MEETING OF THE MEDICAL SOCIETY OF THE C.A.M.C., SHORNCLIFFE.

Held at No. XI Canadian General Hospital.

MAJOR W. L. WHITEMORE read a paper on "Relapses after apparent recovery in Delayed Tetanus," illustrated by the cases of two men, one of whom had been wounded four months, the other nine months previously to the onset of this tetanus. From being mildly sick when the signs were localized, both men became dangerously ill when the symptoms became generalized, showing in sequence pain, stiffness, clonic contractures in the wound areas, increasing trismus, photophobia, terror of noise and movement, opisthotonos, with, later on, emprosthotonos, excessive dyspnoea, and cyanosis. Eye complications—a keratitis in one and an iritis in the other—developed. Both made successful, though slow, recoveries.

In both cases relapse occurred about four months after convalescence, with a recurrence of the symptoms of the first delayed attack in milder form.

The interesting features about these cases are that they bring out the following points about tetanus.

(1) That the incidence of tetanus may be markedly delayed.
 (2) That relapses may occur after attacks of delayed tetanus, and that they are not so severe as the first delayed attack.

(3) That the question arises of just when the last inoculation against this attenuated organism should be discontinued.

(4) That the question arises of excision of the focus, even when there may be no foreign body, as a precautionary measure against tetanus.

The two cases mentioned in this paper had inoculations of tetanus antitoxine on the same days that they were wounded, during this first delayed attack of tetanus, during the relapse, and on discharge from the hospital.

Captain N. B. Taylor read a paper on "The Treatment of Wounds by the Liquid-tight Closure Method." This method is advanced as a means of exhibiting to the best advantage the undoubted value of mechanical agencies in the treatment of infected wounds. Its essential feature is the inundation of a wound with an irrigating solution under positive pressure and its subsequent evacuation under negative pressure. By means of these alternating pressures an ebb and flow current is set up within the wound, which cleanses it to its remote recesses. The medium through which such a method of irrigation is made possible is a soft rubber cap, which, placed over a wound and held in position by a bandage, acts as a water-trap to confine the fluid to the wound and the skin surface immediately surrounding the latter. Thirty-six hours was stated to be the average time required to cleanse a wound and keep it free from pus. Cases were cited to illustrate the characteristic features of the treatment and the results obtained.

THE TREATMENT OF TUBERCULOUS SOLDIERS.

THE importance of the early diagnosis and sanatorium treatment of tubercle of the lung in the Army has been brought to the attention of the D.G.M.S. by Lieutenant-Colonel W. M. Hart, O.C., Canadian Special Hospital, Lenham, in the following letter dated October 8, 1918:—

Between June 26 and September 20, 1918, a period of almost three months, no patients were evacuated from this hospital for invaliding to Canada. This afforded the medical officers in this hospital an opportunity of observing the results of treatment of tubercle of lung under sanatorium conditions in this country not hitherto possible at this hospital, owing to the average duration of treatment previously prevailing being much shorter.

During the above-mentioned period we have all been impressed in the case of many of the patients in this hospital with the marked response of the disease to treatment under sanatorium conditions.

Subsequent to the discharge of 130 patients on September 20 we have admitted 118 patients, most of whom had been on our waiting list for a considerable period, and presumably had not previous to admission to this hospital been under sanatorium conditions. We have all been impressed with the fact that amongst these patients there is an unusually large proportion with positive sputum and with advanced and highly active lesions. We have also noted in a number of instances the almost immediate (i.e., within ten days) response to treatment at this hospital under sanatorium conditions, as indicated by a gain in weight of several pounds and a tendency towards quiescence of symptoms and signs indicative of activity.

It is obviously difficult to demonstrate and conclusively prove the truth of these impressions by statistical evidence. If, however, their truth is admitted, they would seem to point to the following conclusions:—

(1) The contrast between sanatorium conditions and extra-sanatorium conditions is apparently even more marked in the Army than in civil life.

(2) It follows, therefore, that in the interests of the Service, of the individual, and of the general public, the necessity of early diagnosis, followed by prompt sanatorium treatment, in cases of tubercle of lung is even more marked in the Army than in civil life.

(3) It might be desirable to take the necessary steps to endeavour to impress upon all C.A.M.C. medical officers the

truth of the above paragraph (2), as it is recognized that practitioners without sanatorium training are seldom sufficiently familiar with the best means of making a diagnosis in the truly incipient case of tubercle of lung.

CORPS NEWS.

Honours and Awards.

The names of the undermentioned have been brought to the notice of the Secretary of State for War for valuable services rendered in connection with the War, and, when applicable, an entry will be made in the records of service of officers and other ranks:—

Chown, Major S. G.; Delaney, Lieut.-Colonel W. H.; Goldsmith, Lieut.-Colonel P. G.; Goodall, Captain (Acting Major) J. R.; Irving, Lieut.-Colonel (Acting Colonel) L. E. W., D.S.O.; McKee, Colonel S. H., C.M.G.; Panton, Lieut.-Colonel K. D.; Warner, Captain E. L.; Young, Major C. A.; Aldon, No. 1552, S./Sgt. (Acting Sgt./Maj.) F.; Counce, No. 02648, Sgt. (Acting S./Sgt.) H.; Gray, No. 28904, Sgt. (Acting Sgt./Maj.) G. K.; Hitchman, No. 1006, Sgt. (Acting S./Sgt.) E. F.; Hope, No. 8221, Pte. (Acting S./Sgt.) W.; Lawler, No. 521105, Sgt.-Major W.; O'Brien, No. 34102, Sgt.-Major F. C.; Roddick, No. 534446, S./Sgt. A. S.; Sainsbury, No. 400378, Qr.-Mr.-Sgt. (Acting Sgt.-Maj.), F. J.; Townsend, No. 9281, Sgt. (Acting S./Sgt.) W. B.

(H.Q., C.R.O., No. 4541, August 23, 1918.)

His Majesty the King has been graciously pleased to approve of the award of the *Military Medal* for bravery in the Field to the undermentioned non-commissioned officer and man:—

No. 524143 L./Cpl. G. E. Phillips.
 No. 525526 Pte. H. J. Griffiths.

His Majesty the King has been graciously pleased to award the *Meritorious Service Medal* to the undermentioned non-commissioned officer in recognition of valuable services rendered with the Armies in the Field during the present War:—

No. 524773 S./Sgt. A. J. Pickman.

(*London Gazette*, No. 30873, August 29, 1918.)

His Majesty the King has been graciously pleased to approve of the following award to the undermentioned officer in recognition of his gallantry and devotion to duty in the Field:—

Awarded the *Military Cross*: Captain William Clarke Givens.

(*London Gazette*, No. 30901, September 16, 1918.)

His Majesty the King has been graciously pleased to approve of the following award to the undermentioned officer in recognition of gallantry and devotion to duty in the Field:—

Awarded the *Military Cross*: Captain Christopher Matherson Finlayson.

(*London Gazette*, No. 30915, September 24, 1918.)

His Majesty the King has been pleased to approve of the award of the *Military Medal* to the undermentioned ladies for distinguished services in the Field:—

Matron Edith Campbell, R.R.C.; Nursing Sisters Leonora Herrington, Lottie Urquhart, Janet Mary Williamson, Meta Hodge, Eleanor Jean Thompson.

(*London Gazette*, No. 30917, September 24, 1918.)

His Majesty has been graciously pleased to approve of the award of the *Military Medal* for bravery in the Field to the undermentioned non-commissioned officers and men:—

No. 1220 Sgt. D. Brown.
 No. 223 Pte. D. K. McDonald.
 No. 524879 Bugler A. Morison.
 No. 03672 Pte. R. W. E. Scully.
 No. 2136 Cpl. R. Thompson.

(*London Gazette*, No. 30940, October 7, 1918.)

The following are among the Decorations and Medals awarded by the Allied Powers at various dates to the British

Forces for distinguished services rendered during the course of the campaign :—

His Majesty the King has given unrestricted permission in all cases to wear the Decorations and Medals in question.

DECORATIONS CONFERRED BY THE PRESIDENT OF THE FRENCH REPUBLIC.

Légion d'Honneur: Croix de Chevalier.

Colonel Henry Raymond Casgrain.

Hon. Major Charles Frederick Skipper.

(*London Gazette*, No. 30945, October 10, 1918.)

His Majesty the King has been graciously pleased to approve the following awards to the undermentioned officers in recognition of their gallantry and devotion to duty in the Field :—

Awarded the *Military Cross*: Captain Benjamin Lyon, Captain Walter James Ellis Mingie.

(*London Gazette*, No. 30950, October 15, 1918.)

Promotions.

Temp. Major F. A. Young to be Temp. Lieut.-Colonel. (June 20, 1918.)

Temp. Major C. A. Young to be Temp. Lieut.-Colonel. (March 12, 1918.)

The undermentioned Temp. Captains to be Temp. Majors :—
C. G. Imrie (February 17, 1918); F. A. St. John (June 26, 1918).

(*London Gazette*, No. 30851, August 20, 1918.)

Temp. Major G. S. Mothersill, D.S.O., to be Temp. Lieut.-Colonel. (April 8, 1918.)

Temp. Captain W. J. E. Mingie to be Temp. Major. (June 15, 1918.)

(*London Gazette*, No. 30882, September 4, 1918.)

Temp. Captain F. E. Pottman to be Temp. Major. (July 17, 1918.)

Temp. Lieut.-Colonel P. G. Goldsmith to be Temp. Colonel. (August 6, 1918.)

(*London Gazette*, No. 30914, September 23, 1918.)

The undermentioned Temp. Captains to be Temp. Majors (June 30, 1918) :—

A Beech; R. W. Kenny, M.C.

(*London Gazette*, No. 30907, September 19, 1918.)

E. L. Warner (July 30, 1918); W. R. W. Haight (June 30, 1918).

(*London Gazette*, No. 36924, September 28, 1918.)

Temp. Captain (Acting Major) F. C. Clarke to be Temp. Major. (June 30, 1918.)

The undermentioned Temp. Quartermasters and Hon. Lieutenants to be Temp. Quartermaster with the hon. rank of Captain :—

G. S. Cook (August 18, 1918); H. A. Marshall (September 1, 1918).

(*London Gazette*, No. 30933, October 4, 1918.)

Temp. Major S. Paulin to be Temp. Lieut.-Colonel. (August 30, 1918.)

Temp. Captain H. J. Shields to be Temp. Major. (September 16, 1918.)

(*London Gazette*, No. 30955, October 16, 1918.)

The undermentioned Temp. Captains to be Temp. Majors :—

D. B. Kennedy, M.C. (July 16, 1918); J. A. Briggs (August 14, 1918); H. Hart, M.C. (August 14, 1918).

(*London Gazette*, No. 30943, October 9, 1918.)

Struck off Strength.

The undermentioned officers, on transfer to the C.E.F. in Canada, being retained for duty, with effect from dates specified :—

Major H. B. Jeffs, M.C., July 6, 1918; Captain L. F. Houghton, August 15, 1918.

(H.Q., C.R.O., No. 4537, August 22, 1918.)

Captain W. A. Hutton, on transfer to the C.E.F. in Canada, with effect June 17, 1918, having been retained for duty.

(H.Q., C.R.O., No. 4566, August 28, 1918.)

Lieut.-Colonel L. E. W. Irving, D.S.O., on transfer to C.E.F. in Canada for duty, with effect August 16, 1918.

The undermentioned officers, on transfer to C.E.F. in Canada for duty, with effect August 21, 1918 :—

Lieut.-Colonel C. S. McVicar, Captain A. B. Greenwood, Captain W. R. Coles, Captain J. W. McIntosh, Captain H. C. Pearson.

Captain W. E. Struthers, on transfer to C.E.F. in Canada, with effect August 21, 1918, permanently unfit General Service.

Captain C. L. B. Stammers, on transfer to C.E.F. in Canada, with effect August 21, 1918, unfit General Service six months.

Qr.-Mr. and Hon. Captain P. H. Salmond, on transfer to C.E.F. in Canada, with effect August 21, 1918, to resume medical studies.

(H.Q., C.R.O., No. 4599, September 3, 1918.)

Major W. Creighton, on transfer to C.E.F. in Canada, with effect June 1, 1918, being retained for duty.

(H.Q., C.R.O., No. 4610, September 6, 1918.)

Qr.-Mr. and Hon. Captain D. Law, on relinquishing appointment as Temp. Qr.-Mr. and on appointment as Temp. Hon. Major, Canadian General List, May 4, 1918.

(*London Gazette*, No. 30889, September 9, 1918.)

Qr.-Mr. and Hon. Captain J. U. Casgrain, on transfer to C.E.F. in Canada for duty, September 2, 1918.

(H.Q., C.R.O., No. 4665, September 16, 1918.)

Qr.-Mr. and Hon. Captain G. B. Strathy, having been appointed Temp. Hon. Captain, Canadian General List, August 29, 1918.

(*London Gazette*, No. 30902, September 16, 1918.)

Captain G. H. Wade, on transfer to C.E.F. in Canada, compassionate grounds, September 4, 1918.

(H.Q., C.R.O., No. 4699, September 23, 1918.)

The undermentioned officers, on transfer to the C.E.F. in Canada for duty, with effect September 19, 1918 :—

Colonel F. G. Finley, C.B.; Lieut.-Colonel J. C. Meakins; Lieut.-Colonel T. A. Starkey.

(H.Q., C.R.O., No. 4730, October 1, 1918.)

The undermentioned officers, on transfer to the C.E.F. in Canada, being invalided, with effect September 19, 1918 :—

Captain J. H. Fisher; Captain G. B. Wiswell, M.C.; Qr.-Mr. and Hon. Captain J. B. Showler.

(H.Q., C.R.O., No. 4730, October 1, 1918.)

Major C. G. Imrie, on transfer to the C.E.F. in Canada, with effect September 19, 1918, resuming civil occupation.

(H.Q., C.R.O., No. 4730, October 1, 1918.)

The undermentioned officers, on transfer to the C.E.F. in Canada, September 20, 1918, being invalided :—

Major L. J. Rhea; Captain W. S. Atkinson, Captain W. J. Dowswell, Captain G. G. Elliott, Captain M. J. Gibson, Captain A. W. Park, Captain C. B. Trites (H.Q., C.R.O., No. 4753, October 5, 1918). With effect September 24, 1918: Captain N. J. Amyot, Captain N. T. Beeman, Captain T. Gaddes, Captain J. G. McCammon, Captain S. Traynor.

The undermentioned officers, on transfer to the C.E.F. in Canada for duty, with effect from dates specified :—

Captain W. A. Harvie, September 24, 1918; Captain A. J. B. Hebert, September 22, 1918; Captain G. S. Williams, September 24, 1918.

(H.Q., C.R.O., No. 4761, October 8, 1918.)

The undermentioned officers, on transfer to C.E.F. in Canada, with effect from dates specified, being permanently unfit General Service: Major S. S. Skinner, September 24, 1918; Captain J. T. Mulvey, September 23, 1918; Captain C. D. Rilance, September 24, 1918.

The undermentioned officers, on transfer to the C.E.F. in Canada, with effect September 24, 1918. Services no longer available for duty with the O.M.F.C.: Major K. F. Rogers, Major A. S. Langrill.

Captain G. A. Macpherson, M.C., on transfer to C.E.F. in Canada, with effect September 24, 1918, unfit General Service six months.

(H.Q., C.R.O., No. 4761, October 8, 1918.)

The undermentioned nursing sisters, being returned to Canada for duty, with effect July 27, 1918: Nursing Sister E. Handcock, Nursing Sister A. L. McPhee, Nursing Sister D. V. Robinson.

(H.Q., C.R.O., No. 4505, August 16, 1918.)

Nursing Sister C. E. Bryant, having been permitted to resign her appointment in the C.A.M.C., C.E.F., with effect August 27, 1918.

(H.Q., C.R.O., No. 4559, August 26, 1918.)

Nursing Sister F. S. Perry, having been permitted to resign her appointment in the C.A.M.C., C.E.F., with effect September 1, 1918.

(H.Q., C.R.O., No. 4472, August 10, 1918.)

Nursing Sister E. Leslie, being permitted to resign her appointment in the C.A.M.C., C.E.F., with effect September 3, 1918.)

(H.Q., C.R.O., No. 4592, September 2, 1918.)

The undermentioned nursing sisters, being returned to Canada for duty, with effect August 21, 1918:—

Nursing Sisters D. L. Baillie; A. M. Cameron; Y. Doucet; E. O. Holland; V. H. Keene; C. S. Leacy; E. E. Lumsden, A.A.R.C.; L. M. Mabe; M. A. Seriver.

(H.Q., C.R.O., No. 4599, September 3, 1918.)

Matron M. M. Goodeve, R.R.C., being returned to Canada for duty, with effect August 21, 1918.

(H.Q., C.R.O., No. 4599, September 3, 1918.)

The undermentioned nursing sisters, being permitted to resign their appointments in the C.A.M.C., C.E.F., with effect August 31, 1918:—

Nursing Sisters E. E. Carpenter, A. Chisholm, M. H. Langman.

(H.Q., C.R.O., No. 4592, September 2, 1918.)

Nursing Sister L. E. D. Pugh is permitted to resign her appointment in the C.A.M.C., C.E.F., with effect September 2, 1918.

(H.Q., C.R.O., No. 4603, September 4, 1918.)

Nursing Sister W. E. Forbes is permitted to resign her appointment in the C.A.M.C., C.E.F., with effect September 3, 1918.

(H.Q., C.R.O., No. 4603, September 4, 1918.)

Nursing Sister R. C. MacAdams is permitted to resign her appointment in the C.A.M.C., C.E.F., with effect July 22, 1918.

(H.Q., C.R.O., No. 4609, September 5, 1918.)

Nursing Sister E. M. Holmes, A.R.R.C., on being permitted to resign her appointment in England, with effect August 9, 1918.

(H.Q., C.R.O., No. 4648, September 13, 1918.)

Nursing Sister D. E. Winter, A.R.R.C., on being permitted to resign her appointment in England, with effect September 18, 1918.

(H.Q., C.R.O., No. 4677, September 19, 1918.)

Home Sister M. Hicks, on being permitted to resign her appointment in England, with effect September 19, 1918.

Nursing Sister M. F. King, on being permitted to resign her appointment in England, with effect September 21, 1918.

(H.Q., C.R.O., No. 4693, September 21, 1918.)

Nursing Sister M. R. Heath, on being permitted to resign her commission in Canada, with effect May 6, 1918.

(H.Q., C.R.O., No. 4699, September 23, 1918.)

Nursing Sister D. H. Montizambert, on being permitted to resign her appointment in England, with effect September 28, 1918.

Nursing Sister C. C. Jack, on being permitted to resign her appointment in the C.A.M.C., C.E.F., with effect September 18, 1918.

Acting Matron N. T. Cameron, R.R.C., on being permitted to resign her appointment in England, with effect October 1, 1918.

(H.Q., C.R.O., No. 4713, September 27, 1918.)

Nursing Sister M. M. Parker, on transfer to the C.E.F. in Canada, having been retained for further medical treatment, with effect August 31, 1918.

Acting Matron D. P. Cotton, on transfer to the C.E.F. in Canada for duty, with effect September 19, 1918.

(H.Q., C.R.O., No. 4730, October 1, 1918.)

Nursing Sister J. M. Smith, on being permitted to resign her appointment in England, with effect October 1, 1918.

(H.Q., C.R.O., No. 4732, October 1, 1918.)

Nursing Sister M. McB. Muir, on being permitted to resign her appointment in England, with effect September 30, 1918.

Nursing Sister K. Adams, on being permitted to resign her appointment in the C.A.M.C., C.E.F., with effect September 30, 1918.

The undermentioned nursing sisters, on being permitted to resign their appointments in the C.A.M.C., C.E.F., with effect October 4, 1918:—

Nursing Sisters J. W. Cochrane, G. M. Ferguson.

The undermentioned nursing sisters, on transfer to the C.E.F. in Canada, with effect September 20, 1918, being invalidated:—

Nursing Sisters C. Brosseau, I. M. Carr, M. O. Gauvreau, I. A. E. Lloyd, G. D. Long, N. B. Montgomery, B. MacKinnon, R. G. Peterkin.

(H.Q., C.R.O., No. 4753, October 5, 1918.)

The undermentioned nursing sisters, on transfer to the C.E.F. in Canada, with effect September 24, 1918, being invalidated:—

Nursing Sisters M. K. Brown, B. Contryman, A. E. Gardiner, H. M. Gleeson, M. F. Halliburton, B. M. Hanna, G. B. Hiscock, A. R. Layton, M. Mackintosh, S. A. L. Manchester, N. Morkin, M. E. Patterson, J. B. Pringle, E. T. Rogers, L. A. Spry, L. Walker, B. M. Webber.

(H.Q., C.R.O., No. 4761, October 8, 1918.)

Nursing Sister B. B. Robb, on transfer to the C.E.F. in Canada for duty, with effect September 20, 1918.

(H.Q., C.R.O., No. 4753, October 5, 1918.)

Nursing Sister F. M. Bloy, on being permitted to resign her appointment in England, with effect October 11, 1918.

(H.Q., C.R.O., No. 4762, October 8, 1918.)

Captain C. A. Yates having been cashiered by sentence of a General Court Martial, September 24, 1918.

(*London Gazette*, No. 30946, October 11, 1918.)

Nursing Sister M. Parks, A.R.R.C., being permitted to resign her appointment in the C.A.M.C., C.E.F., with effect October 13, 1918.

(H.Q., C.R.O., No. 4809, October 16, 1918.)

Nursing Sister E. Vice, being permitted to resign her appointment in England, with effect October 17, 1918.

(H.Q., C.R.O., No. 4819, October 18, 1918.)

Deaths.

Qr.-Mr. and Hon. Captain A. F. Marshall, having died August 26, 1918.

(C.L. No. 1070, Section A., August 27, 1918.)

Lieut.-Colonel H. H. Moshier, having been killed in action, August 29, 1918.

(C.L. No. 1075, Section A., September 2, 1918.)

Captain J. C. Forsyth, having died of wounds at sea (through enemy action), September 8, 1918.

(C.L. No. 1083, Section C., September 11, 1918.)

Captain Andrew Ross, killed in action, September 29, 1918.

(C.L. No. 1104, Section A., October 5, 1918.)

Captain H. A. Culham, killed in action, October 4, 1918.

C.L. No. 1106, Section A., October 8, 1918.)

Captain T. F. Graham, having died, September 20, 1918.

(C.L. No. 1091, Section A., September 20, 1918.)

Captain A. A. Parker, M.C., having died of wounds, October 12, 1918.

(C.L. No. 1111, Section A., October 14, 1918.)

Nursing Sister M. E. Green, having died October 9, 1918.

(C.L. No. 1109, Section A., October 11, 1918.)

Nursing Sister H. Mellett, having been killed by enemy action at sea, October 10, 1918.

(C.L. No. 1112, Section C., October 15, 1918.)

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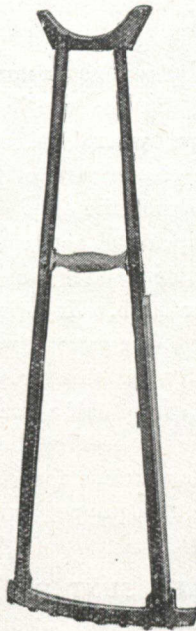
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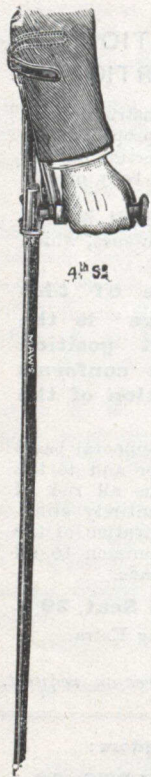
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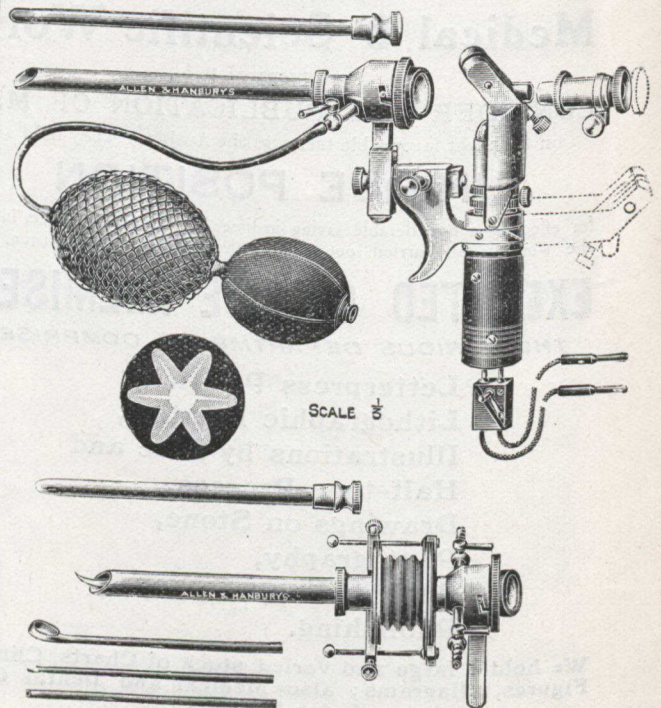
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