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HISTORICAL OFFICER

CANADIAN MILITARY HEADQUARTERS

5 Apr 45

Historical Sketch, Rates of Wastage of Personnel,
Canadian Army Overseas, 1939-45

1. Attached is a brief historical sketch of the question of calculated "Rates of Wastage" of personnel as it has affected the Canadian Army Overseas during the present war.
2. This question is closely related to the larger one of availability of reinforcements, and in this way is certain to be of some importance to the Canadian Official Historian.
3. This outline, like that presented as Report No. 133, was prepared at the request and for the information of Lieut-General Sansom in the course of his investigation of the reinforcement problems of the Canadian Army Overseas. The outline was passed to Staff Duties, C.M.H.Q., for comment, but the comments required were not received in time for this document to be made available to General Sansom before the conclusion of his investigation. As it is felt, however, that despite its brevity it has some historical value, it is now placed on record in the present manner, with references to sources attached.
4. The document has been carefully checked by S.D.1, C.M.H.Q., and certain suggested amendments have been incorporated in the version now forwarded.

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RATES OF WASTAGE

Historical Sketch 1939 - 45

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by: *ore* Date: *JUL 1986*

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1. The first calculations of the numbers of reinforcements likely to be required by the Canadian Army overseas were based upon the casualty statistics of the War of 1914 - 18. After making allowances for new developments in weapons and organization it was believed in Canada that the average monthly requirements for infantry would be 15 per cent; for mechanized cavalry and machine gun, 10 per cent; and for other arms and services variously from 4 - 5 per cent.(1)

2. There was, however, some question as to the applicability of the wastage estimates prepared in Canada. On 8 Dec 39 the War Office sent to General Crerar, after his arrival in England, tables of rates showing the anticipated battle activities in different theatres of war during 1940 and the probable wastage of personnel which would result therefrom. These rates were, of necessity, purely hypothetical* (2):

<u>Arm</u>	<u>No Activity</u> per cent per month (ORs)	<u>Normal Activity</u> per cent per month (ORs)	<u>Intense Activity</u> per cent per month (ORs)
Infantry	3 per cent	6 per cent	20 per cent
Machine Gun	3 " "	5 " "	10 " "
Armoured Units (Hy)	3 " "	5 " "	14 " "
Armoured Units (Lt)	3 " "	5 " "	10 " "

Officer casualties during 'normal' periods were estimated at percentages similar to those of other ranks, but in periods of 'intense' activity they were approximately doubled (except in the case of infantry). Other arms and services - Artillery, Engineers, Signals, Medicals, Army Service and Ordnance were estimated at 7, 6, 4, 4, 3 and 3 per cent respectively for other ranks during active fighting. These revised estimates were cabled to Canada 14 Dec 39.

3. The general Canadian plan for the reinforcement units in the spring of 1940 was designed to maintain in the United Kingdom a reinforcement reserve equivalent to three months' "intense" wastage with an additional one month's wastage maintained at the Base Depot in a theatre of operations. Steps to accommodate these reinforcements were taken in the spring of 1940.

4. Following the capitulation of France in June 1940, a re-assessment of the reinforcement policy and wastage rates became necessary. It was apparent that the role of the Canadian troops in the United Kingdom would be for some time to come no longer offensive but defensive in character.

* The War Office contemplated seven months' "intense activity", three months' "normal" and two "no activity" for the year 1940.

5. It was at first considered that the requirements of the new situation would be met if provision were made to hold three months' reinforcements calculated on the percentage laid down for a "normal" period. This, however, when applied to the infantry arm would have meant a pool of not more than 18 per cent, which, bearing in mind the distance from Canada and possible casualties from enemy air action, was too low a figure to meet all the contingencies that might possibly have to be met. Accordingly a revised schedule of rates of wastage was prepared by C.M.H.Q. This schedule was as follows:

<u>Arm or Service</u>	<u>Per cent per month</u>	<u>Per cent per 3 months</u>
Artillery	8	24
Engineers	6	18
Signals	6	18
Infantry (R)	10	30
Infantry (MG)	10	30
R.C.A.S.C.	6	18
R.C.O.C.	4	12
R.C.A.M.C.	4	12
Other Services	4	12

These figures were approximately mid-way between British "intense" and "normal" rates. (3)

6. On 24 Aug 40 N.D.H.Q. agreed to the proposed percentages and advised C.M.H.Q. that it was intended to maintain infantry reinforcements in Canada, based upon four months' wastage at the rates proposed, with other arms in proportion. This was designed to "avoid accumulation very large reserves during inactive periods" and would make available a total of seven months' supply of reinforcements for active service, when required.

7. Rates of wastage were again examined in June 1941, following the publication of a War Office pamphlet "Rates of Wastage of War Material and Personnel, June 1941". Broadly speaking, the new War Office scale was based upon one month "intense" rates and eleven months' "inactivity". This estimate arose out of the belief that should invasion occur, intense fighting would not last more than a month. As there had been no substantial change in the general situation it was decided at C.M.H.Q. that no change need be made in the scale of reinforcements applicable to Canadian troops, except in the case of the R.C.A.S.C. in which the Canadian rates were reduced from 6 to 4 per cent per month. (4)

8. During 1941 provision was made for a scale of reinforcements for armoured units of the Canadian Armoured Corps. The rates adopted were the same as those for infantry i.e., 30 per cent (10 per cent per month for three months). (5)

9. In January 1942 the question of wastage rates was again reviewed and the conclusion arrived at that the existing rates were satisfactory. A comparative statement

showing Canadian and Home Forces percentages is given below:(6)

Arm or Service	Canadian Percentage		Home Forces Percentage	
	Offrs	O.Rs.	Offrs	O.Rs.
Armd Car Regts	30	30	30	19½
Armd Regts				
Army Tk Bns	30	30	22½	22½
Artillery	24	24	18½	13½
Engineers	18	18	18½	13½
Signals	18	18	16½	12½
Infantry (Rifle)	30	30	28½	28½
Infantry (M.G.)	30	30	28½	28½
Reece Bns	30	30	28½	28½
Army Service Corps	12	12	11½	11½
Medical and Dental	12	12	12½	12½
Ordnance	12	12	11½	11½
Provost	12	12	14½	14½
Others	12	12	10½	10½

10. A comparison of the Canadian and British figures indicates substantial agreement except in the following particulars:

- The Canadian figures show the same percentages for officers and other ranks in all cases, whereas Home Forces do not.
- Canadian figures agree generally with Home Forces "Officers" figures but not with "Other Ranks" figures.
- Canadian figures are higher than the Home Forces figures for the arms where casualties are highest and are in very close agreement where casualties may be expected to be low.
- Home Forces figures for artillery and engineers are equal, whereas Canadian figures for artillery are higher than for engineers.

This last difference may be explained by the fact that it was necessary to give artillery reinforcements, particularly A.A. reinforcements, considerable additional training after their arrival overseas owing to the lack of training equipment in Canada.

11. Following a request from H.D.H.Q. in March 1942 that existing scales of reinforcement provision be reviewed (7), C.M.H.Q. forwarded a recommendation to OTTAWA, suggesting an increase in the percentage applied to Provost personnel from 12 to 18 per cent (i.e. 4 to 6 per cent per month for three months). It was also pointed out that the War Office was making a survey of Middle East casualties with a view to preparing scales appropriate for operations on the Continent.(8)

12. The possibility of the employment of the Canadian Army in offensive operations necessitated a further examination of the scale of reinforcements. In considering the question of wastage rates appropriate for offensive operations on the Continent of Europe, it was decided that the War Office estimates of monthly wastage incurred as battle casualties during intensive periods should become the basis of calculation in respect of the provision of reinforcements for the Canadian Army overseas. This change-over from the rates of wastage prepared by C.M.H.Q. to the British scale was a logical corollary of the change-over of the composition of the Canadian Army Overseas to the British War Establishments.

13. A revised table of rates of wastage was received from the War Office and despatched 5 Jul 43 to N.D.H.Q. These were as follows:

Arm or Service	Monthly Intense Rates		Monthly Normal Rates	
	Offrs	ORs	Offrs	ORs
Cavalry Horsed	20	10	5	4
CAC (Excl Recce and Arm'd Recce Regts)	25	14	5	4
RCA	15	8	5	4
RCE Fd and Svy	10	5	4	3
RCE L of C Transportation & Movement Control	3	3	2	2
RC Sigs, Divisional incl Tk Bde Sigs	8	4	4	3
RC Sigs, Non-Divisional & L of C	3	3	2	2
Inf and SS Bns incl Corps & Army Def Coys, Div Def & Empl Pls & Bde Def Pls	25	20	7	6
Inf MG and Sp Bns	20	10	5	4
Inf, Motor	20	10	5	4
Recce Regts (incl Arm'd Recce Regts)	20	10	5	4
Para Bns & Units which if in the British Army would belong to the Army Air Corps	25	20	7	6
Glider Pilot Regts	15	8	5	4
R.C.A.S.C.	5	4	4	3
RCAMC and CDC	5	4	4	3
R C O C	3	3	2	2
R C A V C	3	3	2	2
C Pro C (less Military Prisons and Det Bks)	6	6	3	3
C Pro C (Military Prisons and Det Bks)	2	2	2	2
Pioneers	4	4	2	2
HQ Units				
Inf Bde	25	20	7	6
Arm'd Bde	25	14	5	4
Inf Div (incl FS Sec)	8	4	4	3
Arm'd Div (incl FS Sec excl HQ Sqn)	8	4	4	3
Corps (excl Def Coy)	3	3	2	2
Army (excl Def Coy)	2	2	2	2
C M H Q	2	2	2	2
All CMHQ Units	2	2	2	2
Any other units not mentioned above	2	2	2	2 (9)

14. These rates were substantially the same as those prepared in 1940 with two principal exceptions; in the case of the Armoured Corps the rate for officers was increased from 14 to 25 per cent (the rate for ORs remaining unchanged at 14 per cent) and in the case of the Artillery the officer casualties were estimated at 15 per cent and ORs at 8 per cent.

15. This list was revised on 10 Oct 43. There were no alterations in the rates prepared in July with the exception of the R.C.A. which was divided into two sections R.C.A. (Field) and R.C.A. (A.A. and C.A.). The monthly percentages

remained the same in the first instance but in the latter special rates were adopted namely 4 per cent and 3 per cent for "intense" periods and 2 per cent and 1½ per cent for "normal" periods for officers and O.Rs. respectively. (10)

16. Canadian forces were involved in active operations in the Mediterranean during the second half of 1943 and later in the North-West European theatre of war from June 1944; finally in August 1944 wastage estimates based on this battle experience were prepared. The new rates were concurred in by the Chief of Staff, C.M.H.Q. 29 Aug 44. (11) These new "Canadian rates of wastage" were forwarded 31 Aug 44 to N.D.H.Q. and were authorized for adoption by OTTAWA 23 Sep 44. (12) For these rates see Appendix "A".

17. In his recommendation to N.D.H.Q. for the adoption of the new rates, the Chief of Staff noted the importance of establishing specific rates applicable to the Canadian Army Overseas:

Enclosed herewith are three copies of "Cdn Rates of Wastage (Battle Casualties)" dated 31 Aug 44 which I have approved to be taken into effect for the Army Overseas in order to facilitate the adjustment of our rft holdings between corps so that these holdings will more nearly approach our rft requirements to meet battle casualties. It is of importance to note that total rft holdings determined by the application of these rates varies but slightly from the total holdings determined by the application of FFC rates of wastage, but the rft holdings by Corps determined by the application of these rates vary appreciably from those determined under FFC rates of wastage. All corps are decreased in favour of infantry.

The reason for this change in rates of wastage is that our forecasts of casualties determined by the application of the FFC rates of wastage under War Office forecasts of theatre activity vary between corps to such an extent that we under-estimate in infantry and over-estimate in practically all other arms and services. On the other hand, a study of specific periods indicates that our total forecasts of casualties determined by applying FFC rates of Wastage under theatre forecasts of activity usually exceed our total battle casualties. This excess has been as much as 25 - 35%, but recent indications are that for NW Europe the total casualties may coincide with, and for short periods may exceed, the total forecast. In AAI however, it is still a reasonable assumption that our forecasts will exceed our casualties and possibly to an appreciable extent. (13)

18. The new Canadian rates of wastage established 31 Aug 44 have continued in use to date with only minor modifications.

31 Aug 44

CDN RATES OF WASTAGE (BATTLE CASUALTIES)

(As applied to Cdn Army Overseas as organized at 31 Aug 44 and under conditions of battle prevailing in NW Europe and in Italy)

Based on FFC rates of wastage but pro-rated between corps so reinforcement provision will bear same relation to total as casualties by corps bear to the total.

Line Serial No.	Arm or Service	Intense		Normal		Quiet	
		Offrs	OR	Offrs	OR	Offrs	OR
1	CAC (incl Recce and Armd Recce Regts)	20	7	7	2½	3	3
2	RCA (Fd, Med, A Tk and Svy)	12	5	5	2½	3	3
3	RCA (AA and CA)	3	1½	2	1	3	3
4	RCE (Fd and Svy)	9	3½	3½	1½	3	3
5	RCE (L of C Tn and MC)	3	2	1½	1	3	3
6	RC Sigs (Div incl Armd Bde Sigs)	4	3	1½	1½	3	3
7	RC Sigs (Non-Div and L of C)	2	2	3	3	3	3
8	Inf SS and Para Bns and Army Air Corps	45	30	13	13	3	3
9	Inf MG, Mot, Sp Bns and Bde, Div, Corps and Army Def Units	35	15	8	8	3	3
10	RCASC	2	3	3	3	3	3
11	RCAMC, CDC, C Ch S and RCAPC	2	2	3	3	3	3
12	RCOC and RCEME	1	3	3	3	3	3
13	C Pro C (less M11 Pri- sons and Det Bks)	5	5	1½	1½	3	3
	C Pro C (M11 Prisons and Det Bks)	3	3	3	3	3	3

Serial No.	Arm or Service	Intense		Normal		Quiet	
		Offrs	OR	Offrs	OR	Offrs	OR
14	Pnr and Map Units	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
15	HQ UNITS -						
	Inf Bde	35	15	8	8	$\frac{3}{4}$	$\frac{3}{4}$
	Armd Bde	20	7	7	2 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
	Inf Div (incl FS Sec)	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
	Armd Div (incl FS Sec)	2 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
	Corps (excl Def Coy)	1 $\frac{1}{2}$	1 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
	Army (excl Def Coy)	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
	C.M.H.Q.	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
16	All CMHQ Units	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
17	Any other Units not mentioned above	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$

NOTES

1. Wastage of personnel attached from other corps to Para and SS Bns will be calculated at the rates laid down for these Bns (i.e. line serial 8).
2. L of C Units except as rated above will be rated in accordance with the appropriate arm or service.
3. Personnel of one corps included in the WE of another corps will be rated as for the corps to which personnel belong, except as in note 1).
4. For the purpose of calculating dead wastage the following estimate of proportion of battle casualties will be used:

(a) Killed.....	15%
Missing and PW	15%
Wounded (non-recoverable).....	20%
TOTAL - dead wastage.....	50%
(b) Wounded - recoverable within 6 months -	
In same grade.....	35%
In lower grade.....	15%
TOTAL - recoverable.....	50%
TOTAL - battle casualties.....	100%

NOTES (Cont'd)

4. (Cont'd)

(c) Of the recoverable casualties -

$\frac{1}{3}$ are estimated to be available in 4th month

$\frac{1}{3}$ are estimated to be available in 5th month

$\frac{1}{3}$ are estimated to be available in 6th month

5. These rates of wastage apply to battle casualties and only the dead wastage from sickness and accident casualties. Sickness and accident casualties are estimated to amount to 8% of the total strength of the force in the theatre at all times in the form of a "float" which when once established (two to three months after entering the theatre) is self-supporting.

NOTES ON RATES OF WASTAGE - HISTORICAL

OUTLINE - 1940-45

1. See Preliminary Narrative, History of the Canadian Military Forces Overseas 1939-40, Chap. IV, para 93.
2. Ibid: para 97
3. Ibid: Chap. VIII, paras 70-2
4. C.M.H.Q. file 1/Reinf/2: "Memorandum - Basis on Which Reinforcements Should be Held Overseas" prepared by the General Staff, C.M.H.Q. 5 Jan 42.
5. Ibid: "Memorandum - Basis on Which Reinforcements Should be Held Overseas" prepared by General Staff, C.M.H.Q. 4 Nov 41.
6. Ibid: "Memorandum - Basis on Which Reinforcements Should be Held Overseas" prepared by the General Staff, C.M.H.Q. 5 Jan 42.
7. Ibid: Tel GSD 584, Defensor to Canmilitary, 23 Mar 42.
8. Ibid: Tel GS 2430, Canmilitary to Defensor, 13 Jul 42.
9. C.M.H.Q. file 1/Wastage/2: Montague to Secretary Department of National Defence, 5 Jul 43. See also Tel A 2281, Canmilitary to Defensor, 13 Jul 43.
10. Ibid: Brigadier Rodger to D.A.G.(CMHQ), 10 Oct 43, Appx "A".
11. C.M.H.Q. file 1/Wastage/2/2: Memorandum Chief of Staff, C.M.H.Q., to D.C.G.S., 29 Aug 44.
12. C.M.H.Q. file 1/Wastage/2/3: Tel GS 585, Defensor to Canmilitary, 25 Sep 44.
13. C.M.H.Q. file 1/Wastage/2/2: General Stuart to Secretary Department of National Defence, 31 Aug 44.