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HISTORICAL SECTION

CANADIAN MILITARY HEADQUARTERS

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SITUATION OF THE CANADIAN MILITARY FORCES OVERSEAS.
Progress in Equipment (January - December 1944)

1. This report deals with the equipment problems of the Canadian Army Overseas during 1944. The last report dealing with this topic, No. 113, brought this subject to the end of 1943. The major development of the period dealt with in this report was the assault landing in Normandy on 6 Jun 44 and the campaign that followed. The assault required a considerable amount of special equipment such as amphibian vehicles and self-propelled guns for the formations taking part. The provision of these and the completion of the process of equipping the Canadian Army for battle was the principal concern in the first half of 1944.

2. As in previous reports only weapons and vehicles are considered. No attempt is made here to cover engineer or signal equipment. Digests of the state of equipment of the Canadian Army Overseas are attached as Appendices. These have been divided by theatres as each is, in effect, a separate picture.

3. Although a large part of the Canadian Army was in action in the second half of 1943 it was not possible to deal at length with their experiences in the last report. During 1944 the whole of the Canadian Army Overseas was engaged, and for the first time it has been possible to include references to the performance of the equipment in action. As many of the reports from the field have been circulated in "Canadian Operations in the Mediterranean Area, Extracts from War Diaries and Memoranda" (on C.M.H.Q. file 24/AAI/1) or in "Canadian Operations in North-West Europe, Extracts from War Diaries and Memoranda" (on C.M.H.Q. file 24/AEF/1), reference has been made to these two series whenever applicable. For the sake of convenience they have been cited as "Cdn Ops in Med Area", and "Cdn Ops in N.W.E." respectively.

SOME GENERAL TRENDS

4. The history of the process of equipping the Canadian Army Overseas was outlined at the beginning of Report No. 113. During the period covered by that report the emphasis was mainly on developing new types and improved patterns of equipment and much was in an experimental stage. But with the beginning of 1944 the necessity arose of stabilizing policy. It became a matter of deciding what types were to be used in operations, having regard to their suitability and the expected state of supply. An important factor in these decisions was British policy. In order to

facilitate supply and maintenance it was desirable to maintain a general uniformity of equipment in each theatre of operations. This division of the Canadian forces between two theatres accentuated this factor.

5. The Canadian forces operating with the Allied Armies in Italy were supplied through British channels, though responsibility for the provision was naturally Canadian. On arrival in Italy 5 Cdn Armd Div took over the vehicles of 7 Brit Armd Div. These mostly needed replacement, and during the year the Canadian forces in Italy were completely re-equipped with Canadian vehicles. For an account of the process of equipping 1 Cdn Corps troops and 5 Cdn Armd Div see Historical file Italy 1944/1 Cdn Corps/R/F: The re-equipping of 1 Cdn Corps and 5 Cdn Armd Div in the Central Mediterranean Theatre, Oct 43-Feb 44, informal account by Colonel J.A.W. Bennett, D.D.O.S., 1 Cdn Corps. In some instances the equipment of the Canadians in Italy differed from that used in North-West Europe. This was due to the policy of the theatre, and this report has accordingly merely recorded the differences.

6. In the United Kingdom the first five months of 1944 were devoted largely to the process of completing the equipment of the Canadian Army for the invasion of Europe. There were two problems involved. Not only had the standard types to be determined and provided in sufficient quantity, but also a considerable amount of special equipment had to be issued to 3 Cdn Inf Div and 2 Cdn Armd Bde for the purposes of the assault landing. This special equipment was provided entirely through the British.

7. The fortunes of Canadian production during the year have an interest of their own. Apart from carriers few Canadian-made armoured vehicles were adopted for use by the Canadian Army, though some use was found for most of those already delivered. The majority of the "B" vehicles held by the Canadian forces continued to be Canadian-made. Canada also made useful contributions in weapons of the standard British pattern. The distinctive Canadian equipment in the 20-mm field was not required due mainly to decreased demands. Special mention might be made of the 25-pr self-propelled guns on the Ram chassis ("Sextons") which have been in demand.

8. In the last half of 1944 the two main problems were those of maintaining supplies of equipment in use and developing new weapons and vehicles that experience had shown to be desirable. General policy decided at C.M.H.Q. occasionally had to be modified by circumstances prevailing in the theatre. This applied to North-West Europe as well as Italy (Historical file AEF/2 Cdn Corps/R/F: Chief of Staff 2 Cdn Corps letter, 23 Sep 44). It is noteworthy that very little

of the equipment of the Canadian Army failed to be entirely satisfactory in action. The new developments were of new types rather than of replacements for existing equipment.

WEAPONS

9. Rifles. By the end of January 1944 the Canadian Army was completely equipped with the No. 4 Rifle (C.M.H.Q. file 1/Rifle/1: Minute by G.S.O.II, S.D.3, 31 Jan 44). This rifle continued in use and in good supply. The main source was Canadian production and in the second half of the year reinforcements from Canada began to arrive in the United Kingdom already equipped with rifles (ibid: Tel G.S. 444, DEFENSOR to CANMILITRY, 24 Jul 44: secret cipher Tel No. 92543, ALLOC 3119, War Office to MILSTAF Washington, 10 Nov 44). The main objection to the No. 4 Rifle was the aperture battle sight (Cdn ops in N.W.E., series 1, p. 12). In July this began to be replaced on all new rifles by the Mks 3 and 4 leaf backsights (C.M.H.Q. file 1/Rifle/1: Tel G.S.W. 558, DEFENSOR to CANMILITRY, 22 Jul 44). At the beginning of July the replacement of the aperture battle sight by the Mk 3 for Rifles No. 4 held by units was authorized. This modification was to be done on a G.S. priority (C.M.H.Q. file 24 Reports/1/3: Q(A.E.) Memorandum, 15 May 45).

10. As regards the Sniper's Rifle, No. 4 (T), the supply situation was not so satisfactory, but there was no marked deficiency on the existing scale of issue. In April units of the Canadian Army with the Allied Armies in Italy recommended an increase in the scale of issue for this weapon, but the supply situation prevented any immediate action being taken (C.M.H.Q. file 1/Rifle/1: S.D.3, C.M.H.Q. to War Office, 25 Apr 44; and reply, 11 May 44). In June a renewal of this request was turned down for the same reason (ibid: 12 Jun 44, and 16 Jun 44). This situation still prevailed in September, when requests for increases were being received from North-West Europe as well (ibid: War Office to Senior Officer C.M.H.Q., 22 Sep 44; Tel S.D.W. 2819, CANMILITRY to S.D. Main First Cdn Army, 31 Aug 44).

11. During the year the Rifle (Light) No. 5 was developed and production started in the United Kingdom. The first were available for issue by 1 Dec 44 (C.M.H.Q. file 1/Inf Eqpt/1/4: Agenda of Army (44) 104th Meeting held 1 Dec 44). These were intended for use in the Far East only. The production policy in force was that Canada would continue to produce the No. 4 only, whereas the United Kingdom would shift entirely to the new model. This caused some concern in Canada over prospects for post-war production (C.M.H.Q. file 1/Pers Weapons/1/2: D.G. of A., Cdn T.L.C. Staff Memorandum, 3 Nov 44).

12. Pistols. The principal types of revolver on issue in the Canadian Army were the Smith and Wesson .38-in and the pistol No. 2 .38-in. But they did not prove entirely satisfactory; officers usually preferred to carry a rifle or machine carbine (Cdn Ops in Med Area, series 19, p. 1; Cdn Ops in N.W.E., series 1, p. 12). In October it was decided "to replace with Pistols Automatic Browning 9-mm H.P. of Cdn manufacture all Pistols Revolver .380 calibre, and (also) Carbines Machine Sten at present issued to tk crews and sigs D.Rs. of Cdn units operating in N.W.E. Pistols Revolver .380 calibre will remain in use with units operating in the A.A.I."(C.M.H.Q. file 1/Pers Weapons/1/2: Equipment Policy Letter No. 123, 6 Oct 44). By the end of December First Cdn Army held about three-quarters of the Browning 9-mm, perhaps better described as self-loading, needed to cover the new establishment, and sufficient stocks had been shipped to complete the process of replacement (C.M.H.Q. file 13/Equip State/2/5: Equipment State, Cdn Units in First Cdn Army as at 31 Dec 44). 1 Cdn Para Bn, under British command, used the .45 Colt automatic. On 30 Nov 44 they held exactly enough of these to meet their establishment. They also were changing to the Browning 9-mm.*

13. Machine Carbines. Two principal types of machine carbines were in use in the Canadian forces throughout the year. In the Allied Armies in Italy the Thompson machine carbine continued in use. Supplies, from British sources, were adequate to meet the requirements of the field units and to train and equip reinforcements in the United Kingdom proceeding to Italy (C.M.H.Q. file 13/Equip State/2/4: Equipment States, Cdn Forces in A.A.I.: C.M.H.Q. file 13/Equip State/1/7: Equipment States, C.M.H.Q. and C.R. Units). This weapon proved quite satisfactory in action (Cdn Ops in Med Area, Series 9, p. 8; series 19, p. 1).

14. In North-West Europe the Sten Machine Carbine was the standard issue to the Canadian Army. Supplies were adequate, and in May an additional pool of 12 Stens over and above establishment was allowed to each infantry battalion for the use of platoon commanders as desired (C.M.H.Q. file 1/Sten MC/1: Equipment Policy Letter No. 120, 10 May 44).

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* The following comparison of the two pistols is cited from the War Diary of Historical Officer, C.M.H.Q., Diary of visit to First Canadian Army, 19 Apr 45: "At Corps we picked up Major Wrinch and drove with him to 5 Cdn Armd Div across the high ground north of Arnhem, a sandy tract of pinewoods. En route we stopped to fire our pistols. I had carried a .38 at intervals since 1940 but had never fired it before. We found that of five .38 bullets striking a German metal ammunition box used as a target, two holed it and bounced off, the rest fell inside; but a bullet from Major Wrinch's 9-mm automatic pistol penetrated both sides of two such boxes placed beside each other. The difference in the performance of the two weapons is striking. The .38, however, appears to be quite accurate."

15. Soon after the Canadian forces went into action in Normandy complaints began to be received concerning the performance of the Sten (Cdn Ops in N.W.E., series 2, p. 11; C.M.H.Q. file 1/Sten MC/1: Tel S.D.W. 2593, CANMILITRY to S.D. Main H.Q. First Cdn Army, 4 Aug 44). These came from 3 Cdn Inf Div and may be summarized as follows:

(a) Troops have lost confidence in the weapon.

(b) Jamming of the mechanism by slight dust or sand.

(c) Action not reliable; no certainty whether it will fire automatic or repetition or at all.

(d) Failure of magazine spring.

(e) Not safe unless cocked; if cocked dirt gets in the chamber through the ejection slot.[1]

(f) Magazine too wide for the rounds.

(g) Lips of the magazine easily bent.

(h) Firing pin not long enough and easily worn causing too many misfires.

(i) The magazine held by the left hand while firing loosens the clamp causing jamming.[2]

It was recommended that either these faults be corrected or the Sten replaced by the Thompson sub-machine gun. The complaint was investigated by Second British Army, of which 3 Cdn Inf Div formed a part at the time. They recommended modifications to incorporate (1) safety catch, (2) better magazine, (3) improvement of the repetition and automatic lever. It was "considered that good maintenance and cleanliness will eliminate troubles. No other fmn reports bear out 3 Cdn Inf Div report". (ibid: Tel S.D. 92, S.D. Main First Cdn Army to S.D.W., C.M.H.Q., 5 Aug 44). A detailed comment by D.Q.M.G., C.M.H.Q., on these criticisms is attached as Appendix "A" to this report. However the unfavourable reports continued. Early in August various substitutes were being suggested (ibid: Extract from Notes on Visit by Col. F.P. Fulton, S.D.W., C.M.H.Q., to H.Q. First Cdn Army, 9 Aug 44). It should be noted that the objections were not unanimous; the S Sask R in July reported the Sten gun to be excellent; "we killed more Jerries with Stens

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1 It has also been reported to be not entirely safe even in the safety slot (Major B.L. Anderson, S.D.12, C.M.H.Q.).

2 It should be noted that this method of holding is contrary to what is laid down in training pamphlets.

that day than with any other weapon" (Historical file AEF/C Cdn Inf Bde/C/D: Account of the Attack by S Sask R on 20 Jul 44 by Major L.L. Dickin).*

16. Apart from the replacement of a few of the Stens by the Browning 9-mm automatic pistol (para. 12 above), no change took place in policy with regard to machine carbines in 21 Army Group. In Italy issues were made to British forces of the American S.M.G. .45-in M3, though up to the end of November Canadians had not received any (C.M.H.Q. file 1/Sten MC/1: Tel A.C.C.2401, CANDEX to CANMILITRY, 29 Nov 44). Canadian reinforcement units in the United Kingdom held some of these for the purpose of training reinforcements destined for Italy (C.M.H.Q. file 13/Equip State/1/7: Equipment State, C.M.H.Q. and C.R. Units as at 30 Nov 44).

17. Sten production in Canada had ceased by the end of 1944. In the United Kingdom it had switched over entirely to the new Mk 5. But a new design was also being undertaken on a long term basis (C.M.H.Q. file 1/Pers Weapons/1/2: D.G. of A. Cdn T.L.C. Staff Memorandum, 3 Nov 44). The Mk 5 incorporates a wooden butt and pistol grip, a foresight similar to that on a rifle, and other improvements; it was designed primarily for airborne forces and was not intended for general issue (C.M.H.Q. file 24/Reports/1/3: S.D.W. Memorandum, 4 May 45).

18. Light Machine Guns. No change took place during the year with regard to the Bren gun. It continued in general use in the Canadian forces, and supplies remained adequate. Reports from all fields of operations spoke highly of its efficiency.

19. Two new models were produced in the United Kingdom, the Mk 3 and Mk 4 which are lightened versions of the Mk 1 and Mk 2 respectively and like the light rifle were developed primarily for use in the Far East (C.M.H.Q. file 24/Reports/1/5: S.D.W. Memorandum, 4 May 45; C.M.H.Q. file 1/Inf Eqpt/1/4: Agenda of meeting held 1 Dec 44). British production switched entirely to the Mk 3, while Canadian production remained on the Mk 2 basis (C.M.H.Q. file 1/Pers Weapons/1/2: Memorandum from D.G. of A. Cdn T.L.C. Staff, 3 Nov 44). The reason for Canadian production remaining on older models in the case of Rifle, Sten and Bren was that it depended mainly on British orders which were still for the older models (ibid: Memorandum on Rifles, Brens and Stens from C.S.C.I, S.D. (E), 7 Nov 44).

20. Two Lewis guns were still held as museum exhibits at the Canadian Training School at the beginning of 1944. This weapon had now ceased to be part of the Army's equipment (C.M.H.Q. file 13/Equip State/1/6: Equipment State, Cdn Army in U.K. as at 31 Jan 44).

21. Medium Machine Guns. At the beginning of 1944 a further reorganization of the divisional support battalions turned them once more into machine gun battalions. It was expected at first that this would restore the

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* Further evidence concerning the effectiveness of the Sten is summarized in Appendix "F".

48 guns per battalion, but in fact there was no change from the total of 36 guns formerly issued to the divisional support battalions. The new organization called for three companies each of 12 M.M.Gs. and one company of 4.2-in mortars in each battalion (C.M.H.Q. file 1/Vickers/1: B.G.S., C.M.H.Q. to S.D. & T., C.M.H.Q., 14 Jan 44; C.M.H.Q. file 1/4.2 Mortar/1: D.S.D. War Office Memorandum, 3 Feb 44). In addition independent machine-gun companies were formed for the infantry brigades of armoured divisions; these each had 12 M.M.Gs. and four 4.2-in mortars (C.M.H.Q. file 1/Vickers/1: War Office Letter 20/Gen/6160 (S.D.1), 28 May 44). There were also 8 M.M.Gs. in the motor battalion (C.M.H.Q. file 1/Carr Vickers/1: Tel S.D. 374, EXFOR (Main) to Troopers Inf one, 8 May 44). Four were allotted to 1 Cdn Para Bn.

22. The Vickers can now be mounted on a carrier (C.M.H.Q. file 1/Univ Carr T16/1: Tel S.D.W. 1548, CANMILITRY to DEFENSOR, 23 Mar 44). It was used effectively from this mounting as well as in its more normal ground role (Cdn Ops in N.W.E., series 4, p. 5). There are numerous tributes to the effectiveness of the Vickers from all theatres (e.g. Cdn Ops in Med Area, series 8, p. 3; series 9, p. 4; Cdn Ops in N.W.E., series 9, p. 2). There was no shortage of guns or carriers during the year. In August 1 Cdn Inf Div doubled its holding of M.M.Gs., and still held this increased number at the end of the year (C.M.H.Q. file 13/Equip State/2/4: Equipment State, Cdn Forces in A.A.I. as at 31 Aug 44).

23. 20-MM Gun. The position of this weapon within the Canadian Army changed considerably during 1944. At the beginning of the year policy regarding 20-mm guns envisaged three phases. (a) To meet immediate requirements American Hispano M 1 guns on American M2A1 mounts were to be issued. (b) These would be replaced by Canadian Inglis mounts when the latter became available, and Hispano M 2 guns were ordered from the United States for use on the Inglis mounts. (c) The ultimate policy was to use Canadian Inglis 20-mm guns on the Inglis mounts (C.M.H.Q. file 1/20-mm Guns/1/2: Col. F.F. Fulton, S.D.(W), C.M.H.Q. to B.G.S., C.M.H.Q., 21 Jan 44). Early in 1944 there were 1950 M2A1 mounts available, and an equivalent number of Hispano Mk 1 were being obtained from the British in place of the American M 1, modification of which had presented difficulty. Issues began in January (ibid: Tel CARL 126, CANMILITRY to DEFENSOR, 13 Dec 43; C.M.H.Q. file 15/Equip State/1/6: Equipment State, Cdn Army in U.K. as at 31 Jan 44). By February the Inglis quad mounts were coming into production. The total order was for 2600 single mounts, and 1000 quadruple mounts. 6600 Hispano M 2 guns had been ordered from the United States for use on these mounts. 3800 of these had been delivered in Canada by February. The Inglis gun, which would use Hispano type ammunition was still in the development stage (C.M.H.Q. file 1/20-mm Guns/1/2: Tel G.S. 70, DEFENSOR to CANMILITRY, 8 Feb 44;

Col. F.P. Fulton, S.D.(W), C.M.H.Q., to B.G.S., C.M.H.Q., 10 Feb 44). The guns on the single mounts were allotted on a generous scale to a wide variety of units; the total establishment in First Cdn Army was 1065. Those on the quadruple mount were intended for light anti-aircraft regiments (ibid: S.D.2, C.M.H.Q. Memorandum, 11 Nov 43; Col. F.P. Fulton, S.D.(W), C.M.H.Q., to B.G.S., C.M.H.Q., 15 Jan 44).

24. Early in February 1944 this policy had to be extensively revised in the light of a decision by the Commander-in-Chief, 21 Army Group, not to use 20-mm guns except in divisional light anti-aircraft regiments, on the basis of one troop per battery, and on anti-aircraft tanks and armoured cars (ibid: A/G.O.C.-in-C, First Cdn Army to 21 Army Gp, 19 Jan 44; Director of Staff Duties, War Office, to C.M.H.Q., 3 Feb 44). This virtually eliminated all requirement for quadruple mountings and reduced that for single mountings from over 1000 to 72. Canadian policy was to conform to the British in order to simplify maintenance and ammunition supply, particularly since First Cdn Army was a composite force. The 20-mm guns had been an exception to this as the Canadian Army preferred the Hispano type to the Oerlikon type adopted by the British (ibid: Senior Officer, C.M.H.Q., to Under-Secretary of State, War Office, 6 Dec 43). But the greatly reduced requirement made this no longer practical, and it was decided to adopt the British Polsten on the Universal mounting for First Cdn Army (ibid: Col. F.P. Fulton, S.D.(W), C.M.H.Q. to B.G.S., C.M.H.Q., 10 Feb 44; Tel S.D.W. 1331, CANMILITRY to DEFENSOR, 22 Feb 44). Canada was advised to cancel as much as possible of the Hispano M 2 and Inglis single mount orders, and not to start production of the Inglis gun. The Inglis quadruple mountings were still to be produced, but for Polsten guns. Cancellation of this order would be costly and it was felt desirable to have the equipments in case of future need (ibid: Tel S.D.W. 1292, CANMILITRY to DEFENSOR, 14 Feb 44; Col. F.P. Fulton to B.G.S., C.M.H.Q., 10 Feb 44). The delivery of Hispano M 2 guns was checked at 3800, and it was found possible to cancel the whole order for Inglis single mounts (ibid: Col. F.P.Fulton, S.D.(W), C.M.H.Q. to B.G.S., C.M.H.Q., 20 Feb 44; Tel O.S. 114, DEFENSOR to CANMILITRY, 25 Feb 44).

25. The new establishment for 20-mm guns called only for one troop of 8 guns per battery added to divisional light anti-aircraft regiments (ibid: Equipment Policy Letter No. 111, 8 Mar 44). These troops were completely equipped with Polstens on Universal mountings by April, though training in Canadian Reinforcement Units was still carried out mainly with the Hispano Mk 1 (C.M.H.Q. file 13/Equip State/1/6: Equipment State, Cdn Army in U.K. as at 30 Apr 44). The Canadian forces in Italy were equipped throughout this period with Oerlikon 20-mm guns on the Hazzard-Baird mounting (C.M.H.Q. file 13/Equip State/2/2: Equipment States, Cdn Forces in A.A.I.). The 20-mm gun was also mounted on tanks for

use in armoured units (C.M.H.Q. file 1/20-mm Guns/1/3: 20-mm Eqpt Scale of Issue, First Cdn Army, 3 Apr 44; see below para 77). By June the first deliveries of the quadruple mounts were arriving in the United Kingdom, but there was no immediate use for them (ibid: Chief of Staff, C.M.H.Q., to Under-Secretary of State, War Office, 1 Jun 44). Some of the quad mountings were self-propelled on a 3-ton chassis, and the others were towed on a travelling platform (ibid: D.C.G.S., C.M.H.Q. to D.Q.M.G., C.M.H.Q., 17 Jul 44). One was tried against flying bombs in England, but otherwise no use was found for them and in August it was recommended that the rest of the order be cancelled, due to the "vast improvement in strategic situation since these eqpts were ordered" (ibid: Tel S.D.W. 2780, CANMILITRY to DEFENSOR, 25 Aug 44). This was found to be uneconomical and the contract was in fact completed (ibid: Tel G.S. 530, DEFENSOR to CANMILITRY, 2 Sep 44). Altogether 441 mounts were shipped to the United Kingdom from Canada (ibid: Tel G.S. 558, DEFENSOR to CANMILITRY, 12 Sep 44).

26. Very little use was found for the 20-mm gun in an Anti-Aircraft role. One great difficulty with the weapon in this role was the lack of self-destroying ammunition, which caused considerable danger to our own troops in the neighbourhood (C.M.H.Q. file 1/20-mm Gun/1/2: Tel S.D.W. 1331, CANMILITRY to DEFENSOR 22 Feb 44). As early as October 1943 Canadian units in Italy were considering its possibilities in a ground role, but no suitable mounting had then been developed (Cdn Ops in Med Area, series 8, p. 6). In February 1944 experiments in that direction were continuing (ibid: series 17, p. 2). Similarly in North-West Europe the 20-mm gun was soon felt to be unnecessary. The Anti-Aircraft tanks were no longer being supplied, although 10 Cdn Armd Regt had found the guns useful in a ground role (Cdn Ops in N.W.E., series 3, p. 9). In August the 20-mm troops of the light anti-aircraft regiments were being disbanded (C.M.H.Q. file 1/20-mm Gun/1/3: D.C.G.S., C.M.H.Q. to D.Q.M.G., C.M.H.Q., 15 Aug 44). In December it was being suggested that the M2A1 mountings be disposed of for salvage (ibid: Chief of Staff, C.M.H.Q. to Ministry of Supply, 4 Dec 44).

27. Though it would appear that in this case a great deal of effort and expense was incurred in developing a weapon which was scarcely used, this is not quite the true picture. There was a definite improvement in the strategic situation while the weapon was in process of production, resulting in a decrease in requirements. When not needed in an anti-aircraft role it was turned to use as a heavy machine gun in a ground role (ibid: Notes on Visit by Col. F.F. Fulton, S.D.(W), C.M.H.Q., to H.Q. First Cdn Army, 10 Aug 44). Early in November the activities of the enemy's M.E. 262 jet-propelled aircraft brought a demand for anti-aircraft weapons (ibid: Notes on Visit by Col. F.F. Fulton, S.D.(W), C.M.H.Q. to H.Q. First Cdn Army, 4-9 Nov 44: Tel S.D.W. 3484, CANMILITRY to C., S.D. Main H.Q. First Cdn Army, 21 Nov 44). Four of the once unwanted quadruple

mounts (trailer-borne) were requested by First Cdn Army (ibid: Tel S.D. 94, S.D. Main First Cdn Army to S.D. Main EXFOR, 27 Nov 44). Early in December two self-propelled mountings and two trailer-borne mountings were sent to First Cdn Army for trial. Similar issues were made to the British in Italy and India (ibid: Tel S.D.W. 3654, CANMILITRY to DEFENSOR, 7 Dec 44).

28. Two-Inch Mortar. The deficiency in supplies of the 2-inch mortar was made up in March 1944 (C.M.H.Q. file 13/Equip State/1/6: Equipment State Cdn Army in U.K.). This deficiency had been caused at least in part by the adoption of the 2-in mortar (NOT 3-in as in Report No. 115, para 31) in place of the smoke projector on carriers. The establishment of the Canadian Army in the United Kingdom in February 1944 called for 207 2-in mortars mounted on carriers (C.M.H.Q. file 1/Mortar/1: C. in C., 21 Army Gp to Under Secretary of State, War Office, 11 Feb 44). Supplies, though adequate, were still short during most of the year. In August 300 2-in mortars were withdrawn from units in Canada to meet an urgent British requirement (C.M.H.Q. file 4/Progress/4/12: Progress Report No. 180, 1-31 Aug 44).

29. In the course of operations the 2-in mortar was found useful in a number of ways. The smoke bomb was employed by the infantry to indicate targets to tanks, in addition to its usual job of supplying cover for the infantry. The H.E. bomb was also useful and was carried in almost as large quantities as the smoke bomb (Cdn Ops in Med Area, series 14, p. 3; series 15, p. 10; Cdn Ops in N.W.E., series 14, p. 9). Some doubts, however, have been expressed as to the value of this weapon (Major B.L. Anderson, S.D.12., C.M.H.Q.).

30. Three-Inch Mortar. Reports from all fronts continued to recognize the value of the 3-in mortar (Cdn Ops in Med Area, series 15, p. 10; Cdn Ops in N.W.E., series 1, p. 12). By 1944 it used a stronger propellant charge for the bomb, increasing its range considerably (C.M.H.Q. file 1/Mortar/1: War Office to Department of Munitions and Supply, 11 Sep 43). This was fired from a strengthened mortar (Mk 4) and a new base plate which were issued to all Cdn units. There was no difficulty regarding supplies of this weapon or of carriers to transport it. Experiments were carried out in Canada during the year with a lightened biped and base plate and also with a tapered barrel, but these were not yet in production (C.M.H.Q. file 4/Progress/4/13: Progress Report No. 182, October, and No. 183, November 1944).

31. 4.2-Inch Mortar. In February 1944 the reorganization of the divisional support battalions resulted in a decrease in the total number of heavy mortars held. The new machine gun battalion in the infantry division had one mortar company of sixteen 4.2-in mortars; the independent machine gun company with an infantry brigade of an armoured division had one mortar platoon of four 4.2-in mortars (C.M.H.Q. file 1/4.2 Mortar/1: D.S.D. War Office Memorandum, 3 Feb 44). Previously there had been 24 mortars in an infantry division and 8 in an infantry brigade of an armoured division. In Italy the Canadian forces tended to use a rather higher establishment (C.M.H.Q. file 13/Equip State/2/4: Equipment States, Cdn Forces in A.A.I).

There was an ample supply of these weapons for the Canadian forces.

32. At the beginning of the year, the problem of transport for the 4.2-in mortar had not been entirely settled. The intention was to use the new T16 - Carrier as a tower for the mortar which would be carried on a 10-cwt trailer (C.M.H.Q. file 1/Univ Carr T16/1: Equipment Policy Letter No. 84, 18 Oct 43). These carriers were not yet available (ibid: Tel O. 194, G. First Cdn Army to C.M.H.Q., 25 Jan 44). In February trials were started at the Canadian Training School for stowing the mortar (ibid: Chief of Staff, C.M.H.Q., to Under-Secretary of State, War Office, 7 Feb 44). Towards the end of that month authority was granted to modify the Carrier T16 for stowing the mortar directly on the carrier (ibid: Tel S.D.W. 1363, S.D.(W), C.M.H.Q. to H.Q., C.T.S., 23 Feb 44). This method proved successful and in April the policy was adopted of mounting the mortar on the carriers, of which a sufficient number suitably modified were now available (ibid: Chief of Staff, C.M.H.Q., to Under-Secretary of State, War Office, 17 Apr 44). This method was in use in North-West Europe with the Canadian forces only (ibid: A/Chief of Staff, C.M.H.Q. letter, 16 Nov 44). In Italy the mortar was carried on a trailer towed by the Loyd Carrier (Cdn Ops in Med Area, series 8, p. 7).

33. The 4.2-in mortar played an effective part in operations. The one criticism was that the base-plate tended to bury itself in soft ground. This was corrected by the end of June with the issue of a base-plate skirting, a wide saucer-shaped rim fitting over the base-plate. This had the slight disadvantage of adding to the weight of the equipment (C.M.H.Q. file 1/4.2 Mortar/1: Chief of Staff, C.M.H.Q. to H.Q. First Cdn Army, 2 Jun 44; Cdn Ops in N.W.E., series 4, p. 5).

34. At the end of 1943 it was expected that the 95-mm Infantry Howitzer, then in process of development, would replace the 4.2-in mortar in infantry support groups (C.M.H.Q. file 1/95-mm Guns/1: Director of Infantry, War Office to Senior Officer, C.M.H.Q., 10 Nov 43). But early in January this idea was abandoned when 21 Army Group decided to continue using 4.2-in mortars (ibid: C-in-C, 21 Army Gp to Under-Secretary of State, War Office, 7 Jan 44). The 120-mm mortar was still under development in Canada in the first half of the year (C.M.H.Q. file 4/Progress/4/12: Progress Report No. 178, June 1944). This was not expected to be adopted, but the British were introducing some new developments in heavy mortars.

35. P.I.A.T. As indicated in Report No. 113, para 37, the PIAT replaced all former small arms anti-tank weapons. In Italy there was still a deficiency of these weapons at the beginning of the year, but by the end of April there were sufficient stocks in the theatre to cover establishments and supplies increased each month (C.M.H.Q. file 13/Equip State/2/2: Equipment State, Cdn Forces in A.A.I. as at 30 Apr 44). In North-

West Europe and the United Kingdom there was no deficiency (C.M.H.Q. file 13/Equip State/1/7: Equipment States, Cdn Army in U.K.; C.M.H.Q. file 13/Equip State/2/4: Equipment State, Cdn Forces in N.W.E.). The ammunition supply had definitely improved, although until near the end of the year operational requirements somewhat restricted the amount available for training (C.M.H.Q. file 1/PIAT/1: Tel CARO 449, DEFENSOR to CANMILITRY, 19 May 44; Tel CARL 278, CANMILITRY to DEFENSOR, 25 May 44).*

36. Reports from operations have testified to the effectiveness of the PIAT against pill-boxes or in a house-breaking role (Cdn Ops in Med Area, series 27, p. 6; Cdn Ops in N.W.E., series 1, p. 12). The adoption of the new graze fuse for the bomb considerably improved its performance against tanks (Cdn Ops in Med Area, series 9, p. 12; Cdn Ops in N.W.E., series 3, p. 6). It was found effective even against Tiger tanks (Cdn Ops in Med Area, series 30, p. 14).

37. 6-Pounder Gun. This was still the principal anti-tank weapon of the infantry battalion, motor battalion and reconnaissance regiment. In these units it was held in the same quantities as indicated in Report No. 113, para. 43. In artillery anti-tank regiments it was largely replaced by the 17-pr and self-propelled guns, but it was still used in the anti-tank regiments of infantry divisions on the basis of one troop of 4 guns per battery, a total of 16 per regiment. 2 Cdn Inf Div was, however, the only division which conformed exactly to this. 3 Cdn Inf Div held a higher proportion of 6-prs in place of 17-prs for the assault in June, and they were not replaced (C.M.H.Q. file 13/Equip State/2/4: Equipment States, Cdn Army in N.W.E.). In Italy 1 Cdn A Tk Regt continued on the basis of two 6-pr troops and one 17-pr troop per battery in 1 Cdn Inf Div. 4 Cdn A Tk Regt of 5 Cdn Armd Div in the same way continued to use some 6-prs (C.M.H.Q. file 13/Equip State/2/4: Equipment States, Cdn Forces in A.A.I.). There were no deficiencies of this weapon in North-West Europe. In Italy a slight deficiency was covered by the use of the 57-mm M 1 anti-tank gun. This is the American counterpart of the 6-pr. The deficiency was made up by the end of the year.

38. The 6-pr was towed by the new T16 Carrier in reconnaissance regiments, motor battalions, and infantry battalions in North-West Europe (C.M.H.Q. file 1/Univ Carr T16/1: D.C.G.S., C.M.H.Q. to D.Q.M.G., C.M.H.Q., 28 Jul 44). The Portee used in Italy was not found satisfactory; by October this was being replaced by Half-Track vehicles (Cdn Ops in Med Area, series 20, p. 15, series 30, p. 5). In anti-tank regiments the

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* The references cited refer only to Canada. But in the personal experience of the writer of this report live PIAT ammunition was scarce in Canadian Reinforcement Units in the summer of 1944. In September of that year there was an allotment of one bomb per man, but only half of these were with the graze fuse.

gun was towed by the Field Artillery Tractor (C.M.H.Q. file 1/Eqpt Pol Ltr/1/2: Equipment Policy Letter No. 92, 3 Dec 43).

39. In operations the gun was found particularly effective against buildings. A report from Italy states that it was more effective than the 17-pr in this role (Cdn Ops in Med Area, series 17, p. 9). In North-West Europe it was found very effective against tanks when using the new Discarding Sabot ammunition (Cdn Ops in N.W.E., series 2, p. 9; series 14, p. 7). An experiment in Italy was to replace the anti-tank platoon of an infantry battalion with an anti-tank company using No. 75 grenades, PIATS, and 2-pr anti-tank guns; the 6-pr guns were turned in (Cdn Ops in Med Area, series 30, p. 16). This was a special arrangement for the type of operations then being undertaken.

40. 2-Pounder Gun. Trials continued during the year with the Canadian 2-pr David (C.M.H.Q. file 1/2-Pdr/1: Tel CARL 404, CANMILITRY to DEFENSOR, 14 Sep 44). But its adoption by the Canadian Army depended on similar action by the British, and it was considered unlikely that they would find any use for it (ibid: A/S.D.(W), C.M.H.Q. to Under-Secretary of State, War Office, 9 Nov 43). In Italy some 2-pr taper-bore anti-tank guns ("Littlejohns") were issued to Canadian units for river crossings and mountain fighting. They were used for the first time in October (Historical file Italy 1944/1 Cdn Corps/C/F: 1 Cdn Corps Summary No. 30, 22 Oct 44).

41. 17-Pounder Gun. At the beginning of 1944 Canadian anti-tank regiments were to be equipped with the towed 17-pr anti-tank gun on the basis of two troops per battery in infantry divisional anti-tank regiments, and two batteries per regiment in armoured divisions and corps troops (C.M.H.Q. file 1/17-Pdr/1: H.Q. First Cdn Army Memorandum, 5 Dec 43). As noted above (para 37), this establishment was in fact subject to modifications. 3 Cdn Inf Div had never received any towed 17-prs since their assault landing in June, preferring to retain the self-propelled guns issued for that occasion. There was no difficulty over supply, the weapons being received from British sources as required (ibid: M.G.A., C.M.H.Q. to Under-Secretary of State, War Office, 6 Mar 44: Tel CARL 464, CANMILITRY to DEFENSOR, 8 Nov 44).

42. The question of a tower for the gun received considerable attention. Within 21 Army Group the policy was adopted of fitting all tanks with 17-pr towing hooks for emergency use (ibid: B.G.S., C.M.H.Q. to D.Q.M.G., C.M.H.Q., 21 Dec 43). In March 1944 it was intended to use entirely wheeled vehicles as standard towers, probably the American 2½-ton 6 x 6 lorry (ibid: Chief of Staff, C.M.H.Q. to Under-Secretary of State, War Office, 4 Mar 44). These were found not to be available, and various vehicles were used. 6 Cdn A Tk Regt of 2 Cdn Corps used modified Ram tanks specially for this purpose. In Italy the anti-tank regiments of 5 Cdn Armd Div and 1 Cdn Corps used modified Crusader tanks. Other

units used the Field Artillery Tractor (C.M.H.Q. file 1/SP 17-Pdr/1: S.D. (E), C.M.H.Q. to S.D. (M.T.), C.M.H.Q., 8 Jun 44; Cdn Ops in N.W.E. series 6, p. 4). Half-Tracks were also used.

43. Besides the towed 17-pr anti-tank gun, two types of self-propelled 17-pr anti-tank gun were introduced during the year. In April 3-in M 10 self-propelled equipments were being modified to mount 17-pr guns (C.M.H.Q. file 1/SP 17-Pdr/1: Chief of Staff, C.M.H.Q. to H.Q. First Cdn Army, 21 Apr 44). In June twenty-four of these were issued to 5 Cdn A Tk Regt of 4 Cdn Armd Div in place of the 3-in M 10 equipment which had been held as an interim measure (C.M.H.Q. file 13/Equip States/1/7: Equipment State, Cdn Army in U.K. as at 30 Jun 44). At the end of June three more were issued to Canadian Reinforcement Units for training (C.M.H.Q. file 1/SP 17-Pdr/1: Director Royal Artillery, War Office to C.M.H.Q., 29 Jun 44; D.C.G.S., C.M.H.Q. to D.Q.M.G., C.M.H.Q., 13 Jul 44). In August the policy was adopted of equipping infantry divisional anti-tank regiments on the following basis (ibid: Extract from Eqpt Policy Memorandum, First Cdn Army, 3 Aug 44; S.D., First Cdn Army to C.M.H.Q. 6 Aug 44):

1 tp in each bty with 6-pr towed - total 16 guns.

1 tp in each bty with 17-pr towed - total 16 guns.

1 tp in each bty with 17-pr Valentine SP - total 16 guns.

None of the Valentine self-propelled equipments had been received by the Canadian forces at the end of November.

44. The 17-pr anti-tank gun proved very effective in operations. But there was a definite preference for self-propelled guns. The towed gun was hard to move and a tracked tower was often necessary. The Ram Tower was reported to be the best available, but was noisy and bulky (Cdn Ops in Med Area, series 25, p. 3; series 28, p. 2; Cdn Ops in N.W.E., series 12, pp 5-6). 6 Cdn A Tk Regt were to change to Crusader towers.

45. 3-in M10 S.P. Gun. These self-propelled anti-tank guns were issued to the Canadian Army as an interim measure pending the availability of self-propelled 17-prs. They were issued to two batteries per regiment in armoured divisions and corps troops. In addition one troop per battery of 3 Cdn A Tk Regt of 3 Cdn Inf Div received them for the assault landing in June. By the end of February the Canadian forces in the United Kingdom were fully equipped on this basis (C.M.H.Q. file 13/Equip State/1/6: Equipment State, Cdn Army in U.K. as at 29 Feb 44). The Canadian forces in Italy received their quota in April (C.M.H.Q. file 1/3" M10/1: Report by S.D.(W), dated 14 Apr 44 on visit to A.F.H.Q. and A.A.I.; C.M.H.Q. file 13/Equip State/2/2: Equipment State Cdn Forces in A.A.I. as at 20 Apr 44). The supply situation since that time remained satisfactory, and it was possible in April to allow eight M10 self-propelled

equipments in each corps and armoured divisional anti-tank regiment in First Cdn Army to be run to death and replaced (C.M.H.Q. file 1/3" M10/1: S.D., First Cdn Army to 2 Cdn Corps, 22 Apr 44). Apart from the gradual replacement by 17-pr self-propelled guns there was no change in the holdings of this weapon. 3 Cdn A Tk Regt did not replace their self-propelled guns with towed 17-prs after the assault as originally intended; in August in place of 3-in equipment they received 17-pr M10 equipment (C.M.H.Q. file 13/Equip State/2/4: Equipment State, Cdn Army in N.W.E. as at 31 Aug 44).

46. All reports from the field have spoken highly of the self-propelled anti-tank guns. They proved themselves very effective against enemy tanks. But the great value of the self-propelled gun was its ability to get up quickly to give close support to the infantry. On at least one occasion the M10's proved their ability to travel long distances at considerable speed (Cdn Ops in Med Area, series 25, p. 3; Cdn Ops in N.W.E., series 3, p. 6; series 12, p. 5; series 15, p. 4).

47. Field Artillery. Three types of field guns were given to the Canadian artillery at the beginning of 1944. The three field regiments of 3 Cdn Inf Div and 19 Cdn Army Fd Regt were equipped with the 105-mm M7 self-propelled gun (Priest) to conform with British practice for the assault landing (C.M.H.Q. file 1/SP 105-mm/1: B.G.S., C.M.H.Q. to D.Q.M.G., C.M.H.Q., 14 Aug 43; War Office Memorandum, 29 Oct 43). There was some delay in obtaining these equipments, as some originally intended for the Canadian Army were rerouted to the Mediterranean (ibid: S.D.3, C.M.H.Q. to H.Q., First Cdn Army, 5 Nov 43). But by the end of February the four regiments were completely equipped (C.M.H.Q. file 13/Equip State/1/6: Equipment State, Cdn Army in U.K. as at 29 Feb 44). Self-propelled guns were used for the assault landing as they alone could fire from the landing craft while on the way in to shore and still be easily moved when they landed muzzle first (Cdn Ops in N.W.E., series 17, p. 6). These guns were to be replaced after the landing with tractor-drawn 25-pr guns. The replacement duly took place in August for the three regiments of 3 Cdn Inf Div (C.M.H.Q. file 13/Equip State/2/4: Equipment State Cdn Army in N.W.E. as at 31 Aug 44). In September 19 Cdn Armd Fd Regt exchanged its 105-mm M7 guns for 25-pr Ram self-propelled guns (ibid: as at 30 Sep 44). In April 8 Cdn Fd Regt (S.P.) of 5 Cdn Armd Div received 24 Priests; these were still being used at the end of the year (C.M.H.Q. file 13/Equip State/2/5: Equipment State, Cdn Forces in A.A.I. as at 30 Nov 44). The 105-mm M7 S.P. was most popular in Italy (Cdn Ops in Med Area, series 10, p. 7). Many of the replaced M7 equipments in North-West Europe were converted into armoured personnel carriers by removing the guns, and under the name of Kangaroos rendered valuable service (para 86 below). The guns were later replaced and the equipment turned over to the Americans.

48. 23 Cdn Fd Regt of 4 Cdn Armd Div had already obtained its complement of 25-pr Ram self-propelled guns (Sextons) (Report No. 113, para 45). The Canadian forces in the United Kingdom actually held 32 of these wapons at the beginning of the year (C.M.H.Q. file 1/SP 25-Pdr/1: Director of Royal Artillery, War Office to H.Q. 21 Army Gp, 28 Dec 43). The rest of the Canadian production was consigned to the British who would provide for necessary replacements in the Canadian Army (ibid: Tel CARO 324, DEFENSOR to CANMILITRY, 20 Jan 44: Director of Royal Artillery, War Office to Senior Officer, C.M.H.Q. 21 Apr 44). Canadian supplies were sufficient for British needs, and in August they were willing to have the production of Sextons cut to allow the Canadian factory (Montreal Locomotive Works) to supply their requirements for Ram G.P.O. vehicles (C.M.H.Q. file 1/Tk GPO/1: War Office to B.A.S., Washington, 13 Aug 44; Chief of Staff, C.M.H.Q. to Secretary, Department of National Defence, 16 Aug 44). These latter are Sextons with the guns removed for use as a command vehicle for the gun position officer (1/SP 25-Pdr/1: Chief of Staff, C.M.H.Q. to H.Q. First Cdn Army, 10 May 44). In fact the G.P.O. Sextons were provided by conversions in England; the production of Sextons in Canada was not altered. In Italy 5 Cdn Armd Div received 24 Sextons in April; on the formation of 12 Cdn Inf Bde they were replaced by tractor-drawn 25-prs (C.M.H.Q. file 13/Equip State/2/4: Equipment States, Cdn Forces in A.A.I.).

49. Although the self-propelled guns have attracted more attention, the tractor-drawn 25-pr remained the field gun for infantry divisions and for one regiment in each armoured division. The Canadian forces did not lack sufficient supplies of this weapon at any time during the year. The apparent deficiency of 86 guns in December 1943 referred to in Report No. 113, para 45, was due to the temporary equipping of four regiments with the 105-mm self-propelled guns (see para 47 above). In fact by November 1944 production of 25-prs was actually surplus to requirements (C.M.H.Q. file 1/25-Pdr/1: B.A.S., Washington to War Office, 4 Nov 44).

50. Medium Artillery. The three regiments in the United Kingdom at the beginning of 1944 were fully equipped with 5.5-in gun-howitzers during most of the year. Although the expenditure of barrels in First Cdn Army caused trouble at one period, there was no deficiency of these weapons (C.M.H.Q. file 1/5.5 Gun How/1: Extract from Notes on Visit by Col. F.F. Fulton, S.D.(W), C.M.H.Q. to H.Q. First Cdn Army, 9 Aug 44). At the end of July it had been decided to replace them in one regiment with 4.5-in guns which have a greater range (ibid: Tel S.D.61, S.D. First Cdn Army Main to Q. (A.E.), 30 July 44). By the end of December this replacement

was complete (C.M.H.Q. file 13/Equip State/2/5: Equipment State, Cdn Units in First Cdn Army as at 31 Dec 44).

51. In Italy there was considerable delay in equipping the three Canadian medium regiments. Only 1 Cdn Med Regt was equipped by the end of January. In February the other two regiments began to receive 4.5-in guns in lieu of 5.5-in (C.M.H.Q. file 13/Equip State/2/2: Equipment State, Cdn Forces in A.A.I.). The situation in the middle of April was as follows (C.M.H.Q. file 1/5.5 Gun How/1: Report by S.D. (W) dated 14 Apr 44 on visit to A.F.H.Q. and A.A.I.):

Establishment		Holding	In Good Shape	Promised
1 Cdn Med Regt	16 Guns	14x5.5in	6	2x5.5in
2 Cdn Med Regt	16 Guns	11x4.5in	11	4x4.5in
5 Cdn Med Regt	16 Guns	16x4.5in	16	-

By the end of the month the deficiency had been made up by further issues of 4.5-in guns. In August a further issue of 5.5-in guns allowed two regiments to be equipped with this weapon, leaving one with the 4.5-in guns (C.M.H.Q. file 13/Equip State/2/4: Equipment State, Cdn Forces in A.A.I. as at 31 Aug 44). The 4.5-in gun was preferred, especially for mobile operations, because it out-ranges the 5.5-in gun, and as well is more accurate (Historical file Italy 1944/1 Cdn Inf Div/M/F: 1st Canadian Infantry Division in the Liri Valley Battle, 31 Jul 44).

52. 40-mm L.A.A. Gun. Supplies of the Bofors 40-mm light anti-aircraft gun were adequate throughout 1944 to meet requirements. For the purpose of the assault landing 4 Cdn L.A.A. Regt of 3 Cdn Inf Div was completely equipped with self-propelled guns. They held their full complement of 54 by the end of February (C.M.H.Q. file 13/Equip State/1/6: Equipment State, Cdn Army in U.K. as at 29 Feb 44). The conversion of one troop per battery for the other regiments proceeded steadily. 3 Cdn L.A.A. Regt of 2 Cdn Inf Div were complete by the end of March as was 6 Cdn L.A.A. Regt of 2 Cdn Corps. In the same month 7 and 11 Cdn L.A.A. Regts were disbanded. 8 Cdn L.A.A. Regt of 4 Cdn Armd Div were not fully equipped with self-propelled guns until July, but they held a surplus of tractor-drawn guns in lieu (C.M.H.Q. file 13/Equip State/1/7: Equipment States, Cdn Army in U.K.). In Italy 1 and 5 Cdn L.A.A. Regts received the self-propelled Equipment in April and May; 2 Cdn L.A.A. Regt were equipped with these soon afterwards (C.M.H.Q. file 13/Equip State/2/2: Equipment States, Cdn Forces in A.A.I.). During 1944 there was a tendency to reduce the establishment for light anti-aircraft weapons. Thus in Italy it was possible to convert 1 Cdn L.A.A. Regt to an infantry battalion as part of 12 Cdn Inf Bde. There was accordingly no difficulty in keeping field units supplied up to establishment.

53. The Canadian Ford vehicles to replace the Morris lorries for the self-propelled guns were supplied during the summer. Some guns mounted on the Morris chassis

were still held in First Cdn Army, but this was not due to a lack of the Canadian vehicles (Historical file: Cdn Units, 21 Army Group, "A" and "B" vehicle Position States). In September it was considered that in view of the diminishing requirements further Canadian vehicles would not be needed (C.M.H.Q. file 1/Veh 40-mm/1: Tel GRDVE 1297, CANMILITRY to DEFENSOR: 1 Sep 44). 52 of those held in Canada were diverted to Italy (ibid: Tels CONSI 1650 and CONSI 1669, War Office to B.A.S., Washington, 14 Sep 44 and 17 Sep 44).

54. Very little use was found for the Bofors in an anti-aircraft role in operations due to the weakness of the enemy air force, and reports speak mostly of its services in a ground role. It was used in this way in Italy before the end of 1943 (Cdn Ops in Med Area, series 9, p. 11). In this role it was used both in Italy and in North-West Europe for ordinary ground shooting, using tracer to mark lanes for night attack, and using armour-piercing and H.E. to blow in buildings (Cdn Ops in Med Area, series 14, p.8; series 22, p. 4; Cdn Ops in N.W.E., series 6, p. 4; series 12, p. 11).

55. Heavy Anti-Aircraft Artillery. The one Canadian heavy anti-aircraft unit in the United Kingdom proceeded to the Continent with First Cdn Army. At the end of 1944 it still had its full complement of 24 guns (C.M.H.Q. file 13/Equip State/2/5: Equipment State, Cdn Army in N.W.E. as at 31 Dec 44). Like other anti-aircraft weapons the 3.7-in was used mainly in a ground role, firing airburst with considerable effect (Cdn Ops in N.W.E., series 8, p. 3).

56. Rocket Projectors. Towards the end of 1944 a new weapon was introduced in operations by First Cdn Army. This was the "Land Mattress", known officially as Projector Rocket 3-in No. 8 Mk 1. Twelve projectors were obtained by First Cdn Army and operational trials started about the end of October which proved successful (C.M.H.Q. file 1/Rocket Eqpt/1: Extract from Minutes of Meeting held at C.M.H.Q., 19 Oct 44; Extract from Notes on Visit by Col. F.F. Fulton, S.D.(W), C.M.H.Q. to H.Q. First Cdn Army, 4-9 Nov 44). As a result it was proposed to establish a rocket projector regiment of 3 batteries each of 12 30-barrel projectors, in First Cdn Army. This regiment would consist of a small permanent establishment of instructors and would use personnel of light anti-aircraft regiments for operations (ibid: Extract from Notes on Visit by Col. F.F. Fulton to H.Q. First Cdn Army, 4-9 Nov 44; S.D. (T.D.) Memorandum, 1 Dec 44). Production difficulties were experienced in obtaining ammunition as the British were unwilling to produce large quantities until a more satisfactory fuse was developed; the one in use was not considered safe but was found satisfactory by First Cdn Army (ibid: Col. F.F. Fulton, to Major-General V. Evelegh, A.C.I.G.S.(W), War Office, 13 Dec 44). In January 1945 21 Army Group asked for the equipment and ammunition for one regiment per Army to be used by one of the corps light anti-aircraft regiments in the same way as the Canadians (ibid: Minute by Col. F.F. Fulton, 6 Jan 45: Director of Royal Artillery Memorandum for Senior Officer, C.M.H.Q., 21 Jan 45). Deliveries of the projectors to meet

the original Canadian requirement began in February 1945 (ibid: Director of Royal Artillery Memorandum for Senior Officer, C.M.H.Q., 14 Feb 45).

57. Flame Weapons. Various types of flame-throwing weapons were employed by the Canadian Army during the year. Flame throwers had been used by the British on an experimental scale since 1940 (C.M.H.Q. file 1/Fl Throw)2: Senior Officer C.M.H.Q. to H.Q. First Cdn Army, 24 Nov 42), but the development of these weapons as standard equipment of the Army depended largely on Canadian interest. Various experiments had been carried out by the Canadian Army in the United Kingdom and the first production on a large scale was in Canada (C.M.H.Q. file 55/4220/2: D.C.G.R.D. Memorandum, 25 Mar 42; W.D., Canadian Training School: An Account of Flame Warfare and Technical Development by Lt.-Col. E. Arnason, O.C. No. 4 (C.W.) Wing, February 1945; see also W.D., Cdn Petroleum Warfare Experimental Unit, June 1943).

58. The first type developed on a large scale for use by the Canadian Army was the Canadian-made Ronson. This weapon was mounted on a Universal carrier. Orders had been placed in Canada by July 1942 for 1000 of these for the Canadian Army Overseas (C.M.H.Q. file 55/4220/2: Tel G.S. 2427, CANMILITRY to DEFENSOR, 13 Jul 42; C.M.H.Q. file 1/Fl Throw/2: Tel G.S.W. 272, DEFENSOR to CANMILITRY, 4 Mar 43). First deliveries were ready by the end of 1942, when a British proposal to use 50 of them in the Middle East was opposed by the Canadian Army Commander on the ground that surprise would be sacrificed by their use on a small scale. The proposal was abandoned (ibid: Memorandum by G.O.C.-in-C. First Cdn Army, 23 Nov 42; Tel G.S. 4123, CANMILITRY to DEFENSOR, 12 Dec 42). It is worth noting that none were yet available from British production (ibid: War Office Memorandum, 21 Nov 42). By the end of July 1943 the Canadian Army Overseas had received 818 Ronsons from Canada; the rest of the order had been lost at sea (ibid: S.D. 3, C.M.H.Q. to D.O.S., C.M.H.Q., 3 Aug 43). Supplies were now adequate, but it remained to determine the method of their employment. Training was carried out at the Canadian Training School, particularly with personnel of infantry divisional reconnaissance regiments. The intention was to use a maximum of 300 at one time using three reconnaissance regiments to operate approximately 100 each (ibid: Tel S.D.W. 474, CANMILITRY to DEFENSOR, 16 Oct 43). It was intended to hold these equipments in ordnance depots in the operational theatre for issue as required for particular operations.

59. The principal defect noticed in the Ronson was the difficulty of maintenance. There was some suggestion in March 1943 of adopting a new type, but the Army Commander expressed himself as satisfied with the Ronson (ibid: Tels S.D.T. 901 and S.D.T. 948, CANMILITRY to DEFENSOR, 12 and 19 Mar 43). The only alternative available at that time was the British Wasp Mk 1, which was not as good. In October 1943, however, the Canadian Army decided that the British Wasp Mk 2 Flame Thrower, just coming into production, was superior to the Ronson and placed an order for 500 of these with the War Office.

The Wasp Mk 2 is a more advanced design using the principles established by the development of the "Barracuda" by the Canadian Petroleum Warfare Experimental Unit in conjunction with the British Petroleum Warfare Department (Major G.E. Wilson, S.D. 11, C.M.H.Q.). It is mounted like the Ronson on a Universal carrier and has two fuel tanks mounted inside the carrier, but the Canadian Army desired to have one external tank in view of the difficulty of maintenance with the internal tank (ibid: G.O.C.-in-C. First Cdn Army to Senior Officer, C.M.H.Q., 24 Oct 43; Tel S.D.W. 506, CANMILITRY to DEFENSOR, 23 Oct 43; Cdn Ops in N.W.E., series 17 pp. 1-3). The production of Wasps was proceeding rather slowly and the modified Canadian version, known as Wasp Mk 2c, was accordingly delayed (ibid: Director of Special Weapons and Vehicles, War Office to Senior Officer, C.M.H.Q., 14 Jan 44; S.D. 11, C.M.H.Q. to S.D. 3, C.M.H.Q, 15 Apr 44). Meanwhile Ronsons were used for training and it was intended to use them for operations if the Wasps were not available. They were not in fact used in North-West Europe and the Canadian Army had some 700 Ronsons available for disposal (C.M.H.Q. file 1/Fl Throw/2/2: Tel CARO 570, DEFENSOR to CANMILITRY, 6 Oct 44).

60. The policy in 21 Army Group was for the Wasps to be used by infantry carrier platoons as an occasional weapon; stocks held in advanced ordnance depots would be available on 7 days' notice (C.M.H.Q. file 1/Fl Throw/2: Tel S.D.W. 637, CANMILITRY to DEFENSOR, 12 Nov 43; Chief of Staff, First Cdn Army Letter, 23 Mar 44). Training was given to personnel of infantry carrier platoons at the Canadian Training School on the British Wasp 2. The first Wasp 2c was ready about 1 Jun 44 (ibid: Chief of Staff, C.M.H.Q. to Under-Secretary of State, War Office, 21 May 44). On the scale of 8 equipments for each infantry divisional reconnaissance regiment, motor battalion and infantry battalion, First Cdn Army had a requirement of 192 with wastage estimated at 29 per month. Up to the latter part of November First Cdn Army had received 134 Wasp 2 and 73 Wasp 2c, but many of these had gone to equip 49 and 51 Brit Divs. Total holdings were 45 Wasp 2 and 37 Wasp 2c of which 10 were held by the Polish Armoured Division. Efforts were being made to have First Cdn Army equipped entirely with the Canadian model (C.M.H.Q. file 1/Fl Throw/2/2: First Cdn Army Memorandum, 25 Nov 44; Notes on Visit by Col. F.F. Fulton, S.D.(W) C.M.H.Q. to H.Q. First Cdn Army, 4-9 Nov 44). Wasps were used by the Canadian forces in North-West Europe, often with considerable effect (Cdn Ops in N.W.E., series 7, p. 2; series 12, p. 1; Historical file AEF/7 Cdn Inf Bde/C/D, the Bridgehead over the LEOPOLD CANAL, Account by Major A.L. Gollnick and Capt. C.M. Rehill; Historical file AEF/3 Cdn Inf Div/L/F, Docket III: Conversation G.O.C. 3 Cdn Inf Div with Major-General Eberding, G.O.C. 64 German Inf Div, 1 Nov 44). They were also supplied for operations in Italy (Historical file Italy 1944/1 Cdn Corps/C/F: Bi-Monthly Summary of Ops of 1 Cdn Corps by Hist Offr, 16-30 Nov 44).

61. Early in 1944 another and more powerful flame-thrower was coming into production in the United Kingdom. This is the Crocodile, a flame-throwing apparatus usable in all Churchill VII tanks. Other types of tank and other marks of the Churchill cannot be used for Crocodiles. The fuel is carried in an armoured wheeled container pulled by the tank; the flame gun is mounted in place of the Besa. These were to be issued on the scale of one per troop in each Churchill regiment; due to short supply, 141 R.A.C.

was equipped as a Churchill VII unit capable of using Crocodiles as an interim measure for the initial stages of Operation "OVERLORD" (C.M.H.Q. file 1/Fl Throw/2: Director of Special Weapons and Vehicles, War Office to Senior Officer, C.M.H.Q., 14 Jan 44; Chief of Staff, 21 Army Group to H.Q. First Cdn Army, 6 Mar 44). On the basis of one per troop in each armoured regiment First Cdn Army had a requirement for 100 Crocodiles, but they would have to be adapted to fit Sherman tanks. The American Army were intending to use Crocodiles on the Sherman I which should fit the Sherman III and V used by the Canadian Army (ibid: A/G.O.C.-in-C. First Cdn Army to Chief of Staff, C.M.H.Q., 19 Feb 44; Chief of Staff, C.M.H.Q. to H.Q. First Cdn Army, 25 Mar 44). No production was started on the Canadian requirement owing to the prior claims of the Churchill model. At the end of August the requirement was cancelled. The American Army had abandoned the idea of using Crocodiles on Shermans, leaving the Canadians as the only potential users (ibid: Director of Special Weapons and Vehicles, War Office to C.M.H.Q., 1 Aug 44 and 23 Aug 44; Tel S.D. 88, S.D. Main First Cdn Army to S.D. Main EXFOR, 2 Sep 44). The Canadian forces in North-West Europe frequently had the support of Crocodiles provided by 141 R.A.C. (Cdn Ops in N.W.E., series 8, p. 3; series 9, p. 10; series 12, p. 1; Historical file AEF/First Cdn Army/R/H: 2 Cdn Corps Requirements Special Eqpt, 4 Oct 44).

62. To meet the lack of Crocodiles First Cdn Army in August requested to have a Wasp 2 mounted in a Ram Armoured Personnel Carrier. By December 1944 First Cdn Army had received 36 of these (C.M.H.Q. file 1/Fl Throw/2: Tels S.D. 90 and S.D. 68, S.D. First Cdn Army to S.D.(W), C.M.H.Q., 15 Aug 44 and 17 Sep 44; C.M.H.Q. file 1/Fl Throw/2/2: Tel S.D. 99, First Cdn Army to S.D.(W), C.M.H.Q., 21 Dec 44). These equipments, known as "Cougars" and later "Badgers", were issued for trial purposes on the scale of 6 to each armoured regiment of 2 Cdn Armd Bde and 6 to the motor battalion of 4 Cdn Armd Div. They had not been used by the end of 1944.

63. Another flame-thrower employed during the year was the Lifebuoy, Mk 2. This is a portable flame-thrower operated by one man. Like the others it was held in ordnance depots for issue as required for operations. It was intended for use particularly in house or wood clearing or in street fighting where the Wasp and Crocodile cannot be manoeuvred (Cdn Ops in N.W.E., Series 17, pp. 3-4). It was employed occasionally by the Canadian forces, but in practice it was found to be too heavy and to require considerable maintenance, and there was a lack of trained operators (Cdn Ops in N.W.E., series 8, p. 7). A few Lifebuoys were held by Canadian forces in the United Kingdom for training at the Canadian Training School (C.M.H.Q. file 1/Fl Throw/2: Director of Special Weapons and Vehicles, War Office to C.M.H.Q. (S.D.3), 29 Jul 44). There was a shortage of these equipments for the Canadian Forces in Italy (C.M.H.Q. file 1/Fl Throw/2/2: War Office to A.F.H.Q., 29 Nov 44). At the end of the year there was under development in the United Kingdom

the A.A.A. Pack Flame Thrower, which was reported to be better than the Lifebuoy but would not be in production until March 1945 (C.M.H.Q. file 1/Fl Throw/2: Tel S.D.W. 2545, C.M.H.Q.(S.D.W.) to S.D. Main First Cdn Army, 31 Jul 44; C.M.H.Q. file 1/Fl Throw/2/2: Tel S.D.W. 3645, CANMILITRY to G., S.D. Main First Cdn Army, 7 Dec 44).

VEHICLES

64. Cruiser Tanks. The policy of using Sherman tanks in the Canadian Army remained in effect. The majority of these required for operations had been received from the British by the end of 1943, but apart from a few for training purposes they were not issued to units until April and May 1944. The policy was to use Ram tanks for training both in field units and Reinforcement Units (C.M.H.Q. file 1/Tk Cruiser/1/2: A.D.Q.M.G. (A.E.), C.M.H.Q., Memorandum, 27 Dec 43; Policy Regarding Issue of Tks to meet Trg Requirements, First Cdn Army, 10 Nov 43). Besides saving the Shermans for operations, this permitted a considerable amount of necessary work in modifying the tanks to be done before they were issued. This work was not completed until April (ibid: Extract of Meeting held at C.M.H.Q., 8 Apr 44; Historical file AEF/2 Cdn Armd Bde/C/F: 2 Cdn Armd Bde/Op "OVERLORD", 5 Jul 44). Canadian units were fully equipped with Shermans before the start of operations. Except for a slight deficiency in November the Canadian Army was kept fully supplied (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position States).

65. The tank chosen for use in the Canadian Army was the Sherman V (M4A4), but due to the supply situation it was found necessary to equip assault brigades with the Sherman III (M4A2) throughout 21 Army Group (C.M.H.Q. file 1/Tk Cruiser/1/2: Director of Royal Armoured Corps, War Office to Senior Officer C.M.H.Q., 7 Feb 44). This meant that 2 Cdn Armd Bde received Sherman III tanks while 4 Cdn Armd Div was equipped with the Sherman V. This distinction continued generally in effect, though issues included still other marks of the Sherman tank. The Sherman III has a Twin Diesel engine (G.M.6-71) not used in any of the other marks of this tank but used in the 3" M 10 S.P. gun referred to in para. 45 (ibid: Classification and Nomenclature of A.F.Vs, 27 Nov 43).

66. The mounting of 17-pr guns in 15 tanks per armoured regiment (Report No. 113, para. 67), proved difficult of attainment. The gun used was the Mk 4 and later the Mk 7, which differ considerably from the Mk 1 used in the anti-tank regiments (C.M.H.Q. file 1/17-Pdr/1: Report by Capt. G.H. Pratt, 2 C.A.C.R.U., 3 Aug 44). Only some of the Sherman V tanks were suitable to mount this weapon, and it was finally decided to use the Sherman I (M4) as well for that purpose (C.M.H.Q. file 1/Tk Cruiser/1/2: Royal Armoured Corps to Chief of Staff, C.M.H.Q., 25 Apr 44). These tanks, known as Sherman Vc and Ic, remained in short supply until near the end of the year, and it was necessary to use tanks mounting the

normal 75-mm gun to cover the deficiencies (ibid: Extract of meeting held at C.M.H.Q., 8 Apr 44; C.M.H.Q. file 1/17-Pdr/1: Tel CARL 464, CANMILITRY to DEFENSOR, 8 Nov 44). By the end of the year the total Canadian holdings of 17-pr tanks were sufficient to cover an increased establishment (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position State as at 31 Dec 44).

67. For the assault landing in Normandy in June some special tanks were issued to 6 and 10 Cdn Armd Regts of 2 Cdn Armd Bde. These were D.D. (Duplex Drive) or "swimming tanks" fitted with two propellers. The tanks used were the Sherman V and Valentine. 38 were issued to each regiment to be replaced as soon as possible after the landing with ordinary Sherman III tanks (C.M.H.Q. file 1/Tk Cruiser/1/2: Director of Royal Armoured Corps, War Office to Senior Officer, C.M.H.Q., 7 Feb 44; to Chief of Staff, C.M.H.Q., 23 Mar 44). As it happened, due to the weather, less than half of the D.D. tanks did swim in to shore, the others being landed in the same way as other tanks. Of those that did swim in a large number were drowned or otherwise lost. But the rest reached shore and remained as planned hull-down in the water and provided the only close support for the infantry in the early stages (Cdn Ops in N.W.E., series 1, p. 2; Historical file AEF/2 Cdn Armd Bde/C/F: 2 Cdn Armd Bde/Op "OVERLORD", 5 Jul 44).

68. The Canadian Forces in Italy also were equipped with Sherman tanks. Reports both from there and from North-West Europe speak favourably of the performance of the Sherman, though desires were expressed for more of those mounting 17-pr guns (Cdn Ops in Med Area, series 18, p. 1; series 28, p. 16; Cdn Ops in N.W.E., series 1, pp. 9-11; series 13, p. 1). Both the 75-mm and the 17-pr guns were reported as satisfactory, but the shortage during most of the year of the 17-prs resulted in a lack of training of reinforcements in that weapon (Cdn Ops in N.W.E., series 17, pp. 9-10). Towards the end of the year Shermans mounting 105-mm guns were issued to the Canadian Forces in Italy on a proposed scale of six per regiment (C.M.H.Q. file 24/Reports/1/3: S.D.(W), Memorandum, 4 May 45).

69. Something should be added concerning cruiser tanks of Canadian manufacture. The total production of Rams was 1948, of which 277 were retained in Canada for training and other purposes. The last of the overseas assignment of 1671 had been shipped by December 1943 (C.M.H.Q. file 1/Tk Cruiser/1/2: Tel G.S.W. 831, DEFENSOR to CANMILITRY, 2 Dec 43). Of these 104 were lost at sea so that a total of 1567 were actually received. Although these were not used in action as cruiser tanks, a variety of other uses was found for them. As already mentioned they played an important part in training and continued to be used in Canadian Reinforcement Units. At the end of 1943 446 Rams were transferred to the British for conversion into Armoured Vehicles Royal Engineer (A.V.R.E.). These were intended to replace the Churchill in this role (C.M.H.Q. file 1/AVRE/1: Tel S.D.W. 1235, CANMILITRY to DEFENSOR, 9 Feb 44; C.M.H.Q. file 1/Tk Cruiser/1/2: D.Q.M.G., C.M.H.Q. to D.O.S., C.M.H.Q., 16 Dec 43). In fact the

Ram was never used as an A.V.R.E. About half the tanks turned over to the British were converted into armoured recovery vehicles, for a new design of which they proved eminently satisfactory. About a third were turned into armoured personnel carriers, a type developed by the Canadians. The remainder were used for various miscellaneous jobs (information supplied by Major Hawkins, R.A.C. 2 (a), War Office). Of those still in Canadian hands about 300 were converted into armoured personnel and armoured ammunition carriers for First Cdn Army, and the War Office accepted a further 330 of these for use in Italy as well as North-West Europe as armoured personnel carriers and armoured recovery vehicles (C.M.H.Q. file 1/Fl Throw/2/2: Tel S.D.W. 3753, CANMILITRY to G., S.D. Main First Cdn Army, 21 Dec 44). 36 of these Ram carriers were equipped with Wasp Flame Throwers (above para. 62). Another 59 Rams were converted into towers for 17-pr anti-tank guns (C.M.H.Q. file 4/Progress/4/13: Progress Report No. 183, November 1944). They were used by 6 Cdn A Tk Regt of 2 Cdn Corps (above para. 42). Still others were used as O.Ps. for artillery units. At the end of November First Cdn Army held a total of 125 Rams of various types not counting 25-pr self-propelled guns on the Ram chassis (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position State as at 30 Nov 44). The British were expected to take over all but 250 of the remaining Rams; these 250 would be used for training in the United Kingdom (Major C.A.N.Harvie, S.D. 3, C.M.H.Q.).

70. The successor of the Ram in Canadian production was the Grizzly, a Canadian tank on the Sherman chassis. In August 1944 there were 134 of these in stock in Canada and production had stopped (C.M.H.Q. file 1/20-mm Guns/1/3: Tel G.S. 505, DEFENSOR to CANMILITRY, 25 Aug 44). About two-thirds of these were to be sold to the British; the remainder would probably be kept in Canada for training.

71. Light Tanks. In October 1943 the decision was taken to use light tanks in place of carriers in armoured regiments following the British practice (C.M.H.Q. file 1/Tk Lt/1: G.O.C.-in-C. First Cdn Army to Senior Officer, C.M.H.Q., 17 Oct 43). About the same time the War Office adopted a new establishment for armoured reconnaissance regiments which called for 30 light tanks per regiment. This was adopted by the Canadian Army early in November (ibid: War Office Letter 2 O/Misc/2273 (S.D.1), 12 Oct 43; S.D.3, C.M.H.Q. to War Office, 5 Nov 43; Equipment Policy Letter No. 88, 11 Nov 43). The War Office undertook to supply Stuart V tanks (Light M3A3) to cover Canadian requirements (ibid: Director of Royal Armoured Corps, War Office to Senior Officer, C.M.H.Q., 27 Oct 43). Unfortunately the supply situation was poor and some of the Stuarts received were in bad condition (ibid: Director of Royal Armoured Corps, War Office to Senior Officer, C.M.H.Q., 17 Dec 43; E.M.E. 4 Sub Depot 1 C.B.O.D. to C.O.C. H.Q. 1 C.B.O.D., 24 Dec 43). This situation showed little improvement during the next five months; at the end of May the Canadian Army held only 36 Stuart tanks against an establishment of 77 in six armoured regiments and one armoured reconnaissance regiment (now organized as an armoured regiment), and the unsatisfactory

condition of many of those delivered still prevailed (ibid: Extract of Minutes of Meeting held at C.M.H.Q., 8 Apr 44; Historical file: Monthly Vehicle Position Report of Cdn Units in 21 Army Gp as at 31 May 44). 2 Cdn Armd Bde was, however, almost completely equipped. By the end of June, before they had seen action, 4 Cdn Armd Div had also received all but two of their Stuart tanks (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position State as at 30 Jun 44). Early in August it was possible to release 9 Stuarts surplus to field requirements to Canadian Reinforcement Units (C.M.H.Q. file 1/Tk Lt/1: D.C.G.S., C.M.H.Q. to D.Q.M.G., C.M.H.Q., 8 Aug 44).

72. In August a proposal was made to replace some or all of the light tanks in the Canadian Army with Scout Cars (ibid: Extract from 65-2-0/S.D., Main H.Q. First Cdn Army, 3 Aug 44). This was not in fact carried out but in October steps were being taken to replace the Stuart V with some other light tank. A number of American M24 Light Tanks had been allotted to the United Kingdom on the understanding that they would not be issued until the American troops had them. They would be issued to Canadian formations through 21 Army Group (ibid: Director of Royal Armoured Corps, War Office to Senior Officer, C.M.H.Q., 13 Oct 44). The M24 (formerly T24) has been adopted as the standard light tank for the American Army. It mounts a 75-mm gun as compared with the 37-mm carried by the Stuart V (ibid: M.G.O., N.D.H.Q. to C.M.H.Q., 2 Sep 44). Meanwhile the policy was adopted of replacing all Stuart V Tanks with Stuart VI's (M5A1). Early in November First Cdn Army reported that this replacement was nearing completion (ibid: S.D. Main H.Q. First Cdn Army to S.D.(W), C.M.H.Q. 23 Oct 44 and 3 Nov 44). At the end of December the Canadian Army held 76 Stuart VI Tanks against an establishment of 77; the deficiency was covered by 3 Stuart V Tanks still held; no M24 Tanks had yet been issued (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position State as at 31 Dec 44).

73. Although the Stuart V does not seem to have been particularly satisfactory in North-West Europe, Stuarts I, II and III were used very successfully in Italy. In that theatre the Canadians employed them principally with the turrets removed and a .50 Browning machine gun mounted on top. Known as "Honey" Tanks the Stuarts are frequently mentioned as giving good service (Cdn Ops in Med Area, series 21, pp. 1, 4, 5; series 22, p. 4; series 27, p. 6; series 28, p. 3).

74. Special Tanks. In addition to the Cruiser and Light Tanks the Canadian Army used a number of specialist tanks, and still others manned by the British appeared from time to time in support of the Canadian troops. Those used by the Canadians were Tanks O.P., Tanks A.R.V., Tanks A.A., Tanks Bridge-laying, as well as the Towers and Armd Personnel Carriers referred to above (para. 69).

75. The Canadian Army used both Shermans and Rams as Tanks O.P. These tanks were used in self-propelled regiments and tractor-drawn regiments of armoured divisions, and a pool was held in armoured brigades for the use of infantry divisional artillery when co-operating with tanks. The policy was ultimately to use Shermans throughout, but as an interim measure to use Rams in armoured divisional regiments (C.M.H.Q. file 1/Eqpt Pol Ltr/1/2: Equipment Policy Letter No. 92, amendment No. 2, 7 Mar 44). Supplies of the Ram O.P. were adequate, but there was a continual shortage of the Sherman O.P. (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position States). The shortage of Tanks O.P. was felt in Italy also (Historical file Italy 1944/1 Cdn Corps/R/P: D.D.O.S. 1 Cdn Corps, Re-equipment Progress Report, 22 Jan 44).

76. Tanks A.R.V. Armoured Recovery Vehicles used by the Canadians were intended to be Rams. About 50 of these tanks were converted for this purpose. But early in 1944 it was decided to use Shermans in this role (C.M.H.Q. file 1/Tk Cruiser/1/2: D.Q.M.G., C.M.H.Q. to D.O.S., C.M.H.Q. 16 Dec 43; C.M.H.Q. file 1/Veh Meetings/1/2: Equipment Policy Letter No. 92, 3 Dec 43, and amendment No. 2, 7 Mar 44). By the end of May Canadian units in First Cdn Army were almost completely equipped with Sherman A.R.V's. Shermans were also used as Recovery Tanks by the Canadian Forces in Italy, where they were reported as working well (Cdn Ops in Med Area, series 21, p. 4; series 28, p. 16).

77. At the end of 1943 policy of the Canadian Army was to use British Crusader or Centaur Tanks in the anti-aircraft role, and to replace these with Canadian "Skink" turrets mounted on Sherman tanks when they became available. Later it was planned to use complete tanks from Canada, i.e., "Skinks" on the Grizzly tank (C.M.H.Q. file 1/Veh Meetings/1/2: Equipment Policy Letter No. 92, 3 Dec 43, and amendment No. 2, 7 Mar 44). The Crusaders mount twin 20-mm Oerlikon guns; the Skink turret provides a quadruple 20-mm mount for Polstens (C.M.H.Q. file 1/Tk Comd/1: Provision of Tanks and S.P. Arty for Cdn Army Overseas, 4 Aug 43). The Canadian Army was slow in receiving the Crusader A.A. Tanks; a deficiency of 15 still existed in June, but it was eventually completely equipped with these specialist vehicles (C.M.H.Q. file 1/Tk Cruiser/1/2: Tel O. 271, S.D. First Cdn Army to S.D. EXFOR Main, 3 Jun 44; Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position States). In April it was felt in the Canadian Army that there was little need for anti-aircraft tanks, and soon after the landing in Normandy this was borne out by experience (C.M.H.Q. file 1/Armd Car/1: Draft of letter (not sent) from Chief of Staff C.M.H.Q. to Under-Secretary of State, War Office, 6 Apr 44; C.M.H.Q. file 1/Tk AA/1: Tel S.D.W. 2600, CANMILITRY to DEFENSOR, 5 Aug 44). In August the Crusaders were withdrawn from units of the First Cdn Army, though towards the end of the year some were being used in a ground role. (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position States).

78. The Canadian-made "Skink" turret was not used. The total order was for 265 of which 130 were for the British; the remainder were to be mounted on Grizzly tanks for the Canadian Army. In February 1944 there was some discussion about reducing this order, but Canada was advised to continue the production of 265 Skinks (C.M.H.Q. file 1/20-mm Gun/1/2: Tel S.D.W. 1355, CANMILITRY to DEFENSOR, 26 Feb 44; C.M.H.Q. file 1/20-mm Guns/1/3: Tel Vehicles 4341, DEFENSOR to CANMILITRY, 6 Apr 44). In April General Crerar advised 21 Army Group that anti-aircraft tanks would not be required, but in view of the possible bad effect on the morale of those engaged in their production no cancellation was ordered until this was definitely settled. In August Canada was advised that both the British and Canadian orders might be cancelled owing to the improvement in the strategic situation (ibid: Tel S.D.W. 2600, CANMILITRY to DEFENSOR, 5 Aug 44). It was agreed to cancel the whole order (ibid: Tel G.S. 505, DEFENSOR to CANMILITRY, 25 Aug 44). The cost of this cancellation was estimated at $7,600,000; to complete the order would have cost $13,025,000 (ibid: Tel G.S. 495, DEFENSOR to CANMILITRY, 18 Aug 44). Four Skinks were actually completed, of which one was shipped to the United Kingdom for trials. In November this one was called forward to the field for trial (C.M.H.Q. file 1/Tk AA/1/2: Tel S.D.W. 3540, CANMILITRY to G., S.D. Main First Cdn Army, 28 Nov 44; Tel S.D. 72, S.D. Main First Cdn Army to Main EXFOR, 28 Nov 44).

79. Bridge-Laying Tanks became a renewed requirement for the Canadian Army early in 1944. The total requirement was 6, which were supplied from British sources. The tanks used were Valentines (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position States). In this connection a few Ram tanks were turned over to the British for special use with Bailey Beach Bridges. These were for "ship to shore" use; the Ram tank both supported the bridge and manoeuvred it into position from the shore end (C.M.H.Q. file 1/Tk Br Laying/1: Director of Royal Armoured Corps, War Office to Senior Officer, C.M.H.Q., 3 Apr 44). In Italy the Canadians on occasion had the use of ARKs (Churchill tanks with bridging on top) supplied by 142 R.A.C. (Historical file Italy 1944/1 Cdn Corps/C/F: Report on ARK Crossing at MR 58750965, 20 Oct 44). In that theatre also Shermans were adapted to carry and launch the Bailey bridge (Historical file Italy 1944/1 Cdn Corps/M/F: Bailey Bridging Tanks, by Capt. H.A.G. Kingsmill, June 1944). In North-West Europe the idea of using tanks without modification to shove the Bailey mobile bridge to a gap was introduced in October (Historical file AEF/2 Cdn Corps/R/F: Chief of Staff, 2 Cdn Corps, 17 Oct 44).

80. In addition to these specialist tanks used by Canadian troops various types of tank manned by British troops were used from time to time in support of the Canadian forces. Some of these are frequently referred to in reports of Canadian operations, and it may be as well to mention them here for the sake of completeness. Flail

tanks, sometimes known as "Crabs", are tanks fitted with whirling chains on the front used to breach minefields. They were operated by a special Flail Regiment of 79 Brit Armd Div using Sherman tanks. They were supplied several times to assist Canadian operations (Cdn Ops in N.W.E., series 3, p. 1; series 8, p. 3; Historical file AEF/First Cdn Army/R/H, 2 Cdn Corps Requirements Special Eqpt, 4 Oct 44). A.Vs.R.E. or Armoured Vehicles Royal Engineer are tanks converted for various special uses by the Engineers such as carrying "Fascines" to fill short gaps. They were operated in North-West Europe by 79 Brit Armd Div. The tanks used were Churchills. A.Vs.R.E. were used in support of Canadian troops both in Italy and North-West Europe (Historical file Italy 1944/1 Cdn Corps/C/F: Report on ARK Crossing at MR 58750965, 20 Oct 44; Cdn Ops in N.W.E., series 1, pp. 1, 3; series 3, p. 1; series 8, p. 3; series 10, p. 3; series 11, p. 5). The Crocodiles, likewise operated by 79 Brit Armd Div, have been described above (para. 61).

81. Carriers. The Universal carrier remained the standard vehicle in the Canadian Army. At the beginning of 1944 the number of British-made vehicles with Canadian units had decreased still further, only 72 being held as compared with 3888 Ford carriers at the end of February. The 3-in mortar carriers numbering 942 were all Canadian-made, as were 149 carriers fitted for Ronson Flame Throwers (C.M.H.Q. file 13/Veh Rets Prov/1/4: Canadian Manufactured "B" Vehicles in possession of Cdn Units as at 29 Feb 44). Although in September the Ford factory began the model change to the new Windsor carrier, by the end of the year a total of 8901 Carriers Universal had been produced against Canadian orders and of these 6985 had been shipped overseas. In addition to this 18650 were produced and disposed of through the Ministry of Supply and Mutual Aid (C.M.H.Q. file 4/Progress/4/12: Progress Reports Nos. 179, 180, 181). As a very large number of the carriers received from Canada were Carriers Universal Mk I* and establishment called for use of the Carrier Universal Mk II* (Welsh Guards Stowage) a programme was undertaken by Q(A.E.) in which 1891 carriers were converted to the Mk II pattern in the United Kingdom before issue to units (C.M.H.Q. file 24/Reports/1/3: D.D.E.M. Memorandum, 30 Apr 45) Supplies of Universal and 3-in mortar carriers were adequate throughout the year, and expected deliveries covered estimated wastage up to the end of 1945 (C.M.H.Q. file 1/Carriers/1/2: Tel ORDVE 1032, CANMILITRY to DEFENSOR, 11 May 44; A.D.O.S. (M.T.) Memorandum to S.D.3, C.M.H.Q., 23 Aug 44). Special uses of the Universal carrier were to mount the Wasp Flame Thrower, to mount the Vickers Machine Gun, and as an Armoured O.P. (above paras. 22, 59; C.M.H.Q. file 1/Veh Meetings/1/2: Equipment Policy Letter No. 92, amendment No. 3, 18 Apr 44; C.M.H.Q. file 1/Armd OPs/1). The carriers adapted for the Medium Machine Gun were a new requirement in 1944 and were obtained from British sources (C.M.H.Q. file 1/Carr Vickers/1: A.D.O.S. (M.T.), C.M.H.Q. to S.D.3, C.M.H.Q., 12 Feb 44).

82. Besides the standard Universal carrier the Canadian Army used the American Carrier Universal T16, also a Ford vehicle. This is a later type of the Universal carrier with increased stowage space and load carrying capacity. It was adopted originally by the Canadian Army in October 1943 as a tower for the 6-pr gun in reconnaissance regiments, infantry battalions, and motor battalions, and also as a tower for the 4.2-in mortars (C.M.H.Q. file 1/Univ Carr T16/1: Equipment Policy Letter No. 84, 18 Oct 43). At the beginning of 1944 it was still undecided whether the T16 or the Loyd Carrier would be used to tow the 6-pr. Supplies of both were slow in being delivered (ibid: G. First Cdn Army to S.D.(W), C.M.H.Q., 5 Jan 44; C.M.H.Q. file 1/Carriers/1/2: Chief of Staff, C.M.H.Q. to Under-Secretary of State, War Office, 29 Jan 44; Tel. C. 175, G. First Cdn Army to S.D.(W), C.M.H.Q., 11 Feb 44). By the middle of February 229 T16 Carriers had been received out of a total requirement of 484. By April supplies were practically complete (C.M.H.Q. file 1/Univ Carr T16/1: Chief of Staff, C.M.H.Q. to Under-Secretary of State, War Office, 18 Feb 44; ibid: 17 Apr 44). 3 Cdn Inf Div were issued with Universal Carriers as 6-pr towers for the assault landing and continued to be equipped mainly with these (C.M.H.Q. file 1/Veh Meeting/1/2: Equipment Policy Letter No. 92, amendment No. 3, 18 Apr 44; Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position States). The T16 carrier was adapted to carry the 4.2-in mortar instead of towing it on a trailer as originally intended (above para. 32). 100 suitably modified carriers were available for issue by the end of April (C.M.H.Q. file 1/Carr Univ T16/1: Chief of Staff, C.M.H.Q. to Under-Secretary of State, War Office, 17 Apr 44). This use of the T16 Carrier was peculiar to the Canadian Army in North-West Europe and had some disadvantages. The bomb carrying capacity was limited and there was a lack of stowage space. 4 Cdn Armd Div recommended the use of M14 Half-Tracks as 4.2-in mortar carriers to remedy this and also give greater manoeuvrability (ibid: G.O.C. 4 Cdn Armd Div to G. (S.D.) First Cdn Army, 6 Dec 44). Due to the short supply of M14 Half-Tracks, it was decided that the T16 carrier would continue in use, but with fresh modification to overcome the faults outlined (C.M.H.Q. file 24/Reports/1/3: S.D.(W) Memorandum, 4 May 45).

83. During the year trials were made with new types of carrier. The Canadian Windsor Carrier was submitted for trial in February (C.M.H.Q. file 1/Carriers/1/2: Notes on Meeting to Discuss Windsor Carrier, 1 Feb 44). This is similar in appearance to the T16 Carrier but is actually a lengthened version of the Canadian Carrier Universal Mk IIIx, and has greater stowage capacity than either the T16 or Universal (C.M.H.Q. file 24/Reports/1/3: D.D.E.M. Memorandum, 30 Apr 45). By April it had been decided to adopt it as well as the T16 as a tower for the 6-pr gun, and the British Ministry of Supply had placed an order for 5000 in Canada which would replace the Loyd Carrier

in this role; the Windsor would not replace the Universal Carrier. The Canadian Army decided to follow the British in this policy (C.M.H.Q. file 1/Carriers/1/2: D.Q.M.G., C.M.H.Q. to D.C.G.S., C.M.H.Q., 15 Apr 44; Chief of Staff, C.M.H.Q. to Under-Secretary of State, War Office, 28 Apr 44; War Office Letter, 2 Jun 44; D.C.G.S., C.M.H.Q. to D.Q.M.G., C.M.H.Q., 10 Aug 44). Production of Windsor carriers was due to start in September (ibid: Tel G.S.W. 321, DEFENSOR to CANMILITRY, 28 Apr 44). The British intention was eventually to replace all existing types with the C.T.20 which was being developed (ibid: War Office Letter, 2 Jun 44).

84. Armoured Personnel Carriers. A number of different vehicles were considered for this comparatively new requirement. In September 1943 the requirements of the Canadian Army Overseas were about 600 armoured personnel carriers and 108 armoured ammunition carriers, 18 for each of 6 self-propelled artillery regiments. The vehicle which had been in use by the British as a personnel carrier was the American Car 4 x 4 Scout M3A1 (White Scout Car), but this was going out of production. The vehicles available were various American half-track carriers and the new Canadian Truck 15-cwt 4 x 4 Armoured (known as the "carrier wheeled", a name that has since been dropped). Also as a long-term policy the Canadian Army was considering the Caplad, a Canadian 3-ton armoured lorry which would perform a wide variety of tasks (C.M.H.Q. file 1/Veh ½ Track/1: S.D. (Weapons) C.M.H.Q. to H.Q. First Cdn Army, 1 Sep 43). The policy adopted by the Canadian Army was to use the Canadian Truck 15-cwt Armoured as the personnel carrier and the American M14 15-cwt Half-Tracked as an ammunition carrier for the assault landing (C.M.H.Q. file 1/Veh Meetings/1/2: Equipment Policy Letter No. 92, 3 Dec 43). In January 1944 neither of these vehicles had yet been obtained by the Canadian Army; it was decided to issue White scout cars pending the availability of the Canadian 15-cwt armoured truck (ibid: Equipment Policy Letter No. 92, amendment No. 1, 17 Jan 44). Production of the Canadian vehicle had been delayed by strikes (C.M.H.Q. file 1/Veh Meetings/1: Minutes of Meeting held in Office of S.D.(W), C.M.H.Q., 30 Sep 43). In February in view of the protracted delay in delivery of the Canadian 15-cwt armoured truck it was decided to adopt the British scale of issue for M14 Half-Tracks and White Scout Cars. This meant a greatly increased proportion of Half-Tracks (C.M.H.Q. file 1/Veh ½ Track/1: A/G.O.C.-in-C. First Cdn Army to Chief of Staff, C.M.H.Q., 19 Feb 44). Both these vehicles were obtained from British sources. By May the Canadian Army had received sufficient vehicles to cover unit establishments (ibid: D.C.G.S., C.M.H.Q. to D.Q.M.G., C.M.H.Q., 8 May 44). By this time the Canadian 15-cwt armoured vehicles were beginning to arrive and 21 were issued to 3 Cdn Inf Div (ibid: Tel O. 262, S.D. First Cdn Army to 3 Cdn Inf Div, 16 May 44).

85. In May it was anticipated that future demands would be for Half-Tracks rather than wheeled vehicles. In view of this steps were taken to ensure that only the

original 800 Trucks 15-cwt Armoured were ordered from Canada (ibid: C. in C. 21 Army Group to Under-Secretary of State, War Office, 26 May 44, and Minute by S.D. (W), C.M.H.Q.). Half-Track vehicles were officially adopted by the War Office in June in place of field artillery tractors as 17-pr towers, including Canadian units, but owing to the limited availability of Half-Tracks this policy was slow in coming into effect (ibid: Director of Royal Armoured Corps, War Office Memorandum, 13 Jun 44 and 12 Oct 44).

86. In the field of armoured personnel carriers two heavier vehicles were developed by the Canadian Army. For Operation "TOTALIZE" (7-9 Aug 44) the 72 Priests (105-mm S.P. guns) used by the three field regiments of 3 Cdn Inf Div for the assault landing in June had their guns removed and were employed by 4 Cdn Armd Bde as armoured personnel carriers. This was the first time heavily armoured carriers had been used to carry infantry forward in battle (Historical file: First Cdn Army/C/F Operation "TOTALIZE"; 2nd Canadian Corps Immediate Report on Operation "TOTALIZE"; An Account of Ops by 2 Cdn Armd Bde in France 5-8 Aug 44). In this new role the Priests came to be known as Kangaroos and continued to be used for several months (Cdn Ops in N.W.E., series 7, p. 1; series 8, pp. 1-3). Towards the end of the year it was reported that, "Reduction in inf casualties following experimental use of Priests stripped of armament used as armd personnel carriers has resulted in a 21 Army Gp decision to provide such facilities in the form of armd personnel carrier regts on the scale of one per army" (C.M.H.Q. file 1/Org C.A.C./1: Tel G.S. 3453, CANMILITRY to DEFENSOR, 4 Nov 44). In accordance with this 1 Cdn Armd Personnel Carrier Regt was formed in First Cdn Army (Overseas Routine Order No. 5287, 29 Nov 44). Meanwhile a start had been made in converting a number of Ram tanks into armoured personnel and ammunition carriers. The new unit had an establishment of 106 armoured personnel carriers (C.M.H.Q. file 1/F1 Throw/1/2: Tel S.D. 74, S.D. Main First Cdn Army to S.D.(W), C.M.H.Q., 14 Oct 44). At the end of November 66 of the Ram carriers were held by First Cdn Army (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position State as at 30 Nov 44).

87. Armoured Cars. Policy at the beginning of 1944 was to use the American Staghound Armoured Car (T17E1) except in reconnaissance regiments where the Canadian Fox would be used (C.M.H.Q. file 1/Veh Meetings/1/2: Equipment Policy Letter No. 92, 3 Dec 43). Infantry divisional reconnaissance regiments needed a car within the class 9 bridge classification of infantry divisions; this excluded the Staghound. Also consideration was given to following British policy in using some light armoured cars instead of all heavy cars within the armoured car regiment. The difficulty was supply. While sufficient Staghounds would be available, there were only three light armoured cars available, the Fox, Daimler, and Humber. There were plenty of Fox Cars but their suitability was questionable; enough

Daimlers could be obtained in time to cover the requirements of infantry divisional reconnaissance regiments only (C.M.H.Q. file 1/Armd Car/1: Senior Officer, C.M.H.Q. to H.Q. First Cdn Army, 12 Jan 44). The decision was taken to use Daimlers in reconnaissance regiments and Staghounds in all other units (ibid: Tel O. 182, G. First Cdn Army to C.M.H.Q. (S.D.W.), 23 Jan 44). By the middle of February 128 Staghounds had been received against an establishment of 129, although these did not include any command or control vehicles for which there was a requirement of 20 (ibid: A.D.O.S. (M.T.) to S.D.3, C.M.H.Q., 14 Feb 44). Some of these special types became available in April; the rest were covered by conversion of White Scout Cars (ibid: Extract of Meeting held at C.M.H.Q., 8 Apr 44; Chief of Staff, C.M.H.Q. to Under-Secretary of State, War Office, 13 May 44). 18 Cdn Armd C Regt continued to be equipped entirely with Staghounds, but they were being replaced in formation headquarters with lighter cars as available. 18 Cdn Armd C Regt reported the Staghound to be a magnificent vehicle (Cdn Ops in N.W.E., series 11, p. 1).

88. The supply of Daimler Armoured Cars did not materialize and in February Humber IV Cars were ordered instead. The Canadian Army obtained 56 of these at once, enough to cover establishment, and reserves followed soon after (C.M.H.Q. file 1/Armd Car/1: Chief of Staff, C.M.H.Q. to Under-Secretary of State, War Office, 11 Feb 44; Director of Royal Armoured Corps, War Office to Senior Officer, C.M.H.Q. 21 Feb 44). In July it was decided to re-equip 7 and 8 Cdn Recce Regts with Daimlers as they became available. By the end of November the conversion was complete. Humbers were still being used in other units (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position State as at 30 Nov 44). In October 21 Army Group requested that all Fox Armoured Cars in the United Kingdom be held available for internal security purposes in North-West Europe. The Canadian Army in the United Kingdom held all these vehicles amounting to about 200 (C.M.H.Q. file 1/Armd Car/1/2: Director of Royal Armoured Corps, War Office to Senior Officer, C.M.H.Q., 25 Oct 44; Chief of Staff, C.M.H.Q. to Under-Secretary of State, War Office, 9 Nov 44).

89. In Italy 1 Cdn Armd C Regt in April held 14 Staghounds and 8 Half-Tracks against an establishment of 66 Armoured cars. Daimlers were held to cover the rest of their requirements. The policy was to equip them entirely with Staghounds (C.M.H.Q. file 1/Armd Car/1: Report by S.D.(W) dated 14 Apr 44 on Visit to A.F.H.Q. and A.A.I.).

90. Scout Cars. The problem of supply to a great extent governed Canadian policy regarding scout cars during 1944. The intention of replacing the Lynx I with the Lynx II, mentioned in Report No. 113, para. 82, was abandoned in December 1943 when it appeared that the Lynx II would not be ready in time. The War Office was asked to supply Humber I Scout Cars instead and the first were released to the Canadian Army in January 1944 (C.M.H.Q. file 1/Scout Cars/1: Senior Officer, C.M.H.Q. to Under-Secretary of State, War Office, 15 Dec 43; Tel S.D.W.989, CANMILITRY to DEFENSOR, 4 Jan 44; Tel S.D.W. 1686, CANMILITRY to DEFENSOR

15 Apr 44). But the estimated number available in time for operations was 150 out of a requirement of 188. Accordingly it was decided to use the Lynx I in 18 Cdn Armd C Regt, a total of 65, and keep the Humbers to cover all other requirements (ibid: Tel C. 182, G. First Cdn Army to C.M.H.Q. S.D.(W) 23 Jan 44; C.M.H.Q. file 1/Armd Car/1: Armd C and Scout C Policy, G.S. First Cdn Army, 12 Jan 44). The Canadian Army was completely equipped on this basis early in April (C.M.H.Q. file, 1/Scout Cars/1: Extract of Meeting held at C.M.H.Q., 8 Apr 44).

91. Towards the end of August a growing need for scout cars for liaison officers of infantry brigades and battalion commanders was reported. Some Daimler Scout Cars began to be issued to the Canadian Army in August, but both these and the Humbers were still in short supply (ibid: Minutes of Meeting held at C.M.H.Q., with S.D.(W), C.M.H.Q. and S.D. Army, 29 Aug 44). Supplies were, however, always sufficient to cover establishment, and at the end of November a surplus of these vehicles was held (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position State as at 30 Nov 44).

92. The main problem was to keep 18 Cdn Armd C Regt equipped with scout cars. In June they were reported as satisfied with the Lynx I (C.M.H.Q. file 1/Scout Cars/1: D.C.G.S., C.M.H.Q., to D.Q.M.G., C.M.H.Q., 15 Jun 44). But the wastage rate with these vehicles proved to be high. Although 75 reserves were held against an establishment of 65, by the middle of September it was estimated that these would be used up entirely in another six weeks. It would take too long to overhaul any further of these for operations, and there was no prospect of being able to equip the armoured car regiment with Humbers (ibid: Tel S.D. 96 and S.D. 54, S.D. Main First Cdn Army to S.D.(W), C.M.H.Q., 22 Sep 44 and 27 Sep 44; A.D.O.S. (M.T.) to S.D.3, C.M.H.Q., 26 Sep 44; Cdn Ops in N.W.E., Series 11, p. 1). Accordingly it was decided to use the Lynx II, a number of which had now been shipped on the British order (ibid: Minutes of Meeting held at C.M.H.Q. with S.D.(W), C.M.H.Q. and S.D. Army, 19 Oct 44). The first of these had come off production in April and at that time it was felt that the Canadian Army would have no use for them. The British intended to use them only in the Mediterranean or India, and the Canadian Army felt bound to follow British policy (ibid: Tel CARO 393, DEFENSOR to CANMILITRY, 11 Apr 44; Tel S.D.W. 1973, CANMILITRY to DEFENSOR, 18 May 44; Director of Royal Armoured Corps, War Office to Senior Officer, C.M.H.Q., 7 Jul 44). The process of re-equipping 18 Cdn Armd C Regt was started in November (ibid: Minutes of Conference at S.D. Main H.Q. First Cdn Army, 5 Nov 44).

93. Amphibian Vehicles. A particularly interesting development in 1944 was the number of amphibian vehicles used by the Canadian forces at various times. Mention has already been made of the amphibian D.D. Tanks used for the assault landing in June (para. 67). There is no

mention of any other amphibian vehicle being used specifically by Canadians on this occasion, but considerable use was made by the British beach groups of DUKWs in landing stores and evacuating casualties (Current Reports from Overseas, No. 67, p. 6; Cdn Ops in N.W.E., series 7, p. 11). These are American amphibian wheeled load carriers which were loaded at sea from the ships and carried the stores to the beaches and inland to the dumps.

94. Amphibian vehicles were used on one notable occasion by the Canadians. This was the assault landing across the SAVOJAARDS PLAAT during the clearing of the SCHELDT Estuary in October, when 9 Cdn Inf Bde were transported in Buffaloes. A good description of this vehicle and its performance is given in the account of that action by the O.C. 80 Sqn R.E., who operated the vehicles (Cdn Ops in N.W.E., series 11, p. 5; see also Current Reports from Overseas No. 72). They are armoured tracked vehicles which carried 9 Cdn Inf Bde across the water and on landing crossed a mud flat, a slope studded with pickets, a grassy stretch, a dyke and a 7 foot wide drainage ditch. Two types were used, one for men and stores, the other with a door at the rear for vehicles. Jeeps, carriers, and 6-pr anti-tank guns were carried. On the same occasion Terrapins were used as load carriers. These, the British equivalent of the DUKW, are 8 wheeled amphibian lorries unarmoured. Both vehicles were supplied for the occasion by the British.

95. No amphibian vehicles were on the establishment of the Canadian Army but two types were reported as being in the possession of First Cdn Army. The first acquired was the American Weasel (U.S. Army type M29). This is a fully-tracked unarmoured vehicle intended as a load or personnel carrier primarily for swamps or on inland waters only (C.M.H.Q. file 1/Veh Amph/1: S.D.(W) A.F.V. Report No. 46, 5 May 44). The first were acquired by First Cdn Army in August (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position State). Some Weasels were used during the clearing of the SCHELDT Estuary (Historical file AEF/First Cdn Army/R/H: 2 Cdn Corps Requirements Special Eqpt, 4 Oct 44). The Amphibian Jeep (5-cwt Ford) was first considered by the Canadian Army in May 1943, but this like other amphibian vehicles was to be supplied by 21 Army Group (C.M.H.Q. file 1/Veh Amph/1: Extracts from Agenda for third meeting Cdn M.T. User Committee, 4 May 43; S.D.3, C.M.H.Q. to Trg 3, C.M.H.Q., 5 Oct 43). The first four were received in October 1944 (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position States). A further vehicle was being developed in Canada; this was the Willys Tracked Jeep which has amphibian characteristics. Trials were still in progress to determine its best use. It seemed most likely to be developed as an airborne tracked load carrier (C.M.H.Q. file 1/Tracked Jeep/1).

96. The Canadian forces in Italy made use of DUKWs in river crossings both for reconnaissance purposes and in operating a ferry service (Cdn Ops in Med Area, series 9, p. 5; series 11, p. 10). Weasels also were reported in that theatre for operations (Historical file Italy 1944/1 Cdn Corps/C/F: Bi-monthly Summary of Ops, Hist Offr, 1 Cdn Corps, 16-30 Nov 44).

97. Other Mechanical Transport. The great majority of the "B" vehicles held by the Canadian Army continued to be Canadian-made. The picture in this respect has not noticeably changed since the last report. Supplies were adequate to maintain establishments in the field. Deficiencies that might appear from time to time with regard to any particular type of vehicle were balanced by surplus holdings of types that would serve in lieu. There was, however, at the end of 1943 a shortage of 15-cwt wireless vehicles which led to the employment of Heavy Utility Trucks in a role for which the 15-cwt might be preferred (C.M.H.Q. file 1/Veh Meetings/1: Minutes of Meeting held at H.Q. First Cdn Army, 5 Oct 43; C.M.H.Q. file 1/Eqpt Pol Ltr/1/2: Equipment Policy Letter No. 92, 3 Dec 43; Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position State, 31 Jan 45). It might also be noted that supplies of the popular Jeep were not always able to keep pace with increased demands. In May First Cdn Army held a surplus of about 200, whereas at the end of November with increased total holdings there was a deficiency of nearly 300 (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position States).

98. A few types of "B" Vehicles were supplied as a matter of policy from British sources. Several specialist vehicles for which there was a very small Canadian requirement were supplied in this way. One was the 3-ton Troop Carrying Lorry for which the British Bedford T.C.V. was used. Production of a Canadian vehicle with the same capacity was being considered (C.M.H.Q. file 1/Veh Meetings/1/2: Equipment Policy Letter No. 92, 3 Dec 43). But the most notable examples of "B" vehicles supplied by the British were Light Reconnaissance Cars and Motorcycles. The standard Light Reconnaissance Car in the Canadian Army was the Humber III (C.M.H.Q. file 1/Scout Car/1: Tel. O. 182, G. First Cdn Army to S.D.(W), C.M.H.Q., 23 Jan 44; C.M.H.Q. file 1/Veh Meetings/1/2: Equipment Policy Letter No. 92, amendment No. 3, 18 Apr 44). A number of Canadian Otters were issued to R.C.A.S.C. units, but this was not a normal establishment (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position States). The decision to change from the heavy motorcycle (Harley - Davidson of U.S. Manufacture supplied from Canada) to the light motorcycle using the British Norton and Matchless was taken in the summer of 1943 (C.M.H.Q. file 1/Veh Meetings/1: Minutes of Meeting held in office of S.D.(W), C.M.H.Q., 30 Sep 43). The changeover was completed early in 1944. First Cdn Army continued to hold a few Harley - Davidson machines as well as a few other British makes, but the great majority of the motorcycles held were Norton and Matchless (Historical file: Cdn Units 21 Army Group, "A" and "B" Vehicle Position States). In November it was decided to use the Harley - Davidson once more in some R.C.A.S.C. units, and Provost Corps units in Army Troops (C.M.H.Q. file 1/MC/1: Letter, 15 Nov 44).

GENERAL

99. In comparing the situation during the period covered by this report with earlier years, a great difference is apparent. The major problem was no longer a matter of making up serious deficiencies, but rather of deciding what type of equipment was to be employed. It was a question of considering relative availability and suitability of various types. Another problem was the disposal of equipment no longer needed or its conversion to some new use. Examples are the cancellation of the order for Skink anti-aircraft turrets, the conversion of Ram Tanks for various specialist jobs, and the matter of the surplus of Grizzly tanks and Ronson Flame Throwers.

100. It should be emphasized that this report, like its predecessors, covers only a part of the equipment of the Canadian Army, and that only in a very general way. Much of the subject is of a technical nature which would require specialist handling. It would expand this report to unwieldy proportions if an attempt were made to cover every aspect of the equipment situation.

101. This report was prepared by Captain J.E.A. Crake, C.I.C. It was submitted in draft to S.D.(W), C.M.H.Q., and D.Q.M.G., C.M.H.Q. for comment. The substance of their comments was incorporated and a revised draft again submitted. Further comments were received and the report as now forwarded takes account of these. It is accordingly believed to be, within the limits noted in para. 100, an accurate and reliable statement of the facts.

J.E.A. Crake Capt

for (C.P. Stacey) Colonel,
D.D. Hist Sec.
CANADIAN MILITARY HEADQUARTERS.

APPENDIX "A"

TOP SECRET

13/Sten/1/2 (DQMG)

CANADIAN MILITARY HEADQUARTERS
2 Cockspur Street,
London, S.W.1.

DA & QMG
First Cdn Army

10 Aug 44

Machine Carbines

1. With reference to the report on the Sten Machine Carbines on page 11 of Cdn Ops in N.W. Europe Jun 44, Extracts from War Diary and Memoranda (series 2), the following information which has been drawn, without prejudice, from several sources is forwarded for your assistance in assessing the defects reported and remedial action required.

2. Thompson Sub-Machine Gun

In considering the recommendation made in the report that the TSMG replace the Sten, the following points should be given full weight:-

(a) Policy has been decided that British and Canadian troops of 21 A Gp be armed with the Sten.

(b) The TSMG is not in good supply. A small stock is kept in UK for Commandos and if Cdns were to change to the TSMG it would be at least two months before they would receive the first shipment.

(c) All marks and types of TSMGs in the U.K. cannot be used satisfactorily with the steel case ammunition now being supplied, nor can they all be modified to take this ammunition. Adoption therefore would result in complaints being received the first time steel case ammunition and unmodified TSMGs were married up in some Cdn formation.

3. Sten Machine Carbines

In considering the faults described in the extracts, it is pointed out that these complaints have already been forwarded through the normal channels and some have been dealt with and others are being investigated.

4. It is emphasized that the Sten is expected to be a high wastage weapon and production caters to this end. The weapon should be scrapped when it will not function correctly and fewer attempts to rectify faults should be made by Unit Armourers and Workshops.

5. The following comments are submitted on the complaints listed:-

(a) that the mechanism jams with only a slight accumulation of dust and sand is not in agreement with the results of the exhaustive sand and mud tests carried out with this weapon before its adoption. Overall magazine covers designed to keep out sand, mud and water are at present under investigation and have so far proved satisfactory, but if accepted and issued will not do away with the regular and proper weapon maintenance that any weapon requires.

(b) that the magazine spring acquires set and becomes weak when the magazine is left loaded for any length of time, was investigated and loaded magazine trials were carried out with magazines returned from Normandy as faulty. The sample magazines complained of were examined by weapon technical experts and tested with the magazine fully loaded for periods of six hours to fourteen days. Tests are continuing for longer periods. Two springs only showed slight signs of set, and even these were within the permitted limits. It was found on firing that all the magazines functioned perfectly. When received from Normandy the magazines were very dirty, and it is far more likely that the trouble is caused by dirty magazines than by any fault of the spring. Arrangements should be made to unload magazines and clean them and the ammunition every day.

(c) that the Sten will fire automatic or part automatic when set for single shot is well known and was found to be largely due to light loaded ammunition until last year when the heavy load was introduced. With the British heavy load and most Continental 9-mm ammunition, the bolt is driven far enough back to engage and be retained in the recoil position when the change lever is set for single shots. Double taps and runaway guns are seldom found with the latest manufactured ammunition. Another reason for double taps and runaway guns is a worn change lever which jumps when set for a single shot. The remedy for this is the same as for any worn store - scrap it.

(d) that the weapon can be accidentally discharged if dropped when the bolt is home is only too true of some marks of Sten. In earlier production Marks II and III Stens, no safety catch is provided. It is, therefore, possible for the gun to fire by being "bounced off" when the action is forward and the magazine is in position. This can be avoided by placing the cocking handle in the safety slot provided in the weapon. If

the cocking handle is left in the safety slot for long periods, the return spring will be kept compressed and may lose some of its resilience. To avoid this, the cocking handle should not be kept in this position longer than is absolutely necessary. In the Mk V Sten the cocking handle is re-designed so that it will project through the body casing of the weapon thus rendering "bounce off" impossible as the breach block is kept stationary in the forward position. Steps have also been taken for the provision of this new cocking handle for Mk II and Mk III Carbines, which can be easily modified in Ordnance Workshops. Mk II and III weapons thus modified cannot be "bounced off". To carry out this modification in 21 Army Gp, 50,000 cocking handles were flown over to France and further shipments are being made according to the demands from Workshops. 174,000 cocking handles are presently in stock in the UK and France awaiting these demands and 80,000 are coming off production weekly. An E.M.E.R. on this modification has been published by 21 Army Gp and will be published for action in the UK in one month.

(e) that the magazine is too wide for the rounds and consequently causes jamming is incorrect. Apparently someone has noticed the magazine is wider than the base of the round and so jumped to conclusions. The magazine is the same type as the German 9-mm Schmeisser and it was designed as a double column magazine and is, therefore, no more too wide for its ammunition than the No. 4 rifle magazine for the .303, as this rifle magazine is also a double column magazine. To double column the rounds give us the means by which a large number of rounds can be got in a short magazine. Except for small handbag models most automatic weapons have double column magazines.

(f) incorrect loading is the reason for the complaint that the lips of the magazines bend and cause jamming of the rounds in the chamber. This is particularly cautioned against in S.A.T. Vol. 1 Pamphlet No. 21 page 12, which reads in part:-

> "Insert a round, base first, <u>under</u> the lips of the magazine (NEVER try to force a round downwards between the lips, or it may be damaged)."

Early pattern magazines had only one thickness of metal at the lip while the latest patterns have two thicknesses and are very robust. The remedy for this fault is to scrap the faulty magazine and not to attempt to repair it.

(g) the complaint that the firing pin is too short and causes misfires, also that it wears out quickly has never been heard before by D of A (SA), though all complaints, questions of design, etc., pass through that Directorate. It is suggested that the trouble is due to dirty bolt heads, the remedy for which is cleaning of the weapons.

(h) the first sentence in this complaint to the effect that the magazine is held by the left hand is a misstatement, as the weapon should NEVER be held

by the magazine. Not only will the pressure on the magazine catch release the magazine from its housing as stated in the complaint, but the magazine will be pulled out of alignment and faulty feed will result. The pamphlet on the Sten Carbine reads in part:-

> "Grasp the barrel nut with the left hand well clear of the ejection opening and the wrist under the magazine."
> (S.A.T. Vol. 1 Pamphlet No. 21 page 14).

If this method of holding was used, complaints such as (H) would not be made.

6. It will be seen from the above that where there is substance to the complaint, steps have already been taken to overcome the fault or there is a remedy through:-

(a) Correct handling by the user.
(b) Daily maintenance and cleaning.
(c) Scrapping of the weapon or parts as soon as a fault appears.

(sgd) J.H. MacQueen, Brig.
for (P.J. Montague)
Major-General
In Charge of Administration
CANADIAN MILITARY HEADQUARTERS

APPENDIX "B"

EQUIPMENT STATE, CANADIAN UNITS

IN

FIRST CDN ARMY JUNE 1944

The following shows the state of equipment of the Canadian Forces at the start of operations in Normandy in June 1944. Figures for weapons are taken from C.M.H.Q. file 13/Equip State/1/7: Equipment State, Cdn Army in U.K. as at 31 May 44. Vehicle totals are extracted from "Monthly Vehicle Position Report No. 3, as at 31 May 44, compiled by 21 Army Group," in Historical Section file.

	Establishment	Held	Deficiencies
Rifles No. 4	51224	52305	Surplus
No. 4(T) Snipers'	188	204	Surplus
Pistols No. 2 .38-in	9234	8680	554
Machine Carbines (Sten)	33687	36068	Surplus
L.M.G. (Bren)	4958	5120	Surplus
M.M.G. (Vickers)	92	91	1 (a)
PIAT	1758	1755	3 (a)
Mortars 2-in	712	780	Surplus
3-in	144	152	Surplus
4.2-in	36	33	3 (a)
Guns 20-mm Polsten	72	72	Nil
40-mm A.A. (Tractor-Drawn)	144	113	31 (b)
40-mm A.A. (S.P.)	72	103	Surplus
6-pr Anti-tank	186	207	Surplus
17-pr Anti-tank	112	80	32 (c)
3-in M10 S.P. Anti-tank	48	60	Surplus
25-pr Tractor-Drawn	192	96	96 (d)
25-pr S.P.	24	25	Surplus
5.5-in Gun-Howitzer	48	48	Nil
3.7-in Heavy A.A.	24	23	1 (a)
Tanks Cruiser (Sherman) *	412	490	Surplus
Light (Stuart) *	83	36	47 (a)
O.P. (Sherman) *	55	11	44
O.P. (Ram) *	32	32	Nil
A.A. (Crusader) *	48	16	32 (a)
A.R.V. (Sherman) *	25	22	3 (a)
Bridge-Laying (Valentine)	6	6	Nil
Carriers Universal	725	1017	Surplus
Universal (T16)	300	155	145 (e)
M.M.G.	84	216	Surplus
Mortar	237	281	Surplus
Trucks 15-cwt Armd Personnel	414	179	235 (f)
Half-Tracked	72	260	Surplus
Armoured Cars Staghound	88	85	3
Humber	63	46	17 (a)
Scout Cars Humber	180	116	64 (g)
Cars Light Reconnaissance	243	239	4 (a)

* The following figures for 6 Jun 44 have been supplied by Q (A.E.), C.M.H.Q. (C.M.H.Q. file 24/Reports/1/3: Q (A.E.) Memorandum, 15 May 45):

		Establishment	Held	Deficiencies	
Tanks	Cruiser (Sherman)	568	542	26	(a)
	Light (Stuart)	96	69	27	(a)
	O.P. (Sherman V)	62	62	-	
	(Sherman III)	10	10	-	
	(Ram)	32	32	-	
	A.A. (Crusader)	20	15	5	
	A.R.V. (Sherman)	28	25	3	(a)

(a) These deficiencies were in formations which did not see action until a month later. The deficiencies were made up during June.

(b) 3 Cdn Inf Div held 36 S.P. guns in lieu. 4 Cdn Armd Div had a deficiency of 5 of the latter; they received 4 in June.

(c) 3 Cdn Inf Div held 16 6-pr and 16 3-in M10 in lieu for the assault landing. 4 Cdn Armd Div had a deficiency of 4 of the latter; they received them in June.

(d) 3 Cdn Inf Div held 96 105-mm M7 S.P. in lieu.

(e) Other types of carrier held in lieu.

(f) Deficiency partly covered by surplus Half-Tracks held. Sufficient stocks of one or the other were issued during June.

(g) Deficiencies covered by 102 Lynx I.

APPENDIX "C"

EQUIPMENT STATE, CANADIAN ARMY

IN

NORTH-WEST EUROPE DECEMBER 1944

Figures for weapons are taken from C.M.H.Q. file 13/Equip State/2/5: Equipment State of the Canadian Units in First Cdn Army 21 Army Group as at 31 Dec 44. Vehicle totals are extracted from "Cdn Units 21 Army Group "A" and "B" Vehicle Position State as at 31 Dec 44", in Historical Section file.

	Establishment	Held	Deficiencies
Rifles No. 1 Mk 3	Nil	135	Surplus
No. 4	48840	54595	Surplus
No. 4 (T) Snipers'	186	182	4
Pistols No. 2 .38-in	Nil	3381	Surplus
9-mm Browning	10573	7980	2593
.45 Colt	Nil	2	Surplus
Machine Carbines (Sten)	32116	34013	Surplus
L.M.G. (Bren)	5148	5816	Surplus
M.M.G. (Vickers)	101	102	Surplus
PIAT	1758	1849	Surplus
Mortars 2-in	670	738	Surplus
3-in	144	149	Surplus
4.2-in	36	39	Surplus
Guns 20-mm Polsten	Nil	1	Surplus
40-mm Tractor-Drawn	72	54	18
40-mm S.P.	72	90	Surplus
6-pr A tk	190	202	Surplus
17-pr A tk	80	80	Nil
17-pr M10 S.P. (Sherman)	60	33	27
3-in M10 S.P. (Sherman)	Nil	23	Surplus
25-pr	168	168	Nil
25-pr S.P. (Ram)	48	49	Surplus
5.5-in	48	32	16
4.5-in	Nil	16	Surplus
3.7-in A.A.	24	24	Nil
Tanks Cruiser (Sherman 75-mm)	280	286	Surplus
Cruiser (Sherman 17-pr)	150	162	Surplus
Cruiser (Crusader III)	Nil	1	Surplus
Light (Stuart)	77	79	Surplus
O.P. (Sherman)	48	19	29
O.P. (Ram)	Nil	18	Surplus
O.P. (Crusader)	2	2	Nil
A.A. (Crusader III)	Nil	13	Surplus
A.R.V. (Sherman)	25	24	1
A.R.V. (Ram)	2	Nil	2
A.R.V. (Grant)	Nil	1	Surplus
Bridge-Laying (Valentine)	6	1	5
Tower (Ram)	24	26	Surplus
Tower (Crusader)	24	14	10
Armd Personnel Carriers (Ram)	106	51	55
Armd Ammunition Carriers (Ram)	49	1	48
Carriers Universal	716	812	Surplus
Universal T 16	348	266	82

Mortar 3-in and 4.2-in	237	276	Surplus
M.M.G.	100	139	Surplus
A.O.P.	80	Nil	80
Trucks 15-cwt Armd Personnel	103	249	Surplus
Trucks Half-Track	387	399	Surplus
Armd Cars Staghound	83	77	6
Humber	17	19	Surplus
Daimler	56	56	Nil
A.E.C.	Nil	2	Surplus
A.A. Staghound	5	Nil	5
Scout Car Humber	109	149	Surplus
Daimler	Nil	12	Surplus
Ford (Lynx)	65	52	13
Cars Light Recce Humber	256	73	183
G.M.C. (Otter)	Nil	173	Surplus
Weasels Amphibious	Nil	5	Surplus
Cars 8-cwt Amphibious (Ford)	Nil	3	Surplus

Cdn Sec 1 Ech H.Q., 21 Army Group Cable Q.G. 92 dated 5 Jan 45 States as follows: "Equip State, 31 Dec 44. Weapons no major deficiencies. "B" Veh Posn good. "A" Veh very satisfactory".

APPENDIX "D"

EQUIPMENT STATE, CANADIAN FORCES

IN

A.A.I. NOVEMBER 1944

Figures for weapons are taken from C.M.H.Q. file 13/Equip State/2/5: Equipment State of Canadian Forces in A.A.I. as at 31 Dec 44. Those for vehicles are not available.

	Establishment	Held	Deficiencies
Rifles No. 4	25295	31270	Surplus
No. 4 (T) Snipers'	124	134	Surplus
Pistols All Types	6563	6954	Surplus
Machine Carbines All Types	Nil	21544	Surplus
S.M.G. .45-in M3	18365	Nil	18365
L.M.G. (Bren)	3036	3483	Surplus
M.M.G. (Vickers)	111	135	Surplus
PIAT	1082	801	281 (a)
Mortars 2-in	499	484	15 (a)
3-in	90	94	Surplus
4.2-in	56	44	12 (a)
Guns 20-mm	188	12	176 (a)
40-mm Tractor-Drawn	36	37	Surplus
40-mm S.P.	36	37	Surplus
6-pr A tk	144	126	18 (a)
17-pr A tk	27	34	Surplus
3-in M10 S.P.	51	29	22 (a)
A tk other types	Nil	7	Surplus
25-pr	120	130	Surplus
25-pr S.P.	24	Nil	24
105-mm M7 S.P.	Nil	24	Surplus
5.5-in	48	33	15 (a)

(a) "War Office state that there are sufficient available from A.O.Ds. in theatre to meet all deficiencies in holdings in Italy."

APPENDIX "E"

EQUIPMENT STATE, CANADIAN FORCES

IN

UNITED KINGDOM DECEMBER 1944

Figures for weapons are taken from C.M.H.Q. file 13/Equip State/1/4: Equipment State of C.M.H.Q. and C.R. units as at 31 Dec 44. Those for vehicles are not available.

	Establishment	Held	Deficiencies
Rifles No. 1 Mk 3	Nil	23	Surplus
No. 4	25409	38830	Surplus
No. 4 (T) Snipers'	91	89	2
Pistols No. 2 .38-in	Nil	5316	Surplus
9-mm Browning	4796	895	3901
.45 Colt	77	79	Surplus
Machine Carbines (Sten)	18449	13920	4529
Machine Carbines (Thompson)	346	913	Surplus
S.M.G. .45-in M3	Nil	185	Surplus
L.M.G. (Bren)	982	1280	Surplus
M.M.G. (Vickers)	26	43	Surplus
PIAT	317	486	Surplus
Mortars 2-in	299	365	Surplus
3-in	56	93	Surplus
4.2-in	18	27	Surplus
Guns 20-mm Polsten	11	6	5
40-mm Tractor-Drawn	33	14	19
40-mm S.P.	18	4	14
6-pr A tk	85	46	39
17-pr A tk	13	15	Surplus
17-pr M10 S.P.	Nil	18	Surplus
3-in M10 S.P.	16	19	Surplus
25-pr	37	47	Surplus
25-pr S.P.	8	21	Surplus
5.5-in	11	11	Nil
3.7-in A.A.	5	1	4

APPENDIX "P"

BATTLE EXPERIENCE QUESTIONNAIRES

The "Battle Experience Questionnaires" completed by Canadian officers hospitalised in the United Kingdom after return from theatres of operations are a source of useful information on the reactions of fighting units to their own and enemy equipment. Officers were asked to list weapons as "outstandingly effective" and as "ineffective". Arrangements have been made for these questionnaires to be passed to D.H.S., D.N.D., when they have served the purposes of technical experts.

During March, April and May, 1945, questionnaires passing through the hands of Hist Sec, C.M.H.Q., included 19 from Canadian infantry officers with experience in North-West Europe. Of these, 12 listed the Sten as ineffective, while none listed it as "outstandingly effective". A complete statistical study of these questionnaires might be undertaken to advantage.