NOTE

This is a preliminary narrative and should not be regarded as authoritative. It has not been checked for accuracy in all aspects, and its interpretations are not necessarily those of the Historical Section as a whole.

Ce texte est préliminaire et n'a aucun caractère officiel. On n'a pas vérifié son exactitude et les interpretations qu'il contient ne sont pas nécessairement celles du Service historique.

Directorate of History
National Defence Headquarters
Ottawa, Canada
K1A 0K2

July 1986

SECRET



REPORT NO. 137

HISTORICAL OFFICER

CANADIAN MILITARY HEADQUARTERS

29 May 45

Enemy Air Attack and the Canadian Army in the United Kingdom, 1943-45 : The V-Weapons.

1. Report No. 106, dated 29 Nov 43, was an account of the effect of enemy air action on units and personnel of the Canadian Army in the United Kingdom during the period 1939-43, and of the part played by Canadian units in the defence of Britain against enemy air attack during that period. The present report continues this account, and rounds off the subject; for hostilities in Europe came to an end while it was in preparation.

2. The period treated in the present report witnessed further raids by German aircraft against the United Kingdom, although none of this activity was on a scale equal to that of 1940-41. It also saw, however, more important attacks delivered by new weapons - the V-1 or flying bomb and the V-2 or long-range rocket. Both these forms of attack, directed primarily at London, caused casualties to the Canadian Army. It is worth noting in passing, moreover, that these attacks, directed from bases on the coasts of France and the Low Countries, have a close relationship to the operations of First Cdn Army in 1944 and 1945. Canadian troops, operating along the coast on the extreme left of the Allied line in North-West Europe, cleared in 1944 the majority of the sites in France from which flying bombs had been launched against England, and in 1945 played an important part in severing the lines of communication between Germany and the sites in Holland from which rockets had been launched. The story of the V-weapons thus has a Canadian interest extending beyond the mere damage and casualties inflicted upon establishments and personnel of the Canadian Army in the United Kingdom, and it is desirable to place the main points of the story on record in narrative form for the benefit of the future Official Historian.

## ATTACKS BY PILOTED AIRCRAFT, 1943-45

3. As noted in Report No. 106 (para 17), the latter part of the year 1943 witnessed unimportant nuisance raids by the enemy air force against Britain. These continued through the early weeks of 1944. For example, although the weekly report for the period 6-13 Jan 44 ran simply, "There has been no enemy activity during the period" (War Cabinet: Chiefs of Staff Committee: Weekly Résumé (No. 228) of the Naval, Military and Air situation from 0700 6th January, to 0700 13th January, 1944: file in possession of A.D.M.I., C.M.H.Q.), the similar return for the period 20-27 Jan noted a not inconsiderable bombing attack on "South-eastern England and the London area" on the night 21/22 Jan, "44 incidents" being reported in London (ibid., No. 230).

4. These minor routine attacks were succeeded in the latter half of February by the most important raids since the "blitz" of 1941. Beginning on the night 18/19 Feb, London was raided "in appreciable force" on five nights (18/19, 20/21, 22/23, 23/24 and 24/25 Feb), and the attacks were officially described as "the heaviest on London since the 10th/11th May, 1941" (ibid., No. 234; cf. No. 235). The civilian casualties for the week ending 0600 hrs on 23 Feb were, for the whole country, calculated at 442 killed, 995 seriously injured, and 67 missing (ibid., No. 234). It was subsequently announced that civilian casualties for the month of February amounted to 961 killed or missing, believed killed, and 1,712 seriously injured, the heaviest total since May 1941 and actually heavier than the grand total for the preceding seven months (Daily Telegraph, 14 Mar 44).

5. In the course of these attacks on London a considerable number of fires were started. Some buildings occupied by Canadian establishments were damaged or destroyed. On the night of 20/21 Feb the Government Building, Bromyard Avenue, Acton, housing the Canadian Overseas Records Office and the offices of the Chief Paymaster, received a direct hit on its south end - a portion of the building not occupied by Canadian offices. The Canadian establishments suffered only minor damage. On the night 18/19 Feb the building occupied by No. 6 Canadian Provost Company at 6 Elm Tree Road, St. John's Wood, was destroyed. The building was struck by a phosphorus bomb and a canister of incendiaries and was burned out. One N.C.O. was injured. (Appx 14 to War Diary, 6 Cdn Pro Coy, February, 1944). This series of raids caused considerable damage in the Whitehall area; on the night 20/21 Feb one bomb fell in the roadway in Whitehall itself outside the Treasury, just north of Downing Street, and two others on the Horse Guards Parade (ibid.). It was stated in the press that the largest number of aircraft employed by the enemy during this series of attacks was about 175 on 18/19 Feb; of these about 100 reached Greater London (Daily Telegraph, 28 Feb 44). The enemy's scale of effort was thus less than half that of the heaviest raids of 1941.

6. These raids caused a number of Canadian Army casualties. A nominal roll of casualties suffered by enemy action in the United Kingdom furnished by Records Office, C.M.H.Q., indicates that three other ranks were killed during February (one on 20 Feb and two on 24 Feb), while thirteen other ranks are returned as wounded during the month, all on dates ranging from 18 to 24 Feb (C.M.H.Q. file 18/Air Raids UK/1).

7. These February raids of 1944 were the last really significant effort of the German air force against the United Kingdom, although there was some raiding during the succeeding month of March. Minor attacks continued until the beginning of the flying bomb offensive in June. Thereafter activity by piloted aircraft virtually ceased for a long period. In successive months the monthly General Note on Operations issued by A.C.I.C.S. (Operations), War Office (C.M.H.Q. file 4/Gen Apprec/3/2) reported no enemy air activity against the United Kingdom except flying bombs and rockets. (The General Note for December 1944 observes, "There has been the usual activity by aircraft launching flying bombs, but apart from that, only one enemy aircraft has crossed the coast of this country".)

There was however a slight final recrudescence of activity by piloted aircraft early in March 1945 when the Germans used "long-range fast night fighters carrying a limited number of bombs" (Speech of Sir A. Sinclair in Parliament, The Times, 7 Mar 45). These attacks included "intruder" activities. "The largest force engaged in these operations was some 70 enemy aircraft, and on this occasion nineteen of our returning bombers were either shot down or crashed" (A.C.I.G.S. General Note for March, 1945). These operations in March, and particularly those of the night 3/4 Mar 45 (that on which 70 aircraft were employed) were the last stroke of the Luftwaffe proper against Britain. Examination of Home Security Intelligence Summaries indicates that the last actual sorties over Britain, and the last attacks, took place on the night 20/21 Mar, when about 10 aircraft were employed (Home Security Int Summary No. 4052, for 12 hours ending 0600 21 Mar 45).

## THE FLYING BOMB (V-1)

8. The Germans during this war have been fond of boasting of "secret weapons" which they would in due course unveil with terrible effect. One new weapon used in the early part of the struggle was the magnetic sea mine. Much later came the glider bomb (see below, para 14 and Appx "B", para 1). After Allied air attacks on Germany had grown to formidable proportions, German spokesmen began to utter threats of retaliation against the United Kingdom to be delivered by other secret weapons. These threats materialized during the summer and autumn of 1944 in a form which showed that the enemy's statements had not been altogether without foundation. The weapons employed were certainly new, extremely ingenious and very destructive (although somewhat less so than the enemy propaganda had suggested). They may well represent the beginning, in some respects, of a new era in warfare.

9. Of the moral aspect of these weapons there is no point in speaking at length here. It is enough to remark that in their present form they are essentially indiscriminate missiles; it is impossible to aim them with any accuracy at a target of a diameter smaller than several miles (Greater London is the ideal target for them, and so far as the United Kingdom is concerned it has absorbed almost the whole of the enemy's attention). The V-weapons[1] accordingly must be considered as directed primarily against the civilian population of large communities. The implications are obvious.

10. For at least a year before the enemy discharged his first flying bomb in June 1944 it was apparent to the Allied authorities that he was engaged in the preparation on the French coast of the English Channel (in the Pas de Calais, Dieppe and Cherbourg areas) of installations which implied "new forms of attack" against the United Kingdom. The development of these installations, needless to say, was watched by the British Government with the greatest care and interest, and every scrap of intelligence relating to the enemy's intentions and the means of countering them was collected and collated.

---

1 V - Vergeltungswaffe (revenge weapon).

11. The sites on the Channel coast were evidently attracting attention at least as early as June 1943. Two documents which serve to set on record the general information concerning these installations which was in the hands of the British Government during the period before they came into action are attached to the present report as Appendices "A" and "B". The first is an extract from the A.C.I.G.S. General Note on Operations for December 1943 (C.M.H.Q. file 4/Gen Apprec/3). The second, which evidently derives originally from R.A.F. sources, is a note attached to 1 Cdn Corps Air Summary No. 31, dated 1 Mar 44. These documents together present in comparatively small compass a fairly complete picture of the menace as it was seen in high official circles in London during the winter of 1943-44.

12. It will be noted from these documents that energetic and resolute counter-measures were being taken. These consisted primarily of heavy air attacks directed against the sites. Attacks against "military installations in the Pas de Calais area" became in due course a commonplace of Air Ministry communiques. In the summer of 1944 Canadian soldiers were able to examine many of these sites for themselves, and to reach the conclusion that the work of the Allied air forces had been well and truly done.

13. The British authorities, apart from ordering these active counter-measures, also considered it necessary to take certain precautions in the London area, which was so clearly indicated as the primary target of the new weapons. It was decided that "Service and Civil Ministries will remain in London and that alternative accommodation will not be earmarked for them elsewhere. Such Ministries will, however, be provided with protected accommodation for a minimum essential staff, which will have to be capable of operating for a short period". (War Office letter to Brigadier Penhale, 23 Dec 43, C.M.H.Q. file 3/Ex Rock/1). The War Office precautionary scheme was known as Exercise "CROSSBOW". This scheme was reflected in the issuance at Canadian Military Headquarters of C.M.H.Q. Operation Instruction No. 1, dated 11 Feb 44, which provided arrangements for the operation of C.M.H.Q., if the worst came to the worst, by a skeleton staff living and working in the basement shelters. The remainder of the personnel of the Headquarters were to remain in their dispersed quarters, and if circumstances warranted it, were to be evacuated to certain designated points outside the London area. These arrangements, known as Exercise "ROCK", were elaborated in considerable detail, and were amended from time to time as circumstances dictated (C.M.H.Q. file 3/Ex Rock/1).

14. It was evidently considered desirable to warn the British public that the German threats had some foundation. On 21 Sep 43, accordingly, the British Prime Minister, in one of his periodical reviews of the war situation in the House of Commons, after referring at length to the steadily growing Allied air offensive against Germany, proceeded as follows:

> We must not in any circumstances allow these favourable tendencies to weaken our efforts or lead us to suppose that our dangers are past or that the war is coming to an end. On the contrary, we must expect that the terrible foe we are smiting so heavily will make frenzied efforts to retaliate. The speeches of the German leaders, from Herr Hitler downwards, contain mysterious allusions to new methods and new weapons which

will presently be tried against us. It would, of course, be natural for the enemy to spread such rumours in order to encourage his own people, but there is probably more in it than that. For example, we now have experience of a new type of aerial bomb which the enemy has begun to use in attacks on our shipping, close-quarter attacks on our shipping when at close quarters with the coast. This bomb, which may be described as a sort of rocket-assisted glider, is released from a considerable height, and is then apparently guided towards its target by the parent aircraft.

It may be that the Germans are developing other weapons on novel lines with which they may hope to do us damage and to compensate to some extent for the injury which they are daily receiving from us. I can only assure the House that unceasing vigilance and the best study of which we are capable are given to these possibilities. We have always hitherto found the answer to any of the problems which have been presented to us. At the same time I do not exclude, and no one must exclude from their minds, that novel forms of attack will be employed, and should they be employed I should be able to show to the House in detail the prolonged, careful examination beforehand which we have made into these possibilities, and I trust we shall be able to show the measures which will be brought into force against them.

(The Times, 22 Sep 43).

15. On 22 Feb 44 Mr. Churchill again reviewed the war in Parliament, and this time he gave rather more definite details of the growing menace. He said:

Retaliation by the enemy has so far been modest, but we must expect it to increase. Hitler has great need to exaggerate his counter-attacks in order to placate his formerly deluded population, but besides these air attacks there is no doubt that the Germans are preparing on the French shore new means of attack on this country either by pilotless aircraft or possibly rockets, or both, on a considerable scale. We have long been watching this with the utmost vigilance. We are striking at all evidences of these preparations on occasions when the weather is suitable for such action, and to the maximum extent possible without detracting from the strategic offensive against Germany.

(The Times, 25 Feb 44).

16. The effective attacks directed by the Allied air forces against the launching-sites clearly had the definite effect of retarding the German offensive programme. It had been appreciated (see Appendix "A") that the enemy could launch flying bomb attacks against England in considerable strength by late February 1944. Actually, he did not succeed in opening fire until four months later, and then certainly on a scale much smaller than he had hoped for.

17. Information subsequently obtained from German prisoners, and particularly from a German officer who had been employed as G.S.O.3 (Ops) on the staff of the 65th German Army Corps (LXV AK), commanded by General Heinemann, which was responsible for the early stages of the V-weapon campaign, includes the following facts concerning this phase of operations:

"SYSTEM 1" 25. The original system of 56 sites in the PAS DE CALAIS area and 8 sites in the CHERBOURG area, plus the two fortified sites of two ramps each at ST POL and near CHERBOURG (so-called "Wasserwerke" of which 10 were supposed to be built) were found, after the heavy air attacks starting in Dec 43, to be too vulnerable and were written off as operational sites. They were thereafter used as decoy sites and work, carried on mainly by foreigners, completed the camouflage. Of the 56 sites in the PAS DE CALAIS area, 44 had been destroyed by 1 Sep 44.

"SYSTEM 2" 26. In Jan 44, LXV AK decided that a simplified form of launching site was essential and entrusted Obst SCHMALSCHLÄGER with experiments for new designs. The new design evolved was much easier to camouflage and quicker to erect. It was planned eventually to build 50 sites a month, which was reckoned to be a much higher rate than the possible rate of detection and destruction by the Allies.

27. The areas for system 2 were identical to those of system 1, and it had been decided to have 5 alternative positions for each tp, apart from the four firing positions. 32 sites, originally surveyed as dummy sites, were built as real sites under system 2. Those sites of system 1 still in order figured as alternative positions. Actually posns number 56 and 100 were the only two of system 1 ever used for firing. Of all the sites built under system 2, 44 had also been destroyed by Allied action by 1 Sep 44; this is known to PW from the report he had to prepare for HITLER.

28. PW does not know the total number actually built under system 2, but believes that apart from 64 firing sites (i.e. for four bns of four tps of 4 sites), they had at least a further 40 alternative sites ready, and several under construction.
(Report C.S.D.I.C. (U.K.), S.I.R. 1641, 27 Apr 45: copy lent by A.D.M.I., C.M.H.Q.)

The Germans' "System 3" consisted of four additional firing sectors in the region between Rouen and Cherbourg, directed against Southampton, Portsmouth and Plymouth. "About 20 to 25 sites were ready in each sector by the time of the Invasion which, however, prevented them ever being used." (Ibid.)

18. The enemy did not in fact employ his new weapons until after the launching of the Allied invasion of Normandy, D-Day for which was 6 Jun 44. The writer has seen no evidence bearing on the manner in which the use of the flying bomb was "keyed into" the enemy's broad strategic plans; but it seems

probable that he would have preferred to use this weapon to disrupt the preparations for our invasion rather than in a mere attempt at disorganizing its communications after it had been launched. It is worth recalling in this connection that it is fairly clear that the Germans were successfully deceived as to the date of the beginning of our enterprise. [2]

19. The first flying bombs were launched against Britain on the night 12/13 Jun 44. The attack this night was on a very small scale; it might have been interpreted as experimental, but accounts by German prisoners give a different explanation (see below). Four "incidents" only were reported. Home Security Intelligence Summary No. 3490 (for twelve hours ending 0600 13 Jun 44) (file in possession of A.D.M.I., C.M.H.Q.) observed, "It is possible that the enemy employed new weapons but confirmation of this has not yet been received." It would almost seem that the public announcement made the following day gave the enemy some useful information; The Times of 14 Jun 44 contained the following item:

> A very small force of German aeroplanes spread over East Anglia and south and south-east England during Monday night.....There was a certain amount of gunfire, and one raider was brought down in east London. Part of the wreckage fell on the railway line, and the L.N.E.R. announce that some passenger services are being diverted.....

The railway incident referred to took place at Bethnal Green (Home Security Int Summary No. 3490, as above; cf. Chiefs of Staff Committee Weekly Résumé No. 250); the "raider" was in fact a flying bomb. There were no further incidents until 2330 hrs on the night 15/16 Jun, on which the enemy launched his offensive in earnest.

20. This night's events are described as follows in an account written at the time:

> Last night there was an "Alert" shortly before midnight. It was followed by sporadic aircraft noises accompanied by heavy bursts of fire. This continued at intervals. In the morning gunfire was still heard; there was a burst at 0640 hours, in broad daylight, and at 0730 hours I saw something I had never actually seen before - black puffs of flak above London in daylight. At about 0915 hours there was a heavy burst of fire in the vicinity of C.M.H.Q., followed by an "All Clear" at 0925 hours and another "Alert" and gunfire at 0945 hours. By this time it was apparent to everybody that the enemy was using a new form of attack, and in the course of the day it was publicly confirmed that "Pilotless Aircraft" were being employed.
> (Diary Historical Officer, C.M.H.Q., 16 Jun 44).

21. The same German source above referred to gives an account of the commencement of operations against London:

> 30. Operations against LONDON were supposed to start on 12/13 Jun 44(?), a date promised to the Führerhauptquartier by Obst WALTER. Although it was afterwards found that the bns were not quite ready, an attempt was made but had to be abandoned

---

2 War Diary of 6 Cdn L.A.A. Regt, June, 1944, contains an instruction issued by 102 A.A. Bde on 5 May 44 describing "possible characterists of Pilotless Aircraft". The description is very accurate except that the operational height (5,000 - 10,000 feet) is overestimated.

after launching four or five missiles. As a result GOERING took a personal interest in the matter for the first time and ordered a special court of inquiry to fix the blame for the delay. This enquiry was afterwards dropped.

31. The real start was finally fixed for 15/16 Jun(?) to take place simultaneously with a genuine air raid to be carried out by the LW with incendiaries. The LW, however, was unable to carry out its part of the plan. On this night eight missiles which failed to start exploded on the ramps through a special self-destroying fuze and destroyed the sites completely. The fuze in question was discontinued.
(Report C.S.D.I.C. (U.K.), S.I.R. 1641, 27 Apr 45).

22. From this time the offensive against the London area continued on a considerable scale. The Chiefs of Staff Committee Weekly Résumé for the period 15-22 Jun 44 (No. 251) reports, "The total of flying-bombs despatched for the week is 920, of which 680 came overland and 193 were destroyed." The further course of the flying bomb offensive can be easily traced in successive numbers of this Weekly Résumé. The statistical tables provided in these Summaries indicate that the enemy's scale of effort varied considerably from day to day and from week to week. It appears that, in terms of the average number of bombs launched per twenty-four hours, the most active seven-day period of the offensive was that ending at 0600 hrs on 6 Jul, the average for that week being 142 bombs per twenty-four hours. The next highest figure was an average of 131 for the period ending 0600 hrs on 23 Jun, at the very beginning of the offensive. (Weekly Résumé, Nos 259 and 261). After mid-August the number of bombs launched tended to decrease; and with the advance of First Cdn Army into the Dieppe and Pas de Calais areas in the first week of September, the menace was, essentially, scotched. Although the enemy began his rocket attacks almost simultaneously (see below), and although he attempted to compensate for the loss of his static launching-sites for flying bombs by launching these missiles from aircraft, the most serious phase of London's second great ordeal in this war had been ended by the victorious advance of the Allied Armies. The changed situation is registered in the A.C.I.G.S. General Note on Operations for September 1944:

> As a result of our advances on the Continent, the enemy has been driven out of all areas where he was able to launch flying bombs against LONDON from the normal static launching-sites. No such launchings have taken place since 6th September.
>
> However, airborne launchings from specially adapted He. 111's based on airfields in North-West Germany have taken place on a small scale. For instance, on the nights of 15/16 and 17/18 September some 17 bombs were launched of which only 3 reached LONDON.

23. The flying bomb offensive caused heavy casualties, though they were less heavy than those in the great air raids of 1940-41. The A.C.I.G.S. General Note on Operations for September, 1944, reported that from the start of the attack on the night of 15/16 Jun up to 6 Sep when the main attack ceased casualties for the country as a whole had been 5,817 killed, 17,086 seriously injured and 22,870 slightly injured. The vast majority of the casualties were suffered in London, where the figures were 5,381 killed, 15,777 seriously injured and 19,256 slightly injured. The same summary recorded that during this period 8,095 flying bombs had been launched, 2,337 had reached London, and 3,823 were destroyed by the combined defences. Of the latter, fighter aircraft destroyed 1,902, anti-aircraft fire 1,657 and balloons 264.

24. These attacks during the height of the summer seriously affected the life of London. This was particularly the case in the early stages, when far more of the bombs reached the city than was the case later when the defences had been perfected. Alerts were very frequent, the Alert and the All Clear frequently following each other in rapid succession. After the first couple of days, anti-aircraft guns in the Metropolitan area did not fire on the bombs; it was obviously undesirable to bring them down there if there was a chance of their passing over. Incidentally, it was considered necessary to conceal from the enemy the fact that his missiles were actually striking London; the communiques accordingly referred merely to "Southern England". The facts were finally revealed by Mr. Churchill in a timely speech on 6 Jul in which he paid tribute to London's steadfastness under bombardment. (Diary of Hist Offr, C.M.H.Q., 6 Jul 44).

25. As the offensive proceeded, there was a considerable unofficial evacuation from the London area. A large number of the London theatres closed down, as they had done in the autumn of 1940. At the end of June, when the attack was at its worst, there appeared to be as many shelterers sleeping in the tube stations as at any time during 1940-41 (Diary of Hist Offr, C.M.H.Q., 30 Jun 44).

26. Work at C.M.H.Q. was never seriously interrupted during this period. The nearest hit to the Sun Life Building was probably that of 30 Jun on the Regent Palace Hotel. The casualties caused by the flying bombs had in great part been the result of cuts by glass, and instructions were issued at C.M.H.Q. that all personnel should immediately take cover, well away from windows, when an internal alert was sounded, indicating the approach of a bomb (ibid., 28 Jun 44).

27. Although London was the main target of the flying bomb, it was not quite the only one. As had been noted at an early date (see Appx "B", para 4) the launching-sites in the Cherbourg area were within easy range of the Southampton region. Sites elsewhere were also capable of striking at this region, for it was the target of minor attacks even after the fall of Cherbourg on 26 Jun. (Information from prisoners indicates that in fact the sites lying between St. Omer and Rouen were the only ones used in France: C.S.D.I.C., S.I.R. 1641, as above). Attacks on the Portsmouth - Southampton area took place on 25/26 Jun and on 11, 12, 14 and 15 Jul (A.C.I.G.S. General Note on Operations for June and July, 1944). It should also be observed that districts on or near the "bomb highways"

between London and the south and south-eastern coasts also suffered considerably during these attacks, although as already seen there was no comparison between the number of casualties suffered there and those in London. There was an evident tendency on the part of the bombs to fall short, and in London itself the southern and south-eastern districts suffered most heavily. Croydon was particularly seriously affected.

28. Inevitably, this bombardment of London and the Southern Counties affected the Canadian Army and occasioned casualties. Certain specific incidents must be noted.

29. In London, two officers were killed on the morning of Sunday, 18 Jun, when a flying bomb made a direct hit on the Guards Chapel, Wellington Barracks, where a service was in progress. This was one of the worst "incidents" of the whole offensive; the casualties as reported in Home Security Intelligence Summary No. 3507 (for twelve hours ending 1800 21 Jun) amounted to 119 killed and 81 injured. C.M.H.Q. personnel were involved in a serious incident at Sloane Court, S.W.3, on the morning of 3 Jul, when two batmen were killed and two officers injured (C.M.H.Q. file 18/Air Raids UK/1).

30. Although 3 Cdn Inf Div and 2 Cdn Armd Bde had participated in the assault on Normandy on 6 Jun 44, at the commencement of the flying bomb attacks the rest of the Canadian field force not engaged in Italy was still in England, and practically the whole of it was standing by in the southern and south-eastern counties awaiting embarkation. In these circumstances some units inevitably suffered casualties from the new weapon.

31. H.Q. First Cdn Army during this period was still located at and about Headley Court, near Leatherhead, Surrey; and many flying bombs came down in this area. The War Diary of the Brigadier, Royal Artillery, First Cdn Army, recorded on 2 Jul 44, "At MAIN "buzz-bomb" came down in near vicinity, closest yet". H.Q. 2 Cdn Corps, which in June was located close to Dover, at Eastling Wood, saw a great many of the flying bombs passing overhead, and the missiles also caused some excitement for this Headquarters on 1 Jul as it was moving through London into its marshalling area (War Diary, H.Q., R.C.A., 2 Cdn Corps, 1 Jul 44).

32. The first serious incident affecting a Canadian field unit was on 28 Jun 44, when a flying bomb exploded close to the billets occupied by the survey section of 4 Med Regt, R.C.A., at Little Selkirk, Caterham, Surrey. This caused four fatal casualties, and eight men were wounded (three seriously), while there were minor injuries in addition (War Diary, 4 Cdn Med Regt, 28 Jun 44).

33. A further incident took place on 3 Jul 44, when a flying bomb was shot down in the lines of 6 A Tk Regt, R.C.A., in East Kent (the unit War Diary does not give the location, but C.M.H.Q. Location Statement No. 29 indicates that it was Sandling Park, Kent). As a result, six men were admitted to hospital, one being seriously injured, while a number of others were treated at the regimental aid post (War Diary, 6 A Tk Regt, R.C.A., 3 Jul 44).

34. The worst single incident, however, took place at 1815 hrs on 5 Jul 44, in the lines of the Lincoln and Welland Regiment on the southern outskirts of Crowborough, Sussex. The unit War Diary records the affair as follows:

> An enemy P-Plane, or Flying Bomb, flying NW, crashed into a strip of woods immediately adjacent to "B" Coy HQ, resulting in the deaths of seven men and serious injury to seventeen. Cas incl CSM RE Wing who died on admittance to hospital. The Coy HQ Stores and Fd Kitchen were fatally destroyed, as well as personal kit of all the coy offrs and various men.

The total fatal casualties suffered by the unit in this incident numbered nine, this including one man originally listed as missing believed killed, and another who died of wounds on 12 Jul (ibid., and information from Records Office, C.M.H.Q. file 18/Air Raids UK/1).

35. As already noted, the enemy, when deprived of his static launching-sites, took to launching flying bombs against England from aircraft. The scale of effort attainable by this method, however, was much lower, while moreover "owing to the navigational difficulties inherent in this method of launching, the aim has been inaccurate and only a very small proportion of those known to have been launched have reached the LONDON area" (A.C.I.G.S. General Note, November, 1944). A total of 284 flying bombs directed at the United Kingdom had been plotted during a period from 0600 hrs 31 Oct to 0600 hrs 30 Nov; of these, 108 had crossed the coast and only 12 had reached the London area. The defences were by now extremely efficient; 119 bombs had been destroyed by anti-aircraft fire and 19 by the R.A.F., while moreover 5 of the launching aircraft had been destroyed (ibid.). From November onwards, even this attack was "on a reduced scale" (A.C.I.G.S. General Note, December, 1944) and air launching activity ceased altogether after the night 13/14 Jan 45 (General Note, February, 1945, and cf. ibid., March, 1945). The last phase of flying bomb activity against the United Kingdom took the form of a small-scale revival of launching against London from ground sites. This began on 3 Mar 45. "Twenty-two bombs were plotted during the first 24 hours, but since then attacks have only been carried out intermittently on a small and inaccurate scale" (A.C.I.G.S. General Note, March, 1945). These bombs were discharged from the region of western Holland still in enemy hands. It is clear that the enemy had succeeded in modifying his original design so as to increase the range of the bomb. While information is still not complete, "the introduction of wooden wings, and possibly a lighter warhead, had reduced the overall weight of the missile, which is now clearly capable of flying at least 200 miles" (ibid.). While it is stated that the last flying bomb was launched on 30 Mar 45 (see below, para 54), none of the missiles reached Britain on this date. The last to come down on British soil landed at Iwade, near Sittingbourne, Kent, at 1000 hrs on 29 Mar, causing slight damage and no casualties; at least two others were destroyed offshore later on the same day (Home Security Int Summary No. 4069, for 12 hours ending 1800 29 Mar 45; all later summaries are nil returns).

36. It remains to give a very brief account of the nature of the flying bomb itself. A fairly detailed description of the missile is to be found in the Chiefs of Staff Committee Weekly Résumé, No. 251 (0700 15 Jun - 0700 22 Jun 44). A much shorter one may be quoted here:

The Flying Bomb

A specimen flying bomb has landed intact. It is of a rather crude all steel construction and dimensions are:-

Wingspan. . . . . 16 ft.
Length of fuselage. . 21 ft. 10 ins.
Maximum width . . . . 2 ft. 10 ins.

On the rear of the fuselage a steel tube approximately 12 ft. long and 1 ft. in diameter is mounted, containing the jet propulsion motor which operates on the "impulse duct" principle, and is of very simple construction. The warhead is equivalent to a 1000 kg. bomb and is fitted with an instantaneous fuze to obtain maximum blast effect. It is known that a further type of flying bomb has operated, with a wing span of 17 ft. 6 ins. and a longer and more pointed nose.
(A.C.I.G.S. General Note on Operations, June, 1944).

Considerable variation in the speed of the missile was reported. "Over land flying bombs normally fly at 2/4000 feet at speeds of up to 400 m.p.h. near the end of the run, when the engine automatically cuts and the flying bomb descends in a dive" (ibid.).

37. The bomb, thanks to its very heavy blast effect, caused tremendous damage to buildings. In one incident known to the writer, a flying bomb made a direct hit on a house in north-west London. This building entirely disappeared. Houses very close by were so badly damaged as to be uninhabitable, and a wing of one had to be demolished. Other houses within a very considerable circle were damaged to the extent of broken windows, stripped of tiles, and other minor damage. Windows were broken in buildings more than half a mile away. The multiplication of incidents like this created a most serious housing situation in the London area and caused considerable discomfort and misery during the winter of 1944-45.

THE LONG-RANGE ROCKET (V-2)

38. A period of nearly three months separated the beginning of the flying bomb offensive from the enemy's first use of his second new bombardment weapon, the heavy long-range rocket known as V-2. During this interval, while the flying bomb attacks were in progress, there was considerable confidential discussion in official circles in Britain as to the possibility of rocket attacks, their probable scale, and the precautionary measures to be taken. In mid-August it came to the notice of C.M.H.Q. that "the War Office had revised their 'stay-put' policy and were, in effect, actually preparing a scheme for evacuation of non-essential departments should the contingency arise" (Memorandum, D.C.G.S. to M.G.A., 14 Aug 44, C.M.H.Q. file 3/Ex Rock/1). Consideration was accordingly given to revising the arrangements at C.M.H.Q., and it was decided to draft a scheme providing for the complete evacuation on a working basis, in case of serious emergency, of all those sections of C.M.H.Q. whose presence in London was not absolutely essential. In consequence, the C.M.H.Q. instructions for Exercise "ROCK" were

modified by C.M.H.Q. Operation Instruction No. 2, dated 23 Aug 44 (C.M.H.Q. file 3/Ex Rock/1/2) and work proceeded on the detailed preparation of an instruction for Exercise "TREK", which was designed to replace "ROCK" and to provide for the evacuation to safer areas of all non-essential sections. Before the instructions were complete, however, information was received (4 Sep 44) that the War Office had not only suspended all imminent moves but had also suspended planning for ultimate moves (Memorandum by S.D.(A), C.M.H.Q., 4 Sep 44, C.M.H.Q. file 3/Ex Trek/1). C.M.H.Q. conformed to the new arrangement, and the instructions for Exercise "TREK" were never actually issued. Exercise "ROCK" remained in effect, as amended, until 4 May 45, on which date, in view of the extremely favourable state of operations on the continent, C.M.H.Q. Operation Instruction No. 2 was cancelled. (C.M.H.Q. file 3/Ex Rock/1/2).

39. The suspension of planning for the War Office evacuation scheme (which was known as Exercise "BIG BEN") was probably due to the very hopeful appearance of operations in September. The A.C.I.G.S. General Note on Operations for August, 1944, after giving a description of the rocket weapon which subsequently proved to have been quite accurate, proceeded as follows:

> Imminence of attack
>
> Recent information indicates that rocket bombardment was due to start in the first half of September, but might possibly start earlier.
>
> However, the rapid advance of the Allied forces, the bombing of the rocket storage depots and special fuel plants, the interruption of communications and the difficulties of meeting his field armies' competing demands for transport and supplies, may well force the enemy to abandon altogether the projected rocket bombardment.

40. This appreciation turned out to have been somewhat optimistic, for the enemy did bring his rocket weapon into action. Its operations, however, were on a comparatively limited scale throughout and never such as to warrant further consideration of the evacuation scheme. The V-2 campaign, incidentally, appears to have been conducted by S.S. troops, whereas V-1 was handled by the Wehrmacht (First Cdn Army Int Summary No. 307, 3 May 45, Part II, para 1 (b)).

41. The rocket attack began on the evening of 8 Sep 44, "with the almost simultaneous arrival of two projectiles, one in the outskirts of West LONDON and the other in ESSEX" (A.C.I.G.S. General Note on Operations, September, 1944). The two rockets actually fell at Chiswick and at Epping Upland (The Times, 27 Apr 45). As it was considered that any public statement might be of use to the enemy technicians, no announcement whatever concerning the new attack was made by the British Government, and the Germans themselves did not refer to it in their communiques until 8 Nov 44, exactly two months after it began (Daily Telegraph, 9 Nov 44). Needless to say, the population of the areas affected was well aware that rockets were being employed; and as long as official secrecy was maintained it was customary in conversation to refer to these explosions as caused by "gas mains".

42. It is worthwhile to assemble, on the basis of contemporary official summaries and later public statements, an outline of the course of the rocket attacks. From 8 Sep until 17 Sep the attack proceeded "on a very light scale", 26 rockets landing in the United Kingdom. All appeared to be aimed at London, and nine fell within a radius of 10 miles of Charing Cross. On 17 Sep there began the important Allied operation known as "MARKET GARDEN", in which a great airborne force was dropped in Holland with a view to seizing crossings over the various branches of the lower Rhine and opening the way into Germany. This operation, it will be recalled, failed; although the Maas and the Waal crossings were successfully seized; it proved impossible to make solid contact with 1 Brit Airborne Div which had been dropped about the crossing of the Neder Rijn at Arnhem, and the tip of the Allied salient at this point was ultimately pinched off. This bold operation apparently led the enemy to withdraw his rocket organization from the region of Holland (around The Hague) from which it had been firing against London, and no more rockets were directed against the capital until 7 Oct. In the meantime, however, a small-scale rocket attack, apparently from a firing area north-east of Arnhem, developed against Norwich. From 25 Sep to 12 Oct a total of 31 rockets fell in Norfolk; of the eight arriving previous to 0600 hrs 30 Sep, the nearest to Norwich fell approximately three miles from the centre of the city. It is of special interest that these 31 projectiles caused very few casualties, "no people being killed and only 1 seriously and 31 slightly injured" (A.C.I.C.S. General Note on Operations, October, 1944; see also ibid., September, 1944). This serves to emphasize the fact that such projectiles are effective only against a great built-up area like London.

43. The failure of the Arnhem enterprise encouraged the German rocket organization to move back into the area about The Hague, and on 7 Oct, as already noted, rockets again began to fall in the vicinity of London. The attack thereafter continued through the winter. Although never on a really large scale, it showed a tendency to increase as time passed. The A.C.I.C.S. General Note on Operations for January, 1945, observes:

> During the week ending 0600 hours 27th January an average of 8.6 rockets a day fell on the United Kingdom, with a maximum of 17 during the 24 hours ending 0600 hours 27th January. This was the highest scale of attack yet recorded against this country.

Although 17 rockets remained a record for a 24-hour period (The Times, 27 Apr 45), during February there was a further increase in the general scale of attack; there were 78 incidents during the week ending 0600 hrs 17 Feb, and 80 during the week ending 0600 hrs 23 Feb (A.C.I.C.S. General Note on Operations, February, 1945). During March a slight reduction in the scale of rocket attack was observed; then, in the last week of the month, the attack ceased altogether. The last rocket on the United Kingdom fell at 0654 hrs 27 Mar (ibid., March 1945) at Orpington, Kent (The Times, 27 Apr 45; the newspaper gives the hour as "4.54 p.m."). 21 Army Group had successfully crossed the Rhine, beginning on the night 23/24 Mar, and at the end of the month 2 Cdn Corps (under command Second Brit Army until midnight 1/2 Apr) was advancing in the region of the German - Dutch frontier and threatening the whole German position in Holland. The land communications of the German forces in Holland with Germany were soon severed, and this was evidently enough to put a permanent end to the rocket attacks,

although those forces did not actually surrender until 0800 hrs 5 May.

44. The total number of rockets reaching the United Kingdom during the seven months of the rocket campaign was 1,050. The total casualties were 2,754 killed and 6,523 seriously injured (The Times, 27 Apr 45).

45. The rocket offensive had much less effect upon the life of London than the flying bomb attacks. It was on a smaller scale and caused fewer casualties; in addition, however, the rocket, which arrived quite unheralded at a speed much greater than that of sound, appeared to make less impression upon the nerves of the population than the flying bomb, which travelled at normal aircraft speed, making a distinctive and daunting sound and inevitably frightening in some degree everyone in the regions over which it passed. It must be added, however, that the rockets would certainly have had a greater effect on nerves and morale if they had arrived in really large numbers. As it was, theatres re-opened and the West End during the rocket period was as gay and crowded as it had been before the flying bomb attacks began.

46. Counter-action against the rocket attack was an altogether different matter from that against the flying bomb. The latter could be dealt with in the same manner as hostile aircraft, either by anti-aircraft fire or by the R.A.F.; and since the bombs flew straight on an easily predicted course both these forms of defence were extremely effective. In the case of the rocket, which travelled at a tremendous speed, no action was possible after it was once in the air, and counter-action had to take the form, in the main, of air attacks on suspected firing points, personnel and vehicles, as well as on road, rail and water communications and on storage areas (A.C.I.G.S. General Note on Operations, September, 1944). Counter-measures were apparently hampered to some extent as a result of desire to avoid endangering the Dutch population, but the A.C.I.G.S. General Note for December, 1944, observes, ".....as a result of Dutch compliance with our request that we should be allowed to bomb rocket targets near built-up areas round the HAGUE, Fighter Command have taken advantage of this concession and many sorties have taken place".

47. By the time the rocket attacks commenced, the whole Canadian field force had left the United Kingdom, and in that country the effect of it (so far as the Canadian Army was concerned) fell upon C.M.H.Q. and the base establishments remaining in the United Kingdom. As the eastern part of London and Essex bore the main weight of the attack (as in the case of the flying bomb, the rocket missiles showed a marked tendency to fall short) Canadian establishments were comparatively little affected.

48. The main incident affecting a Canadian establishment was that of 25 Nov 44, when a rocket fell in a side street just north of High Holborn and just west of Fairfax House, the building occupied by the Ordnance Services sub-branch of C.M.H.Q. Fairfax House was exposed to the blast of the explosion, and secondary damage to the building was heavy. The rooms on the fourth floor of Fairfax House used by the War Artists sub-section of Historical Section were particularly exposed and were considerably damaged. A large canvas ("Canadian Armour Passing Through Ortona"), on which Major C.F.

Comfort had been engaged, was set up within a few feet of a window which was blown in, but the canvas, curiously enough, was scarcely marked. Although many military and civilian members of the staff were treated for minor cuts, etc., only three military personnel were actually reported as casualties: one other rank who died of wounds on 30 Nov, and two other ranks wounded. The only other casualties suffered by the Canadian Army in the United Kingdom by enemy action during the period of the rocket attacks, were three other ranks subsequently reported as wounded, on 7 Jan, 2 Mar and 24 Mar 45 respectively. (Nominal roll of casualties prepared by Records Office, C.M.H.Q. : C.M.H.Q. file 18/Air Raids UK/1).

49. The V-2 rocket should be described. This is the largest and most formidable form in which rockets (a type of weapon which has developed tremendously in the latter stages of this war, and which is likely to play a major part in any future war) have yet appeared. The following description of the V-2 is extracted from the A.C.I.G.S. General Note on Operations for September, 1944:

CHARACTERISTICS

The operational rocket is being reconstructed from fragments and examination of indicents (? incidents). It appears to agree in the main with previous intelligence, and from documents captured in NORMANDY.

A general description of the rocket is as follows:-

| | |
|---|---|
| Length..... | 45 ft 10 ins. |
| Maximum body diameter..... | 5 ft 6 ins. |
| Weight (all up)..... | 13½ tons. |
| Weight of warhead..... | 1900 - 2000 lb. |
| Weight of fuel..... | 9.6 tons. |

The main body of the rocket is cylindrical, but at the front end there is a long tapering portion which gives it a good ballistic shape.

The outer shell is of light steel construction, internal space being provided for housing:-

Combustion chamber
Engine and ancillary equipment
Main fuel tanks
Radio compartment
Warhead.

The rocket is stabilised by four fins at its rear end. Main fuels appear to be oxygen and alcohol, whilst the auxiliary fuel for driving the turbo-fuel pumps is hydrogen peroxide. The rocket is propelled by a jet of gasses resulting from the combustion of the two fuels. It contains radio and gyro equipment for control.

WARHEAD

Where the projectile is presumed to have detonated on impact, the average diameter of the resultant crater is 35 feet and the depth 10 feet. This is consistent with a warhead of something less than one ton.

The missile possesses greater penetrating power than the flying bomb, and causes substantial devastation in its immediate neighbourhood, but the area affected by lateral blast is smaller than in the case of the flying bomb.

A later technical note may also be quoted:

A point of particular interest in connection with the technical development of the rocket which may give improved accuracy to the missile, is the introduction of an instrument in the rocket mechanism (an integrating accelerometer) which would render unnecessary any radio components in the projectile. The function of this instrument is to measure velocity with a higher degree of accuracy and automatically to compensate for errors in trajectory angle by controlling the time of jet thrust. If this instrument proves to be successful and is used exclusively all radio counter-measures will be valueless.
(A.C.I.G.S. General Note on Operations, November, 1944).

50. A further description, based on the examination of "dud" rockets by a First U.S. Army expert, will be found reproduced in 1 Cdn Corps Int Summary No. 141 (19 Oct 44). This estimates the maximum speed of the projectile at 5,000 feet per second, decelerating subsequently, due to the thicker lower atmosphere, to "a striking velocity of about 3700 ft per second". For a 200-mile carry, "a maximum height of about 55 miles is reached". The explosion is thus described, in terms recognizable by those who lived in the London area in the days of the "rocket blitz": "In nearly half the shots observed, an explosion takes place on the way down, at a height of 2000 to 3000 ft usually, presumably due to break up of the structure and mixing of the remaining fuels in the tks. The warhead in every case but one has exploded on impact with the earth. When the fuel explosion also takes place in the air, both explosions are heard about ½ second apart; otherwise there is but a single explosion. There often follows a rumbling sound like thunder and lasting several seconds, due to the disturbance to the air caused by the fast-moving projectile." It is worthy of mention that only one rocket landing in England is reported as having failed to explode; this was on 18 Mar 45 (A.C.I.G.S. General Note, March, 1945).

51. As noted above, the V-2 tended to make a larger crater than the V-1 and to have somewhat less blast effect. Nevertheless, examination of the sites of various incidents, including that near Fairfax House, indicates that the blast effect was very far from negligible.

## USE OF V-WEAPONS AGAINST CONTINENTAL TARGETS

52. The enemy's "secret weapons" were not used exclusively against the United Kingdom; indeed, he employed them on a still larger scale against certain great built-up areas on the continent. The city suffering most heavily from these attacks was Antwerp. It will be remembered that this great port was captured intact by the Second British Army on 4 Sep 44. Having

failed to effect demolitions in the port area before he was evicted, the enemy attempted to repair the omission by an intensive bombardment with both flying bombs and rockets. Extremely heavy damage was caused to the city by this bombardment, but reports indicate that the effect on the operation of the port was not very great. The worst single rocket incident ever recorded resulted from a hit on a cinema theatre in Antwerp, which killed 539 people and wounded 294 (A.C.I.G.S. General Note on Operations, January, 1945).

53. Although Antwerp was the main continental target, there were many others. Brussels and Liége both received attention, and on 8 Sep 44, the first day of the rocket bombardment, "at least one rocket" fell in the Paris area (A.C.I.G.S. General Note on Operations, September, 1944). Several rockets were fired at Paris in October, and some were also directed at Lille (ibid., October, 1944). An attempt at quasi-tactical use of the rocket is indicated in the fact that in March 1945 eleven rockets were fired at Remagen, the site of the first Allied bridgehead over the Rhine (ibid., March, 1945).

## GENERAL SUMMARY OF V-WEAPON ACTIVITY

54. By way of summary of the enemy's V-weapon campaign generally, the following extract from cable GS 1018, Cammilitry to Defensor, 23 Apr 45, is of interest. The information was obtained during the monthly meeting of the D.C.I.G.S. with Dominion representatives on 23 Apr:

> LAST ROCKET FIRED AGAINST UK 27 MAR AGAINST CONTINENTAL TARGETS 28 MAR. LAST FLYING BOMBS LAUNCHED BY ENEMY 30 MAR. OF 1115 ROCKETS LAUNCHED AGAINST UK 517 LANDED IN LONDON 70% OF REMAINDER IN ESSEX. MPI FORTUNATELY ON EASTERN EDGE OF LONDON AREA. GREENWICH MOST FREQUENTLY HIT LONDON BOROUGH WITH 3.8 PER SQUARE MILE. OF 1670 ROCKETS LAUNCHED ON CONTINENT 1427 LANDED IN ANTWERP WITH MPI IN CENTRE OF CITY. OF FLYING BOMBS LAUNCHED ON CONTINENT ALL 6087 WERE DISTRIBUTED BETWEEN ANTWERP AND LIEGE. CASUALTIES IN THOSE TWO CITIES 4265 KILLED 10000 SERIOUSLY INJURED.
>
> (C.M.H.Q. file 1/Conf/17).

55. It seems quite clear that the enemy's programme and preparations would have meant far more serious peril for the United Kingdom but for our own counter-measures and the success of our invasion operations. Mr. Churchill, in his victory broadcast to the nation on 13 May 45, summed the matter up:

> There was one final danger from which the collapse of Germany has saved us. In London and the south-eastern counties we have suffered for a year from various forms of flying bombs and rockets and our Air Force and our Ack-Ack Batteries have done wonders against them. In particular the Air Force, turned on in good time on what then seemed very slight and doubtful evidence, vastly hampered and vastly delayed all German preparations.

But it was only when our Armies cleaned up the coast and overran all the points of discharge, and when the Americans captured vast stores of rockets of all kinds near Leipzig, and when the preparations being made on the coasts of France and Holland could be examined in detail, that we knew how grave was the peril, not only from rockets and flying bombs but from multiple long-range artillery.

Only just in time did the allied armies blast the viper in his nest. Otherwise the autumn of 1944 to say nothing of 1945 might well have seen London as shattered as Berlin..

(The Times, 14 May 45).

## RECAPITULATION OF CANADIAN CASUALTIES SUFFERED BY ENEMY ACTION IN THE UNITED KINGDOM

56. It is now possible to state the final total of casualties suffered by the Canadian Army in the United Kingdom as a result of enemy action during the hostilities in Europe which ended officially at 0001 hrs 9 May 45 with the surrender of Germany.

57. Statistics furnished by Canadian Overseas Records Office (C.M.H.Q. file 18/Air Raids UK/1) indicate that the totals of these casualties were as follows:

| | Offrs | O.Rs. |
|---|---|---|
| Killed | 8 | 97 |
| Died of Wounds | 1 | 17 |
| Wounded | 24 | 274 |
| Battle Casualty Injured [3] | - | 3 |
| TOTAL | 33 | 391 |

Of these casualties, C.M.H.Q. suffered 41 : 10 killed, one died of wounds, 30 wounded.

58. It is worth noting that the lists include one member of the Canadian Womens Army Corps, W.15166 Pte. Davenport, Freda I., injured on a date not known (ibid.). Other members of the same Corps were wounded by enemy action on the continent of Europe. It should also be noted that personnel suffering merely minor injuries are not included in the above statistics. A nominal roll of officer casualties, additional to that appended to Report No. 106, is attached as Appendix "C".

## CANADIAN SHARE IN COUNTER-MEASURES

59. The story of the part played by Canadian Army units in defence of the United Kingdom against enemy aircraft and V-weapons during the period treated in this report can be fairly quickly told. During this period Canadian field units of artillery were not employed to any great extent on A.D.G.B. (Air Defence of Great Britain); they were training actively for the field, and in the latter part of the period they all without exception left the United Kingdom to fight on the

---

3 The fact that three casualties were listed in this category rather than as "wounded" is evidently a mere accident of accounting.

continent of Europe. The last quarterly returns of enemy aircraft destroyed by Canadian units received from H.Q., A.A. Command covered the six months ending 31 Mar 44; both were nil returns. Recent inquiry elicits the fact that the records of A.A. Command include no reference to subsequent successes by Canadian units against piloted aircraft (C.M.H.Q. file 3/Enemy Aircraft/1).

60. As already noted, when the flying bomb campaign began part of the Canadian field force had already left the United Kingdom and the remainder was waiting to embark for Normandy. In these circumstances, the Royal Canadian Artillery played little part in the increasingly successful defensive measures against the new weapon. Examination of War Diaries indicates that only two units participated in these operations. (Others recorded their disgust at not being permitted to share in them. 6 Cdn L.A.A. Regt, for instance, which was stationed in the vicinity of Margate (C.M.H.Q. Location Statement No. 29, 3 Jun 44), recorded on 19 Jun 44, "Pilotless planes continued their activity ..... The Regiment seems to be in a unique position to observe this kind of enemy operation. It was <u>most</u> annoying <u>not</u> to be on gun sites.")

61. It appears that the only Canadian unit to fire at flying bombs with its own guns was 8 Cdn L.A.A. Regt. On 5 Jul 44 steps were taken to de-waterproof six guns per battery of this unit and they were ordered to take up sites in areas not far from the unit's billets in the Heathfield area of Sussex "to try and cope with flying bombs" (War Diary, 8 Cdn L.A.A. Regt, 5 Jul 44). These troops formed a composite battery. They were in position and firing on the following day. Firing continued until 15 Jul, when orders to proceed overseas put an end to this activity. The Canadians, firing "at eyeshooting control", found the V-1 a somewhat difficult target. Some successes were claimed, however: one on 9 Jul, by two different troops, and one on 11 Jul, by three troops. These appear to have been the only definite successes (War Diary, 8 Cdn L.A.A. Regt, July, 1944; cf. War Diary, H.Q., R.C.A., 4 Cdn Armd Div, 16 Jul 44, which says of 8 Cdn L.A.A. Regt, "Their score for certain - 2 buzz bombs.").

62. The other Canadian unit engaged was 2 Cdn H.A.A. Regt, which was at this time employed under 107 A.A. Bde. Beginning on 17 Jul 44, this unit lent personnel to a British H.A.A. unit to assist in the battle against the flying bombs, which involved 24-hour manning. The Regimental War Diary for 17 Jul includes the following passage:

> Each of the Batteries lent approx 100 men to 173 HAA Regt RA to assist them in their role here. It will give our men an opportunity to take a crack at these buzz bombs at last .....

More men from the regiment were subsequently attached to units of 71 A.A. Bde for the same role (War Diary, 2 Cdn H.A.A. Regt, 24 Jul 44). The sites to which the Canadians were attached had very considerable success. Attached as Appendix "D" is a summary of the results obtained by the men of the regiment employed on this duty during the period 16-23 Jul. This summary does not represent quite the whole record of successes during the regiment's partial employment in this role, as firing continued until 28 Jul, when the unit was placed on six hours'

notice to go overseas and all personnel on gunsites were ordered withdrawn. Men were withdrawn accordingly on 29 Jul (War Diary, 1 Cdn H.A.A. Bty, Appx 7 to War Diary, 2 Cdn H.A.A. Regt, July, 1944). [4]

63. In response to an inquiry, H.Q., A.A. Command has advised that no claims by Canadian units to have destroyed flying bombs have been made (C.M.H.Q. file 5/Enemy Aircraft/1). Its account of the relationship of 8 Cdn L.A.A. Regt to the matter is, however, so much at variance with the facts as indicated in para 61 above (it believes that this unit was deployed in the Dover area, but that restrictions on A.A. action there prevented it from opening fire) as to suggest that this Command's records may leave something to be desired.

C.P.S.

(C.P. Stacey) Colonel,
Historical Officer,
CANADIAN MILITARY HEADQUARTERS

---

[4] Major J.M. Wilson of 2 Cdn H.A.A. Regt advises that as early as December 1943 this unit was ordered to plan for the engagement of objects flying a direct course at speeds up to 700 miles per hour, and deployment areas were reconnoitered with this activity in view.

APPENDIX "A"

EXTRACT FROM

"GENERAL NOTE ON OPERATIONS ISSUED BY A.C.I.S. (OPERATIONS), WAR OFFICE, DECEMBER, 1943"

## POSSIBLE USE OF NEW WEAPONS FOR ATTACK ON THE UNITED KINGDOM

### General

From evidence which has been carefully examined during the past few months it is thought probable that the enemy is planning to launch attacks in the near future with new types of weapons against this country.

The greater volume of evidence shows that these attacks will probably be by means of Pilotless Aircraft, and up to date nearly 200 launching sites have been reported in the PAS DE CALAIS area at ranges from LONDON varying from 120 to 140 miles. Five other sites have also been located which suggest that some form of long range rocket may also be introduced. 90% of the sites seem to be orientated for an attack on LONDON, and the remainder on BRISTOL or intervening cities.

### Scale and Probable Date of Attack

In their latest report the Joint Intelligence Sub-Committee consider:-

(a) that a single pilotless aircraft could be launched against England any day, but such an attack is not expected;

(b) that pilotless aircraft carrying from 215 - 770 tons of bombs could be launched in the space of eight hours by late February; and

(c) that from 430 - 1540 tons could be launched in the same time by late March.

None of the above estimates take into consideration the effect which our counter measures will have. Moreover, evidence of the actual nature and performance of the weapon is scanty, and there is a body of expert opinion which holds the view that the J.I.C. estimates are exaggerated.

### Counter Measures

Orders have been issued to the Tactical Air Force to attack those sites which are over 50% complete as a first priority. Eighth U.S. Air Force and R.A.F. Bomber Command also give assistance as and when possible. Between 5th December and 1st January over 3,000 tons of bombs have been dropped, and it is estimated that 12 sites have been so damaged as to require a further six weeks work and that 24 other sites have received damage in varying degrees.

Various plans are in hand for the redeployment of our A.A. defences and balloon barrage to meet the threat if it develops.

APPENDIX "B"

SECRET
APPX 'A' to
1 Cdn Corps
Air Summary No 31
dated 1 Mar 44

"SKI-SITES"

1. For a long time the Germans have been developing and experimenting with long range rockets, pilotless aircraft and glider bombs. Of these, only the glider bomb is in service; it has achieved some success in attacks against ships.

2. The development of these weapons has been and is still taking place on the shores of the BALTIC at, or near PEENEMÜNDE. On 17/18 Aug 1943 the main establishment of PEENEMÜNDE was attacked by Bomber Command with great success and considerably delayed experimentation and production of prototypes. The last occasion when what was thought to be a rocket was photographed on the ground at PEENEMÜNDE was 30th Sep, 1943, and what is believed to be pilotless aircraft was seen on a catapult on 28th Nov, 1943, also at PEENEMÜNDE.

3. During Jun of last year, photographic reconnaissance showed that the building of certain structures in the Pas de Calais and in the Cherbourg Peninsula had begun, and this has proceeded rapidly. These structures have been named "Ski-sites", because among their various standardized buildings there are always at least three long, narrow concrete buildings of a standard shape similar to a ski lying on its side.

4. By the 26th Dec 1943 a total of 83 "Ski-sites" had been photographed, and it is believed, from reports from ground sources, that the number will ultimately exceed 150. All the sites photographed in the Pas de Calais and Dieppe areas are within 140 miles of London, and those near Cherbourg are within 100 miles of Southampton, and within about 140 miles of Bristol. Up to date no sites have been found outside these ranges. By this date (26th Dec 1943), the civil engineering work of 43 sites was 50% to 75% complete, while on 20 others it was between 75% and 100% complete, the estimated time for the completion of a site being 2½ to 3 months. On a few advanced sites "military" engineering now believed to have been started, the construction of launching ramps on the extensions to firing points being observed. Some of the more advanced sites are now protected by light flak and elaborate camouflage is in progress at most. All information confirms the previously stated opinion that "Ski-sites" are associated with the launching of pilotless aircraft. There is still no evidence relating to the rate of production of this weapon or to that of the long range rocket.

5. There are a number of other constructions within these areas which are definitely not "Ski-sites", although it is believed that they are connected with some form of long range attack. One of these was nearing completion at Watten on 27th Aug 1943 when it was so successfully attacked by the VIII USAAF Bomber Command that work on it was stopped.

6. An unmistakeable link has recently been established between the experimental station at PEENEMÜNDE and the sites in France. Although no "Skis" have been found at PEENEMÜNDE, exact replicas of the other buildings common to "Ski-sites", including what is believed to be the launching point, have been photographed. On this launching point is seen an aircraft of 20' wing span. The absence of "Skis" at PEENEMÜNDE supports the view that they are store buildings for which there would be no need on an experimental station.

7. 5-gun light flak positions have appeared at one site which is in a very advanced stage of completion. Smoke which has been observed at some sites may be produced by smoke generators but this has not been confirmed. As the sites approach completion, it is noticed that camouflage measures proceed rapidly.

8. The layout and shape of the firing points definitely suggest a low launching angle, possibly by catapult. One of the buildings present on every "Ski-site" is known to be of non-magnetic structure and its orientation on the line of launching suggests that the intention is to utilize a system of control based on the magnetic compass. This is a system used in the German automatic pilot. These two points, in conjunction with photographic evidence of PEENEMUNDE, support the view that the "Ski-sites" are intended for the launching of pilotless aircraft.

9. The layout and storage arrangements of "Ski-sites" suggest that it is the enemy's intention to make a concentrated attack. Whether the weapon is of rocket or pilotless aircraft type, it is estimated that, provided it functions with reasonable accuracy, rapid and simultaneous fire from a 100 sites would achieve the equivalent effect of at least a 2,000 ton bombing attack in a period of 24 hours.

10. At the present moment there is no indication when these projectiles will be brought into operational use by the enemy.

(Air Intelligence Weekly Summary)

APPENDIX "A"

OFFICER CASUALTIES DUE TO ENEMY AIR RAIDS IN THE U.K.
(Information compiled by Records Office, C.M.H.Q.)
Extracted from C.M.H.Q. file 18/AIR RAIDS U.K./1

| Rank | Name | Unit | Date |
|---|---|---|---|
| | KILLED | | |
| Capt. | J.D. Gall | 3 C.A.C.R.U. | 18 Jun 44 |
| Major | C.A. Baker | H.Q. First Cdn Army | 18 Jun 44 |
| Lieut. | H. Murfitt | S D & G Highrs | 1 Jul 44 |
| | WOUNDED | | |
| Brig. | J.A.W. Bennett | H.Q. First Cdn Army | 8 Jul 44 |
| Brig. | C.S. Booth | C.M.H.Q. | 4 Aug 44 |
| Lieut. | R. Bissonnette | 1 C.S.R.U. | 23 Feb 44 |
| Lieut. | W.L. Neville | 1 C.S.R.U. | 23 Feb 44 |
| Col. | J.E. Wilson | C.M.H.Q. | 2 Jul 44 |
| Lt.-Col. | M.D. Scott | C.M.H.Q. | 2 Jul 44 |
| Major | F.B. Fisher | Linc & Welld R | 5 Jul 44 |
| Lt. (N/S) | N.B. Siddons-Grey | 2 Cdn Gen Hosp | DNK |
| Lieut. | W.S. Russell | 8 LAA Regt R.C.A. | DNK |

COPY

APPENDIX "D"

## 2 CDN HAA REGT

### Summary of Anti-PAC Activity (Period 16-23 Jul 44)

16 Jul - The C.O. made arrangements with Lt-Col Tusting of 173 HAA Regt, RA to have 2 Offrs and 50 men of 2 Cdn HAA Regt attached to each of the six 173 HAA Regt sites to assist in the present state of 24 hour manning.

17 Jul - Bty parties move to sites as arranged, arriving during late afternoon.

The following are notes of activities by Troops.

A Troop - The left section under Capt R.A. Patch and Lt MacGregor arrived on 17 Jul 44. This site, D3, above Dover, is manned by 413 HAA Bty (Comd Maj T.W. Poole). It is a static site and not located well for a PAC role. Few of the "Doodlebugs" take a course over, or near, this site. This fact, added to the restrictions on fire due to siting, meant that the left section did not fire until the night of 22 Jul 44. Fifteen rounds were fired for a claim of one Cat "A". Lt Wall and Lieut DeBlois with the right section took over from Capt Patch on 23 Jul 44.

B Troop - Part of B Troop with Lieuts Grace and Mullaley in charge arrived at FO 2 in the evening of 17 Jul 44. This site is occupied by 513 HAA Bty, RA and is situated in a static position on the cliffs above Folkestone with a good field of view but several restrictions on fire. In spite of restrictions this site has given good account of itself. Night of 18/19 Jul two Cat "B", one Cat "A". Night of 20/21 Jul one Cat "B". Night of 22 Jul two Cat "A".

C Troop - One section of this troop in charge of Capt J. Reynolds, Lieuts Turnbull and Bayne were attached to FO7 the evening of 17 Jul. The 416 HAA Bty, RA (Comd Maj H.T. Nicholls) is situated at CAPEL between Dover and Folkestone. The 2 Cdn HAA Regt men have only been on the guns twice during engagements by this site. On the night of 18 Jul nine rounds were fired and on the night of 22 Jul they justified their existence to the tune of six Cat "A"s.

D Troop - This troop, in charge of Lieuts Snider and Nussey, have been very fortunate in their siting and have had many hours of firing. The first round fired after arrival was a direct hit (Cat "A") and the credit was given to the Canadian Gun Detachment (Sgt Reeh) who had the first round in the sky. The site is occupied by 390 HAA Bty (Comd Maj P Ross) and is situated between Hythe and Folkestone on the cliffs. Their record for the week - 18 Jul Cat "A", 19 Jul Cat "B", 20/21 three Cat "A", 22/23 Jul five Cat "A".

E Troop - FO 4 is situated on the cliffs in the west side of Folkestone. The site is occupied by 339 HAA Bty, RA (Comd Maj H.M. Glen). Of the six sites this one is most favorably sited for anti-PAC. Capt Darling with Lieuts Thomas and Poulin is in charge of the 50 men from E Troop who have been manning continually since their arrival. Their record has been good. 18 Jul Cat "B", 19 Jul two Cat "A" one Cat "B", 20 Jul two Cat "A" one Cat "B", 21 Jul one Cat "A", 22 Jul three Cat "A", 23 Jul three Cat "A" three Cat "B".

. . . . . ./2.

F Troop - The men of this troop are in charge of Lieuts Doyle and Norcott. D1 is sited on the cliffs west of Dover and is manned by 339 HAA Bty, RA. The Cdns supplied three complete teams, one detachment, one relief and one off. While the Canadians have been on the guns, however, there have been few opportunities to fire. Total number of rounds - 212 - most of which were fired the morning of 23 Jul. Site claims one Cat "A".

(War Diary, 2 Cdn H.A.A. Regt, July, 1944).