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The Work of the Canadian Tunnelling
Units at Gibraltar, 1942-43.

1. This Report deals with the work of the Canadian Tunnelling units at GIBRALTAR from the summer of 1942 until their return to Great Britain in December of the same year. This Report should be read in conjunction with Report No. 80, which outlined the history of the tunnelling units at GIBRALTAR from the date of the despatch of the first Special Detachment, 1 Cdn Tun Coy on 15 Nov 40 until July 1942.
2. The materials upon which this Report is based include the pertinent files at C.M.H.Q. (6/2 Tun/1; 6/1 Tun/2; 21/Gib/1); Comd R.C.E. (Wks) file 1-8-3, which was borrowed for the purpose; the War Diary of 2 Cdn Tun Coy; and conversations with Lt.-Col. C.A. Campbell, C.R.E., 4 Cdn Armd Div, Major D. Taylor, O.C., 1 Cdn Tun Coy, Capts. J.D. Bryce and E.F. Creelman, 2 Cdn Tun Coy, all of whom spent some time with the Canadian Tunnelling units at GIBRALTAR.

THE WORK DONE BY 2 CDN TUN COY

3. The principal task upon which the personnel of 2 Cdn Tun Coy were employed during 1941 and the first half of 1942 was the construction of the large subterranean hospital, called after Field Marshal the Viscount Gort, formerly C.-in-C., B.E.F., 1939-40 and subsequently Governor and Commander-in-Chief of GIBRALTAR, in the interior of the Rock. There were other jobs of lesser importance; many of which are noted in the Report referred to above. By June 1942, work on the Nurses' Quarters and main body of the hospital was completed and Canadian soldier miners were engaged during the period between June and December 1942 on the development of the Harley Street tunnel and attached chambers. These included the linen and pack rooms, the north and south ventilation tunnels, the laundry and chambers designated as A, B, C, D and E (see Appendix "A"). At the same time Canadians were also employed on the tunnelling and chambering of the great underground magazine in the southern end of the Rock, which bears the name Europa Magazine.
4. During the summer months work proceeded slowly. On 5 Jun 42 the War Diary of 2 Cdn Tun Coy records that 1600 tons had been excavated during the week and this was noted as an improvement upon the work of the previous week. One month later, on 3 Jul, the weekly tonnage amounted only to 1400 tons (W.D., 2 Cdn Tun Coy, 3 Jul 42).
5. Following the visit during the first week of July of Major-General C.S.L. Hertzberg, Chief Engineer, First Cdn Army and Lt.-Col. C.A. Campbell, C.R.E., 2 Cdn Corps Tps, and the prospects of an early departure from GIBRALTAR, there was an improvement in the general output. On 7 Jul 42, the unit War Diary states:-

At the job, work seems to be speeding up considerably and we hope this week to reach the mark of 2000 tons per week after which we shall shoot for 4000 tons. More chambering is being done at present than formerly, a great many of the different cross-cuts having been completed.

6. This optimistic forecast was not, however, immediately borne out in fact. The hot and "sticky" weather known locally as the "Levante" had an enervating effect upon the men. On 6 Aug it was reported that only 1800 tons had been excavated during the week (ibid.; 6 Aug 42). It might be noted, however, that "a good supply of reserve muck" had been built up both at Harley Street and Europa Magazine which gave a promise of more rapid work when the cooler weather should arrive (ibid.; 10 Aug 42)
7. With respect to this last point, the construction of a special chute at Europa Magazine made it possible for the spoil to be dumped directly into the sea. This method had the effect of speeding up the work and it was held to be a great improvement over the former system whereby the greater part of the spoil had to be carried away in trucks.
8. With the passing of the "Levante", and the approaching termination of their stay in GIBRALTAR, and the use of diamond drilling for chambering operations, the tonnage removed from the underground workings showed a steady increase. On 27 Aug it was noted that a record had been set with "an all-time high of 1275 yards or 2550 tons" (ibid.; 27 Aug 42). This record was soon eclipsed. The War Diary of 2 Cdn Tun Coy states that 2830 tons had been removed during the week ending 10 Sep 42; while on 17 Sep the tonnage amounted to 3118 tons "for the best week yet". The muck cars were kept moving all day and every week showed further improvements. The most successful week was that ending 19 Nov when the Canadians removed 4832 tons from the underground workings at Harley Street and Europa Magazine.
9. When, on 26 Nov 42, the unit was put on 48 hours' notice to move there was a natural tendency to relax, but the task which the Canadians had been set to do was more than completed. Chambers A, B and C had been finished during October and the linen and pack stores, chambers D and E and the two chambers of the laundry were ready before the Canadians departed from the Rock in December. Judging from the maps which accompany monthly War Diaries of 2 Cdn Tun Coy there was little left to be done on the Harley Street workings except the West Chamber of the Laundry and the North Ventilation Tunnel; and it was estimated that these would be ready by 25 Dec 42 and 1 Mar 43 respectively (ibid.; Aug 42, Appendix IX). The Europa Magazine chambers A, B, C and D and the searchlight position had been excavated. The remaining chambers E, F, G and H, and the Turnabout could be completed by April 1943 (ibid.).
10. On 5 Dec 42, the Canadian Tunnellers carried out their last underground shift on the Rock. The few days which remained were spent at the crushing plant at Governor's Cottage and instructing the British engineers in the use of Canadian wet drilling equipment.
11. All told the Canadians, during their stay at GIBRALTAR, mined and removed approximately 140,000 tons of solid rock (Comd R.C.E. (Wks) file 1-8-3; Major Tatham to C.R.E., 26 Nov 42). In addition they expended 46,000 man hours on construction. During the 29 week period 7 May - 26 Nov 42 they mined and removed 72,000 tons; a tonnage which totalled more than half of the work done. The maximum effort attained during the week 15-19 Nov averaged over 800 tons per day, or approximately 4 tons per man per shift. "This figure" wrote Major Tatham "is in excess of most of the larger mining companies of Canada" (ibid.).
12. The Gort Hospital, which was, when the Canadians first went to GIBRALTAR, to have been named the Maple Leaf Hospital in their honour, is popularly regarded as the great achievement of the Canadian Tunnellers. It is indeed one of

the most remarkable military hospitals in the world. The floors are made of concrete while the walls, ceiling and partitions are made of wall board and corrugated iron painted white. Owing to the nature and geology of the rock (Jurassic limestone) heavy timbering was unnecessary. In this connexion, it might be noted in explanation of para. 50, Report No. 80, that work on the present site did not actually begin until March 1941 on the arrival of No. 2 Cdn Tun Coy. The original workings were found to be unsuitable owing to certain geological faults and the site was therefore changed.

13. From the point of view of actual tonnage removed the Harley Street job was, however, the larger and more extensive operation. Indeed the Laundry Chamber alone was "the largest single operation carried out by the R.C.E. at Gibraltar" (Comd R.C.E. (Wks) file 1-8-3, Report by Major Tatham "Gibraltar adds the Diamond Drill to Mining"). The finished size of the chamber was 167' by 40' with an 18 foot wall and a two foot centre back arch. The total floor length is 197 feet, 50 feet being required for an off loading point at the front end. Approximately 11,000 tons of rock were removed from this one room (ibid.).

THE WORK DONE BY SPECIAL DETACHMENT, 1 CDN TUN COY

14. The second Special Detachment, 1 Cdn Tun Coy, which had been formed on 6 Jan 42 (Report No. 80, paras. 21-24), carried on work distinct and separate from 2 Cdn Tun Coy. It had been sent to GIBRALTAR in January 1942 at the special request of the War Office in order to engage in quarrying operations in connexion with an aeroplane runway which was being constructed by the Royal Engineers. The importance of this work was not fully apparent at the date of writing Report No. 80. In view of subsequent military developments in the North African theatre it can now be seen that the construction of this airfield was a necessary preliminary to the Allied landings in ALGERIA and FRENCH MOROCCO in November 1942. Without an enlargement of existing airfield facilities at the old race-course the Allied forces would have experienced considerable difficulty in accommodating the heavy bomber aircraft required for the successful execution of this operation. According to a statement made by Capt. de Morest there were seven aeroplane (bomber) accidents before the runway was lengthened.

15. In order to obtain the fill for this runway, which extended into the sea, it was planned to make use of the scree at the base of the east and north sides of the Rock and to quarry stone to build up the outside containing walls of the fill. It was found practically impossible, however, to move the scree by ordinary means and the problem arose as to what method might be developed to render it possible to shovel the scree. When drilling did not achieve the expected results Capt. DeMorest tried everything "from rolling the rocks down by hand to hydraulicking with a Briggs and Stratton" (Comd R.C.E. (Wks) file 1-8-3; Lt. Whittaker to Lt.-Col. Campbell, 24 Jun 42).

16. According to Lt. J.D. Whittaker, who was sent out from 1 Cdn Tun Coy to take charge of this work in June 1942, the difficulties experienced by Capt. DeMorest "would fill a book". The Chief Engineer, GIBRALTAR, was not apparently receptive to new ideas and it was not only hard to obtain the necessary equipment with which to work, but "nobody on the job would co-operate with anyone else". Lt. Whittaker wrote privately to Lt.-Col. Campbell on 24 Jun 42 describing his experiences on arrival at the Rock (ibid.). His letter stated:

They were hydraulicking rather dangerously all over the scree with a fire hose which meant the men had poor footing, had to get very close to the work and could really get

no advantage of a face to carve down by undercutting. I got another pump installed ran another pump line and joined the two pumps into a makeshift nozzle which is discharging about 1200 g.p.m. at 150 lbs pressure. It has brought down about 50,000 yards for easy digging for the shovels and the stuff has plenty of big boulders in it for the rock they need. One, it would seem about 75 tons we brought down from about 75 feet up the face and all they had to do was plug it and get more rock than the quarrying section could supply in two days. The weekly output has been increased to 25,000 yards which is almost double what it was.

17. The lack of suitable equipment was a matter of some concern. Lt. Whittaker, in the letter just cited, continues:

I still have plenty of worries; the pumps and motors are not built for continuous running and they now have about 500 hours without overhaul or check-up and as the engines are old and obsolete there is (sic) no spare parts or tools with which to repair them. The spark plugs are real hard to get out without special tools. Now the weather is hot it is difficult to cool the engines with warm sea water going through the heat exchanger. Also my working face is getting high on the scree and I'll have to figure some way of getting around that.

18. The use of hydraulic pressure, however, proved to be the solution and "hydraulicking" became the standard practice at GIBRALTAR. The Canadians supplied the personnel necessary for these operations until July 1942. After this date it would appear that only one officer, namely Lt. J.D. Whittaker, and three other ranks were retained on this work; the remaining personnel being provided by the British.

19. Meanwhile, the remainder of the Detachment, including Capt. DeMorest, were kept busy with different diamond drilling tasks for the British military and naval authorities. This work consisted chiefly of exploration, preparing holes for communication and power cables, drainage and ventilation purposes.

20. During his visit, 5-6 Jul 42, Lt.-Col. Campbell discussed with the Chief Engineer at GIBRALTAR the question of the retention of the Special Detachment at the Rock. He pointed out that the officers and men of this Detachment formed part of an operational unit on duty with First Cdn Army and that it was not felt that the best use was being made of the qualified skilled tradesmen belonging to the Detachment. The Chief Engineer agreed, therefore, to call a conference of the various commanders on the Rock who required diamond drilling to be done with a view to co-ordinating this work and deciding upon a definite drilling programme. This programme completed, the Detachment was to be returned to England to rejoin 1 Cdn Tunn Coy. (W.D., 2 Cdn Tunn Coy, Sep 42; Appendix 8, Memoranda re Visit of Lt.-Col. C.A. Campbell, C.R.E. 2 Cdn Corps Tps to Special Detachment No. 1 Cdn Spec Tunn Coy Gibraltar 5-6 July 42).

21. It is not clear whether this conference was ever called. On 2 Aug 42 Capt. DeMorest wrote to Lt.-Col. Campbell that no steps had been taken to preparing a drilling programme and that "no one seems very keen on drilling holes" (Comd R.C.E. (Wks) file 1-8-5, Capt. DeMorest to Lt.-Col. Campbell). He added

somewhat bitterly, "undoubtedly if you were to ask for our early return to U.K. all sorts of jobs would crop up".

22. During the latter part of their stay on the Rock the Special Detachment were employed, to a large extent, in conjunction with the mining operations being carried on by 2 Cdn Tun Coy. Although Lt.-Col. Campbell had strongly urged the use of the diamond drill for mining, this method was not favoured by Major North, former O.C. 2 Cdn Tun Coy, and it was not tried out on any scale until the arrival of Major Tatham. The increase in tonnage noted in paras. 8-9 may be partly attributed to the introduction of this method (*ibid.*; Lt.-Col. Campbell to C.E., First Cdn Army, 9 Oct 42). Major Tatham was quite enthusiastic over the success of the diamond drill. In a technical report written to Lt.-Col. Campbell on 27 Aug 42 he outlined the advantages of this system of mining which, he stated, "has given excellent results" (*ibid.*; Major Tatham to Lt.-Col. Campbell, 27 Aug 42). These advantages included, for instance, the preparation well in advance of large tonnages for blasting; the allotment of a whole chamber to the drilling crew; the conservation of compressed air by the use of petrol-driven diamond drills; and a minimum of loose scale in the completed chamber. For a further statement on the use of diamond drilling in mining, see Appendix "B".

23. It might be noted at this point that the Special Detachment was in no way under the command of the O.C., 2 Cdn Tun Coy. Capt. DeMorest had been granted the powers of a Detachment Commander prior to the departure of the unit from England (Report No. 80, para. 24). For operational purposes, the unit was directly under the Command of the Chief Engineer, GIBRALTAR (W.D., 2 Cdn Tun Coy, Sep 42, Appendix 8); for all other purposes, it remained under the control of Canadian Military Headquarters, LONDON. Subsequently, on 11 Aug, the Special Detachment was attached to 2 Cdn Tun Coy for rations and accommodation (*ibid.*; 11 Aug 42). This, however, did not affect the channels of communication and authority as outlined above.

TYPE OF EQUIPMENT USED

24. Generally speaking the equipment used by the Canadian Tunnellers at GIBRALTAR was of British manufacture with the exception of the diamond drills which were strictly a Canadian product. The principal items of equipment included compressors with a capacity of 150 to 300 feet per minute. There were also two 500 cubic-feet-per-minute units; these were K-500 Canadian Ingersoll-Rand which gave excellent service and were highly recommended as standard tunnelling company equipment. The rock drills used by the British R.E. were Holman SL-9 dry hand held pluggers. The Canadians, however, used 2½, 3 and 3½ inch Climax Leyners and Stopers after the Canadian mining practice. Riley rip bits were available and were used on some other smaller isolated jobs.

25. The diamond drilling equipment is of special interest. At the outset of the war arrangements had been made with the three principal commercial mining supply companies to share the responsibility of providing equipment for the Canadian Tunnellers; each company undertaking to furnish those particular items of equipment it was best suited to provide. The companies in question included J.V. Boyles Bros. (VANCOUVER) who provided various types of diamond drills in addition to their own standard air driven underground drills; Canadian Longyear Company (NORTH BAY) who provided rods and casings; and Smith & Travers Limited (SUDBURY) who provided various accessories. All of this equipment was furnished at cost to the Canadian Government. (This information was obtained from Lt.-Col. Campbell in conversation with the writer, 26 Aug 45).

26. The differences in the technical equipment and the mining methods of the British and Canadian tunnelling units at GIBRALTAR led, as one might imagine, to considerable controversy. The British method of dry drilling with small pluggers was regarded by the Canadians as inferior to their own. Subsequently the R.E. units at GIBRALTAR adopted the Canadian system and it was noted in the War Diary of 2 Cdn Tun Coy that "this change over to standard wet drilling equipment may mean they finally realize that drilling dry with hand held pluggers is nothing but doing it the hard way" (W.D., 2 Cdn Tun Coy, 8 Dec 42).

TECHNICAL DIFFICULTIES ENCOUNTERED

27. The greatest individual problem encountered by the Canadians at GIBRALTAR was the maintenance of their equipment. In his letters to Lt.-Col. Campbell, Capt. DeMorest invariably referred to the difficulties of the equipment situation. The drill rigs used by the Special Detachment had been in operation nearly two years and there was a serious shortage of spare parts. In one of his letters Capt. DeMorest wrote, "the machines were only in fair shape when we landed here and since have taken considerable abuse". In another letter he stated:

The equipment is certainly not in very good shape. Scott deserves considerable credit for keeping it in operation. We are now experiencing major break downs such as transmissions, drive shafts and master valves. As you know the equipment while having been roughly overhauled in U.K. was in fairly bad shape and its (sic) had seven months of hard work here mostly on 3 $\frac{1}{2}$ " holes which cause a lot of vibration due to the short distance between the collar of the hole and the chuck. (Comd R.C.E. (Wrs) file 1-8-3, Capt. DeMorest to Lt.-Col. Campbell, 11 Oct 42).

28. Considerable trouble was also experienced with the compressors. These machines were subject to considerable strain and breakdowns seriously curtailed tonnage production. The introduction of diamond drills operated by petrol driven engines relieved part of the strain upon the compressors with the result, already noted, that more work was actually accomplished in the second half of 1942 in the previous year and a half.

LIFE ON THE ROCK

29. Duty on the Rock presented serious problems of morale to the officers in charge of the Canadian Tunnellers. Mention has already been made of the absence of female companionship, the lack of suitable facilities for leave and the propensity of the troops to spend their money in the numerous establishments selling intoxicating liquors. At the same time something should also be said about the weather. The War Diary of 2 Cdn Tun Coy contains numerous references to the depressing effect upon the men of the humid weather of the summer months. This weather, known as the "Levante" was "blamed for everything from a "browned-off" feeling to an upset stomach" (W.D., 2 Cdn Tun Coy, 13 Jul 42). It was generally accompanied by low lying clouds and sticky heat. For the Canadians, accustomed as they were to the more bracing climate of North America, it was impossible to work at full pitch and the low tonnage output referred to in paras. 4-8 was due partly at least to the "Levante". Moreover, the hot weather combined with underground work appears to have brought on illnesses of various kinds, principally dermatitis; and the record of men in hospital was invariably higher during the hot than during the cooler months. (ibid.; 4 Jun 42).

30. There seemed to be little relief from the heat. Meteorological data for the month of June showed a rainfall amounting only to .02 inches and a daily average of 11.88 hours of sunshine (ibid.; 26 Jul 42). During August the normal daily maximum temperature was 84 and the minimum 69 degrees Fahrenheit.

31. By way of recreation the men often went swimming in the sea, although even in this connexion the War Diary of 2 Cdn Tun Coy remarks that the water was "a bit too warm" (ibid.; 9 Aug 42). Others were permitted to take cruises on the various ships operating out of GIBRALTAR. Limited leave was permitted to LA LINEA and to ALGECIRAS, but the regulations were such that only a small percentage of the men were able to avail themselves of this privilege (ibid.; 27 Oct 42). The introduction of a canteen during the early summer of 1942 proved to be a popular move among the Canadians and according to the unit War Diary went "a long way towards improving discipline by keeping them away from bad liquor and the down-town pubs" (ibid.; 2 Jul 42).

32. Occasionally the War Diary records the arrival at GIBRALTAR of Canadians attached to the Royal Navy; and in some instances, of escaped prisoners of war. On 28 Sep 42, for instance, the Diary states "some Canadians are already back through here after the Dieppe action, making their escape after being a prisoner"; and in one case a Sergeant Pilot from EDSON, ALBERTA, whose name is not given, reached British soil and safety at GIBRALTAR after 15 months in a German prison camp. On 16 Oct P.S.M. L.A. Dumais of the Fusiliers Mont-Royal, who was awarded the M.M. following his escape from the enemy after DIEPPE, arrived at the Rock (Sgt.-Major Dumais' story is to be found in Report No. 89).

33. One item of greater local interest than historical value was a reference in the War Diary on 6 Oct 42 to the appearance in the town of GIBRALTAR of the Rock Apes. These animals, according to tradition, had been brought to GIBRALTAR from North Africa at the time of the Moorish invasion of Spain. Their presence on the Rock led to many complaints on the part of the local inhabitants and men of the garrison owing to their thieving proclivities and periodical visits to the town in search of food. Eventually it was decided to do away with them in 1924; but the superstition had developed that if the apes left the Rock it would cease to be a British colony. In the summer of 1942 their numbers totalled 17 and despite the heavy anti-aircraft barrage which was thrown up whenever hostile aircraft appeared in the sky, the apes remained apparently unperturbed.

34. There are few references in the Diary between June and December 1942 to hostile enemy air activity. An entry on 29 Jun 42 refers to "our first raid in many months". Two British planes on the North Front were slightly damaged and several casualties were suffered by R.A.F. personnel. This raid, however, appears to have been the only one of any consequence during the period covered by this Report.

THE NORTH AFRICAN INVASION

35. As noted in para. 71, Report No. 80, ship movements in and out of the harbour of GIBRALTAR were always a source of great interest to the Canadians on the Rock. During the mid-summer months there are repeated references in the unit War Diary to various large warships including H.M.Ss. Rodney, Malaya, Eagle, Argus, Charybdis and others. On 17 Jun, the torpedoed cruiser H.M.S. Liverpool limped into port; while on 12 Aug the loss of the aircraft carrier H.M.S. Eagle, which the people of GIBRALTAR had come to think of "as a permanent part of the Gibraltar Naval Forces", (W.D., 2 Cdn Tun Coy, 12 Aug 42) was announced.

36. An interesting item indicative of impending events was recorded on 25 Oct 42 when the diarist of 2 Cdn Tm Coy noted the increasing number of Americans appearing on the Rock. On 5 Nov, three days before the Allied landings in North Africa, the War Diary stated that "our harbour is well stocked with warships of all kinds" and referred with satisfaction to the progress of the 8th Army in LIBYA. On 7 Nov the War Diary stated:-

Much activity at the North Front Airport. This together with the Naval movements must indicate some action. A lot of A.A.A.F. around as well as R.A.F., R.C.A.F., R.A.A.F. and R.A.F. New Zealanders, South Africans, Rhodesians, etc. ... A feeling of great events in the offing seems to be in the air to-day together with many rumour (sic) concerning the naval and air activity.

37. On the following day the Canadians learned the significance of these preparations. Over the Vichy radio came the news of the invasion of North Africa "which", concluded the diarist, "accounts for the show we have been seeing here for some time". GIBRALTAR served as the principal base for the naval and air services during the operation and "intense activity" was noted at the aerodrome. According to the War Diary previously cited the concentration of Spitfires on the Rock changed their markings from R.A.F. to U.S.A.A.F. on 8 Nov. Large numbers of U.S.A.A.F. personnel, Fortresses and Liberators, American paratroops and airborne infantry were to be seen crowding the Rock. The War Diary also stated that the R.A.F. "is operating a large number of Hudsons from here and the F.A.A. some String Bags (Swordfish)". (ibid.; 8 Nov 42).

38. On 11 Nov several R.C.N. corvettes made their appearance in the harbour. These craft, headed by H.M.C.S. Louisbourg - subsequently lost in naval action in the MEDITERRANEAN on 6 Feb 43 - were "the first Canadian Naval craft to ever enter Gibraltar" (ibid.; 11 Nov 42). The days which followed were full of activity. Transports, troops, naval craft and aircraft were constantly arriving at and leaving GIBRALTAR. On 12 Nov, twelve large troopships left in the evening with an escort of destroyers and two small carriers, and on 15 Nov the diarist of the Tunnelling Company observed "we have 4 battleships, plus carriers Victorious and Indomitable and many cruisers in the harbour". The presence of large numbers of transports raised the hopes of the men. It was now obvious that the insufficiency of shipping facilities to carry the men back to England could no longer be put forward as a reason for the delay in the departure of the Canadians from the Rock.

THE CANADIANS LEAVE GIBRALTAR

39. The problem of relieving the Canadian Tunnellers, some of whom had been at GIBRALTAR since November 1940, was an urgent one. It has been noted in para. 75, Report No. 80, that the original understanding was to the effect that the Canadians would remain at GIBRALTAR for a limited period only. The failure to return the unit to Great Britain in accordance with this understanding had become a source of grievance among the men.

40. It was in order to discuss this situation with the Governor of GIBRALTAR and to reassure the men themselves that Major-General C.S.L. Hertzberg flew to the Rock early in July 1942. On 4 Jul, the entire personnel of 2 Cdn Tm Coy assembled at Gort's Hospital to hear General Hertzberg. He explained to the men that they "should probably return to England" on completion of their present task "but that this could not be promised as it was against policy to promise relief ... when many R.E. Units, who had been here longer ... have no chance of going home". He assured them, however, that he would do everything

possible to facilitate their return to "join the remainder of the Canadian Army as soon as possible".

41. General Hertzberg's address was followed by some discussion and many questions and everyone left with the impression that "the General was working for us and would do everything to get us away from here, short of demanding special privileges for Canadians" (W.D., 2 Cdn Tun Coy, 4 Jul 42).

42. Following a meeting with His Excellency, Lt.-Gen. F.M. Mason-MacFarlane, C.B., D.S.O., M.C., Governor and Commander-in-Chief of GIBRALTAR, General Hertzberg returned to England where he submitted a report to the G.O.C.-in-C., First Cdn Army on the situation at GIBRALTAR (C.M.H.Q. file 6/2 Tun/1, Memo on Relief of 2 Cdn Tun Coy in Gibraltar). He pointed out that "the men are extremely discontented and feel that the promises given them have not been fulfilled", and added that in his opinion "this feeling is justified". He recommended the recall of Canadians as at early a date as could be arranged. Excerpts from General Hertzberg's memorandum here referred to may be found in para. 77, Report No. 80. In the light of the Chief Engineer's recommendations, General McNaughton requested the Senior Officer, C.M.H.Q. to approach the War Office with a view to arranging for the return of 2 Cdn Tun Coy to England "so soon as its present task is completed, and in any event not later than Jan 43" (ibid.; Lt.-Col. Rodger to Senior Officer, C.M.H.Q., 16 Jul 42; see also paras. 78-79, Report No. 80).

43. In accordance with these instructions the relief of the Canadian Tunnellers at GIBRALTAR was reviewed with the War Office and on 5 Aug 42 the British authorities despatched a telegram to the Governor of GIBRALTAR asking him when it would be possible to release No. 2 Cdn Tun Coy "without serious repercussion defence programme" (ibid.; Tel. 55962, War Office to Governor and C.-in-C., Gibraltar, 14 Aug 42) and on 18 Aug C.M.H.Q. informed OTTAWA that the Canadian Tunnellers would be returned to England "early January subject to available shipping" (ibid.; Tel. G.T. 863, Camilitary to Defensor, 18 Aug 43).

44. On 17 Aug 42 the personnel of the Canadian Tunnelling Company were acquainted with this arrangement. At the request of General Mason-MacFarlane the men were paraded at Gort's Hospital. According to the War Diary "the Governor talked to the men and complimented them on their efforts in Gibraltar saying that "they had carved a monument out of the Rock which would last forever". The Governor also said that "this company would be moved off the Rock to join the 1st Canadian Army by the end of Dec 42". The men "gave the Governor an excellent reception and were very attentive to his remarks". In the usual hearty Canadian fashion Major J.G. Tatham, O.C., 2 Cdn Tun Coy, called for "three cheers and a tiger". The general effect of the Governor's speech was a healthy one. The War Diary remarks "the men feel good about this news and it should help the job and the spirit of this company". On the other hand the undertaking given the Canadians tended to create ill feeling between the British R.E. units on the Rock which, as Capt. DeMorest observed in a private letter to Lt.-Col. Campbell, was already "bad enough" (Comd R.C.E. (Wks) file 1-8-3; Capt. DeMorest to Lt.-Col. Campbell, 18 Aug 42).

45. The spirits of the men were given a further fillip in mid-September. Hitherto the Canadians had been given a definite operational role in the defence of GIBRALTAR. They had, at different periods, been attached to the 4th Devons and to the 7th King's Own for the defence of Governor's Square (W.D., 2 Cdn Tun Coy, 8 Jul 42); but on 17 Sep all plans for the participation

of the Royal Canadian Engineers in military operations on the Rock were cancelled. "A good indication" wrote the diarist of 2 Cdn Tpn Coy "of our impending departure from the Rock" (ibid.; 17 Sep 42). In passing, it might be noted that in consequence of this decision the Canadian Tunnellers did not participate in the defensive arrangements on the Rock during the critical days of November when the Allied attack upon North Africa was launched from the base at GIBRALTAR.

46. On 17 Nov Capt. DeMorest left the Rock by air for England. The following day the War Diary noted "general excitement as the day of leaving seems at end". It would seem, however, that the impending departure of the Canadian Tunnellers had unfortunate repercussions upon the discipline of the British troops at GIBRALTAR, many of whom had been in garrison on the Rock longer than the Canadians. On 18 Nov it was reported that 178 (T Coy) R.E., had experienced a "sit-down" strike as a protest against their remaining any longer at GIBRALTAR. Wrote the Canadian diarist previously quoted, "it has been decided that this is a 3-year station for the British Army. Luckily we are in the Canadian Army (ibid.; 18 Nov 42).

47. The presence of large numbers of troopships in the harbour following the North African adventure held promise of an early departure and the men were inclined to pay more attention to packing their effects than to continuing underground operations on the Rock; and when on 26 Nov the unit was placed on 48 hours notice to move the Canadians declared that 4 hours would be sufficient (ibid.; 26 Nov 42). All they required was time to get the stores and baggage to the docks and loaded on board ship. As the convoys of transports moved out of the harbour the disappointment of the Canadians was most marked until on 27 Nov it was lugubriously stated in the War Diary that "it seems to us that we had been deserted. A small troopship still remains in the Bay as our last hope". This, too, disappeared and on 2 Dec the harbour and Bay were empty (ibid.; 2 Dec 42).

48. On 1 Dec 42, however, the prospects for an early departure appeared much brighter. In a speech broadcast on that day the Governor of GIBRALTAR paid tribute to the work of the Canadian Tunnellers. He said:

On behalf of all of us I want to wish God speed and good luck to our Canadian Tunnellers who are leaving us very shortly. They are the only Dominion troops we have had on the Rock, and like all our tunnelling Units, they have carved out a monument for themselves which will stand as long as the Rock remains. They have done a great job of work and we wish them all good fortune and good luck and good sound rock wherever they may go, (ibid.; Dec 42, Part I Orders, 2 Dec 42, Appendix I).

Two days later preliminary embarkation orders were issued and all ranks were confined to barracks. The continued delay, however, caused considerable restlessness among the men and the windows and roofs of the Canadian billets were occupied "from the first glimmer of dawn until darkness by a volunteer observation corps watching for signs of a trooper, particularly for the Llanstephen Castle which we hope will return from Oran and pick us up" (ibid.; 9 Dec 42).

49. Finally on 13 Dec, the "big day" arrived. Embarkation on the "Llanstephen Castle" was ordered for 1400 hours on the following day. Last minute preparations were put under way and on 14 Dec the Canadian Tunnellers, including Special Detachment, 1 Cdn Tpn Coy and 2 Cdn Tpn Coy, marched to the ship and were played on board by the band of the Somerset Regiment. On the 16th General Mason-MacFarlane came on board the "Llanstephen Castle"

and after a short inspection gathered the Canadians around him and in simple and direct language thanked the officers and men of the unit for their outstanding work while under his command. Before leaving the ship the Governor gave Major Tatham a Special Order for the company issued from Governor's House, GIBRALTAR, 16 Dec 42. It read as follows:

I wish to place on record my very high appreciation of the admirable work performed by Major Tatham and the Officers, N.C.Os., and men of the ROYAL CANADIAN ENGINEER TUNNELLING personnel during their tour of duty at Gibraltar from 1940 to 1942.

Their work has been an invaluable contribution towards the preparation of the ROCK to live up to its great traditions. From the first days of their term on the ROCK when I saw the start of their work until the end of their term when I was again fortunate enough to have them under my Command, they have done a job which will remain for all time a monument of their skill, zeal and endurance.

I will always be proud of having had them under my Command and grateful for the way in which they have consistently delivered the goods. I wish them all godspeed and all possible good fortune.

(*ibid.*; Dec 42; a photostat copy is marked Appendix III of this diary).

50. Towards the evening the "Llanstephen Castle", in company with three other troopships and a freighter and escorted by two corvettes, pulled out into the bay "in a bright moon with various shadows hardly discernible" (*ibid.*; 16 Dec 42). The next two or three days were somewhat unpleasant to those who had yet to find their sea legs and stomachs. A strong sea was running and the vessel, filled only to a third of her capacity, rode high upon the waves (*ibid.*; 17-20 Dec 42). By 20 Dec the greater number had, however, overcome their sea sickness and all were on board to share first sight of Scotland on 23 Dec. Disembarkation was carried out the following day at GOUROCK and on Christmas day the Canadian Tunnellers arrived at OXSHOTT where they were met by General Hertzberg and Lt.-Col. Campbell and Capt. DeMorest (*ibid.*; 25 Dec 42). On 29 Dec they were officially welcomed back to England by General McNaughton and arrangements were concluded for the men to go on leave. The year 1942 ended, as the Diary of 2 Cdn Tun Coy recorded, with a "very quiet camp area with practically all on leave" (*ibid.*; 31 Dec 42).

51. The rear party, which had been left behind under the command of Capt. J.M. Neilson, R.C.E., embarked on 31 Dec and after a sea voyage which took them to the AZORES, arrived in England on 14 Jan 43. It is rather interesting to note that despite the ration restrictions in effect in Great Britain the unit War Diary spoke highly of English food in comparison with that served the troops at GIBRALTAR. An entry dated 22 Jan 43 says:

Meals here in the U.K. are very good and appetizing in comparison to Gibraltar. The fresh meats and fish we have here are much better than the diet of bully beef and maconickie we had on the Rock. Many of the Canadians we have talked to have never heard of this famous stew dish (M. & V.) which we had so many times a week for two years.

52. When the leaves were over the unit began to brush up on military training. It was two years since most of the men had engaged in training, and foot drill, musketry and engineer exercises became the order of the next few weeks pending the reorganization of the company upon a new establishment.

THE GIBRALTAR KEY

53. During the summer of 1942 the question arose of granting some tangible distinction to Canadian troops who had seen service upon the Rock. From the beginning of their stay at GIBRALTAR the Canadian Tunnellers had been anxious to wear the "T" worn by the British tunnelling units. This privilege had, however, been denied them, as it was a matter of policy to retain the tunnelling companies in the Canadian Army essentially as engineers. According to Lt.-Col. Campbell (information here obtained in conversation with Lt.-Col. Campbell, 19 Aug 43) the suggestion finally emanated from Major Tatham that the Canadians might be allowed to wear the distinguishing patch of the Gibraltar Key worn by all troops in the GIBRALTAR garrison. This suggestion was taken up by Lt.-Gen. Mason-MacFarlane, Governor and Commander-in-Chief, GIBRALTAR, who suggested that "Gibraltar Keys" of cloth should be given to the officers and men of the Canadian tunnelling companies to be worn on the right sleeve. (21/Gib/1, Tel. A 3484, Canmilitary to Defensor, McNaughton to Letson, 15 Nov 42). On 17 Aug 42 General Mason-MacFarlane in his address to the men of the tunnelling company referred to in para. 44 stated that in recognition of their work he had asked Lt.-Gen. McNaughton "to permit the men of this Unit to wear the "Key of Gibraltar" on the right hand sleeve of their uniform" and added with this honour would go the privilege of wearing the Key forever (W.D., 2 Cdn Tun Coy, 17 Aug 42). The "Key" as the symbol of service at GIBRALTAR was particularly appropriate. Not only does the "Key" superscribed "Gibraltar 1779-85" form part of the regimental badge of the Suffolk Regiment (12th), which had fought during the Great Siege, but the ceremony of handing over the keys of Gibraltar at the changing of the guard has been carried out by the various regiments in garrison on the Rock since those days. Incidentally the Key is also to be found on the Coat of Arms granted GIBRALTAR during the period of Spanish rule when the Rock was referred to as the "Key to the Spanish Dominions".

54. Lt.-Gen. McNaughton did not, apparently, concur in the proposal put forward by the Governor of GIBRALTAR. The Governor did not possess the power to authorize the wearing of any badge perpetually by Canadian troops. Moreover the concession of this privilege raised important questions of policy. Should the Canadian Tunnellers, for instance, be given special distinguishing insignia there was the possibility that other Canadian units serving in detached theatres of war might, with justification, expect a similar distinction. In view, however, of the fact that General Mason-MacFarlane had already committed himself, it was suggested that "in order to get out of the difficulty tactfully" silver watch fobs might be substituted for the cloth badges (21/Gib/1, Tel. A.3484, Canmilitary to Defensor, Lt.-Gen. McNaughton to Letson, 15 Nov 42). Accordingly, on 15 Sep 42, General Mason-MacFarlane informed 2 Cdn Tun Coy that "it has been decided that all Canadians in the No. 1 and 2 Tunnelling Coys will be entitled to have some memento of their stay in Gibraltar" and that a Watch Fob would be given then in place of the sleeve badge (W.D., 2 Cdn Tun Coy, 15 Sep 42). On 22 Sep the design for the fob, prepared by Spr. R.J. Cunningham, along with a list of all personnel of the tunnelling companies entitled to wear it, was forwarded to the Governor for transmission to the G.O.C.-in-C., First Cdn Army (ibid.; 22 Sep 42).

55. It was proposed that these watch fobs should be made privately in Canada and General McNaughton passed the design to the Hon. C.D. Howe, Minister of Munitions and Supply, who was

then in England and who had taken a keen personal interest in the matter, for production (21/Gib/1, Tel. M.224, Defensor to Canmilitary, Banks to Shiels, 24 Oct 42). It would appear, however, that the Department of National Defence had not been kept fully informed of these developments as on 26 Oct a telegram was despatched from OTTAWA to C.M.H.Q. asking for a clarification of the "so-called Gibraltar medal for Cdn troops who served there" (ibid.; Tel. A.G. 878, Defensor to Canmilitary, 26 Oct 42). A week later, on 2 Nov, a telegram was sent to N.D.H.Q. explaining that the Minister of Munitions and Supply "is arranging production of three hundred watch fobs in the form of Gibraltar Key for presentation to Cdn Tunnellers as a souvenir for their service in Gibraltar". It further stated that C.M.H.Q. was "now awaiting delivery of the watch fobs from Mr. Howe" (ibid.; Tel. A.3351, Canmilitary to Defensor, 2 Nov 42).

56. National Defence Headquarters did not take a wholly favourable view of the action taken in connexion with the souvenir Gibraltar Key. On 7 Nov a reply was sent to General McNaughton's telegram referred to above suggesting possible objections to the award. This telegram read as follows:

It appears that this presentation of souvenir watch fobs to all personnel of a particular unit may be regarded as being in the nature of a campaign award for service in a specific theatre. Is it not probable that other troops who have served in other detached theatres will feel that they too should be eligible for similar recognition. No doubt this aspect has been carefully weighed but in order to formulate a definite policy in this regard for the future we would welcome views on the above. Since the matter has gone so far we are putting forward necessary Order in Council authorizing purchase and issue. (ibid.; A.G. 970, Defensor to Canmilitary, 7 Nov 42).

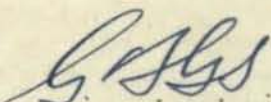
57. In reply the G.O.C.-in-C. pointed out that an Order in Council authorizing the purchase of the watch fobs was quite unnecessary. The presentation in question was entirely of an unofficial nature and the medals were being produced at the expense of the War Time Mining Association who had helped to finance the original special Section 12 Fd Coy R.C.E. in 1939, and at no cost to the people of Canada (ibid.; Tel. A.3484, Canmilitary to Defensor, Lt.-Gen. McNaughton to Maj.-Gen. Letson, 13 Nov 42). The question was discussed at OTTAWA by the Hon. Mr. Howe and the Hon. Mr. Ralston and it was finally agreed that no official action would be taken by the Canadian Government (ibid.; A.G. 1256, Defensor to Canmilitary, Maj.-Gen. Letson to Lt.-Gen. McNaughton, 18 Nov 42).

58. The design of the watch fob as finally decided upon consisted of a silver medal superimposed upon the Gibraltar Key. On the face of the medal was the figure of a miner against the background of the Rock with the caption "Gibraltar 1941-1942". Beneath the medal was the scroll containing the words "Royal Canadian Engineers".

59. Although it was originally proposed that the Governor of GIBRALTAR should make the formal presentation to the Canadian Tunnellers (ibid.; Tel. A.3351, Canmilitary to Defensor, 2 Nov 42) this did not prove possible owing to delay in the production of the fobs. (From conversation with Lt.-Col. Campbell, 19 Aug 43, it would appear that the fob was originally to have been made of bronze. This metal, however, could not be released for the purpose and silver was therefore substituted. This change was one of the factors involving the delay in the production of the fobs). It was not until late in March 1943 that the actual

ceremony took place. 324 names appeared on the nominal roll of those eligible to receive the award. On 27 Mar, General McNaughton inspected some 250 of the recipients, headed by General Hertzberg and Lt.-Col. Campbell, and presented each with a souvenir silver watch fob for his service on the Rock. After a brief description of the ceremony the War Diary of 2 Cdn Tun Coy concluded:-

There is no doubt that the 324 recipients of the Gibraltar Key will be the most distinctive Unit in the Canadian Army and should and, no doubt, will preserve this distinction for all time to come. Whether with the Unit or not at the close of the War each individual on the nominal roll will return to Canada a proud possessor of the "Key" which will enhance in value as time marches on.



(G.F.G. Stanley) Major,
for Historical Officer,
Canadian Military Headquarters.

REPORT

GIBRALTAR ADDS THE DIAMOND DRILL TO MINING

Operation of

No. 2 Tunnelling Coy., R.C.E.

10 Mar 41 to 10 Sep 42.

J.G. Tatham, Major,
Officer Commanding,
No. 2 Tunnelling Coy., R.C.E.

CONCLUSIONS.

1. The major mining problem of the R.C.Es. at Gibraltar is to make holes for blasting. This condition is brought about by working with insufficient air and spare parts for the Leyner machines. Try as we may, in the past 12 months operation we have never been able to keep more than seven machines working at one time. Our average for that period is five. It therefore has been necessary for us to use the diamond drills to assist in this work.

The petrol driven diamond drills are the 100% answer to this problem. Where ventilation will allow they are put to work, and although drilling slower than the Leyner machines, will drill off any given amount without air consumption.

The air driven diamond drills being slightly slower and consuming slightly more air than the Leyner machines will work any place, regardless of ventilation. Since we are always short of Leyners these machines although less economical are a great help in our work.

So far the $1\frac{1}{4}$ inch hole drilled at $3\frac{1}{2}$ to 4 foot centers and not more than 75 - 80 feet long has been the most satisfactory. The detailed data collected to date indicates that this arraignment will require 1.2 pounds of explosives per foot of hole per ton of muck broken. This compares favourably with Canadian statistics from 1933 to 1940 of 1.3 to 1.1 pounds explosives per ton mined.

The most satisfactory blasting practice has been to load 40 to 50 feet of hole solid with explosives using prima cord over the entire length. If prima cord is not available the use of C.E. primers at 6 foot intervals is recommended. All holes are blasted separately.

Fragmentation in blasting the chamber bottom slices has had a tendency to be small, while the single hole blasting of the top slice has been large and requiring blockholing.

Due to the cross fracturing and porosity of bad ground, if a blast does not break the first time the diamond drill holes will plug or even be a total loss.

The loading of long holes is accomplished by connecting 10 foot loading sticks with a 12 inch piece of water hose. The hose is made fast to the loading stick by driving a small copper nail through the end. Two and three foot lengths of chimney sweep brass flexible coupling bamboo rods make excellent sectional loading sticks.

Recommendations.

- (1) That X-ray diamond drills with bar or arm attachments be purchased for work at Gibraltar. (Boyles Bros, Canada).

Advantages.

- (a) No consumption of compressed air.
- (b) Petrol consumption very light - 1 Gls in 8 hours.
- (c) The cheapest and most economical method of drilling. Estimated cost wear and tear, 2 D/ft. diamonds 1 D/ft.
- (d) Light, compact, and will drill any place ventilation will allow. Weight 165 lbs.
- (e) Simple to operate, requiring a two man crew.
- (f) Original cost low.
- (g) Transportation of drill steel eliminated.
- (h) Will not create dust.
- (i) Easy to move about.
- (j) In conjunction with a core barrel may be used for exploration.

Disadvantages.

- (a) Will not work in badly ventilated headings.
- (b) Will not drill a hole larger than $1\frac{1}{4}$ inches or longer than 125 feet.
- (c) Maintenance costs without expert petrol operators is apt to be high.
- (d) Requires water for drilling.
- (e) All the other C.R.Es. will decide they should also have a few holes drilled.

(J.G. Tatham) Major.
Officer Commanding,
No. 2 Tunnelling Coy., R.C.E.

File 6-1-2/764
Gibraltar,
26-11-42

C.R.C.E.,
2nd Cdn Corps Troops,
Canadian Army Overseas,
England.

Summary Report Period 13th March 1941 to 26th November 1942

It is expected that the No. 2 Tunnelling Coy., R.C.E. will shortly leave the Fortress of Gibraltar and return to the First Canadian Army.

During this period of 89 weeks they have worked hard and faithfully. At times the going was tough, but they always came through with their heads up and a determination to "carry on". They leave Gibraltar with the goodwill and good wishes from all. They have the satisfaction of knowing that they have completed an excellent job of work; that they have, as the Commander-in-Chief so ably expressed in a talk to the Company, - "created in this old rock of Gibraltar, a monument that will stand for all times as a credit to yourselves and to Canada". The Company has been proud to represent Canada in this so important link of the British Empire.

During their entire stay the Company has mined and removed approximately 140,000 tons of solid rock. In conjunction with this they have expended 46,000 man hours on construction. During the 29 week period 7th May to 26th November 1942, they mined and removed 72,000 tons; a tonnage that is more than half of the total work done. The maximum weekly effort was attained period 13th-19th November when they mined and removed 4832 tons (Ref. Appendix D), averaging slightly over 300 tons per day, and approximately 4.0 tons per man per shift. This figure is in excess of most of the larger mining companies of Canada.

A serious handicap that followed the Company doggedly throughout the entire period was the large number of men excused duty and S.O.S. During the period 7th May to 26th November 1942, these averaged 15 men excused duty, and 21 S.O.S., cutting the effective strength by 15%.

The greatest individual operation problem was the lack of spare parts for the underground machines and compressors. For efficient underground operation it is essential to have these spares in abundance. Lack of air rigidly controlled the production tonnage, and the problem boiled down to determining ways of breaking greater tonnages per foot of hole drilled, and if possible, drilling holes without the consumption of air. The answer was found in the use of diamond drills operated by compressed air, and petrol driven engines.

Experimental drilling with diamond drills was commenced towards the end of June 1942. Main heading slashing, using 1 1/2 inch holes from 50 to 100 feet long proved a great success. This work then branched out to assist in, and finally take over, the drilling for the standard Iris hut chambers (See Appendix A). In bottom slice chamber mining results were comparable to the standard Leyner type of mining. However, in the top slice mining we attained the required results. By drilling four 1 1/2 inch holes the length of the chamber, the second slice was completed. The very gratifying results of 0.15 lbs explosives per ton broken, and 5 tons broken per foot of hole drilled were obtained.

With this method of breaking ground tremendous tonnage of broken rock soon accumulated. The problem then revolved around better and faster methods of removing the muck from underground. The answer to this was found in the use of the 10 RB diesel operated shovel, and a D 4 Caterpillar bull-dozer assisted in cleaning up and piling. With large volumes of slowly moving air, the problem of the exhaust fumes from these diesel engines was never serious.

The success the Company has enjoyed during it's stay at Gibraltar is due largely to the assistance and co-operation that was so freely and wholeheartedly given by all associated with the work. I extend on behalf of the No. 2 Tunnelling Coy. R.C.E., the deepest appreciation and thanks to:

C.E. Gibraltar, - for his unchanging planning of works and excellent co-operating.

CRE (T) - for his untiring assistance and excellent advice.

O.C's(T)Coys RE,- for their allowing the Company to "scrounge" their much needed equipment.

O.C. Workshops, + for his 24 hour maintenance and quick repair of compressors.

Excavator Coy RE- for the use of their 10 ton trucks.

CRE (W) - for the use of his 10 RB and D4.

No.1(T)Coy RCE - for the continued maintenance and use of their air and petrol operated diamond drills.
(Spec. Detach)

The Governor and Commander-in-Chief, our very very good friend, who mentioned so complimentary the Company, in his talk to the Garrison on 1st December 1942 as follows:

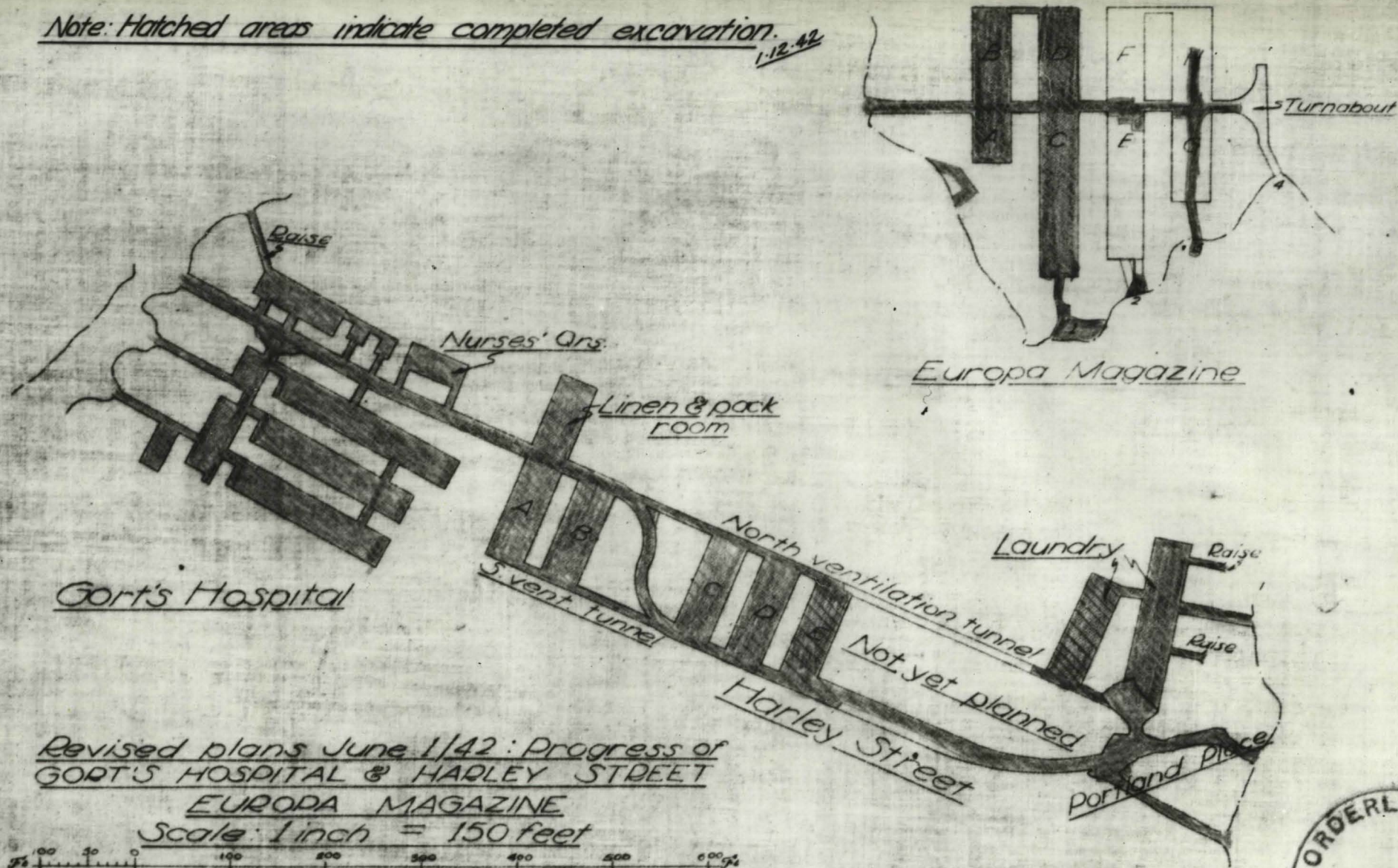
"On behalf of all of us I want to wish God speed and good luck to our Canadian Tunnellers, who are leaving us very shortly. They are the only Dominion troops we have had on the Rock, and like all our tunnelling units they have carved out a monument for themselves which will stand as long as the Rock remains. They have done a great job of work and we wish them all good fortune and good sound rock wherever they may go".

Copy to:
CRE(T) Gib.
File

(Sgd) (J.G. Tatham) Major,
Officer Commanding,
No. 2 Tunnelling Coy. RCE.

Appendix "B."

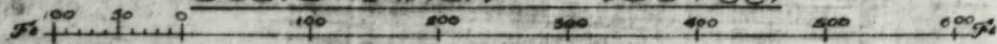
Note: Hatched areas indicate completed excavation. 1.12.42



Revised plans June 1/42: Progress of GORT'S HOSPITAL & HARLEY STREET

EUROPA MAGAZINE

Scale: 1 inch = 150 feet



No. 2 Tunnelling Coy., R.C.E.

Gibraltar

