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Editorial

ARE YOU BEING "CONNED"?

IN the good old bad old days the ability to convince others on any subject was limited by a semblance of honesty in most people. Having moved through a transitional period we seem to have arrived at a time when "anything goes". This is exacerbated by the mass communications available, through which a partial truth can be projected to millions.

As the standard of education has been raised over the years, communications have tended to make greater use of pseudo-learned statements which are often cynical misrepresentations. Advertising in particular uses this technique, "Bu Ho contains di-hexy-tri-methyl-zonko", whatever that might be!

Recently the tendency has been to use "quantitative facts" in communications, not only in advertising, but in official reports and news reporting. Have you been suitably impressed? I hope not!

"Blurpo cures 'whatsistis'. Contains four medically tested ingredients. Recommended by nine doctors out of ten." Recommended for what? What else does it contain, presumably not medically tested?

"90% of animal lovers prefer Zocco for their pets." Do the pets prefer it?

"Refuse storage points (it is presumed this means the bins), should be no further than twenty-two metres from the collection vehicles parking position and the gradients between should normally be no greater than 1:20." Up or down? How heavy were the bins? How big/strong/old were the refuse collectors? Why twenty-two, was the author a continental cricket enthusiast?

Quantitative facts are used to give respectability and an air of importance to the statement; to increase its impact. But do the so-called facts stand up to the test of the whole truth. Quite often they do not. This is only one side of the coin, the end product of a confidence trick. It is of much greater concern that the "con" is often perpetrated by the so-called "Professional Classes".

Professional engineers are very jealous of their position in Society and the images they project. (Dull and humourless they may be, if the letters in the New Civil Engineer are anything to go by!) It is to be hoped that engineers, civilian or military, regardless of engineering discipline, will not descend to the quantitative fact technique.

Imagine the situation, one of the Resident Engineer's Inspectors, on his normal perambulations on site, passes the site of a pump house under construction. Some sixty beams are to be poured *in situ*. The reinforcement has been fixed, the form-work erected, the final clean-out is due the next day before final inspection and pouring. He looks into three of the forms and sees that in two of them there are shavings and, in one of these, the stirrups have not been accurately spaced. He reports: "Of all the beams examined before concreting, 66% had not been cleaned and were unfit to take concrete and of these 50% had stirrups which were incorrectly spaced." Whilst not for a moment suggesting that the Resident Engineer would go through the roof, the risk is there, and constant exposure to this technique is likely to dull the ability to differentiate between the truth and the whole truth.

It is easy enough to mislead unintentionally, how much easier it is to mislead intentionally.

The Editor is delighted to report a 100% favourable response to the last issue of the *Journal*. He thanks the Member who wrote.

The First British Combat Engineers

MAJOR J T HANCOCK, RE

". . . A Corps depending upon and destined to act in aid of the Quarter Master General department—a remark true in every instance but peculiarly applicable when applied to the British Army in which many field duties remain unprovided for but particularly those of Pontoneer as also the more intelligent and important services of the Pioneer, namely when it is meant to fortify a village or secure the avenues of a position—to direct the profile and ensure the solidity of field works, as also to prepare materials for their construction—at other times—to facilitate the movements of an Army over enclosed or intersected ground using the materials at hand for the purpose of bridges—repair of roads—passages of swamps etc, or where it becomes necessary to impede the progress of the enemy by the felling of timber, destruction of roads and bridges . . ."

Memorandum respecting the Royal Staff Corps from the Quarter Master General Department to His Majesty King George the III—5 May 1803.[1]

* * * * *

". . . I have also to acquaint you that the principal purpose for which this Corps was established was to enable the Quarter Master General to give the most effectual assistance towards the Construction of Field Works, Bridges, Roads, and the superintendence of all Labour comprised under the term Field Engineering. . . ."

Circular letter from the Commander-in-Chief—28 November 1808.[2]

* * * * *

". . . This Corps has from its first establishment been under the control of the Quarter Master General, and its duties are to assist in that department in executing all Field Works, taking up of ground, choosing and surveying Military positions, conducting the different columns of the Army in the Field, breaking up or repairing roads, bridges, etc and particularly in directing the labour of Military working parties to advantage. . . ."

Eleventh Report of the Commissioners of Military Enquiry—1809.[3]

* * * * *

FIVE years ago, it would not have occurred to me that our present day Combat Engineers (or yesterdays Field Engineers) had developed from anything but the Royal Engineers. While reading about the Peninsula War, I came across a reference to a unit known as the Royal Staff Corps (RSC) and assumed that it was a Corps of Staff Officers. Shortly afterwards I came across a further reference to the RSC, this time however, it referred to them as building a bridge. The title of the unit and the reference to bridge building, seemed to be rather unusual and it intrigued me sufficiently to make further enquiries.

I was told that the only published article on the Royal Staff Corps was that by Lieut-Colonel F S Garwood RE, in the *Royal Engineers Journal*. The article is based on the notebook and memorandum book of a Charles Rochfort Scott, an officer of the RSC. It shows that the RSC were undoubtedly engineers. Factual details are confined to bridging in the Peninsula War and the campaign in America at the end of 1814. Surprised to find an engineer unit of the British Army that had existed for at least thirty years, but which had no written history, I started to search for further information. I little thought that five years later I would still be searching.

During those five years, anyone foolish enough to mention to me the history of the Royal Engineers, or even an interest in nineteenth-century military history, has found themselves faced with a query—"Have you ever heard of the Royal Staff Corps?" A few had heard of them, very few knew that they had an engineer role and not a single Royal Engineer officer realized that they were the true Combat Engineers of the early nineteenth century. Quite a number refused to believe that they had existed and indicated, politely, that I must have misunderstood the references that I had found. The three quotations from official documents, at the beginning of this article, are sufficient to prove that they did in fact exist and that their role was truly that of a Combat Engineer.

At the present rate of progress, with a bookshelf full of notes and a lengthy list of sources yet to be examined, I estimate that it will take at least another ten years before I have anything approaching a true history of the Royal Staff Corps. However, I think I now have sufficient information to give a general outline of their work and organization.

At the end of the eighteenth century the Army was split into two distinct parts. The Infantry and Cavalry, under the Commander-in-Chief at the Horse Guards and the Royal Artillery and Engineer Department under the Master General of the Ordnance, who was at the head of the Ordnance Board. The Master General of the Ordnance was appointed by the Government in power, from suitable senior officers who were also Government supporters. He had a seat in the Cabinet and his Ordnance Department was independent of the remainder of the Army, since it had its own financial estimates, medical services and commissariat department. The Engineer Department consisted of officers of the Royal Engineers and NCOs and men of the Royal Military Artificers.

When an expeditionary force was formed, it was customary for the Master General of the Ordnance to allot a small detachment of Royal Engineers and Royal Military Artificers to the force. The Royal Military Artificers consisted of a number of static companies based on important fortifications in Britain and the Colonies. Their standards as Artificers were low and due to their static nature, their standards as soldiers were even lower. Engineer detachments supplied for expeditionary forces, therefore tended to consist of the worst of a poor selection and worked under Royal Engineer officers that they had probably never even seen before.[4]

In 1799 the Commander-in-Chief, Frederick Duke of York, was forming a force for the expedition to the Helder and the Master General of the Ordnance proposed to supply the normal small, *ad hoc*, detachment from his Engineer Department. Since the start of the Napoleonic Wars, the role of engineers in continental warfare had changed considerably and the Duke of York did not consider the size of the engineer force adequate for the expedition (one Sergeant, two Corporals and thirty-five Artificers were allotted as support for a corps of 12,000 men).[5] The Quarter Master General, who came directly under the Commander-in-Chief, was responsible for hiring local civilians, as pioneers, on any expedition. To supplement the engineer force allotted, the Commander-in-Chief extended the powers of the Quarter Master General and formed a military Company of Pioneers for this expedition. The Company of Pioneers, working directly under the Quarter Master General, was successful in the Helder campaign. As a result, on 15 January 1800, a warrant was issued raising a Corps of Pioneers which were to be known as the Staff Corps.[6]

The new Corps was commanded by a Major and consisted of a small Regimental Headquarters and four Companies. Each Company was commanded by a Captain with three other officers, four Sergeants, eight Corporals, a Bugler and ninety-two Privates. The total strength of the Corps being twenty-two Officers and 423 Rank and File (for comparison, the establishment of the Royal Military Artificers was 975 all ranks but its recruited strength was only 743).[7] By the end of the year 1800, twenty of the Staff Corps' twenty-two Officers had been appointed and 366 of the 423 Rank and File had been recruited.

Unlike the Infantry and Cavalry, commissions in the new Corps were by appoint-

ment, not by purchase. The trades of the soldiers were very similar to those of the Royal Military Artificers. The Artificers at this period were not armed with muskets and required infantry protection when in contact with the enemy.[8] The soldiers of the new Corps were to be armed and trained as Infantry as well as being trained in Engineer duties.

When the Staff Corps was formed, Woolwich was the Headquarters of the Engineer Department and Chatham was only the station of one of the static Artificer Companies. The Headquarters and Depot of the new Corps was at Chatham Barracks (on the site of the present Kitchener Barracks).

The new Corps was not given long to settle down. In early 1800 a company was detached for work at Dover. In the May, a company formed part of General Sir Ralph Abercromby's expedition to the Mediterranean and Egypt. In addition to carrying out engineer duties, the company formed part of the line of battle, on 21 March 1801, at the battle of Alexandria.[9] As a result the Corps was later awarded its earliest Battle Honour—"Egypt".[10]

At the end of 1800 the other three companies of the Corps moved to Chelmsford, where a fortified camp was under construction as part of the defences against a possible invasion by Napoleon. It was here that they worked, for the first and last time, under the direction of a Royal Engineer Officer. Construction of the camp was under the supervision of an Engineer of the District. Work continued for some years, but in the later stages a Major of the Staff Corps took over entire supervision of the work.[11]

John Rutherford was the first Commanding Officer of the Staff Corps. He was originally commissioned into the Royal Engineers in 1781, but on the formation of the new Corps he transferred to become its Commanding Officer. He did not remain with them for long and when he resigned in May 1802 he was replaced by Lieut-Colonel John Brown, who had also been a Royal Engineer officer. Brown also held the appointment of Assistant Quarter Master General at the Horse Guards and it was in this appointment that he became involved in the construction of the Royal Military Canal. The canal was part of the anti-invasion defences. When the civilian contractors failed, he was placed in virtual control of the construction and naturally used his Staff Corps to supervise much of the work. It was as a result of their work on the canal that their Headquarters and Depot moved to Hythe. There they built their own barracks which were later to become better known, after their disbandment, as the School of Musketry.[12]

Before the move to Hythe took place, the memorandum was written from which the first quotation at the beginning of this article is taken. In the memorandum it was pointed out that a system of instruction was required for the Staff Corps, if they were to be effective as engineers. It also recommended that a suitable area for training must be found. The memorandum states:

> ". . . No place can be more eligible than Chatham should. His Royal Highness may think it proper to apply to the Master General of the Ordnance for the ground adjoining to the Barracks [Chatham Barracks] originally taken by the public for the purposes of defence for a plan since abandoned to which has occasioned the ground to be applied to private use. . . ."

There is no record as to whether or not the ground was allotted before the Corps moved to Hythe in 1805, but on 20 April 1804 Charles Napier (at the time commanding a company of the Royal Staff Corps at Chatham) wrote to his mother and said that they were practicing the construction of field works.[13] Field engineer training was therefore taking place, at Chatham, some eight years before the School of Military Engineering was established.

In the same memorandum a new rank and pay structure was proposed and this was later approved. At the Peace of Amiens the Staff Corps had been reduced in strength, in common with the rest of the Army. It had retained the same number of

companies but the Rank and File of each company had been reduced to fifty-three[11] (the company strength varied between fifty-three and sixty-four for the rest of the time they existed). The officers were to receive the higher Cavalry rates of pay instead of that of Infantry. For the Rank and File a revolutionary principle was introduced. The rank of Corporal was removed from the establishment and the Privates were divided into three separate classes, First, Second and Third. The First Class Private to receive slightly more pay than that for a Corporal, the Second Class slightly less and the Third Class the normal rate of Private pay. (At the end of 1804 even the Third Class Private's pay was increased above that of a normal Infantry Private.) The reason for this unusual pay system was that the companies were expected to operate in detachments and in charge of other military labour. To give flexibility, it was intended that the First Class Privates could be used as Sergeant overseers and the Second Class as Corporals whenever necessary. The First and Second Class Privates wore a white badge on their arm with the figures 1 and 2 as appropriate. This badge can be seen in the illustration of their uniform. Each company was entitled to ten First Class and fifteen Second Class Privates. By the end of 1803 this had been reduced to six First and twelve Second Class (the number of First and Second Class Privates varied with minor changes in their establishment, but remained more or less at this strength).

After these changes had been approved and as a result of the renewal of the war, the number of companies was increased to eight. Thus, although the company strength had been more or less halved, the doubling of the number of companies meant that the overall strength remained much the same. The number of officers had, however, been increased to thirty-four.

There appears to be no record of the approval of the title Royal to the Staff Corps. In the yearly Army Lists, the first time that they were given the full title of Royal Staff Corps was in 1804. It can be assumed, that the title Royal was approved at roughly the same time as the other changes were made in their establishment and organization (ie June 1803).

It was unfortunate, though perhaps to be expected, that petty jealousies and antagonisms developed between the RSC and the Engineer Department of the Ordnance Board. As already stated, the Royal Military Artificers' role was mainly the construction and maintenance of permanent fortifications and the conduct of seiges in time of war. The RSC were formed specifically for war and the Field Engineer role. When not actively engaged on operations, it was only natural that they should be used on tasks which encroached upon the Engineer Department's provinces. The first indication of petty jealousies comes in a letter dated 1 May 1804; once again Charles Napier was the writer.

> ". . . However, two of our Companies go to Dover in a week to work under Engineers; so we are to be overseers not Engineers! Nicolay swears he will resign; but when the Quarter Master General hears of his pets being so scurvily treated we shall be righted. . . ."[15]

The construction of the Royal Military Canal, by the RSC, did little to improve relationships. The Commander-in-Chief was authorized to spend money on temporary works only, leaving the permanent works to the Master General of the Ordnance and his Engineer Department. The Ordnance Board had taken so long to approve the erection of Martello Towers, for the defence of the Southern Coast, that when the decision was made to construct the canal as a priority defence task, the Commander-in-Chief's funds were used in order that the work could start immediately. The consequent use of the RSC in building the canal was a blatant encroachment on the preserves of the Engineer Department. A proposal to use the RSC on the construction of the buildings for the Royal Military College at Sandhurst was a similar encroachment, although in the event they were never actually employed on this task. They did construct at least one bridge[16] and took a part in the lay-out of the plantations in the surrounding area.[17] At the end of 1803 a company was sent

Photo 1. Private Soldiers of The Royal Staff Corps—*c.* 1815. These two figures are two inches high in the background of a coloured print, by C Hamilton Smith, of "Staff of the Army". The uniform colours are: red coat with blue collars and cuffs and white turnbacks; blue pantaloons; black half boots; white shako plume; white cross and waist belts; brass shako plate and belt buckle.

to Ireland, where it constructed Martello Towers and other permanent defence works. In 1806 a company was sent to Jersey and Guernsey for similar work and remained on those Islands until 1812. None of these tasks were likely to endear the RSC to the Engineer Department, even if they had accepted them in their war-time role of Field Engineers.

Although most of the companies remained in England until the beginning of the Peninsula War, they did take part in a few overseas expeditions. In 1805 half a company formed part of Lieut-General Craig's expedition to Naples, Sicily and Calabria and took part in the battle of Maida on 14 July 1806. Also in 1805, half the company in Ireland was detached to Major-General Baird's force which sailed to the Cape of Good Hope and then on to South America. There it took part in the capture of Monte Video on 3 February 1807. A further company took part, in 1805, in the expedition to Hannover under the Earl of Cathcart. In 1806 a company formed part of a force which sailed to Sicily and Egypt. It is unfortunate that few details of the type of work they carried out on these expeditions has been recorded.

From the very beginning, a few of the RSC Officers had been employed on the staff of the Quarter Master General's department, as opposed to regimental duties. These Officers were not officially appointed as Staff Officers and therefore were not regarded by the rest of the Army as having the same status. At the end of 1808, the Commander-in-Chief issued a circular letter regularizing this situation. It notified the fact that all Officers of the RSC were to be regarded as Staff Officers of the Quarter Master Generals department. Field Officers were to rank as Assistant Quarter Master Generals while Captains and Subalterns were to rank as Deputy Assistants. At the same time they were authorized to receive the Field Allowances which went with these appointments. Up to the beginning of the nineteenth century, Royal Engineer Officers had the opportunity to be employed on the Quarter Master General's staff. For a number of reasons these opportunities had decreased. The appointment of all RSC Officers to Quarter Master General staff status, meant that Royal Engineer officers could no longer expect to be employed on the staff with its additional allowances and status in the Army.

The year 1808 marked the beginning of the Peninsula War and a flurry of activity for all arms of the Army. In January of that year a company embarked with Major-General Spencer's force for the Mediterranean and in April a further company sailed with Lieut-General Moore to the Baltic. Both companies remained with their respective forces and when they were eventually ordered to the Peninsula, they landed in Portugal in August. A third company was allotted to Lieut-General Baird's force, which sailed to Corunna in October. All three companies took part in the eventual retreat to Corunna under Moore. The following figures show the relative strength of the Engineer Department and RSC in this first Peninsula campaign:

Royal Engineers and Royal Military Artificers		
	Officers	24
	Rank and File	49
Royal Staff Corps		
	Officers	11
	Rank and File	142

The strengths show the increased importance of the RSC in a campaign. It should also be remembered that the small Royal Military Artificer force consisted, as usual, of three separate *ad hoc* detachments,[18] all of whom were unarmed. The RSC were, of course, three properly formed companies, fully armed and trained to fight as Infantry as well as Engineers.

At the opening of the main Peninsula campaign in 1809, two companies sailed for Portugal in April. In March 1810 a further company embarked for Cadiz and later joined Wellington in Spain in October 1812. Also in 1812 a further company joined the other three in Spain. All four companies remained with Wellington until

the end of the war and returned to England in July 1814.

It was in 1812 that the Royal Engineer Establishment was formed at Chatham and in 1813 the Royal Military Artificers were renamed the Royal Sappers and Miners. The Royal Sappers and Miners were now to be trained, not only in seige work and construction of fortifications, but also in military field works. It was no coincidence that in 1813 the strength of the Royal Sappers and Miners exceeded that of the Royal Staff Corps, in the Peninsula, for the first time. The Royal Staff Corps now had the beginnings of an effective rival in the field.

Lieut-Colonel Garwood's article has fully dealt with the bridging tasks of the RSC in the Peninsula. Bridging was not their only task. They formed part of the advance guard of any column, to repair the roads where necessary. They destroyed bridges and roads in the withdrawal and constructed temporary field works in defence. At the capture of Badajoz, they assisted in placing the ladders for the escalade of the Castle and took part in the storming of one of the Bastions. A sergeant was one of the first to enter the breach at Cuidad Rodrigues on 16 January 1812. Four Officers led columns into action across the river Bidassoa on 7 October 1813.

In addition to these war-like duties, the Officers played a full part as Staff Officers to the QMG department. One of the problems facing Wellington, at the beginning of the campaign, was the lack of maps and the inaccuracies in those that did exist. During the war, a large area of Spain and Portugal was remapped. A number of RSC Officers took part in the reconnaissance and surveying necessary for these maps,[19] which were printed on an early lithographic press at the Horse Guards (a similar press was later installed at the RSC Headquarters in Hythe Barracks).[20]

As already mentioned, there were undoubted rivalries between the Engineer Department and the RSC. This did not, however, stop them from working effectively together. The most outstanding of these occasions being the bridging of the River Adour. The RSC designed the bridge and were responsible for installing the anchorages. The Royal Engineers and Royal Sappers and Miners combined with the Navy in manning the boats and laying the cables to form the bridge. Subsequent maintenance and improvements were an RSC responsibility.[21]

The establishment of the RSC had been increased to ten companies in 1809.[22] In addition to their commitment in the Peninsula and maintenance of the Royal Military Canal, they were able to send two companies with Lieut-General Chatham's expedition to the Scheldt in 1809 and a detachment to Ceylon in 1811 (all except one of the detachment died and he returned in 1820). A very small officer detachment also joined Sir Thomas Graham in the Netherlands in 1813. A half company was in Sicily and Italy from 1813 to 1815 and was almost certainly at the capture of the Island of Ponza.

At the end of the war, in 1814, a company sailed for New Orleans (for details see the second part of Lieut-Colonel Garwood's article). Two companies also sailed for Canada and were maintained, at that strength, until their disbandment.

With the escape of Napoleon from Elba the RSC sent five companies, under the command of a Lieut-Colonel, to join Wellington's Army in Holland. The first four companies left Dover in April 1815 and were with the army at the time of the battle of Waterloo. The company which had been sent to New Orleans in 1814, returned hurriedly to England and was the fifth company to form part of Wellington's Army. It did not sail from Dover until the end of July and so was not present at Waterloo. The part played by the RSC at Waterloo is a complete mystery. The Rank and File of the companies were certainly not present on the battlefield, since no casualties of any kind were recorded on that day. They must, however, have been in the vicinity since the Corps was awarded the Battle Honour—"Waterloo".[23] Ten of their Officers were actually present on the battlefield. Three of these were wounded and another had three horses shot from under him.

After the advance and occupation of Paris, two of the companies returned to

England at the end of 1815. The other three companies remained with the Army of Occupation until it was disbanded and returned to England in November 1818.

In the meantime, a small detachment had been sent to St Helena in 1816. It was employed mainly on repairs and alterations to Longwood House, which was occupied by Napoleon and his suite. Another detachment went to Gibraltar in the same year and remained there until disbandment.

RELATIVE DATE CHART

Engineer Department of the Ordnance Board

Officers — *Other Ranks*

1757—Granted military ranks

1772—Soldier Artificers' Company

Royal Staff Corps

1787—Corps of Royal Engineers

1787—Corps of Royal Military Artificers

1799—Company of Pioneers

1800—Staff Corps

1803—Royal Staff Corps

1813—Corps of Royal Sappers and Miners

1829—Partly disbanded

1838/9—Disbanded

1856—Amalgamation—Corps of Royal Engineers

Before leaving the Napoleonic Wars, mention must be made of the best known RSC Officer, Richard Henry Sturgeon. He went to the Royal Military Academy at Woolwich and was commissioned into the Royal Artillery in 1796. He transferred to the RSC, as a Captain, on 25 June 1803 and rose to the rank of Brevet Lieut-Colonel before he was killed in the Peninsula. It was he who designed the Alcantara and Adour bridges and became famous for his originality in bridge design. A description of his Alcantara bridge has been used in the foreword to the recently published Military Engineering volume *Basic Bridging-Design*, although his name has not been mentioned. It was unfortunate that he was the only RSC Officer to be killed during the War. His family life had been both romantic and tragic, but he overcame the tragedy and became Wellington's favourite bridge builder. Shortly before his death, he incurred the public wrath of Wellington for a mistake that he had made as a Staff Officer. Some of his contemporaries believed that he in fact committed suicide,[24] by riding towards the French picquets at the skirmish at Vic Bigorre in March 1814. There appeared to be no other reason for his having ridden towards the enemy and his death.

With the end of the Army of Occupation in France, the British Army was considerably reduced in strength. The RSC were reduced from ten to eight companies. In 1820 a detachment was sent to the Leeward Islands and remained there until 1823. In 1821 a company sailed to Mauritius and remained there until disbanded. The Army, as a whole, suffered further reductions in the post-war era but the RSC

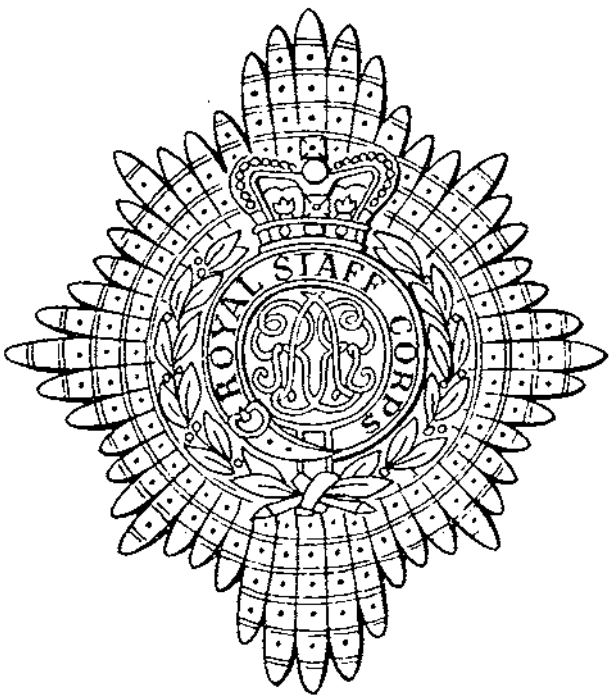

Photo 2. Officers' Shako Plate (or Cap Badge) 1822–1829. Drawn full size from a newspaper photograph and rubbing in the possession of the Ogilby Trust. The colours are: spray star—silver; crown—gilt on light crimson velvet; laurel—gilt; garter—gilt on light blue enamel; cypher—gilt on red/deep orange enamel.

were not affected. In fact their strength was increased in 1823 by a further company. It was specially formed to go to Ceylon, the cost of the company to be paid for by the Colony. An additional company was formed in 1825 to go to New South Wales, under a similar arrangement. These increases brought their strength back to the ten companies that existed during the Peninsula War. With the threats of war in 1825, a further two companies were added to their strength. They had then reached the highest strength ever, with twelve companies and an establishment of fifty-eight Officers and 771 Rank and File. One of the companies formed part of the force which was sent to Portugal at the end of 1826 and returned to England in April 1828. A detachment was at Santa Maura from at least the end of 1824 to the end of 1826 but it is poorly documented and its size, date of sailing and return to the UK have not been established. In 1826 a company was sent to Corfu.

As a war-time unit, the RSC could only be occupied in peace on civil engineer works. Little is known of the work that they carried out overseas in the post-war period. In Canada they built the Grenville and Carillon canals on the Ottawa river[25] and at least one Officer was employed with Royal Engineers on the Rideau waterway.[26] In New South Wales they were employed supervising convict gangs building roads and bridges. In Tasmania they built roads and founded a township at Oatlands.[27] It can be assumed that these are typical tasks.

From 1818 onwards there were many calls to disband the Corps, since it was said to be an anachronism in peace time. Its founder, Frederick Duke of York, died in 1827. It is perhaps more than coincidence that the disbandment of the Corps started less than two years after the death of its founder and protector. The company in New South Wales was disbanded in 1829, at the request of the Colony, due to the expense of its upkeep.[28] Early the same year it was announced that three other companies were to be disbanded and five companies were to be attached to the Ordnance for overseas service. Three companies at home were the only ones to survive with a separate identity.[29]

The Ordnance Board plan was to keep two companies in Canada, to increase the number in Corfu to two and to send the fifth company to Nova Scotia. They planned to disband them with amost indecent haste. As early as March 1829, they gave instructions for a gradual reduction as their services in those countries were no longer required.[30] The total officer establishment, for the five companies, was twenty-two but by the end of 1831 the strength had been reduced to ten and by the end of 1832 to only four officers. The three companies which remained under the Quarter Master General had a small headquarters, but the rank and file strength was only equivalent to one and not three companies. There were ten officers on the establishment but by the end of 1830 the actual strength had been reduced to one Captain and one Lieutenant, as company officers, and a Quartermaster. They existed merely as a maintenance unit for the Royal Military Canal. These duties were slowly taken over by the Engineer Department and in 1838, the Ordnance Board took over complete responsibility for the canal. The last RSC officer, Edward Philip White, remained to complete the handover until 1839.

Many of the officers were transferred to the half pay list; others transferred to the Infantry and Cavalry and continued their army careers. Several continued to serve with distinction. An example is James Freeth who transferred to half pay of the RSC as a Major in 1830, after twenty-three years service in the Corps. He continued to serve in the QMG Department and became Quarter Master General from 1851 to 1855, was Knighted, and promoted General before he died in 1867.

The Royal Staff Corps existed, as an effective engineer unit, for a period of thirty years. For at least twelve of those years they were the only trained combat or field engineers in the British Army. With their disbandment, their regimental records completely disappeared. Their history can only be reconstructed by a lengthy process of examination and deductions from the pay and a few other records that remain. Their existence has been almost totally ignored by our Corps. Is it not time that we now gave them a well deserved place in British Engineer history?

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W6? Problem 1

ONLY one near correct solution was submitted in answer to Problem 1, June 1974 *Journal*.

Major R H Hough, MBE, GM, RE, GSO2(W) Trials, RSME writes:—

"Bomb Disposal Squad *circa* 1940–47 extracting UXB, location uncertain but out of London, probably Sheffield, the officer could be Taffy Morgan but I'm not betting, the steam roller probably belongs to the local authority or their road repair contractor."

The detailed answer is:

Removal of defused 2,000 kg bomb in Frederick Road, Gorleston-on-Sea in 1941 by Major J Staton RE and his Squad from No 10 Section, No 4 BD Company. A gradient was formed leading into the bomb shaft, an RSJ ramp constructed, steel hawsers were fixed to the bomb led via a block (attached to an anchor post concreted into the footpath) to two steam rollers connected in tandem. The steam rollers were loaned by the Borough Surveyor.

The pictorial answer is shown below:

A second solution; from Major G Horne C Eng FICE states: Sir—With regards to your Problem Picture in the June *Journal*. I do not know what, when, why, where or which, but I think I know WHO!!

Corps News

COOPER'S HILL WAR MEMORIAL PRIZE ESSAY

THE winning 1974 Cooper's Hill War Memorial Prize Essay was submitted by Captain M G Fossey RE. There were fifteen entries and all contained ideas that are worthy of serious consideration.

In previous years the winning essay has been published in the *RE Journal*. On this occasion it has been decided to break away from this custom and to publish a major article summarizing the views expressed with a critical review of the ideas submitted. This article will appear early in 1975.

Early Days

MLC

THE early *Journals* are informative enough about the officers and the technical doings of the Corps, but there is little to be learnt about the other ranks. In the *Supplement*, which accompanied each *Journal*, one can discover the whereabouts and unit of every officer; who was going on leave ("Major Stanton has obtained a furlough to Europe"); career news ("Captain Price is permitted to resign his commission; the resignation of Lt Dummler is cancelled"); promotions (surprisingly under "Brevets" it is recorded that Lord Napier of Magdala had been promoted from Lieut-General to General); that in order to observe the Transit of Venus, there had been a world

Early Days 2

wide deployment of small parties of Officers and NCOs. One party, bound for New Zealand, contained Major Darwin, the brother of Charles Darwin. Major-General Wrotham (who was presumably retired) relinquished the post of County Surveyor, North Wales. In 1874, forty-one candidates took the Staff College examinations of which seven failed. The remainder passed, but there were vacancies for only twenty-one. Two out of the first three in the order of merit were Sappers.

In short, one can build up a very reasonable picture as to what sort of an organization the Corps was for the officers—but there is scarcely a hint that the rank and file ever existed.

That there must have been grave problems of management at that time is to be gleaned from the debate in Parliament on the 1874 Army Estimates. From it we learn that "the greatest cause for anxiety as to the future of the Army was afforded this year, as last, by the startling proportions desertions bore to recruitment. 4,000 men deserted in 1873, no less than 33% of the number recruited. In the Infantry the rate was 30%, in the Foot Guards 51% and in the Army Service Corps the extraordinary proportion of 146%. If that Corps was not recruited more assiduously, the whole Corps would soon melt away".

Mr Gathorne Hardy, the Secretary of State, added that "he had already begun to consider very seriously whether some modifications should not have to be made to the whole scheme by which service was now adjusted, so as to make the calling of the soldier more attractive". Even allowing for the fact that there was probably no "buying out" system to act as a safety valve, this statement seems complacent to say the least. The Corps, happily, got no special mention but presumably it also had its problems. In fairness to Mr Hardy a contemporary commentator adds "As to the details of the management and conditions of the Army, Mr Gathorne Hardy had little new to offer, and he was much too prudent to commit himself on points he was aware he might only understand imperfectly as yet." It is unfortunate, perhaps, that more politicians do not follow this example!

The interest in fortifications and their design continued at a high level. Perhaps the comment in the last issue of these notes—that the Corps could have been over obsessed with such matters, may have been correct, especially at a time when the small Colonial War was the order of the day. Although the *Professional Papers* reflected a good deal of interest in the design and use of gabions, which at least smacked of "field engineering", it was paragraphs such as the following which the Editor really took delight in printing:

"Experience shows also that the constant motion of ships prevents their fire from being concentrated upon portions of the walls as that of land batteries is, so as to effect a breach and especially if their surfaces are curved, as in the case of the celebrated Martello Tower on the coast of Corsica, which resisted the fire of a line-of-battle ship and frigate, though it was only armed with one gun; and these circumstances led to the construction of many such round towers for the defence of the coasts of England and Ireland." Good stuff, no doubt, but . . .!

Readers of these notes may remember that Lieut-General William Denison (whose enterprise started the *Professional Papers*) became Chairman of the Royal Commission on the Pollution of Rivers. This commission was mostly concerned with the discharge of raw sewage into rivers, and its report resulted in an Act of Parliament, passed in 1866, which empowered Conservancy Boards to compel all those guilty of this practice to desist.

This ruling very much applied to Windsor. Although the Castle was situated close to the Borough of Windsor, it was not connected with its sewage arrangements, but had a separate outfall directly into the Thames. At that time the War Department (CRE London) was responsible for the Castle's works services. The design and construction of the necessary works fell to the lot of Captain Gun, RE, who published an account of the task in the 1874 *Professional Papers*. It is interesting to note that the main sewer, made in 1846, was driven as a gallery under the main foundations of the Castle by a party of Sappers under Captain Keane, RE. Colonel Keane was

CRE London at the time of this later work. The paper is remarkable for the range of knowledge displayed by Captain Gun, who seems to have had a close personal hand in all phases of the design and construction. The works were not even put out to contract as a whole—but executed by the direct supervision and co-ordination of small contracts.

The expertise displayed by the Corps has already been commented on in these articles, but perhaps no better example exists than the account, admittedly during a period earlier than 1874, of the modernization of Portsmouth Docks, when the docks were converted to cope with a steam Navy rather than one based on sail. At the same time the dockyard was extensively enlarged to provide more alongside berths and new tidal basins. "The Lords of the Admiralty were pleased to order designs and estimates to be prepared under the superintendence of the Officers of the Royal Engineers, who were then employed under the Admiralty." Similar work was being undertaken at the other main dockyards. Wharfs, fitting-out shops, steamshops, brass and iron foundries, sidings, coal handling—let alone a 1,000 ft tideless steam basin and four dry docks, were built. This work was started in 1846 and completed in 1851. The responsible officer was Captain H James RE, FRS, MRIA, FGS, who was one of six RE Officers working under the Director-in-Chief of Admiralty Works, who was a Lieut-Colonel RE. An account of the work appeared in the 1853 *Professional Papers.*

The Officers concerned were all Captains except for Lieut-Colonel Baudrett, the Director. The time for practical experience each had had to fit him for such work was small. Indeed, before being posted to Portsmouth James was employed in the Geological Survey of Ireland and much of Denison's (later to be Lieut-General), who was concerned with the same work at Woolwich dockyard, time had also been spent in survey. Much must have depended on their basic abilities and the YO instruction at Chatham. Pasley's "Architectural Course" must have been very demanding and comprehensive to say the least. Both Denison and James were FRS, even as Captains, as were many other RE Officers during the period. This membership alone singled out the Corps as being a remarkably talented body. In 1874 there were six such members.

A paper read by Captain Seddon RE before the Royal Institute of British Architects and published in the 1874 *Professional Papers* has this to say of Engineers and Architects. "The profession (of Architect) is more elevated in character than that of the Engineer, for by assisting to cultivate the public taste he leads towards the source of all beauty and purity. The Engineer confines himself too closely to one idea, namely the theoretical perfection of his work. To show how maximum results can be gained with materials. In mastering science they have too long neglected art. . . . Members of both professions would be better for working more closely together. . . . The employment of architects would be looked upon less in the false light of an expensive luxury . . . if they were regarded more as scientific constructors, who combining a knowledge of, and true feeling for art were sure to produce a better built, better planned, more beautiful and less costly building, than could be produced without their aid."

Brave words! It is interesting to speculate what Seddon's reaction would have been to a letter in *The Times* (27 June 1973) which, in defence of the old Fenners cricket pavilion (built no doubt at about Seddon's time) stated that the modern, architect designed pavilions, in comparison to the old, looked like something the "Royal Engineers had knocked up in a hurry"!

In the June 1874 *Journal* under the heading "A New Torpedo" there appeared a report of an "infernal machine" in the form of a parcel bomb, which had lately been used in Melbourne. A business man had been killed in his office and his partner badly injured. It seems that the parcel contained a bottle of nitroglycerine. There was much speculation as to the exact construction of the device and the sort of person who could have used it. "The risk almost precludes that the person concerned knew precisely what he was about. . . . There is now a horrible addition to the

means for committing murder." Horrible indeed.

Through the years, Dr Samuel Johnson has not been alone in condemning Governments for overdoing the need for secrecy. He called it the "mysterious secrecy of office". However, in the August 1874 *Journal* appears a comment emphasizing just the reverse. This is in an article by an unnamed Sapper Officer, who was describing the fortifications at Antwerp which he had just visited. "The Belgians reverse the usual practice of concealing the details of their work of fortifications and indeed seem glad to let them be known, both by books and by personal inspections. They are quite right, for no one who knows the strength of Antwerp would be easily led into attacking it."

One cannot help feeling that such words could only have been written by one, who had some vested interest in the construction and design of such works. History seems to indicate that fire power is such that any fortification could not withstand a Commander, who really put his mind to its capture!

In July 1874 the HQ Mess was very badly damaged by fire. The Dining Hall was gutted and the whole suffered extensively from water and smoke. All the contents, including the wine, were happily saved. The main Summer dance, which seems to have been held in conjunction with the Annual Regatta, was to be held on the evening after the fire (could it have been some decoration which caused it?). The dance took place in the new Institute (the present HQ RSME buildings which had just been completed). "The guests were under the impression that it had been intended all along to have the ball where it took place." Furthermore, "the Insurance company wrote to say that all claims would be paid in full without question".

The present Mess Secretary may like to be reminded of the apparently splendid line to which he is heir!

Due to the wind being in the right direction, the Commandant's house, which was next door to the Mess, was fortunately undamaged. An Army *Circular*, dated 1 August 1874, records that because of his increased responsibilities the Commandant would be paid £1,200 per year inclusive of pay and allowances. No doubt at that rate he could have easily made good minor damage out of his own pocket!

Construction Joints in Concrete—A Guide for the Troop Officer

MAJOR W H T SPAIGHT, RE, BSc, C Eng, MICE

INTRODUCTION

THE Royal Engineers have a traditional responsibility for permanent construction works amongst their many other roles. Troop Commanders have to be prepared to undertake construction tasks without the assistance of technically trained personnel. Placing concrete is not the hallowed preserve of the professionally qualified engineer and the clerk of works. All Sappers should be able to understand the problems involved with placing concrete.

AIM

The aim of this paper is to consider one aspect of placing concrete—the construction joint. Firstly, the accepted methods of forming construction joints in concrete will be explained and then some refinements in the techniques used will be suggested.

DEFINITION

A construction joint, sometimes called a "daywork joint", is formed between adjacent concrete lifts which are designed to act monolithically in the completed structure. The main requirement is that the joint should provide continuity between the adjacent concrete sections. There is no provision for relative movement across the joint after construction.

REQUIREMENT FOR CONSTRUCTION JOINTS

As their name implies, construction joints are generally placed for convenience in construction because there may be a limit to the amount of concrete that can be placed in a particular working shift. However a joint may also be required to avoid cracking resulting from the drying shrinkage occurring during the hardening and setting process. This drying shrinkage occurs when the heat of hydration of the cement is retained within the concrete during the time in which it hardens and sets. As the temperature of the concrete falls to that of the surrounding air the concrete mass contracts. Ideally if the free movement of the structure is unrestricted, cracking may be avoided; for example, by the use of the alternate bay construction of concrete floors or, the sub division of concrete pavements by contraction joints. Construction joints can be employed to reduce the restraints on a structure and hence the degree of cracking caused by drying shrinkage. Major cracking may also be reduced by detailing reinforcement and thus construction joints and reinforcement should be considered together. There will be a time lag in construction to allow an appreciable proportion of the total contraction to take place in one section before the next is placed. In the completed structure the construction joint should give a satisfactory bond and continuity between the adjacent concrete sections.

LOCATION OF JOINTS

Although construction joints are formed to aid construction, additional factors must be considered when choosing the location of these joints. The appearance of a structure can be influenced by the position of construction joints and they should be sited either as inconspicuously as possible or as a feature of the structure. If the strength of the structure is critical, it is desirable to position construction joints at points where the shear forces developed are at their lowest value; for slabs and beams it is therefore usual to site construction joints at their midspan or within the middle third of the span. In addition, when considering the positioning of joints the problems involved in formwork construction must be taken into account. For example if a construction joint is needed in the area of a return in a bridge abutment it would be extremely difficult to construct shuttering for a joint on the point of the return.

PREPARATION OF CONSTRUCTION JOINTS

There are no universally accepted rules for the preparation of construction joints, however CP110 Part 1 1972[1] states that "immediately prior to recommencement of concreting on a joint, the surface of the concrete against which new concrete will be cast should be free from laitance and should be roughened to the extent that the largest aggregate is exposed but not disturbed". When concrete is placed and compacted, surplus water and a small percentage of fines are brought to the surface to form a layer called laitance. This laitance is very weak because of the high water content, therefore, to ensure a good bond is achieved across a construction joint the laitance must be removed. The main problem is to achieve an adequate roughness and to remove the laitance as economically as possible. This problem can be considered separately for vertical and horizontal joints.

Horizontal Joints

The surface of a horizontal joint can be effectively roughened by brushing off the laitance about one or two hours after the end of the concreting. In this way the coarse aggregate can be exposed undamaged. An alternative method is the use of a fine water spray to jet away the laitance. However if this method is adopted provision must be made in the formwork to allow the excess water to "run off" the concrete. Unfortunately the timing for removing the laitance is often difficult, especially if the concrete has been placed at the end of the working day. Consequently the roughening treatment is often left to the next day by which time the hardened concrete will require more vigorous treatment. The surface will probably

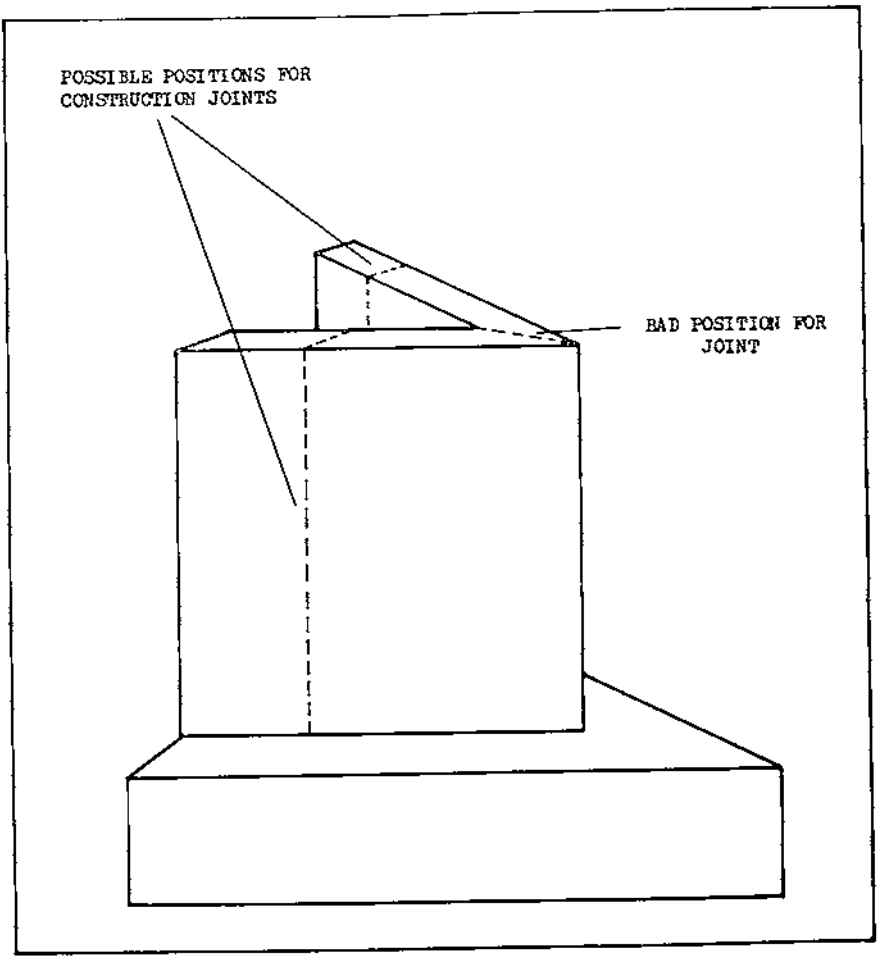

Figure 1. Possible Locations for Construction Joints in a Bridge Wall.

have to be "scabbled" with pneumatic tools which could damage the young concrete. It would be better to arrange for a tradesman to work overtime to finish the construction joint or, possibly, to place the concrete earlier in the day.

Vertical Joints

If conventional timber or plastic formwork is used scabbling methods will probably have to be employed because the formwork cannot be struck for at least a day after concreting. Tests carried out by the Ministry of Works in 1957[2] on vertical construction joints in the centre of small reinforced concrete beams showed that scabbling produced hair cracks in the old concrete and might also cause the surface to be loosened or fractured. This implies that scabbling should be avoided if the construction joints are located in an area where large shear forces are developed. An alternative mechanized method of roughening a joint is sandblasting. However sandblasting a joint face tends to decrease the permeability of the concrete at the joint, which, in turn, might reduce the bond achieved across the joint. To avoid the disadvantages of mechanically producing the required keyed surface other methods should be considered.

Reduction of Scabbling

Scabbling is expensive in labour and time and probably tends to weaken the structure at a joint and therefore it is worthwhile considering methods for reducing the need for scabbling. The two most common ways employed at present are the use of a retarder or by using an expanded metal or fine mesh stop end. It is claimed that retarders do not have adverse effects on the strength of the concrete but as yet not enough is known about these products and further, it is unlikely that retarders will be available for use by Field Squadrons at present. The expanded metal stop end is already widely used in the civilian construction industry and this type of stop end has several great advantages over conventional timber ones. The principle of steel mesh stop ends is that they are designed to be left in position. Some of the concrete fines leak through the mesh and hence provide a good bond with any new concrete placed against the mesh. No scabbling is required and the shuttering does away with the labour operations involved in fixing and striking temporary formwork. One of the most common trade firms producing jointless steel mesh is the Expanded Metal Company who market *Hy-Rib* shuttering. This shuttering is steel mesh stiffened by rigid ribs and it has the added advantage that reinforcement bars can be threaded through it without difficulty. Conventional shuttering tends to retain the considerable heat generated by large masses of concrete. Thus an added advantage of *Hy-Rib* stop ends is that it permits the heat of hydration to be dispersed more easily because of its open-work structure. However wet hessian might also be used to cure the stop end.

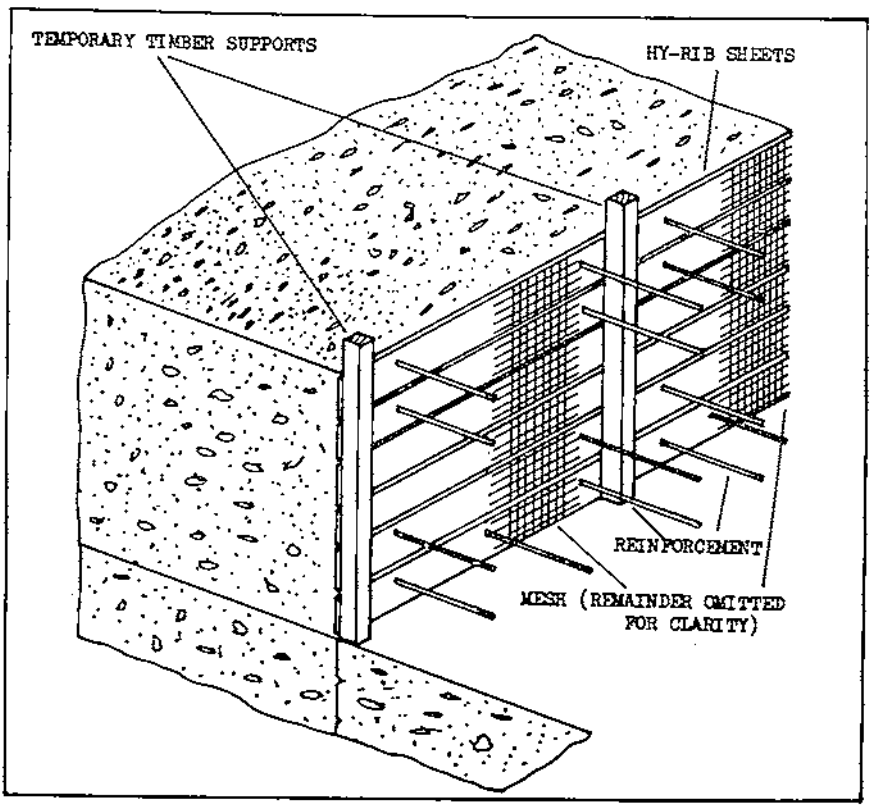

Figure 2. View of Hy-Rib Sheets Providing Keyed Shutter for Construction Joint.

Wet or Dry Joint Surface

Recent research suggests that the bond strength of a construction joint is reduced by wetting the surfaces before the adjacent lift of concrete is cast.[2] Consequently although the remainder of the concrete be kept continuously wet, curing of the joint surface should be suspended a few hours before concreting is to be resumed so as to permit no more than superficial drying of the joint surface. Just before concreting is restarted the roughened joint surface should be thoroughly cleaned and freed from loose matter without rewetting. Unfortunately dust often collects on the concrete surface, and this dust can only be efficiently removed by washing. However it is recommended that a compressed air jet is used in addition to dry the surface prior to concreting.

Cement & Concrete Association tests[2] showed that the bond at the joint was improved if the surface of the old concrete was dry when the new concrete was placed against it. Two hypothesis have been suggested to explain this result:

(a) The absorption of water by the old dry concrete decreases the water/cement ratio of the fresh concrete and so increases the strength of the new material adjacent to the joint.

(b) The finer particles of cement are drawn into the interstices of the old concrete as it absorbs water from the fresh concrete.

This absorption of water can be seen when concrete is cast against absorptive formwork, but the second hypothesis has not been completely proved.

Addition of Mortar

It has been common practice in the past to add a layer of mortar paste to the old concrete before placing further concrete at horizontal joints. The purpose of this mortar layer is to compensate for any loss of fines, caused by adhesion to the reinforcement steel or face of the formwork, and hence to reduce the likelihood that a honeycombed layer of concrete will form immediately above the joint. However tests by the Cement & Concrete Association have shown that if a horizontal joint is primed with a layer of mortar before the fresh concrete is placed, the bond strength of the joint can be reduced by about 15%. Thus the use of a mortar layer is not recommended and other methods of avoiding a possible loss of fines, and hence honeycombing, should be considered. To avoid segregation in the new concrete, it should be thoroughly compacted and the workability of the first batches of new concrete should be increased. The Ministry of Transport[3] specification suggests that the concrete placed above a horizontal construction joint should contain only two-thirds of the normal quantity of coarse aggregate. A further cause for loss of fines is the shrinkage of the concrete away from the formwork during the curing process leaving a path for the fines to leak away. Before placing new concrete above a horizontal construction joint all formwork should be inspected for concrete shrinkage and tightened; in addition, some sealing material can be placed between the formwork and previously placed concrete as shown. The formwork should be water tight and the effects of the heat of the sun should be considered. The formwork may shrink causing opening at both vertical and horizontal joints.

RECOMMENDATIONS AND CONCLUSIONS

It is probable that all Sapper officers will be in charge of a project involving the placing of mass concrete at some stage in their careers. It is therefore important that they should at least understand the problems involved in placing and forming joints in that concrete.

The appearance of a structure can be greatly influenced by construction joints and so they should be sited where they are as inconspicuous as possible or where they may be used as a feature of the structure. If structural strength is critical, construction joints should be positioned where the shear forces developed are at their lowest value. Further the design of the formwork must also be considered when positioning the construction joints.

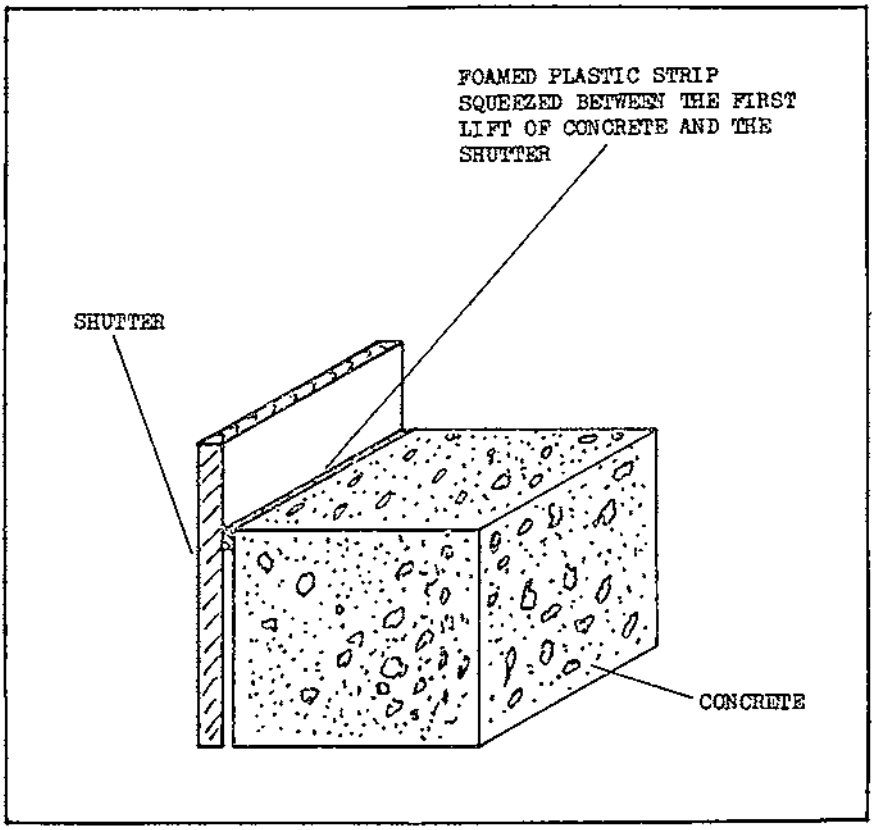

Figure 3. Sealant at Horizontal Construction Joint.

The aggregate at the joint should be exposed, if possible while the concrete is still green, and scabbling should be carefully controlled to avoid forming hair cracks in the surface layer. Expanded metal or fine mesh stop ends provide a simple method of reducing the requirement for scabbling.

The presence of mortar at a joint face generally reduces the strength of the joint. Thus care should be taken to avoid a loss of fines, and to ensure sufficient compaction in the new lift above a horizontal joint. Mortar should only be considered if other methods fail. The surface of the old concrete at a joint should be kept as dry as possible placing further concrete.

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Our Arctic Campaigns Archangel 1918–1919: Narvik 1940

BRIGADIER R S G STOKES, CBE, DSO, MC, MIMM

It may appear irrational for our two Arctic Campaigns, over twenty years apart and differing so widely in origin, character and aims, to be linked under a single head. Contrasts between these ill-fated side-shows, unlike even in the Arctic climates endured, stand out more vividly than similarities. The Archangel Campaign, lasting over fourteen months, was spread over 30,000 miles of forest country, traversed by slow-moving rivers, ice-bound for nearly half the year. The Narvik Expedition, for the most part concentrated in a thousand square miles of mountains and fjords, was over in two months.

The common factors were more political than military. Both ventures have been loudly condemned as "Blunders" in conception and "Failures" in result, with bitter epithets applied to match the bias of the critical authority; and behind them both, was the dominating influence of Winston Churchill.

PART I—ARCHANGEL 1918–1919

THE North Russian Expeditionary Force sprang from small beginnings. In early Spring, 1918, a "Military Mission", with code-name "Elope", was formed in the utmost secrecy. Headquarters were established in a private house facing Waterloo Place, where Lloyd's Bank now stands, supplemented by offices and quarters in the Tower of London.

I was Controller of Mines, 1st Army, when I received a hand-written note from the E-in-C (Major-General Sir G M Heath) informing me of my appointment as CRE "Elope", with an expectation of demolition duties in some distant field. In London, an administrative staff, to cover all arms, was hastily assembled. Our objectives were:—

(1) To proceed to Archangel in order to save from German hands what remained of the vast stock of munitions and stores, shipped for the service of the then disintegrating Russian army.

(2) To ensure that Germany did not obtain the use of the two Arctic ports, Murmansk and Archangel, as bases for submarines and raiders.

(3) To assist the North Russians in the training of new forces, which might join with others (notably Kolchak and his army of Czechs in Siberia) in support of the Allies, or at least to create a diversion if unable to re-form an anti-German front in the East.

By way of adding a touch of mystery to the project, we were instructed to take with us a full rig of plain clothes, suitably packed, maybe to facilitate desertion or, more respectably, transfer to a diplomatic mission on the way out.

No provision was being made for the inclusion of a Field Company or other operational RE unit. Certainly none could be drawn from France at this critical time, when Ludendorff's onslaught had put us, in Haig's words, "with our backs to the wall". On 18 March 1918, had come the Treaty of Brest–Litovsk, releasing nearly all German troops from the East to strengthen Ludendorff's offensive.

British action in North Russia became imperative. The Supreme Council in Paris gave support. If "Intervention" was the mistake proclaimed in later years, there was certainly no "Blunder" in the decisions taken to this juncture.

Murmansk

On 16 June 1918, "Elope" sailed for Murmansk, about 600 strong in officers and other ranks. A war-worn battalion of Royal Scots was in support. Major-General F C Poole, an officer of exceptional knowledge of Russian people and conditions,

was in over-all command.

Incongruously, the most memorable of the many occurrences upon our troopship, *Stephen*, was an epidemic of Spanish flu amongst the Lascar crew. Distressed by the Arctic sun, which failed to set in accord with their needs and traditions, they were convinced that ten of their number were doomed to be carried off by the disease. Ten died and complacency was restored.

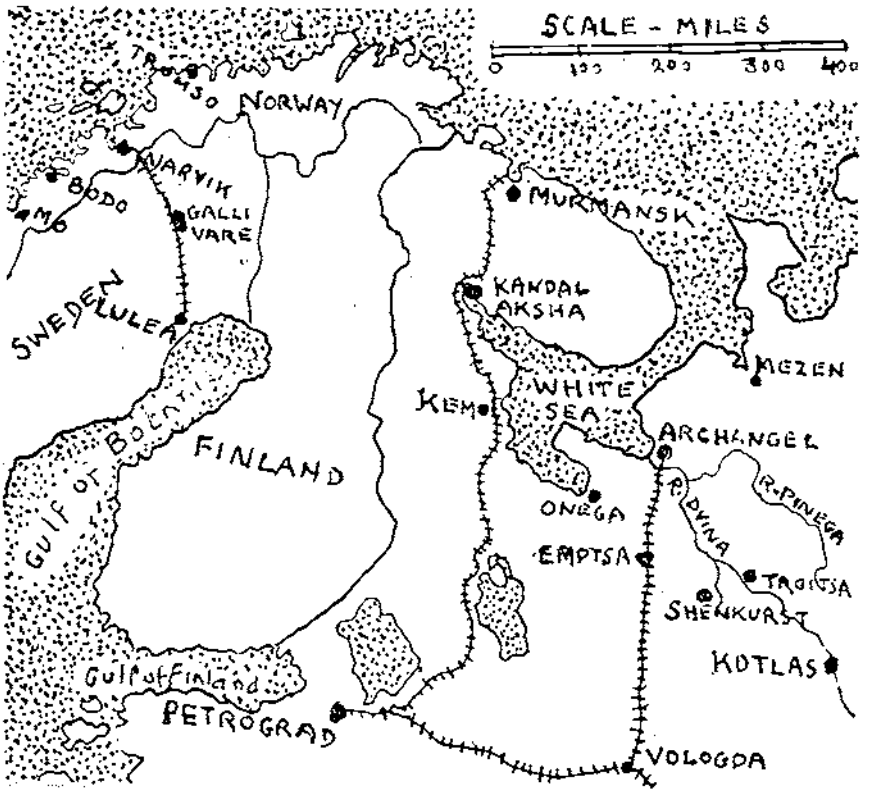
At Murmansk, "Elope" was not called upon to play much part. Co-operation was strengthened with the Regional Soviet, the "Railway Workers" and the "Sailors Council", which held divergent views. On one occasion, General Poole summoned all Russian sailors to come ashore for a discussion. Meanwhile, a small party of officers, including Captain Beckerleg, RE, boarded the then deserted Russian cruiser, and, within the hour, did some creditable work in reducing her immediate capacity for harm.

Late in July, reports were received from Archangel, favouring an early move into the port. The Supreme Council reaffirmed support, with some reservations imposed by Washington, determined not to participate in any form of "Intervention" too belligerent for the democratic conscience.

Early tasks

On 29 July, "Elope", strengthened by a battalion of French Colonial Infantry of doubtful reliability, proceeded to Archangel.

The guns and mountings of two strong batteries, Bolshevic-manned, had to be knocked out by HMS *Attentive* on the approach to port,—a rude "knock on the door" to be given by a friendly mission. The landing was then made without notable



incident and greetings from the ordinary people were encouraging. The Bolshevics, with their Moscow brand of Communism, were disliked by the peasantry who enjoyed their own more homely version of the cult. The people of the North wanted to be left alone and, if involvement became unavoidable, to find themselves on the winning side. Support for the "foreigners" would depend upon the achievements of our forces and the generosity of our material assistance, yet to be determined.

A successful coup by the White Russians, a few days previously, had led to the formation of a new Provisional Government. The evicted Bolshevics fled—halting rarely to show fight. "Intervention" was on. As viewed by a leading British diplomatist in Moscow, Bruce Lockhart, we "had committed the unbelievable folly of landing at Archangel with fewer than 1,200 men". By deduction, "Intervention" was not the "Blunder", but only its sorry lack of strength.

The first task for the RE officers of "Elope", was to become familiar with all the workings of the town, port, railway and other services; to measure up resources, and to give help to our meagre forces, soon static at a point eighty miles south on the Vologda Railway and 130 miles up the Dvina River.

The Provisional Government had to deal with a big influx of people—most of them there for refuge or adventure, apart from the comparatively few wanting to fight for the "White Cause". Many Bolshevics were in hiding. Sabotage by fire in the timber-built town could not be ruled out. Executives responsible for running affairs had their anxieties. One small experience may be cited. Power was cut off maliciously at the Central Station, Archangel, by the shift on duty. The chief engineer, at his home, told me his men had been got at by a Bolshevic agent. He wanted to be forced, not merely requested, to put things right. We marched the man through the main streets to the job, with a detachment from HMS *Attentive* at his heels. In the power station, a revolver was displayed for stage effect. The response was immediate and power switched on. Maybe this play-acting saved the man's life in 1920, when the Bolshevics returned and settled their accounts.

In the Autumn, 1918, General Edmund Ironside took over from General Poole as C-in-C. Brigadier R Chenevix-Trench (CR Signals, RE in "Elope") wrote of him in his brilliant memoirs:—"The General's formidable bulk housed an equally formidable mind. He breathed authority . . . all felt the impact of his personality". His outstanding qualifications for the task ahead were fully exercised.

The Campaign stands unique in the novelty and diversity of its components. An enemy, upon whom no war had been declared: Innumerable spies and agents behind our lines: Operations under a British Mandatory from discordant Allied Powers: A long Arctic winter of intense severity: A summer cursed by a plague of mosquitoes and other flies: Polyglot forces of varying reliability: Bloody mutinies amongst local battalions and insubordination amongst Allied troops: Air reconnaissance and bombing hampered by ice, snow and swampy runways.

Force GHQ was in close proximity to the offices of the Provisional Government, the White Russian Command and Allied Ambassadors who were often at loggerheads and resentful of our military dictatorship. Diversity was also displayed in the wide range of experiences falling to the C-in-C himself, who one day had to sit in conference with the Council of Ambassadors, and another, on a visit to some trouble spot, had to use his gun on an enemy encountered on a forest trail.

American Engineers

At the beginning of September 1918, the 310th Engineer Combat Battalion arrived in Archangel under the command of Lieut-Colonel Morris, at the same time as three battalions of US Infantry under Colonel Stewart. All lacked war experience. Although orders from Washington left no doubt as to the necessary integration of these units with the Allied Forces, under over-all British Command, Colonel Stewart felt himself humiliated by the immediate whisking away from him of two of his battalions, to the Dvina and Railway fronts, while he was under orders from home to station himself in Archangel. After the Armistice, the Infantry Command

pressed for return home at the earliest possible date.

The US Engineers, well-trained, proved to be a body of exemplary zeal and efficiency, co-operating readily at every level, with services stretching from front line back to GHQ. They were not at all in sympathy with Colonel Stewart's rigid interpretation of Washington's restrictions. Upon evacuation, ten months later, Lieut-Colonel Morris—then wearing the DSO riband—asked me if I could exercise my influence with "Q" to get the Engineer and Infantry Commands sent home in different troopships. This request conveyed no lack of regard for the men. Some companies had fought gallantly on the Shenkurst front. Antagonisms had developed at top levels.

Operations

Front-line operations and movements (more often back than forward), inevitably governed sapper activities. The expedition did not turn out to be the magnified "military mission" that some of our sponsors had envisaged. There was a lot of fighting. In the final count, British casualties rose to 1,000 killed and wounded, including forty-one officers killed.

Clashes and minor actions flared up every month and the strain on "Elope's" RE Administrative Staff, remaining at about twenty-eight officers and ninety other ranks, became severe. Thinly spread, they had to serve Force Headquarters on the two main fronts, lines of communication (not free from enemy attack), and all the miscellaneous demands at Base and GHQ, with Stores and Workshops to maintain. Improvised works units were formed. From Archangel too, the training of two Russian Field Companies (to RE Establishment) and work on an inner defence line had to be directed.

The Vologda Railway front at the Emptsa River Bridge, was not as exacting as the Dvina, where we had pushed forward—over-ambitiously—twice as far. Railway troops could be accommodated in box-cars, converted into satisfactory living quarters for sixteen men. This sector had its share of minor activities, not all too creditable, and more than once reverses were the cause of serious alarm. I recall a visit to this front, then held by French Colonial troops, when news of the Armistice

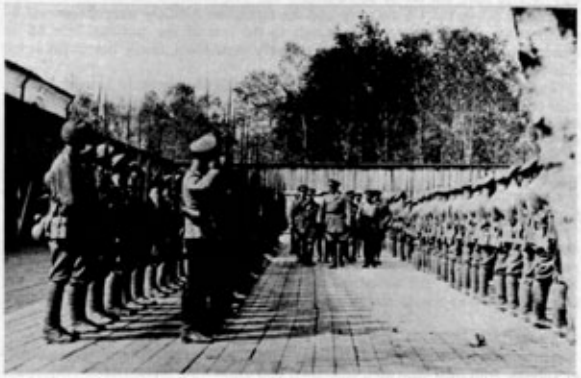


Photo 1. Gen Ironside inspecting No 1 and 2 Fd Coys Russian Engineers. On his right, Col Zimmerman, Russian CE; on left, Gen Miller, Governor General, Provisional Government.

Photo 2. Group of "Elope" RE Officers, Christmas 1918.

came through. "La Guerre est finis" was the excited cry. The end of their tribulations. And the American troops knew that they too were to be sent home as soon as shipping could be brought into port for their release, which did not help. But, on that day of jubilation, our own war, in earnest, had only just begun. About 1100 hours on 11 November, a Bolshevic force of unusual strength and determination launched a well-planned attack on our Dvina positions, with a preliminary bombardment, from 4·7 and 6·0 inch guns, delivered from boats. Under cover of this, the enemy landed about 500 assault troops on both sides of the mile-wide river. They had taken advantage of the open-water prevailing up-stream, whilst our own flotilla was back in port, cut off by down-stream ice. The situation became critical when The Royal Scots, the US Infantry and the Canadian Artillery were threatened by enemy troops emerging from the woods to the rear of the gun-line. Not till 14 November was the attack, checked by a timely snowstorm, finally beaten off at the cost of 100 killed and wounded.

The situation was comparatively quiet for a couple of months. In January, attacks were renewed and we were forced to withdraw from Shenkurst and Ust-Padenga on the Vaga river front. This was a conspicuous victory for the Bolshevics, disclosing, far and wide, the dangerous weakness of our forces in North Russia. Shenkurst was a sizeable town from which the Provisional Government hoped to draw consistent support. The enemy had brought up artillery on land for the first time to deal with our vulnerable block-house defences. This set-back was an anxious phase for the Command; and the bloody mutinies were yet to come.

Although apprehension was widespread, recruiting for the Russian regiments did not suffer. Bolshevic propaganda still found little response from the phlegmatic peasants. The coincident arrival from Paris of the distinguished General Eugene Miller to take over the Governor Generalship, from weak and vacillating predecessors, restored confidence all round.

Defences

Strong-points, away from the Railway Front, were almost invariably established at villages, with their clearings, amenities, and connecting forest tracks. Any attack made upon a village had to result either in successful occupation or in retirement to the starting position, in order to gain protection from the elements. No encircling movements of any duration could survive. In winter, the defence became enormously

strong when attacking troops had to plough their way through snow, hampered by hidden wire, by heaving clothing, by intense cold prohibiting the handy use of weapons. Long white smocks sometimes used by the enemy were effective camouflage in the perpetual darkness, but did not prove a factor of importance except for the movement of scouts and patrols.

Our troops were all reasonably well accommodated during the long winter, in block-houses (normally taking eight men), in village billets or in houses modified to standard requirements. The speedy building work demanded was attainable through the consummate skill of North Russian "axemanship", commonly applied under the guidance and responsibility of a RE Officer or NCO. Though our troops were well satisfied with the provisions made for winter health and comfort, life in perpetual semi-darkness, the eerie silence of the forests and the lack of change and amusement (which had often come their way in France), led to growing despondency, but the expression of grievance rarely got beyond a healthy grouse.

Blockhouses

The unpredictable depth of snow was not as important a factor in the construction of block-houses as anticipated. Playing for safety, to avoid a smothering of loop-holes in an out-size snow-storm, they were generally built too high and conspicuous. Against guns and mortars, all types were vulnerable in the extreme, and protection in trenches could rarely be provided. The consequences of undue height in block-houses were accepted for living comfort. No standard types were set. The usual form involved two single log walls, filled with earth or river sand, to give an overall thickness of about four feet. Bunks and stoves were provided.

Above all for decision, came the best siting of the line or ring of block-houses, governed by undulations, proximity and density of forest and other surrounding features, to ensure a grouping for mutual support against attack from all directions.

Photo 3. Typical Blockhouse, Dvina River Front.

Where practicable, posts were concealed by a screen of trees, and radiating lanes were cleared to give a good field of fire. Trees were often marked for range. Local commands—and they changed pretty frequently—were encouraged to put their own different ideas into effect. Inertia or indifference, as shown by the French Colonials, was the worst of dangers. Visits to forward positions from HQ were inevitably time-consuming. In the normal order of things a round of inspections, covering several hundred miles, might take three weeks.

On the sleigh-routes, rest-houses were set up every twenty miles or so, almost invariably in a village, where the Head-man played a big part in transport organization and stabling for the ponies. These tough little beasts, less than thirteen hands, trot steadily at eight or nine miles an hour. Travelling could be comfortable, especially if the native felt high-boots, "Valenkis", were worn. The "Shackleton" canvas boots were a mixed blessing; wet through upon a thaw and very slippery on dry snow. A guard, once found sitting on a mound of snow, pleaded in exoneration that he was only giving his backside a rest.

When temperatures fall to 40° or more below zero Fahr, breathing becomes difficult. I was once caught in such conditions when having to present an American Engineer NCO with a Military Medal. A suitable oration was reduced to a mumble and no pinning of the award to a tough coat could be attempted: an altogether discreditable performance.

Mutinies

An ugly feature distinguishing the Archangel campaign from all other military ventures was the frequency of Regimental mutinies. Grave insubordination was also experienced in some Allied units, including a raw British reinforcement battalion upon first arrival in the area.

Following a mild revolt in October, 1918, the first serious mutiny occurred in Archangel, when the 1st Archangel Regiment refused to parade, dramatizing their defiance by waving red flags from barrack windows. Two rounds from a mortar brought them scrambling out, to line up in good order. The parade was an unforgettable scene. General Marousheffsky, C-in-C Russian forces, with one officer in attendance, passed down the ranks, personally marking down every tenth man or so for execution—unless the ringleaders declared themselves. Thirteen men later stepped forward and were marched off for court martial and the firing squad. The Regiment left for the railway front the following day in the best of spirits.

A more serious mutiny occurred in April, 1919, on the Dvina front, when 300 men of a Russian battalion went over to the enemy after murdering seven of their own officers during the night. Joining up with a party of enemy troops, the mutineers returned to attack the position, but were held by machine-gunners and other members of their own regiment.

A still more shattering mutiny occurred three months later, also on the Dvina front, when a company of the Slavo-British Legion murdered five British and four Russian officers at night. This unit was composed chiefly of ex-prisoners and misfits not acceptable to the Russian Army staff for enlistment; a British experiment in rehabilitation that failed dismally.

The Onega mutiny, mentioned later, and the coincident news of the complete failure and disintegration of Kolchak's Siberian army raised one more wave of anxiety over the safety of our Force. Fortunately, the epidemic of mutinies was not highly contagious; Bolshevic fertilization was essential.

Treatment of Prisoners

The foul treatment of prisoners in Moscow jails came to light in 1920. The experience of Lieutenant E A E Bolton RE,[5] may be cited. This young regular joined us as a reinforcement, a few months before evacuation and in order to give him some service in the field, helpful in his future career, we posted him as LORE to a Russian Field Company at Onega. Within a month, he was caught up in the biggest mutiny

of the Campaign. The whole of the Russian Infantry regiment, covering our right flank, went over to the Bolshevics, killing most of their officers. The Field Company section was inevitably involved, whatever their sentiments may have been. When Bolton was taken before the Commissar, NCO's interceded on his behalf because of his consideration for the welfare of the men—in strong contrast to their customary treatment—and he was spared, for months of misery in jail. Prisoners were herded together under indescribably filthy conditions. Sodden black bread or cabbage soup was the daily ration. Bolton recorded that on one occasion they got dog-soup, with a cur's head displayed in visual evidence of the cook's bounty.

It was a different story for prisoners amenable to Bolshevic indoctrination. A guileless young padre was captured on the unstable railway front and given a soothing dose of propaganda, with stress on Universal Brotherhood. "That's all very well", protested the padre, "but your men stole my cash and gold watch." Deep shock was expressed and a parade ordered for the recovery of the booty. After a break for tea, the talk continued when there was a sudden burst of rifle fire at close range. "Don't be scared", exclaimed the Russian, "there is no attack. They are shooting the two men who took your things." The proselyte was sent back to our lines, cheerful in the recovery of his watch, and it was reported that he wasn't allowed to break-step until he found himself in a troop-ship homeward bound.

Air-Field Services

The Air Force,—RAF, and Slavo-British Aviation Corps—had little occasion to call on the Royal Engineers for help. Few airfields were used beyond those at Bakharitsa (later Archangel), Beresnik and Obozerskaia. Clearance of forest, uprooting of tree-stumps and levelling of ground was undertaken by local labour with exemplary speed. Hangars, oil-heated, were made of canvas, presenting in snow and thaw a dismal picture.

A number of airmen could not face up to the abnormal difficulties. Much of the

Photo 4. Colonel Morris, US Engineers, on Inspection Tour.

flying had to be tackled by the more experienced officers, British and Russian. The Air Force Commander (a South African) Colonel Van der Spuy,[1] brought out by General Ironside, undertook risky missions of minor importance, in which top-rank is not usually expected to indulge. One day in June 1919, a deserter's report whetted Van der Spuy's appetite for a reconnaissance bombing raid in an open cock-pit single-seater. Engine-trouble developed and he had to make a crash-landing, nearly fatal, on a river bank. Captured, he was sent to a jail in Moscow, and was treated as badly as young Bolton. But Van der Spuy was able to enjoy at least one day of his captivity. Upon routine release of half an hour from his solitary-confinement cell, he spotted as a fellow prisoner the Governor of the jail. He had stolen a pound of butter.

This airman's crash-landing was due, Van der Spuy was convinced, to sabotage by his own mechanic, who had made fake adjustments before the take-off; maybe loosening a magneto terminal to ensure an engine failure over forest country in enemy hands. Intervention in a civil war carries its own particular brand of hazards.

Archangel Inner Defence line

Work of inner defences, twelve to fifteen miles south of the port, constructed with the utmost secrecy by American Engineers and RE late in 1918, was resumed in July 1919.

Brigadier Charles Turner[2] has lent me a diary he kept when, a young reinforcement officer for the 385 Field Coy, he was put in charge of the Dvina Sector Right Bank. His observations throw refreshing side-lights upon the activities of that time and place. Visits by senior officers, easy enough in this locality, were frequent; tactical discussions as lively as up the line. A few quotations:—

"30 July, 1919. Made a Cook's Tour of Blockhouses and MG posts with CRE Archangel, Macadam, and Russian Chief Engineer, Colonel Zimmerman. Both very nice . . ." Brigadier Turner met that CRE in later years, then Sir Ivison Macadam, Director of the Institute of International Affairs. Zimmerman was executed by Trotsky's gangs in 1920.

"18 Aug. Lieut-Colonel Carey arrived . . . to be CRE Archangel defences . . ."

"25 Aug. CRA and another Brigadier General go round the line today, but I didn't run into them, thank goodness!"

"8 Sept. Carey not a bit pleased with the Redoubt nor with the fact that his precious rays have not been cut."

"10 Sep. (and seemingly in desparation) "Cut down a lot of trees myself with one Sapper and eight Russkies."

Lord Ironside, in his memoirs "Archangel 1918/1919", recalled the good relations prevailing between the US Engineers and our Sappers originally on the job. "Much betting went on as to who would win the race."

This rear line was never occupied.

Final Operations

On 4 May 1919, the War Office ordered that, in all circumstances, the troops were to be out before winter. In June, two new brigades constituting a real hitting force of 8,000 men, arrived under the command of Brigadier-Generals Grogan VC (238th Brigade) and Saddleir-Jackson (250th Brigade). To each brigade, was attached a CRE and one Field Company RE, filling the vacuum created by the coincident departure of the American Engineers.

The brigades had been specially raised from seasoned troops and keen young volunteers to give the enemy a shattering blow from which they could not recover until all our troops and any civilians seeking asylum, were clear of port. Responsibility for the final battle was given to Saddleir-Jackson, a dashing cavalryman, on whose elegant dandyism even the most solemn of memoir-writers have never failed to comment. I once only had occasion to see him, in his crack motor-launch up river. The timing of my visit (which didn't go too well) was poor staff work; catching

him before his morning ablutions.

The big attack was made on 10 August, with strong support from the Royal Naval flotilla and the British and Russian Air Forces. Within four days, the Bolshevic positions were surrounded and destroyed: 3,000 were made prisoner and their casualties were heavy.

Major M Luby,[3] 385 Field Company, deployed two sections on each bank of the Dvina. They did fine work in bridge repairs and construction, improvement of tracks, etc. The left-bank sections became involved in several sharp engagements with armed craft and enemy landing parties, finally assisting the Royal Fusiliers in bringing back a batch of 800 prisoners, through the forests. Four minor attacks were beaten off, in which the Sappers, with their high proportion of war-experienced soldiers, played a creditable part.

Earlier, in July, Grogan's Brigade with 384 Field Company had been called upon to restore the position after the mutiny of the Slavo-British Legion. The Field Company, under Major A C Finnimore,[4] established and held a strong point at Troitsa before their planned withdrawal. One section also did excellent work on the Vaga River front, on defences, patrols, tracks, bridge and raft construction.

The Vologda Railway front was active for some time after the Red Army had been shattered on the Dvina, and the Sappers and Russian Field Company were hard pressed. Repairing railway track, cut by shelling and raiding parties was continuous. Our troops took the offensive on 6 September and captured the Emptsa Steel Bridge, when a section of the Russian Field Company performed a remarkably rapid job in crossing the river and adjacent marsh with a road bridge.

At one stage in operations, a RE officer volunteered to lead a flanking party of five Russian Sappers in an attempt to cut the track behind a Bolshevic armoured train. The demolition attempt failed and one sapper was killed; but the officer brought back two gunner prisoners and could boast of having got to the nearest point to Petrograd attained by any troops during the campaign.

During the advance, RE officers were able to examine the enemy defences, and

Photo 5. Emptsa Railway Bridge destroyed by Bolshevics 1918, being replaced by Road Bridge.

found them to be poorly sited and maintained; many blockhouses were not bullet-proof. New construction work showed a great improvement in the standards all round; and, significantly, generous provisions for officer (or commissar) accommodation.

Evacuation

The withdrawal of troops to points of easy access to transport vessels proceeded with little enemy interference. Our shame in leaving to a cruel fate so many whom we had worked with and encouraged was lightened by their incredible display of optimism at the end of our campaign. On 29 August 1919, General Miller launched an attack and took 1,000 prisoners. Later, he recaptured Onega, which had long baffled the Allied forces.

The last troopship left on the night of 27/28 September. Russian Staff Officers with whom the "Elope" RE party had been in close association came down to the wharf to say farewell. They might have been seeing off a party of friends on a Caribbean pleasure cruise. No recrimination, barely regret upon our departure.

There was a lull in their operations during early winter. 3 February 1920 was the beginning of the end. A massive attack on the Dvina front drove the loyal 4th North Russian Infantry Regiment from their positions. The 3rd Regiment mutinied. On 16 February, the Railway Front crumbled and five days later a Bolshevic Regiment entered Archangel, to be welcomed with the customary "bread and salt"—the reception enjoyed by Grogan's Brigade exactly nine months before.

Winston Churchill wrote of this last phase in "The Aftermath":—"Soviet Rule was re-established on the shores of the White Sea, and mass executions, in one case of 500 officers, quenched the last hope of Russian life and freedom!"

(To be concluded)

REFERENCE NOTES

[1] Major-General K Van der Spuy, CBE MC.
[2] Brigadier C E F Turner, CBE DSO.
[3] Brigadier M Luby DSO, MC. (Died 7 October 1974.)
[4] Lieut-Colonel A C Finnimore, MC.
[5] Brigadier E A E Bolton. (Died 19 May 1967.)

Promotion and Career Planning 1959–1972 A Personal View

LIEUT-COLONEL (Retd) R W OBBARD, MA

INTRODUCTION

THERE are many different rosters in the Royal Engineers and from 1960-72 it was one of the many duties of the Seniority Section, RE Records to calculate ideal pyramids of promotion for all rosters so as to ensure that rosters were viable and promotion prospects were good.

In 1972, when I retired as RO3 i/c Seniority Section, all rosters in the Corps could be subdivided into four main types:

(a) Multi-trade Rosters	ie General Roster
(b) Single-trade Rosters or equivalent	ie Clerical Roster, Postal Roster, Survey Roster (Not a single-trade roster but the equivalent for rank structure purposes)
(c) Technician Rosters	ie Clk Wks (C), (E) and (M) Rosters, Mil Plt Foreman Roster (Part Tech on time promotion)
(d) Army Rosters	ie Band Roster

This article will show how ideal rank structures for all rosters were calculated in accordance with instructions initially issued by the War Office as far back as 1959/60 and how the original criteria were subsequently changed and kept up to date within the Record office. It will also outline briefly the history and application of career planning since its initiation in 1959 and will finally explain the present system of promotion within the Corps.

It will deal only with essentially simple principles and will not get involved with details produced for the MOD such as "Soldiers Promotion Statistics" and "Data Sheets for Career Planning". Nor will it attempt to explain the extremely complicated Management Plans and Target Structures produced annually by the Career Planning Section of the MOD aided by statisticians and computers, as these would merely confuse the issue.

HISTORY—PROMOTION

Ideal Speeds of Promotion

The Army Council agreed, in December 1959, that for the time being the following speeds of promotion should be considered as ideal for the three main types of rosters:

	Total years of service to				
	Cpl	Sgt	SSgt	WO2	WO1
Regtl and Tradesman Rosters	3–4	7–8	11–12	14–15	18–19
Technician Rosters	1	5	7	13	16

Ideal Pyramids of Promotion

In July 1960 the War Office issued instructions as to the method of assessing the theoretical speed of promotion on any roster and pointed out that in order to do this all that was required was:—

(a) The establishment of the roster.

(b) The annual wastage from the roster concerned.

(c) The numbers in each rank of the roster who were promotable.

Further guidance was not forthcoming from the War Office and so promotability, based on estimates from seniority rolls, was calculated as between all ranks on all rosters. Wastage and Run-Out were averaged out over three years and the latest manpower figures were used for establishments. Thereafter ideal pyramids/rank structures were calculated for all rosters using the Army Councils agreed speeds. Summaries of requirements so as to give ideal pyramids and rank structures were forwarded to AG7 for onward transmission to the War Office (ECAC) in 1960 and again in 1962.

IMPROVEMENT OF ROSTERS

Having once calculated ideal pyramids the struggle was to get the rosters existing in 1960, which were anything but ideal, improved. This was a matter of co-operation between RE Records, AG7 and SD7 so as to ensure that, as new establishments were approved or old establishments amended, the ideal was approached. As a result of this co-operation the numbers of WOs/NCOs in the Corps have been increased by over 1,350 since 1961 and this despite the loss of posts caused by the McLeod reorganization of the Q services, the closure of the TA and the run-down in the Clk Wks rosters.

During this period the ideal pyramids as originally calculated did not remain static but were kept amended as wastage and run out figures altered, as promotability was checked and simplified, as experience showed that speeds of promotion should be changed and as ratios of WOs1 had to be revised.

IDEAL ROSTERS

Gradually the following principles—many of which are self evident—evolved for ideal trade rosters:

(a) The roster must hold all ranks from Spr to WO1.

(b) The speeds of promotion should be between four and six years to Cpl and thereafter three to four years between ranks. This will permit Cpls and above to do at least one tour in each rank and enable RE Records to receive two CRs. Two years is too fast and five years is too slow.

(c) It should take eighteen to twenty years from Spr to WO1.

(d) The promotion prospects between ranks from LCpls and above should be about 50%. It will be found that 65% is too high and 35% is too low if the shape of the pyramid is to be maintained. However from Spr to LCpl the variations may be between 35% and 80%—the latter being on certain single trade rosters which hold very few Sprs.

(e) The ideal ratio of WOs1 to total strength should be about 1% for the General Roster and 2·5% for single trade rosters. These figures were arrived at from a mixture of army statistics, calculations and experience and were found to fit the bill.

The position is somewhat different for Technician Rosters in the RE as only SSgts, WOs2 and WOs1 are held on these rosters. Promotion to WO2 is by time after six years as a SSgt and so the only rank which affects the flow of promotion is WO1. The aim of RE Records has been to maintain the percentage of WO1 in these rosters at around 23%.

Establishments which are common throughout the Army cannot be amended unilaterally but ideal pyramids for the Band Roster which showed how desperately the Band establishments required amending were worked out as far back as 1960. These establishments were finally improved by the MOD in 1971 and so the roster will not be considered further.

CRITERIA AND CALCULATIONS—IDEAL PRYAMIDS

When once the essential criteria have been decided then the very simple calculations for an ideal pyramid/rank structure can be rapidly completed. Consider the General Roster and the following criteria which applied to it a few years ago.

Criteria	Spr	LCpl	Cpl	Sgt	SSgt	WO2	WO1
(a) Ratio of WO1							1%
(b) Speed of promotion (years)		2½	5	9	13	16	20
(c) Promotability % from rank below		35–50	55	50	50	50	50
(d) Wastage and Run-out % (W and RO)	14	13½	12	6½	7½	11	25 (incl Commissions)

From the above an ideal pyramid for the roster can be quickly calculated if one works backwards from the 1% WO1 and the final result will show the following rank percentages:

Ideal % in each rank 50·9 18·5 15·1 8·0 3·8 2·7 1

The calculations will also show that 36% of the Sprs may expect promotion but allowing for the minimum 100 reductions in rank from LCpl which may be expected annually, the promotability factor for Spr will in fact be about 41%.

To assist in the overall calculations, should you wish to try it, I have just space

in which to show how the numbers of Sgts would be calculated for a 10,000 strong roster in which the above criteria apply and the calculations so far show 100 WO1, 272 WOs2 and 384 SSgts.

(a) As promotions are cumulative, 84 Sgts would be promoted annually to fill the following vacancies, i.e. 25 WO1 vacancies (25% of 100) + 30 WO2 vacancies (11% of 272) + 29 SSgt vacancies (7½% of 384).

(b) If it takes 4 years from Sgt to SSgt then it will be found by trial and error that 798 Sgts are required and the criteria show that 50%, i.e. 399 are promotable and 6½% Waste and Run-Out.

(c) The calculation is then as follows:—

1st Year 399 Sgts out of whom 84 are promoted and 26 W & RO (6½% of 399)
2nd Year 289 Sgts out of whom 84 are promoted and 19 W & RO (6½% of 289)
(399 – (84 + 26))
3rd Year 186 Sgts out of whom 84 are promoted and 12 W & RO (6½% of 186)
(289 – (84 + 19))
4th Year 90 Sgts out of whom 84 are promoted and 6 W & RO (6½% of 90)
(186 – (84 + 12))

Thus over a 4 year period all the promotable Sgts will either have been promoted or will have wasted and run-out.

HISTORY—CAREER PLANNING

Prior to July 1959, no trade or adaptability qualifications were required for promotion on the General Roster. Soldiers, other than WOs2, were promoted subject to selection by the RE Records Board, provided that they were recommended and educationally qualified and their CRs showed that their Military Qualifications were up to a certain minimum standard. Trade qualifications were only required on the various EES (Establishment for Engineer Services) Rosters and on the Survey, Band and Postal Rosters. WOs2 were selected for WO1 by the Corps Senior Selection Board.

In July 1959 the first adaptability rules were introduced and published initially in "A Guide to the Career Planning and Employment of Regular ORs of the General Roster". Finally in November 1959 revised qualifications for promotion were introduced and a soldier in future had to be PES, Militarily, Age and Trade qualified for promotion.

The introduction of adaptability and trade qualifications for promotion made it essential for career planning to be carried out on the General Roster as, in addition to Cbt Engrs, there are a large number of "other" tradesmen on the roster. This gives the roster a great advantage over normal Regimental Rosters as its size makes it possible to plan ideal rank structures although it also has the disadvantage that none of the "other" trades has a viable rank structure as such and there are no specialist trade promotion ladders. Hence it is essential that such tradesmen should be capable of holding down two or three varied appointments in the higher ranks as laid down in the adaptability/employability rules.

The first step in career planning was to notify OCs when a soldier who was trade qualified and recommended was not selected by the RE Records Board because he was not adaptable and to give reasons why and what additional qualifications he required. This was not altogether satisfactory on its own as it left matters too late and did not clarify the type of career and so, in 1970, it was decided that in view of the complexity of the adaptability rules and in order to avoid overtraining the following action should be taken. A Cpl after serving for one year in the rank should receive a career planning letter in which RE Records suggested the type of career for which he appeared to be most suitable, ie Cbt Engr, Trades/Q, MT/Q, Plt/Q, Cbt/Sig, Resources, etc. At the same time he was given the opportunity to comment or suggest, through his OC, any alternative which he would prefer. When once the matter was settled and the extra trade requirements, if any, agreed, then his channel for promotion was marked in red on the cover of his CR file.

MECHANICS OF PROMOTION

Even with a sound rank structure and efficient career planning, it is still essential that the actual mechanics of selection and promotion should be satisfactory if the best soldiers are to get onto the promotion ladder and do well thereafter. The following are essential principles:

(a) LCpls should be selected by the officer on the spot, ie by COs and OCs, with RE Records prepared to help with quota vacancies and waiting lists so as to ensure that no first rate Sprs can lose their chances of promotion.

(b) When a NCO who is fully qualified and recommended is within a year of promotion—if selected—his card is placed in the zone of promotion box. In the case of Cpls and above initial Boards are held to ensure that all NCOs in the zone are up to current Corps standards and are employable in the higher rank. Selections for NCOs to fill higher appointments in acting rank are made from those in this zone.

(c) Boards are again held on all NCOs, Cpls and above, to fill the actual vacancies arising in the higher rank during the current promotion year. These Boards make a final selection from all NCOs in the selection zone and watch over speeds of promotion between ranks. Promotion is by merit tempered by seniority from within this zone.

(d) Soldiers can be recommended and selected for accelerated promotion and when this is done their seniority in their present rank is considered to be increased by one year and they can thus gain up to a years seniority on promotion.

(e) WOs2 are selected for WO1 by the Corps Senior Selection Board.

If the maximum benefit is to be obtained from the promotion system, it is essential that WOs/NCOs who are not up to standard for their present rank should be reduced in rank or transferred to the Reserve. This is fortunately comparatively easy to achieve in the Army especially for LCpls who are considered to be under trial as NCOs, and an OC might well have to reduce annually 5–10% of the LCpls in his unit.

CONCLUSION

This article has endeavoured to trace the history and stress the principles of "Promotion and Career Planning".

Summing up the principles are:—

(a) All rosters must be viable and their rank structures should approach as nearly as possible to the ideal;

(b) OCs must be notified when a NCO is not selected for the zone of promotion because he is not adaptable. In the case of General Roster Cpls career planning is essential after one year in the rank;

(c) Sprs should be selected for and promoted to LCpl by OC Units but thereafter promotion Boards must be held by RE Records or in the case of promotion to WO1 by the Corps Senior Selection Board;

(d) It must be possible to accelerate the promotion of outstanding WOs/NCOs and reduce in rank—or apply for the reduction in rank of—those who have failed to make the grade.

It is considered that promotion and career prospects throughout the Corps are now very good—1,350 additional WOs/NCOs would no doubt vouch for this—but it is still necessary to keep a close watch over rank structures and the criteria on which they are based and to ensure that improvements continue to be made as additional establishments are approved and old establishments are amended.

There is no room for complacency however. It is sincerely hoped that the Career Planning Section of the MOD, with its extremely complicated Management Plans and Target Structures, will be able to give more assistance in the future. Its aim is, I understand, to obtain financial approval to the improvement of rosters on career planning and cost efficiency grounds; to date its plans and structures (which fail to show ideal structures), have only been of limited assistance in the build up and reshaping of RE Trade and Technician Rosters.

Reflections on T and AVR Engineers

BRIGADIER C A LANDALE, BA

IT was not without some trepidation that I motored north along the M1 to join HQ 29 Engineer Brigade (V). The TA, as it is still called by many, was a closed book in spite of its reorganization and re-emergence as the TAVR in 1967. I had never served in either, yet here I was about to take up command of an Engineer Brigade spread from Aberdeen in the north to London in the south. The portents were not good. I was rammed by a luxury 49-seater coach while stationary (but won my battle with the insurance company—eventually) somewhere near Watford Gap—and on the first night, while I lived in an office in the HQ enclave, I killed seven mice intent on breakfasting on my cornflakes, bread and marmalade. Even mice cannot eat cornflakes silently and they suffered for their presumption.

Now two years later, I am perhaps wiser and possibly better educated. The portents were perhaps not so ominous as I had thought, though in such a large parish the inevitable incidents have occurred while travelling to and from scattered drill halls all over England and Scotland. A deer landed on the bonnet, first bounce, and got away unscathed. A bicyclist tried to pedal through the boot of my stationary (again!) staff car, but he was not unscathed and was eventually prosecuted by the local Chief Constable for dangerous riding. He suffered, poor chap, and may still regret the day that he attempted a major time trial on the open road.

How does the TA (sorry I meant TAVR) stand today. There are many, I believe, who have little knowledge of this part of the Army and who fail to realize, for example, that the TAVR represents a major slice of the BAOR order of battle in the event of mobilization. The TAVR is but a part, an essential part, of one army and it behoves the Regular Army to accept this fact. Neither can do without the other and thankfully, viewing my own ignorance two years ago, I feel that there is a growing awareness and appreciation of the part played by the Volunteer Army in our military affairs. It is I believe worthwhile recording some of my own thoughts and experience so that those who follow may be less ignorant than I was, and that others who, while not serving with the TAVR, but who have dealings with them, either on the staff or as neighbouring units, may be better advised on the animal with whom they may be sharing the defence cake.

There are I believe two possible fallacies today: either that the Territorial has done it before on two notable occasions and will be able to do it again; or else that he is a second rate soldier and does not compare with his regular counterpart. Both views are of course extreme and the truth inevitably is somewhere in the middle. The term Volunteer is really a misnomer because the Regular Soldier is a Volunteer in that he has volunteered to serve. The Territorial is a Volunteer in the more widely accepted sense. He has, usually, a main line occupation and his service in the TAVR is voluntary and comes out of his free time which might otherwise be spent with his family, in front of the dreaded box, or on any other pleasant pursuit. It is a taxing *extra-mural* activity, demanding both in time and energy, unfashionable in the mid seventies, a form of communal service not readily recognized by the public at large but wholly satisfying for those who seek some change from the rat-race of civilian life, whether in competition for jobs, pay, a stake in a Union, or simply to be "one up on the Jones's". It is in fact a highly professional activity and most of those who take to it are not recognizable from their regular counterparts. When on duty, it is not possible to differentiate between the Regular and Volunteer, whether in dress, style or competence. At a recent Army Display, it was indeed a problem to decide how to show that the soldiers on the Stands were in fact members of the TAVR and not Regular Soldiers. The solution, to provide each Volunteer with a green dynotape badge, was hardly effective and resulted, in some cases, with the Volunteer taking umbrage that there should indeed be any difference. It needed tactful persuasion to

assure those concerned that the badge was a measure of their merit to help educate the public, and not to differentiate the Volunteer from the Regular. This sense of pride and belonging to a unit that is part of one army is the first lesson that I learned.

My first impressions were of pride—and loyalty. To this I quickly added a degree of competence which I felt initially did not match up to the Regular Soldier—and here I was wrong. My feelings were that all the units in my Brigade were good but that they lacked experience in many of the simpler arts of military life. I felt that in spite of the most evident keenness and enthusiasm of all ranks, they just could not compete in the time frame being considered with mobilization, move to a war theatre and on to a job. There was no doubt that they would learn quickly. This is one immense advantage of the Volunteer; he is there because he has chosen to be. He can opt out whenever he likes and therefore when he is with you he is avid to learn and to take part in any military games that are organized for his benefit. Like any other man, he responds to variety and stimulating leadership and because he is there for fun, he learns quickly, remarkably quickly, and this was my second lesson.

The TAVR soldier does not take long to settle into a military environment. He practices just that every time he attends weekend training. He has the ability to shrug off civilian prejudices and to step out of his own, possibly dull, routine into an extra-mural military life as simply as he would settle into his home arm-chair after a day at the mines or in a factory. It is his choice and he accepts it. Above all no one, no shop steward, no boss, no wife is going to stop him as it is entirely his choice. This is a freedom that is not readily recognized. It is a freedom to accept discipline as it exists throughout the army today. A freedom based on sensible discipline, personal initiative and the need for intelligent and thoughtful soldiers.

Of course there are limitations in the TAVR. It could not but be otherwise in any unit whose members only train on average for about forty days each year. Inevitably it takes longer to train the volunteer to reach any given standard, for example, the average sapper needs two years or more to complete all aspects of the Combat Engineer Class III syllabus. So at any one time about a half of ones soldiers are not fully trained. Every Commanding Officer is continually trying to find ways to overcome this shortcoming, but ultimately it all boils down to money and the total man-days of training that each unit is allowed each year. We exceed our allowance each year—and get away with it—I imagine because others fail to use their quota. But it is nevertheless a limiting factor. There just is not time in any one year to train as Combat Engineers, nor at the same time to keep up with all the basic military training essential for any and every soldier. If they learn to shoot well, to dig properly, to practice guards in the field, to undertake NBC training or any other general military task, this can but be at the expense of the more specialized training needed by the soldier wearing any particular cap badge. The Sapper, especially, has a wide range of skills to learn and it would be wrong to accept standards lower than those found in the Regular Army. This would indeed make the TAVR Sapper a second class soldier and would ultimately lead to ineffective units and unsatisfied volunteers. So one accepts a continual balance of partially trained soldiers, and this must affect the ability of a TAVR unit to undertake some of the tasks that could possibly come their way. The opportunity (I have avoided the word problem!) exists to train each man to meet the most likely tasks within the overall role of any particular unit.

Other limiting factors, all stem from this basic lack of time. Night training is possible, but only at the expense of day-time training. A man can stay awake so long, but not remain effective, nor learn any longer. Fitness is difficult to achieve, though in the Sappers we are fortunate in drawing a considerable number of our recruits from heavy industry where a degree of toughness is natural anyway. It doesn't make for smart soldiers, but Sappers, even regular ones, are often chunky. They need to be. Even so general fitness and particularly tough feet are often lacking. Again a balance needs to be kept between the general military requirement and the specialized needs of any one cap badge—particularly where that cap badge is a sapper one. So I would say that the TAVR Sapper lacks experience of working at night and is maybe

not as tough in his feet as he might be. However as with everything else, he learns quickly and is certainly not averse to being pushed beyond the bounds of comfort. I have yet to meet a truly disgruntled TAVR soldier and this stems I believe from the quite excellent training arranged by the Commanding Officers whom I have been privileged to command and the fact that the Volunteer would not be there if he wasn't truly a volunteer.

It is a truism that there is no such animal as a bad soldier—only bad officers. And herein lies the crux of the future of the TAVR. In the days of National Service, virtually every TAVR Officer had some real military experience. Today he has none —and only the most senior Majors (I have only two left in my Brigade) have actually had regular army experience in the past. Consequently this experience of military management is steadily dwindling. The young TAVR Officer of today is potentially as good as his predecessor and as enthusiastic as ever. But he has even less time than his soldiers in which to learn his job. Relatively inexperienced Squadron Commanders are not ideally placed to train even more inexperienced subalterns. To this fact must be added the dispersion of units created by the reorganization of the TAVR and the attendant difficulties facing Commanding Officers in running meaningful and effective Young Officer training. Even so the Volunteer officer is still expected to provide the same professional competence as his forebears and as his regular counterpart.

But consider his programme. Having been selected as a potential officer, he must spend his first "camp" at Sandhurst attending a two week commissioning course (compared with the twenty-five week SMC course for the Regular). In his second year he must do his "Special to Arm" course at Chatham, again only two weeks compared with about twenty weeks for the Regular. He is unlikely to see his (or even a) troop at Camp until he has been with his unit for three years. Of course there is weekend training during the year. Regiments do run special courses for junior officers as indeed does Brigade HQ, but the Young Officer must learn on the job. OJT ("on the job training") is inevitable from the word go. However the standard of Young Officer is quite excellent. They are usually professional men in their own right, managers in industry, and the art of military command is absorbed quickly. But consider the young troop commander, detached from his squadron. Has he the experience to manage his own troop, keeping his squadron constantly informed of what is going on, and how well, to plan ahead and order his stores for the morrow, to know when to delegate to an equally inexperienced sergeant, to cope with another section attached from another unit, to be awake when his Brigadier drops in unexpectedly, to have organized his harbour area, troop meals, a sleeping roster, a duty watch keeper on his radio, the defence of his soldiers, the flow of refugees, the gas (NBC) sentry and still look alert (make no doubt about it he will be dead tired, unshaven and smelly!) in the face of all odds? No wonder it is the management that collapses first under pressure and not the soldiers.

The problem (and this time it is one) becomes even more acute—at squadron level. The Squadron Commander of today may not have been born when the last war ended. His Second-in-Command certainly was not. He is usually a married man with a young family at a critical stage in his civilian career. And yet he gives up time and energy to a voluntary pastime to which he may find it necessary to devote upward of 100 days a year. The most noticeable limitations are an inability to delegate authority and thereby a failure to train his subordinates in the practice of command. The very nature of the TAVR with its accent on weekend training, organized by the Regimental permanent staff, prevents Captains and junior Majors from learning these arts. The weekend itself is too short to fully test the system of management which can only be properly exercised once each year during the period of camp. Anyone *can* stay awake for forty-eight hours if he has to and it is only in the subsequent period that the failings in management really become apparent. Without in any way decrying the excellent officers that we have, it is apparent that they need more and yet more experience of working continually for periods exceeding forty-eight hours. It is this shortcoming which will limit the effectiveness of units more

than any other in the event of mobilization. No unit can be effective without good, sound, competent unit management. Time is needed for this and time may be short.

It is from the Squadron Commanders that TAVR Commanding Officers are selected. It will be rare in the future for any Squadron Commander to have served in the Regular Army. Probably only about one Squadron Commander in three has both the time, the ability, and lives in the right place to be considered for Regimental Command. Command at Regimental level should, I believe, be the carrot for every young officer joining the TAVR today. But if he is to be successful he has a demanding race to run. He must first overcome the many demands of his family; he must accept a degree of interference with his civilian job. He must be able to live where it suits both his civilian and volunteer career. He must be able to overcome the pressures of civilian life at the same time as he meets the most critical period in his TAVR career. For this he needs both a tolerant boss and, perhaps more important, a tolerant wife. I find that the key post is that of Squadron Commander and particularly where this is Independent. This is the time when the TAVR officer will fully come into his own or else decide to give us best. At present units are very widely spread and no increment of officers is allowed. A sabbatical year or two would do wonders for some. If a few never returned, then this must be accepted. But for many it would provide that breather which would enable them to recoup their energies and come back again mightily refreshed to the benefit of the TAVR and the Regular Army.

I hope I have not given the impression that the TAVR management is bad; far from it. In many ways the Officers and Senior NCO's who fill executive and supervisory jobs in their own right, have a great deal to offer and considerable experience. What they lack is military "know how" in a military environment though this is compensated for by the excellence of the TAVR soldier. If more continual training were possible, I have no doubt that this weakness would rapidly vanish. As one Commanding Officer said to me at the end of annual camp—"What would not be possible if we had them all for another fifty weeks this year".

It is perhaps worth recording some of the highlights—and possibly some of the less well advertised incidents—during my two years in Command of a TAVR Brigade. I have been lucky in the extreme in having really first class Commanding Officers and the achievements of the Brigade are a measure of their competence and enthusiasm and only a little of their success would I claim for the benefit of Brigade Headquarters.

The first real achievement was to be allowed to provide a TAVR Squadron to take part in the Engineer-in-Chief's Biennial Demonstration at Chatham. They were given the task of promoting the mobility aspects of the demonstration, the highlight of which was the construction of a 30 m Medium Girder Bridge. On the first day they achieved this in just under thirty minutes but on the final day, so great was their enthusiasm to beat even this record that they slammed the bridge across too hard and the launching nose buckled. This began I believe an era when the TAVR Engineers came to be more widely known and accepted. Their toughness and fitness, as witnessed by an "all arms" military audience, was most marked and highlighted the potential achievements of the Volunteer given reasonable time to train. The same unit was brought smartly down to earth some months later when a night-build of the same bridge on a virgin site took more hours than I care to mention—but probably more lessons were learned that night than all the practice provided on the demonstration ground at Lodge Hill, Chattenden. If some soldiers—and officers—were chastened by their experience, at least their morale did not suffer and they now know far better how to look after the kit with which they are issued and particularly the MGB Jacks.

A more onerous task was undertaken by 71 Engineer Regiment in April 1974—to construct a Heavy Floating Bridge across the Rhine near Rees as part of a Northern Army Group Exercise. The site chosen was one very near that used by 21 Army Group in March 1945. This was probably the first time since that date that British Army Engineers had attempted a crossing of the lower reaches of the Rhine,

where barge traffic is now heavy and continuous. Arrangements were made for the river to be closed to water traffic for a limited period and with the help of the German River Police this was achieved. Actual construction time was 6½ hours. The bridge was open for vehicular traffic for four hours, though first across was the pipe band of the Regiment. The river was open again ½ hour ahead of schedule. Although all the planning was undertaken by the Commanding Officer, a Regular Officer, actual construction was the responsibility of a TAVR Squadron Commander and of course the entire work force was TAVR Sappers. A young TAVR Captain was in charge of all work at the head of bridge. His calmness and authority was most marked particularly as the number of visiting Generals and German civil officials steadily increased and quite overshadowed the construction party. Worthy of particular note, too, was the fortitude and cheerfulness of the winchmen throughout the operation. Again the TAVR had demonstrated their excellence and their potential. But there is another side to the coin. Inevitably an operation of this sort demands training and practice and this can only be achieved at the expense of other aspects of military engineering and more general military duties. Nevertheless, the TAVR Sappers had shown that they are the equal of the professional army.

Variety has been the keynote of my two years—best exemplified in 1973 when 73 Engineer Regiment went to Camp by LSL. They embarked at Hull and suffered the worst summer gales in the North Sea. Perhaps because every soldier was only too glad to get his feet on to solid ground, they tackled a very wide range of military and para-military tasks with what I now know as their customary vigour, enthusiasm and efficiency. Upwards of 4,000 mines were laid within eight hours of landing while the Regiment deployed on the construction of culverts, the improvement and maintenance of an 8-mile stretch of moorland road, the demolition of an old castle and the construction of a large Nissen hut and a number of footbridges. The standard of workmanship throughout was remarkably high and if some sub-units went short of grub because their radio was not as efficient as it might have been, then this again highlights the realities of a situation where only limited time is available to train in a very wide variety of military and engineering techniques. Needless to say the lessons learned one year become the object of concentrated training throughout the following winter months and are highlighted at Camp the year following.

The Sapper is a versatile animal, and never more so than in the TAVR. He cannot be top-dog in all aspects of military engineering all the time—any more than can his Regular counterpart. But he has hidden skills and the enthusiasm that comes from a real volunteer. He cannot match the specialized techniques acquired by the APC-mounted Sappers in the forefront of BAOR. But he is loyal and determined, mentally robust, and he enjoys his soldiering. If he has weaknesses, and so has everyone, it is beholden on the Regular Army to appreciate what these are and to use him accordingly.

In the light of the current Defence Review, and the TAVR Review which preceded it, both of which may have been published before this article is in print, it is still worth emphasizing the excellent value for money provided by the TAVR in these days of financial stringency. The TAVR is increasingly professional and confident and abounds with natural managerial ability. It may lack in some aspects of fitness and cannot, by the very nature of things, be fully trained in all aspects of military and professional tasks. But, speaking particularly of my own Brigade, it is ready and capable of filling the role assigned to it. It's principle lack is "All Arms" training in an "All Arms" environment, and the increasing lack of real military experience highlights the need for ex-regular officers and soldiers to join the TAVR and to continue to serve their country in this way.

This Volunteer Army could not exist without two means of support. Firstly the Associations who foster and stimulate all volunteer units throughout our country. And secondly the Regular Army itself without whose support and goodwill little could be achieved.

The Indian Sappers and Miners Some Aspects

PART III

COLONEL P A EASTON, OBE

So much has been written about the Mutiny of 1857 that further elaboration is out of place. It should however be made clear that the Mutiny was restricted to the Bengal Army only and did not extend to the other two Presidencies. An "Indian Army List" of two years later showed clearly those units which had mutinied and those that had been disarmed. Being part of the affected Army the Bengal Corps was not free from infection although this by no means extended to the whole of the Corps, whose strength at that time had increased to twelve companies. It might well be said that the heroic conduct of the small party of this Corps at the demolition of the Kashmir Gate of Delhi Fort went a long way towards atoning for the conduct of some of their less fortunate comrades.

"Out of the evil cometh much good", this can well be said of the results of the Mutiny when the British Government took over the Government of India from the East India Company and established a new Bengal Army. But the assumption of the Government of India by the Crown does not appear to have had any major effect on the armies of the three Presidencies which remained independant of each other for the next thirty-five years. At this time the strength of the Madras and Bengal Corps was reduced to ten companies while that of Bombay remained at five. In 1862 the three Corps drew nearer to each other when the Engineer Officers of the three Presidency Armies were given Royal commissions and were held on a separate roster of the Corps of Royal Engineers.

By 1866 it was fully recognized that improvement of the technical skill of the Indian sapper was essential. To achieve this important role it was decided to improve the quality of the British non-commissioned officers, who were attached to each Corps, and thus a skeleton RE Company was established in each of the three Presidency Armies. So for the first time there was a permanent representation of the Corps of Royal Engineers on Indian soil.

Up to 1947 British warrant and non-commissioned officers were borne on the strength of "H" Company RE with its Headquarters in AHQ.

Attention now began to be focused on the type and quality of the British officer in each of the three Corps, which were not completely "officered" by Engineer Officers. Frequent engagement in operations on the North West Frontier attracted Engineer Officers to the Bengal Corps, where they remained. But in the case of the other two Corps the financial, technical and other attractions of the Political and Public Works Departments were far preferable to "peace time" soldiering at Headquarters. So each of the Madras and Bombay Corps contained a number of infantry officers; in fact in 1865 all officers, other than the Commandant, came from the infantry. Ten years later there were still nine infantry officers with the Madras Corps and three with Bombay. It was not until 1885 that all officers of all three Corps of Sappers and Miners were drawn from the Corps of Royal Engineers.

Events of the Second Afghan War, 1878–1880, pressed home the point that, if engineer troops were to do themselves full justice and be of real value, proper equipment and a suitable organization were vital. Prior to this war the three Corps had slowly progressed in efficiency but laboured under the difficulty of being overshadowed by other branches of the army at the, then, Army Headquarters. Only after 1885, when all officers were from the Corps of Royal Engineers, and reasonably permanent, were modern tools and equipment supplied and an organization adopted similar to that in the UK. There had been much criticism in the war and the Indian Sappers had been likened to rather poor infantry with some superior attainments due

to the knowledge and skills of their officers. There also was much criticism of their training in peace. At such times units of each Corps were at their respective Headquarters, where they were organized and treated as an infantry battalion, probably due to the influence of the large proportion of infantry officers. It was argued that the basic unit for operations was the company and that companies should not be treated as detachments of the Corps at Headquarters. It was further argued that companies, while not being independent units, should be posted to stations where they could be more effectively employed. Frequent postings of "Native Officers" should be the exception and not the rule and companies should be of a strength of at least two hundred men. The modern Field Company was now on the horizon. There had also been anomalies in the matter of command of Sapper units on operations in the Second Afghan War. Eventually it was ruled that, on field service, units of the three Corps of Sappers and Miners would be under the command of the CRE but that their own officers would still remain responsible for interior economy.

In 1885 important re-organization was put into effect, and two principles were accepted. The Service Company would be so organized and equipped that it would always be capable of independent movement and action; and the three Corps were to be capable of rapid expansion. Commandants were not to be below the rank of major; equipment of each Service Company was to be carefully scrutinized and revised to bring it up to modern standards. The Field Company of modern times had now come into being and the matter of command and organization in the field remained to modern days as ordained by these two principles. Thanks for this far sighted measure are due to one man, Lieut-Colonel Blood RE, later General Sir Bindon Blood, the first Chief Royal Engineer of the Corps of Royal Engineers. At the same time some alteration was made to the strengths of the three Corps. Each of the Madras and Bengal Corps was to have six Service Companies, numbered 1 to 6, and two Depot Companies, A and B. Of the two depot companies, A Company was to hold two telegraph sections, two field printing sections and a submarine mining unit. The Bombay Corps was to have four Service Companies and one Depot Company.

For a brief period the Sappers and Miners took on the additional role of Submarine Mining. As early as 1868 the need for torpedo defences of the Hugli and the Rangoon rivers had been considered. In 1879 the Madras and the Bombay Corps each provided one company for training in this role, being relieved by an Indian Submarine Mining Company twelve years later. In 1910 this again was replaced by sections at the four ports of Calcutta, Rangoon, Bombay and Karachi. As the necessity for submarine mining diminished and finally disappeared, these four sections became Defence Light Sections, manned by RE and Sapper and Miner personnel and affiliated to the three Corps. In 1927 when Aden became the responsibility of India the Defence Light Section in that station was amalgamated with 23 Fortress Company of the Bombay Corps, which was then stationed at Aden. Sections still remained at the three Indian ports but in 1933 their duties were taken over by Fortress Companies RE of the Indian Auxiliary Force.

To revert to 1885, when there arose the threat of war from Russia. Although the three Presidency Armies were quasi-independent, some form of overall control was exercised by the Commander-in-Chief of the Bengal Army. He had been given certain powers over the armies of the other two Presidencies. At this time the threat of the possible consequences of such a war had not passed unnoticed by Indian Rulers, some of whom offered part or the whole of their State Armies for employment with Imperial Forces. Four were selected to furnish Service Companies, organized and equipped as Sapper and Miner units. By 1895 the need for one army and not three quasi-independent Presidency Armies was fully realized and all three were merged into one Indian Army. The Indian Sappers and Miners too then began to be recognized on an all-India basis.

It took another great sapper Officer, Lord Kitchener, to cause full recognition of the three Corps as one arm of the Service. Having been strongly identified with their three Presidency Armies the "Indian Sappers" were not given sufficient representa-

tion as a Corps at Army Headquarters. In 1897 an order of precedence had been fixed as follows:—first the Madras Corps, then the Bengal Corps and lastly that of Bombay, but this in itself had been insufficient for the three Corps to be understood as one branch of the Army. Following on his abolition of the Indian Staff Corps in 1903 and his proposed re-organization of the Indian Army, the three Corps of Indian Sappers were each allotted numbers. The Bengal Corps became "1st Sappers and Miners", that of Madras (who had become "Queen's Own Sappers and Miners" in 1876), now became "2nd Queen's Own Sappers and Miners" and the Bombay Corps became "3rd Sappers and Miners". Immediately following the bestowal of these titles numbers were allotted to the three Corps on a consecutive basis. The Service Companies of the Bengal Corps retained the numbers 1–6, those of the Madras Corps 9–15, and the Bombay Corps took the numbers 17–22. The Aden Fortress Company was allotted the number 23. Also to avoid confusion Depot companies were allotted consecutive letters.

We must now go back nearly forty years to the time when the Indian Sappers first put their hands to intercommunication in the field in 1869. In 1870 the Bengal Corps constructed a telegraph line between Rawalpindi and Kohat and later from Dera Ismail Khan to Bannu. Later this Corps, in 1877–78, provided a field telegraph for the Jowaki Expedition and also in the Second Afghan War. The Telegraph Section of E company of the Madras Corps served in the Egypt campaign of 1882 and three years later a telegraph section was included in the Depot Companies of each of the three Corps. In 1890 the Indian Telegraph Department took over military telegraphy in India but the three Corps retained their sections with some of their men being trained by the Department. They continued to furnish Telegraph Sections for operations until 1911 when all sections were absorbed into the Indian Signal Corps.

The Indian Sappers may also claim to be the early pioneers of aviation in India when in 1900 an experimental Balloon Section was formed from some British RE personnel returning from the Third China War. These were later joined by twenty-eight men of the Bengal Corps. Various experiments were carried out with a view to the use of balloons on the North West Frontier. Such employment required that balloons should reach a height of at least 7,000 ft, which proved impossible and the section was closed down. By 1908 the advent of the aeroplane doomed further prospects of use.

In the twenty years following the giving of numbers to the three Corps there were several changes in titles. In January 1906 the Prince of Wales became Colonel-in-Chief of the Bengal Corps, which became "1st Prince of Wales Own Sappers and Miners". Later, when the Prince of Wales acceded to the throne the title was changed to "1st King George's Own Sappers and Miners". In March 1923 the title was again changed to "1st KGO Bengal Sappers and Miners". After the death of King George the title was again altered to "KGO V Bengal Sappers and Miners". The Madras Corps who had become "Queen's Own Sappers and Miners" in 1796 and later "2nd Queen's Own Sappers and Miners", in 1911 were awarded the title of "2nd Queen Victoria's Own Sappers and Miners" and, similar to the case of the Bengal Corps, in 1923 altered their title to "QVO Madras Sappers and Miners". In 1921 the title of "Royal" was bestowed on the Bombay Corps, in recognition of the services of the Corps in the Great War. As in the case of the other two Corps the numeral was dropped in 1923 and the Corps became the "Royal Bombay Sappers and Miners".

Although not on such an immense scale as in World War II, the three Corps expanded to a total of approximately thirty-five thousand in the Great War, approximately seven times their peace-time strength. Officers came from the Army in India Reserve of Officers (who "knew their India"), from Indian Survey and the Railways and, later, from the UK. Two infantry and one cavalry divisions sailed for Egypt en route for Europe and after a short pause finally moved to France when 20 Field Company of the Bombay Corps was the first Indian Sapper unit to set foot in France.

This contribution by the Indian Government could hardly be described as fully effective due to inadequate equipment. Artillery, machine-guns and medical supplies were insufficient and obsolete; organization of reserves was unsound. To the Indian soldier the lack of sun, the flooded trenches and the freezing cold were potent factors. Some rations too were very strange indeed. The Indian Sappers fought gallantly in Flanders but later were withdrawn to theatres with more suitable climates. 17 Field Company of the Bombay Corps had the doubtful privilege of being captured by the Turks in Kut el Amara and later by the Japs in Singapore.

Mention has already been made of the employment of Indian Sappers on Railway work and in 1902 two companies, 25 and 26, were raised. Each was organized with two branches, regular and traffic. The latter was manned by civilian employees without military training. Officially classed as Sappers and Miners these two companies were under the aegis of the Bengal and Bombay Corps. Two more companies were raised in 1916 and later all four were formed into one Railway Battalion, which had its own Depot Companies. After the War the battalion was disbanded and the first two companies were absorbed into the Bombay Corps, becoming 25 and 26 Railway Companies of that Corps. They were disbanded in 1932 when a major reorganization of the three Corps took place.

The early thirties marked the start of mechanization when Field Companies were each equipped with four thirty-hundredweight lorries for carrying heavy water supply equipment.

1923 is an important year in the annals of the Indian Army as it marked the beginning of Indianization of King's Commissioned Officers. Certain units were selected for Indianization but no Sapper unit was nominated. Indian Cadets were first sent to Sandhurst for training and later to the RMA at Woolwich and in 1936 the first King's Commissioned Indian Officer arrived in India, having been trained both at Woolwich and at the SME at Chatham. However it had been decided that India should have its own training establishment and an Indian Military Academy was established at Dehra Dun where a "Woolwich" wing was included for the training of Indian Sapper Officers. It is not inappropriate to mention here that one of the first two Indian Engineer Cadets to be commissioned was Second-Lieutenant P S Bhagat, later Lieut-General Prem Singh Bhagat, the first Indian to be awarded the Victoria Cross in World War II while serving with the Bombay Corps.

Hitherto Indian sappers had been enlisted into one of the three Corps of Sappers and Miners but, now that Indian Engineer Officers had been commissioned, some measure was necessary for their inclusion in the Indian Army. Accordingly in 1933 a Corps of Indian Engineers was established. This Corps would contain Indian Sapper Officers and also all new recruits to the three Corps of Sappers and Miners, although there was no other change in their status, in that they continued in the particular Corps which they had joined.

After the Great War, RE officers coming to India were first attached to one of the three Corps of Sappers and Miners for three months, after which they either remained with that Corps as a permanent posting or were posted to the MES, Survey or Indian Railways. From 1933 newly-arrived RE officers were posted to one of the three Corps for one year on arrival.

1932 marked a great upheaval in the three Corps. Since the beginnings of an Indian Army, as has been seen earlier, there had been both engineer and Pioneer units in the three Presidency Armies and from these had sprung the four famous Corps of Pioneers after the unification of the three Armies. Officers of the Pioneer Corps were Indian Army Officers, who received some form of training in Field Engineering at the Headquarters of one of the three Sapper Corps, and the Other Ranks were also given training in elementary fieldworks. Enlisted primarily as fighting soldiers the Pioneer Corps formed large units of man-power on such works as road-building. However the Government of India decided to disband these four Corps as a measure of economy. In order not to cause too much unrest by the discharge of several thousand troops the decision was also taken that a proportion

of the now unwanted pioneers should be transferred to the three Corps of Sappers and Miners. The two Railway Companies would also be disbanded. It was therefore decided that each Corps would be increased by one Training Battalion, which would absorb the existing Depot and training companies, and that each Field Company would be increased in strength by one section, making a large unit of over 300 strong.

When "People" are affected a simple and neat staff plan does not always work. The problem in this case was that of the disposal of the Sikhs of the Sikh Pioneers, who being low caste (Ramdasia and Mazhbi), were not accepted by the high caste Jat Sikhs of the Bengal and Bombay Corps. There were few problems regarding the transfer of Madrassies from the Madras Pioneers to the Madras Corps and the transfer of Mahrattas from the Bombay Pioneers to the Bombay Corps, But AHQ had ruled that each of the Bengal and Bombay Corps would take a quota of the men from the Sikh Pioneers and that "mixed" Sikh units would be the order of the day. It might here be mentioned that at this time the three sections of field companies of the Bengal and Bombay Corps were each drawn from separate classes, e.g., a field company might have one section of Muslims, one of Hindus and one of Sikhs. Each had its own cook-house but as each was trained and equipped to act individually the important matter of cooking presented no problems. Now it was ruled that where there was one Sikh section it would contain mixed castes of Sikhs. A similar problem was encountered by Training Battalions. Despite extremely careful handling and much professed goodwill on both sides there was unrest among the higher caste Sikhs, leading to a shooting incident. A solution had to be found before matters became worse. Eventually it was decided that the Sikhs of the Bengal Corps would be of the higher caste and that the Ramdasia and Mazhbi Sikhs should go to the Bombay Corps. It was a sad but inevitable decision. Jat Sikhs of the Bombay Corps were sad at leaving a Corps where there were many cases of son following father; the Ramdasia and Mazhbi Sikhs, leaving the Bengal Corps, were having a second upheaval inside twelve months. However, with careful handling the scars healed rapidly and soon the temporary loss of morale was cured. To assist the Ramdasia and Mazhbi Sikhs in their new surroundings a few of the Officers of the Sikh Pioneers were loaned to the Bombay Corps for a short period.

After the Declaration of War in 1939 India moved slowly towards meeting the great demands on her man-power and resources and it was some time before even a second training battalion was sanctioned for each of the three Corps. By the end of the war each had three training battalions with some 3,000 men in each. Much technical equipment and MT was in very short supply. In one case, a field company, formed in 1939, did not receive its engineer equipment or vehicles until ten days before its departure for Malaya. However, as momentum increased, the three Corps expanded at least ten-fold.

But this increase in Engineer troops was sufficient only for the needs of Divisional and Corps troops. There were no specialized units. For this purpose additional Engineer Groups were formed for the raising of units such as: Mechanical Equipment Companies, Forestry Companies, Well Boring Sections, Artisan Works Companies, Bomb Disposal Companies and the like. Even Engineer Battalions were formed on the lines of the Pioneer Battalions that had been disbanded only seven years earlier. These new Groups were in the Corps of Indian Engineers but had no other connection with either of the three Corps of Sappers and Miners, except for the fact that a small cadre of VCO's and NCO's was transferred from the three Corps to form a nucleus on which the new Groups could be formed. After the war these Groups were disbanded.

In 1941 the *coup de grâce* was given to the title of "Sappers and Miners" that had been so proudly held for so many years. In fact the name of "Suffering Miner" was held in high esteem throughout the Indian Army. It was decided that the term "Sappers and Miners" should be abandoned in favour of the rather anonymous title of "Group", a term which, due to affection, never really held sway, except on documents, until the end of the British Raj in 1947. In 1946 the title of Royal was

bestowed on the Corps of Indian Engineers and the three Corps became QVO Madras Group RIE, KGO V Bengal Group RIE and Royal Bombay Group RIE.

In 1946 matters in political circles were moving fast and in 1947 the British Raj came to an end. The India of "The Raj" was divided between India and Pakistan. Every soldier of the Indian Army had been asked to record whether he wished to stay in India or be transferred to Pakistan. Naturally all Muslim troops of the Punjab and other areas voted to go to Pakistan, wherein were their homes. Previous to this "one class" units had been formed against the possibility of this move being necessary. A boundary between the two new dominions had been determined and the latter part of 1947 witnessed transfers of whole units from one side of the new boundary to the other. British Officers returned to the UK except for a few, including RE Officers, who remained to assist in the transfer of power. Much has been written of the antagonism between the two new countries but it must be recorded that at the time of the transfer there was no strife among the units of the Indian Army, who true to their tradition, training and history acted impartially and firmly during the bloody days of September and October 1947, irrespective of where they happened to be serving at the time. For example Lahore is part of Pakistan and terrible riots had occurred. Nevertheless at the Railway Station the author met a Madras Sapper NCO quite happily ensuring law and order in the station and on its platforms. At the end of a reconnaissance for a bridge a Punjabi Mussulman Viceroy Commissioned Officer had sat down to tea with the troops of a Mahratta Battalion.

And so in 1947 the three famous Corps of Sappers and Miners, the engineers of the Indian Army, lost their British Officers, who had lived and worked with them for so many years. But the great traditions remain and the Officers of India have carried on from where the British left. Indeed, when the Bombay Corps celebrated its 150th anniversary in 1970 no effort was spared to remind all of its proud history and traditions.

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Correspondence

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BEF NORWAY, 1940

Sir,—What memories Michael Calvert's article (March 1974) bring back to one who was SOIII RE to the Lieut-Colonel Turner, whom he mentions. If my memory serves me right he was SOI RE to what was to have been the Corps HQ, of which we were an advance party. I remember sitting in his cabin on HMS *Galatea*, on our way from Rosyth to Aandalsnes, and trying to work out what we could usefully do; the only thing which occurred to us was to enlarge a section of map and allocate areas to the various services; I still have the sketch, but it was a somewhat unrewarding exercise.

An amusing incident occurred in our endeavours to obtain depth charges from the Royal Navy, for this was their first notification of demolition preparations, auguring an evacuation; so in true style, they set about celebrating with champagne, a crate of which they had "requisitioned" from a French vessel (presumably at Molde). I managed to get one bottle for my SOI RE!

Another incident was the Board set up to supervise the destruction of several thousand pounds in pound notes, which the Paymaster had to dispose of; seeing members of the Board lighting cigarettes with pound notes added a spice of amusement to the proceedings.

The two most eerie experiences were: first a reconnaissance of the railway line between Overdal and Aandalsnes on a pedal-operated trolley, by moonlight; fortunately it was downhill most of the way, and there was no disruption of the track by bombing from the air, as had been feared; second, standing on the wooden jetty at Aandalsnes, waiting for a

RN anti-aircraft sloop to loom up through the early morning mist to take off the rearguard party, knowing that there were no British troops between us and the Germans, and doubting whether there were any effective Norwegians.

Other memories include: learning to ride a motor-cycle on appalling roads, as the thaw began; meeting an exhausted Major Millis Jefferis as he returned from some hair-raising experiences, in a personal expedition to try out new delay detonation devices; the successful evacuation by train of all the Force except the rear party; the order by General Paget to remove all detonators, so as not to embarrass the Norwegians, but a disappointment to the Sapper demolition parties; reporting to the Chief of Staff, Brigadier 'Cam' Nicholson on SS *Batory*, to which we transferred at the Orkneys to be greeted by "Hullo! I heard you had blown yourself up!"; and finally being lined up in a shed on the dockside at Greenock, to be addressed by the CIGS (General Ironside) and told "Don't forget, you were *ordered* out of Norway, not *driven* out"! Yours sincerely, Alfred Jarrett-Kerr.

Major H Johnson RE (retd)
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THE IRISH

Sir,—I have read with interest Lieut-Colonel J R Alford's articles on the Sappers in Ulster in the June and September issues of the *Royal Engineers Journal*.

Browsing through *Journals* of earlier years I came across a most interesting article written by a Sapper officer who was posted to Ireland in the 1880s.

He wrote:

"It has been truly said of the Irishman, who is always against any sort of government, that 'he does not know what he wants and he won't be happy until he gets it.' Another characteristic is their inconsequential behaviour; it is a truism in Ireland that it is always the unexpected that happens, but it does not happen in the way you would expect it if you expected the unexpected.

"They have the gift for ready repartee; but while ever prepared to make fun of others, they dislike being made fun of.

"Their wit is proverbial. I recall an Irishman up before the Resident Magistrate for being drunk. He was fined 2/6d and paid up immediately but would not leave the dock. The magistrate said, 'For goodness sake get down, man.' 'Not till I get your recate,' said Paddy. 'What on earth do you want a receipt for?', said the magistrate. 'Well', said Paddy, 'It's dis way yer onner. When Oi go to heaven St Patrick will be at the gate; and he'll say, "Pat, ye was dhrunk"; and I'll say, "Oi was once yer holiness, but Oi paid me foine". And he'll say, "Then where's yer recate?". And a moighty foine fool I'd be looking then, running up and down hell looking for youse to give it to me.'

"A bad trait is their moral cowardice as individuals. In mass they are brave, and few troops have shown such courage in battle as the Irish infantry. But individually they lack the courage to act according to their own true convictions, and are always afraid of what 'the other fellow' will say. Hence they are easily gulled and led by any intimidating agitator. But their worst trait of all is the latent streak of cruelty that seems to break out once in every generation, as is manifested during the many risings since 1599."

Have things changed since 1880?—Yours faithfully, H Johnson.

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PARTICIPATION IN CORPS "AFFAIRS"

Sir,—I was interested to read in the September *Supplement* that the Chief Royal Engineer had administered a mild rocket to the 1974 Annual General Meeting about the low turnout. During my five years in AG7 and the E-in-Cs Headquarters it always seemed necessary to "press gang" officers into attending the AGM and, to a lesser extent, the Corps Dinner. There were also continual exhortations for more correspondence in the *Journal*, and I don't detect a significant improvement: to some extent that is why I am writing this. The target for all three appeals—AGM, Dinner and Correspondence—was inevitably the Active part of the Corps.

I suggest that the reason why more officers don't attend the AGM is that, once the E-in-C has given his usual stimulating and chest-expanding "sitrep", it becomes a dull, routine affair; and with the many calls on everyone's time these days there is not much incentive to set aside at least half a day to attend the AGM. After all, your readers can keep up to date with the state of the various Corps Funds, the REA and the Widows' Society by spending half an hour reading the report of the Meeting. I am not criticizing the presentations: I doubt if any number of modern visual aids or courses in elocution would either be appropriate or produce better results. Surely AGMs, whether they be RE, Cadbury-Schweppes or Parish, are fundamentally boring. Why don't we accept that view and bleat only if there isn't a quorum? (And you can get a quorum by dragooning HQ E-in-C, the ESE and the RSME to attend because they work locally).

The Dinner is different. It is a more stimulating affair and not unreasonably expensive. But I think that the ratio of "circulating" to sedentary time is wrong. One can't get round to enough of one's friends before dinner and there is too little time after it; and I don't think that you can alter all that because of staff wages and train timetables. Why can't we have a splendid buffet dinner, with no set tables and no seating plans, on the lines of those excellent functions at Chatham? If there must be an exchange of telegrams (and, to be honest, I think most of them are only a matter of form and habit) let the telegrams be posted. And if we require a speech at all—this sentence may be censored—could it please be shorter and savour less of "back-slapping"?

Correspondence. I don't know how we can improve it. (You won't help if you don't publish this!) But can't we raise more challenging subjects on which more readers can feel the urge to express views? Mike Crosthwait deserves a medal for all his past endeavours.

Finally, I would like—just for the record—to be allowed to express a debt to a few senior Sappers whose efforts in one particular direction have not perhaps been fully recognized. At the top of page 99 of the September *Supplement* you record General Richardson's gratitude to General Duke for developing the holding of Institution Branch Meetings. Of course we are grateful to General Duke. But I think that equal gratitude is due to General Caldwell and the Home Chief Engineers during 1971 and 1972 who did so much to further this activity, and with them I would couple Brigadier Steve Goodall, Brigadier John Lacey and yourself. I am sure that General Duke would agree. (But, again, let's have no "back-slapping"!)—Yours sincerely, M G Stevens.

Colonel B S Read
British Liaison Office
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ANTI-TANK MINES IN MOBILE WARFARE

Sir,—As you may know, the *Journal* reaches far and wide, and not least to the US Army Corps of Engineers. The article in the March 1974 issue which was a reprint of General Dewing's views on Mine Warfare, written when he was a Brevet Major in 1924, was particularly well received.

Those working at Fort Belvoir on the Mine Plough and the Mine Roller were encouraged to see that their ancestry went back fifty years. In addition, in an attempt to refute an article in the US *Army Armor Magazine*, a Colonel Joy of the US Army Engineer School drew freely from General Dewing's article. You may be interested in Colonel Joy's letter to that magazine, which is appended.

Incidently, though I have awaited the next publication of *Armor*, they do not appear to have published Colonel Joy's criticism.—Yours faithfully, B S Read.

Editor Armor Magazine, US Army Armor School, Fort Knox, KY 40121

Dear Sir,—". . . well sited anti-tank minefields tied carefully into natural obstacles channelled armored units into deadly enemy killing grounds . . .", ". . . enemy anti-tank mines placed singularly or in clusters at random intervals for miles along high speed avenues of approach severely slowed the momentum of the attacking force . . .", ". . . anti-tank mines aided infantry by holding the enemy in place long enough for the killing fire power to be brought to bear. . .". Afterthoughts for inclusion in the next chapter of "Observations on the Tank/Anti-tank Battlefield"? I hope so, for I noted with considerable concern that the word "mine" was NOT ONCE mentioned in the article entitled, "Observations on the Tank/Anti-Tank Battlefield", that appeared in the January–February *Armor*.

My concern was heightened recently by reading a reprint of an article that appeared in the *Royal Engineers Journal* in 1924. The author of this fifty-year-old article entitled, "Anti-Tank Mines in Mobile Warfare", explored the use of anti-mines in tank warfare. He said at one point, "It is wrong to think that by exploring possible anti-tank measures we are counteracting the offensive value of our own tanks. It is only by foreseeing the probable anti-tank measures which the enemy may employ that our own tanks can be secured against them".[1] We have learned, only too well, the devastating truth of these words in three wars (21 per cent of all allied tanks destroyed were by mines—World War II; 70 per cent for Korea; 70 per cent ground vehicles for Vietnam).

So, I submit that the *full* truth about the Tank/Anti-Tank battlefield can never be learned without serious consideration being given in tests and evaluations to the effective employment of the anti-tank mine, both conventional and scatterable, in offensive and defensive operations.—Sincerely, D Duncan Joy, Colonel, CE

[1] *Anti-Tank Mines in Mobile Warfare* by Captain and Brevet Major R H Dewing DSO, MC, RE.

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QUARRYING FOR LARGE ROCK AT AKROTIRI, CYPRUS

Sir,—Having served in Cyprus when the original Akrotiri Mole project was under discussion, and having later seen it in its completed state I also had the chance last summer to see the second Mole under construction. I was, therefore, extremely interested in the article by the late Major Hutchings in the September 1974 *RE Journal*.

I was delighted to see mention of Major Moseley's geological investigation: geologists from the Engineer Specialist Pool (V) make a most valuable contribution in the investigation into many potential engineer projects. That, in fact, was not the end of the involvement of the RE Volunteer Sponsored Units in the project. In 1972, before the project got under way, Captain Jack Hobbs of 111 Engineer Regiment (V), who in civilian life is in the quarrying business in the West Country, arranged for the regular officer who was designated as project officer, to visit quarries in the Bristol area to study normal civil practice. Captain Hobbs then went out to Cyprus and, with the help of Moseley's report, conducted a detailed investigation of the quarry site and produced a detailed report recommending how the quarry should be set up and operated. Finally Captain Hobbs was able to attend the opening ceremony (combined, of course, with some extra out of camp training!)

This project illustrates the way in which the regular and reserve army can and do work together in peace time and will, I am sure, be of interest to your readers. All requests for consultancy services should be addressed to the writer!—Yours faithfully, B H Dempsey.

* * * * *

Memoirs

GENERAL THE LORD ROBERTSON OF OAKRIDGE, BT, GCB, CBE, KCMG, KCVO, DSO, MC, DL COL COMDT RE (RTD), COL COMDT REME (RTD), HON COL ENGR & RLY STAFF CORPS T & AVR (RTD)

Born 22 July 1896, died 29 April 1974, aged 77

BRIAN HUBERT ROBERTSON was the son of Field-Marshal Sir William Robertson Bt, GCB, GCMG, GCVO, who was an outstanding figure during the 1914–18 War and rose to be Chief of the Imperial General Staff. The son was very proud of his father and particularly of the fact that he had risen to the rank of field marshal from trooper. The father would have been equally proud of the son.

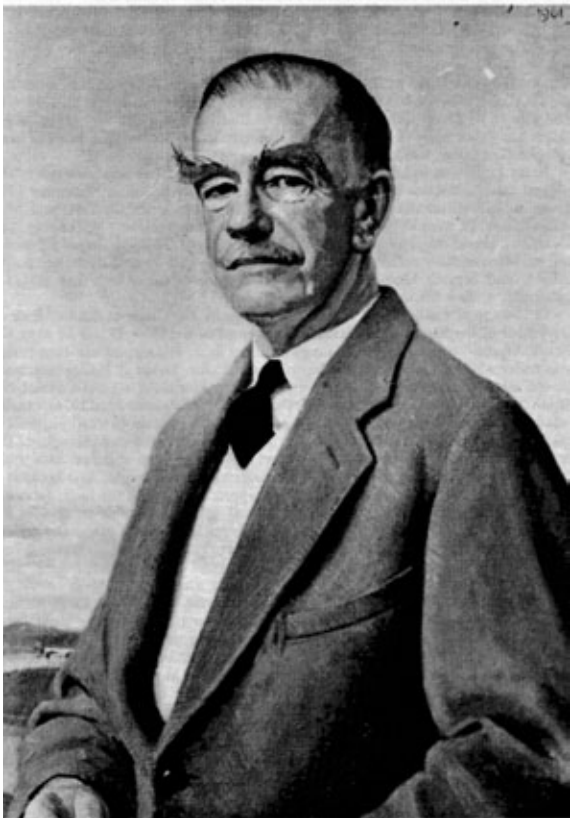
Brian Robertson will best be remembered in the Army as an administrator of the highest calibre, but this is not the whole picture. Commissioned in November 1914 he served with distinction in France and Italy and was awarded the DSO and MC. After the war he went to India and took part in operations on the NW Frontier, was awarded a brevet majority, and went to the Staff College. This was indeed a promising start to a military career, but in 1934 he retired to take up employment in South Africa, and became Managing Director of Dunlop South Africa Ltd and, incidentally, a close friend of Field-Marshal Smuts.

In 1940 he was called back to full time service by the Union of South Africa as a member of the Reserve of Officers, and for most of the 1939–45 war he wore the South African "war volunteers" orange shoulder flash. His second war-time career was under way: this time he was to be an administrator. To list all his appointments would serve no purpose, but some should be mentioned. As a Lieut-Colonel, Sir Brian (together with Lieut-Colonel A C Duff—p 126 *RE Journal* June 1974), ran the administration of that extremely complicated L of C from Nairobi to Abyssinia. He was Brig AQ Eighth Army when General Montgomery arrived and throughout the operations in North Africa and Sicily he met the exacting logistic demands of those campaigns with unfailing success. His advice carried great weight; first because it was obviously based on a deep and rigorous appreciation of all the facts; secondly because it came from a man who already had achieved notable success in the Abyssinian Campaign and thirdly, perhaps, because his business career (by adding another dimension to his administrative experience) had increased his maturity and authority.

A story of this period would not be amiss, WGF writes:

"A day after the launching of the attack which relieved Tobruk, I was walking about the new desert-railhead at Bir Mischiefa when I saw Brigadier Robertson, A/Q Branch Eighth Army, drive up. He beckoned together a bunch of passers-by, officers, including myself, and told us that a German armoured column had broken into the back-up area of our attack, and that we should at once prepare some local response, which he clearly and briefly indicated. One special problem had arisen: a Div HQ had become isolated from its brigades and he had found it necessary to form a temporary Div HQ. His eye swung round his anxious audience and hit on me, whom he knew as a Lieut-Colonel in some Eighth Army sapper job. In a few words he appointed me GSO1 of this shadowy Div HQ, gave me the name of the shadow GOC, and departed. The whole meeting lasted ten minutes. Instructions were given with crystal clarity and Wavell brevity; and off he went in a cloud of sand leaving us as sharp as could be to meet a situation from which he had extracted all panic by his limpid cold clarity. I thought it good going for an A/Q officer wearing South African shoulder flashes!"

Even when an unexpected storm in January 1943 reduced by a factor of six the capability of Benghazi port, on which the further advance of the Eighth Army primarily depended, there was little discussion of what should be done; within a



General The Lord Robertson Of Oakbridge
BT GCB CBE KCMG KCVO DSO MC DL

matter of hours a new plan, involving the use of the first line transport of 10 Corps for a logistic link with Tobruk, and the consequential reduction in the scale of operations, was quickly agreed by the C-in-C with his logistic adviser.

Subsequently he became Commander (Major-General) Tripolitania Base (later to become Fortbase in Sicily). Of this latter period a colleague, CEFT, writes:

"Sir Brian got up early and would then linger sitting in his pyjamas on the open balcony outside his bedroom—sipping his tea, puffing occasionally at a cigarette—and THINK. Office started at 8.00 am which gave us an hour to sort out immediate problems before the daily conference at 9.00. Brian himself would have a more leisurely breakfast and arrive, immaculate, just before that time.

"There we all were, heads of services, senior staff officers, the American Liaison Officers, all bristling with apparently insoluble problems and rival requirements. Brian would deal with each of us in turn and quietly, hearing our story, would then pass on to our neighbour and ask what his troubles were. Then at the end he would sum up the whole situation in a few minutes, giving us each his decision, and we would go on our way convinced once more that life's difficulties had been resolved and all would be well."

By 1944 he had become Chief Administrative Officer to Field-Marshal Alexander at Allied Forces Headquarters in the rank of Lieut-General. In the Western Desert the task of supporting the Eighth Army had been very demanding; in Italy the problems were further complicated because the Allied Armies were of many nationalities, with differing organizations and weapons. By dint of careful planning and improvisation success was achieved largely due to his sterling qualities.

In 1945 he nearly went back to Dunlop but decided against it and he was restored to the Active List of the Army. In August 1945 he became Chief of Staff, Control Commission Germany, British Zone, and then Deputy Military Governor of the British Zone. In 1947 he was promoted to General and appointed C-in-C British Forces in Germany and Military Governor of the British Zone. In 1949 he was seconded from the Army and became the first British High Commissioner for Germany. These were difficult years, the vital years of rehabilitation and reorganization of devasted Germany. They included the Berlin Airlift, in which he played the dominant part in an event—indeed a politico military battle—which marked a turning point in the Cold War. He was responsible for cementing Anglo-German relationships, particularly through the great bond of friendship between Dr Adenauer and himself. Good relationships with the Federal Republic were dear to his heart until the end of his life. In the realm of diplomacy—he was given high political responsibilities which he fulfilled with immense skill.

Fortunately he had a very clear brain and an intellect of the highest order; in addition he was a great worker and had a high sense of duty. Naturally reserved in manner, he did not make friends easily, but those who knew him, especially those who worked with him, had the highest respect for his ability and great admiration for his integrity. He was a man of high purpose and strong resolve.

Despite these characteristics, which were not unknown, it was not until 1950 that he was given experience of high command in a purely military role when he became C-in-C Middle East. Although he proved himself to be a successful C-in-C, this was to be his last appointment as a soldier. In 1953 Winston Churchill called upon him to leave the Army to become Chairman of the British Transport Commission. This closed the door on his ambition to become CIGS and so follow his father.

During the period 1953–61, as Chairman of the British Transport Commission he became in effect the controller of one of the largest industrial undertakings in the world. His original appointment was for five years but his tour was extended to eight. This period was probably the greatest challenge of his life. The task was made almost impossible by political pressures and the absence of a consistent Government plan. Many of his colleagues were of the opinion that he should have resigned in protest, but he was made of sterner stuff. He bore unceasing public criticism, much of it unfair, as he struggled to carry out the directives of successive masters. Despite

all the difficulties he won the respect of railwaymen and union leaders; to them he was unfailingly helpful and courteous, and above all he knew that the morale of the railwaymen was a key factor and worked hard to improve it. He was well aware that "talking to the chaps" was not really his strongest suit but he succeeded in giving the railwaymen a sense of purpose.

It was during 1959 that the Gloucestershire Association of Boys' Clubs approached Sir Brian, in an attempt to acquire a small railway station on a line about to be closed. Not only was Sir Brian more than interested in the project but his active help in Boys' Clubs in South Africa prompted him to become more involved in such work. Suffice it to say that the Association was able to acquire station buildings which were then developed as the first Adventure and Training Centre of its kind in Britain; there must now be hundreds. In 1960 Sir Brian became Chairman of the Gloucestershire Association and then Deputy President. During his years as Chairman, the Association made great progress; thirty clubs became fifty clubs, and on average two new club buildings were completed each year. He enjoyed visiting clubs and his friendliness and direct approach made it easy for young people to talk freely of their fears, problems and successes. He believed in the voluntary principle in Youth Work and he admired volunteers and devoted a lot of his time to finding ways of helping them. As Chairman he was a man to be reckoned with; his dealings were straight and direct and he had little time for the prevaricator. It was natural that he should attract like people to him. In addition to his County work he was a member of the Council of the National Association of Boys' Clubs and of the Executive Committee where his direct approach to problems was often evident. A devout man, he became Chairman of the Religious Advisory Committee of the National Association of Boys' Clubs and did much throughout the country to encourage the three-fold fitness of body, mind and spirit. He was also a very active supporter of the Forces Help Society and Lord Robert's Workshop and of the Regular Forces Employment Association.

Of Brian Robertson's character there is no better judge than his close friend the Bishop of Coventry who said at the Thanksgiving Service at Westminster Abbey:

"What were the outstanding features of his character which enabled him to get where he did? First, his clear incisive mind. He could think more quickly, more trenchantly, more accurately than anybody I have ever met. He had a remarkable power of rapid diagnosis and assessment. He had an astonishing capacity for disentangling a thorny problem. In fact he was almost frightening in his brilliance of intellect, and perhaps it was this mental brilliance which led some, who only met him occasionally, to be in awe of him.

"The second outstanding feature of his character was his integrity. 'He nothing common did or mean.' He was scrupulously honest and wouldn't consider doing anything that was in any way 'grey'. To him things were either black or white. If black, he wouldn't touch them; if white, he would throw himself wholeheartedly into them.

"The third outstanding feature of his character was his warmth of affection. This did not appear immediately, and that is why some may have found him rather cold and aloof. And that is why some thought he could not be a success in the transport world; but he was: and his success was due to his remarkable ability to get alongside ordinary, humble people. This ability to elicit friendship from Tom, Dick and Harry, was a feature of his character which only some discerning people recognized and appreciated.

"A fourth outstanding feature of his character was his power of leadership. He was born to command. His orders were clear, incisive and to be obeyed. He did not suffer fools gladly but his brilliant capacity for administration and delegation made him an unquestioned and highly successful leader.

"But in total contrast to all this was his personal humility. His 'inner man' was very humble, unassuming, almost diffident. This was one of the surprising features of his fascinating character, so full of unexpected characteristics.

"As to his humour, many people found him rather austere, but those who knew him better discovered that he was unusually full of fun. Young people loved him. His family adored him, and often 'pulled his leg'. He was so full of gaiety, such fun to live, work and play with. Indeed, talking about playing, he threw himself wholeheartedly into the two areas of Polo and Bridge; in both of which he became much more than merely competent. He entered as wholeheartedly into these areas of leisure as he did into his work. It was part of his character to enjoy himself to the full.

"Two last hallmarks of his character should be recorded. First, his kindly gentleness and courtesy. This, too, was unexpected in such a brilliantly successful and rather austere character, but a vast number of people were constantly surprised by his gentle kindness and by the genuine love and sympathy which he showed to people in need. And so to the last hallmark of his character—one which indeed permeated and motivated everything he did—his religious faith. Many people never saw this, but I did, and his family did, as did his intimate friends. He believed in God. His faith was simple but profound. God was for him an intense reality."

The Corps was indeed fortunate to have attracted the young Brian Robertson to join it in 1914. Perhaps the influences brought to bear in those first twenty years had some bearing on the immensely versatile and successful career that was to follow. Certainly throughout his career Brian was an enthusiastic supporter of the Corps, appearing at annual events long after some contemporaries had lost interest. The Corps has lost a great and kindly man who reached the top of four professions: soldier, statesman, industrialist and railwayman. His life will remain an inspiration to those who follow after him.

To his widow and family we extend our sympathy.

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LIEUT-GENERAL R G W H STONE, CB, DSO, MC, FRGS

Born 16 January 1890, died 27 June 1974, at the age of 84

ROBERT GRAHAM WILLIAM HAWKINS STONE was the son of Brig-General F G Stone CMG, late RA. Having outgrown his Prep School but still too young for Wellington, he accompanied his father to South Africa and as a *twelve-year-old* enlisted in the District Mounted Troop, Aliwal North and served out the last six months of the Boer War. This episode created some problems later. He was presented with his SA Medal at Wellington. Imagine his reception at "The Shop" and with the hardened regular soldiers in World War I! The powers-that-be ruled that his early service entitled him to the medal but would not be allowed for the purpose of his pension!

In WWI he was occupied as a regimental officer but it was after the war, having attended Staff College and having moved onto the Staff, that he really began to make his name.

In 1935 he was posted to Rome as Military Attaché. Sir AN writes:

"I first met Robbie Stone in 1935 when he was Military Attaché in Rome. He was a man of strong character with a good brain and a talent for expressing himself clearly on paper. He had great political difficulties to overcome and earned great respect all round. We shared many common interests; he had been a distinguished lawn tennis player and was a keen follower of all forms of sport. He was a cheerful companion with his own independent view of everything that was going on in the world."

Of the same period Sir JGL writes:

"Our friendship began with the flowering of his career in the testing and chancy role of soldier–diplomatist. That was 1935, the turning-point in the collision course to Hitler's War and at the action centre of the vile drama—Rome. The dual craft, when war threatens, calls for conciliation before the shooting starts; thereafter, and harder still, to handle the allies. Robbie Stone was an able performer in both functions. He won the trust of the Italian high command. It could have halted a drift but nothing could stem a rush—which was how Mussolini went to war. Of the later phases of his soldier-diplomacy I can testify that he did his full part in a wizardry of tact and firmness. With no greater talent, and often less virtue, practitioners of the dual craft have become the glittering figures of history. To reach those heights one must have not some, but all of the 'breaks' going for you. Stone had some—but often too few. Of the happy turn of coincidence of opportunity, time, place and events, he never had quite enough, and at least one evil turn of fortune. Never by a whisper did he betray that he knew it; that was not his way."

In 1938 he went to the Sudan as Chief of Staff, JHRO writes:

"When he arrived in Khartoum in 1938 to become 'Number Two' to Major-General (later General Sir) William Platt, the Sudan was just emerging from the relatively placid peace-time routine of soldiering. Always immaculate and meticulous in all he did he was soon involved in putting into practice the General's plans for reorganizing the troops, British and Sudan Defence Force. To put them on an active war footing left little time for the social and personal contacts which would have been normal in other circumstances. In 1940 he was whisked away at very short notice to become Chief of the British Military Mission with the Egyptian Army as a Major-General and two years later, as a Lieut-General, to become GOC British Troops in Egypt."

RW writes:

"The General faced immense problems in his BTE Command but still found time to show great consideration for others. This first, and lasting, impression was soon followed by the realization of other outstanding qualities of which only one or two can be mentioned here. He would not allow himself to be hurried into reaching a decision, however urgent, until he had weighed up all the known facts and then his confidence that the best solution had been found was most reassuring. His calm

Lieut General R G W H Stone CB DSO MC

demeanour when there was gossip about Cairo being evacuated was a considerable help to the pro-British Egyptians, amongst whom he numbered many friends."

Of the same period AR writes:

"It was not until I graduated into his household that I came to know him and to start a friendship which I am happy to say survived and lasted to the day he died. His official image was that of a shy introvert, a man of extreme courtesy but one who seemed to find personal relations difficult to cultivate beyond a certain stage. The man I found and came to know in his own home was a horse of a very different colour. His work as the war moved westward was almost as diplomatic as it was military and his guests included all leaders of note in the political and industrial world of Egypt, as well as the great international world leaders and celebrities of the day. When left to himself Robbie reverted to his quiet moods. He was a voracious reader whose tastes covered a wide field. He liked conversation and encouraged debate among all members of his entourage, but those who expressed strong views had better have good and explicit reasons to support them, because he did not lightly tolerate muddled thought or slovenliness of any kind. In the sports which he loved, notably tennis, at which he excelled, and golf, at which he was no more than competent, his precision of mind was always evident. I played golf with him frequently. His game was short but meticulous and he was very difficult to beat. I suppose half a dozen times I was 'dormy' on the last tee but he never failed to square the match."

After the war General Stone became Chief of an Inter-Services Mission dealing with enemy installations in the liberated areas of Europe and was with the British delegation which arranged with the French the programme of evacuation of troops from Syria and Lebanon. In 1947 he retired from the Active List.

In his retirement he continued to take an interest in most things but two should be mentioned in particular, the Royal Geographical Society and Kitchener Scholarships.

Sir LK writes:

"He served on the Council of the RGS and was Vice-Chairman from 1960–64. I came to know him well partly because he continued to be much interested in the Sudan where I had been engaged in archaeological work. He said little at meetings but when he spoke it was to the point. He served on our Expeditions Committee and was of course particularly interested in the support we give to service expeditions."

As a member of the Kitchener Scholarship Selection Committee he showed an enormous interest in the young men who appeared before it.

In summarizing the views expressed by those who have contributed to this Memoir one can do no better than to quote some extracts:

Sir KMcL writes:

"His talents and interests lay in staff work rather than engineering. He was transparently honest and straightforward, hating all forms of intrigue and injustice. One could trust him implicitly. He read widely, being specially interested in geography and travel, philosophy and religion. He talked readily on these subjects and was a delightful companion."

Others have written:

". . . a modest and self-effacing man, one could sum up his life by saying that he had in high degree that most enviable of qualities—he got his priorities right."

"He could detach his mind from current difficulties and had wide interests ranging from poetry and painting to golf and tennis. These and other qualities made it a pleasure to be in the company of a gifted and courteous gentleman."

"If the majority of mankind had been fashioned in his mould, the human species would still be happy, peaceful and secure—instead of which . . .'

"I think he enjoyed life; he had the talent of making other people feel happy too. Such men are rare."

Sir FDSH, really expresses the substance of General Stone, when he writes:

"He was one of those rare men who achieved high rank without appearing to make any enemies on the way. Foreigners were quick to recognize his qualities, they

admired and trusted him. Although he was very much the professional soldier, his knowledge and interests were so wide that there can have been few subjects on which he could not speak with authority; yet he never forced his views on anyone, and always listened with courtesy. The friendships he and his wife formed with Egyptians of all ranks played a great part in maintaining friendly Anglo-Egyptian relations during moments of crisis when a rupture might have altered the course of the War. Everybody who was anybody in World War II passed through Cairo at some time or other, and the Stones knew them all. Yet they always found time to offer comfort and hospitality to young officers on leave, and to other young men who never reached commissioned rank.

"General Stone steadfastly refused to write his memoirs and history will be the poorer for this. For his services as a young officer in WW1 he was awarded the DSO, MC and five Mentions in Despatches. For his services as a General in WW2 he was awarded the CB and four Mentions. Many of his friends considered this a most inadequate recognition, but he did not think so. In his retirement he devoted himself with energy to his many interests. He kept very much up to date with the younger generation and was an unfailing source of help and advice to them.

"He is survived by his widow, Ena. They were indeed fortunate in finding each other, and their friends doubly fortunate."

* * * * *

COLONEL H W T PALMER, DSO, OBE

Born 21 February 1886, died 26 August 1974, at age of 88

THE worlds of equitation and foxhunting will be the poorer by the recent death of Henry Wellington Tuthill Palmer.

During a distinguished military career in the Royal Engineers he served in both world wars and was awarded the DSO and OBE, as well as receiving two Mentions in Despatches. He retired as Chief Engineer in York and settled in the neighbourhood. Here, he devoted the same dedication and skills which he had long practiced in his professional life to the interests of animal welfare, horses and foxhunting.

He served on the Committee of York Branch of the RSPCA for thirty-seven years being Chairman for seventeen of them. He was largely responsible for the formation of the York District Branch of the British Horse Society and was its very active Chairman until his death. In the 1950s he and his wife devoted much work to the Pony Club. First with the Middleton and then in 1959 they formed the York and Ainstey (South) Branch of the Pony Club of which he was first District Commissioner and later President. Henry Palmer and his wife were keen followers of the York and Ainstey as well as the Middleton Hounds. He served on both Hunt Committees at various times and was Chairman of the Middleton Hunt Wire Committee for many years. Many of today's followers of these hounds owe much to his hard work in keeping the country rideable.

However the mere catalogue of achievement does little to portray the charm and personality of the man. He was interested in everything and willing to help anybody who needed his help and advice. For him generation gaps did not exist and one of his most endearing characteristics was his ability to enthuse and encourage the young particularly in the hunting field.

Henry Palmer will be sadly missed by his many friends in all walks of life and our sympathy goes to his wife Cynthia and their family.

JMDW-H

BRIGADIER J D STURROCK, OBE

Born 20 March 1915, died 20 July 1974, aged 59

GRG writes:

"JOHN DOUGLAS STURROCK (Jan) was an outstanding oarsman: a foundation rock for any crew in training, controlled dynamite in a race. His trophies ranged from the University Sculls to successful Empire and Olympic crews. Jack May the boatman, remembering the days of Nickalls and Horsfall, would murmur the one new name worth his breath: 'Lovely oar, Sir, Mr Storrick. Pow-er-ful!' At last in 1937 Oxford (burdened with those dozen defeats and the Middlesex station), held, then went for Cambridge against the great bend, and won. J D Sturrock, Winchester

Brigadier J D Sturrock OBE.

and Magdalen, fourteen stone four, was rowing Six. Everybody liked Jan: undergraduates, dons, servants, shopkeepers. He himself, cheerful, easy, modest, liked other people and tried to share their tastes and interests. Girls found him delightful, the more so because ('Manners Makyth Man', and here *was* such a man) he respected them. The field seemed limitless for him, but—like old Jack—he could spot a winner. The twelvemonth of the Olympics and the Middlesex station was also the year he met Janet. That best of triumphs was, is, also the most enduring."

MCAPL writes:

"I knew him whilst he was at Oxford and I at the other place. He stroked the Great Britain coxwainless four which came second in the 1936 Berlin Olympics. I remember him as a most cheerful, friendly and modest man and as a powerful solid oarsman."

TTS writes:

"He was a man of many interests and great depth of character; a civilized man in the widest sense of the word; of great stature, physical, intellectual and moral. By long standing tradition, the strength of the British Army rests not on its material resources but on the quality of its men. Jan Sturrock exemplified the best of this tradition. As a CO he ran a happy regiment. He had a deep knowledge of those under his Command. By succinct and penetrating comment, warmed by sympathy and humour, he assisted in their development as individuals. The high reputation of the Corps is our legacy from officers of his calibre. Those of us, both regular and territorial, who had the benefit of knowing him will remember his example."

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COLONEL T H PRITCHARD, OBE, MC, TD

Born 6 April 1898, died 18 March 1974, aged 75

TOM PRITCHARD was educated at Trent and commissioned to the 4th Battalion, The King's Own Royal Regiment (Lancaster) in 1917. He served with this battalion in the 55th West Lancashire Division, being wounded at Ypres and at Givenchy where he was awarded the Military Cross.

Between the wars he served on the TARO and managed his own building firm in Cheshire. On recall he served for a short time with 6th Battalion East Lancashire Regiment before transferring to the Royal Engineers in 1940. He was Garrison Engineer for Barrow and Lancaster before being posted to Dhond in India. From 1942 to 1945 he was Commandant of the Ceylon Engineers Training Depot where he saw the expansion and formation of several units including an Engineer Battalion, two Mechanical Equipment Companies and a Port Operating Company. His former recruits and officers will long recall his stern countenance and eagle eye on tours of inspection. Ever a strong disciplinarian, with duty always uppermost in his mind, he was however a kind man having a deep sense of fair play and an almost impish sense of humour which gained him the highest respect.

Most years since the war the British Officers of the Depot have held a reunion in London, occasionally having serving Ceylon Engineer Officers as their guests. Tom Pritchard maintained strong links with the Ceylon Engineers by regular correspondence and always spoke happily of his days at the Depot. One of the last

guests at his home was Brigadier Douglas Ramanayake who had been one of his subalterns.

When the Territorial Army was reformed in 1947 he was appointed to Command and raise 130 Construction Regiment RE(TA) which was based in Liverpool but had detachments in Lancaster and Preston. In 1954 he became their Honorary Colonel, an appointment which gave him tremendous pleasure. Even after he had relinquished command of the Regiment he continued to display a keen interest in all the TA Sapper units on Merseyside both on a personal level and in his official capacity as a member of the General Purposes and Personnel Committees of the West Lancashire TA and AF Association.

After his retirement he moved from Cheshire to Oxfordshire where he died.

Colonel T H Pritchard OBE MC TD

Book Reviews

THE NATIONAL GRAVITY REFERENCE NET 1973 (NGRN73)

ORDNANCE SURVEY PROFESSIONAL PAPER NEW SERIES No. 26
(Published by Ordnance Survey of Great Britain; Southampton. Price £2·00)

A framework of gravity reference points within the UK was built up by the Institute of Geological Science (IGS) between 1949 and 1964 but began to suffer from varying standards of observation due to improvements in instruments over a long period of development and from the loss of some of the earlier reference points due to road reconstruction. Thus the need arose for a nation-wide gravity reference net, observed to a uniform standard, with reference points at permanent sites. At the same time, the Ordnance Survey (OS) began to need gravity data along geodetic levelling lines for the recomputation of heights in geopotential units.

It was seen that the requirements of both organization could be satisfied by the establishment of gravity reference points at the Fundamental Bench Marks, which are stable, permanent and cover the country fairly uniformly.

Collaboration between IGS and OS in the period 1964–71 led to the observation, by OS using gravity meters on loan from IGS, of a gravity net coincident with the geodetic levelling net and including links to existing IGS stations. Discrepancies between the OS and IGS results were attributed to errors in gravity meter calibration factors, and IGS made airborne links between various UK airports which allowed them to undertake a simultaneous adjustment of all gravity measurements in the UK and to provide improved calibration factors. Additional IGS airborne links to European stations of the International Gravity Standardisation Net 1971 (IGSN71) enabled a final adjustment to improve further the scaling of the whole net and its connection to the international system, and to give definitive values at the junction points of the UK net. The results of this adjustment are designated the National Gravity Reference Net 1973 (NGRN73) and provide a first order control framework of gravity values on which all future work should be based. Minor modification (C 0·02 mgal) may be indicated when altered international values, IGSN71 (Edition 1974), become available.

The collaboration between IGS and OS has been continued into the joint production of this OS Professional Paper (New Series) No. 26 which describes the operations of both Departments towards the achievement of NGRN73. The paper also tabulates gravity values at the airports used and at the junction points of the net, most of which are at FBM. Improved values for the gravity differences of the Short Calibration Line are also given and these will provide the correct relationship between future work and NGRN73.

PR

WHERE THE TRAILS RUN OUT

JOHN BLASHFORD-SNELL
(Published by Hutchinson of London. Price £4·95)

Where The Trail Runs Out should cast away any fears that we may have in the Corps that we no longer have the "characters" of old. From the description of his early wartime boyhood, when he raised a private army of boys armed with "slings, bows and arrows, homemade grenades, and molotov cocktails", to the mature soldier-explorer the book reveals a "character" who, in his own words "intensifies life". The author takes the reader through many amusing and colourful incidents of his life at school and Sandhurst, and includes the fascinating story of his circumnavigation of the world to see his girl friend, an exercise which branded him as mad rather than married or Methodist when he joined his squadron in Cyprus. The book continues to be fascinating to any reader, describing the thrills of underwater exploration, the vastness of desert travel, and the risks of boating down tropical rivers. One can feel as part of the major Great Abbai Expedition as the author describes the river ridden with crocodile, hippopotamus, bandits, and above all, horrifying cataracts. He gives one a vivid impression of what was involved in conquering the great waters. The reader is then taken to the Red Sea desert islands, and then to the rigorous crossing of the Darien Gap.

The story shows that the author, chairman of the Scientific Exploration Society, has the widest experience of planning expeditions on a vast scale. Any would-be expedition leader should read this book to learn from somebody who plans on such a scale and who leads so admirably. While it is useful and fascinating to read this volume now, one cannot help feeling that it might be early days. The author is about to lead a mighty team down the Zaire River, and it is too much of an autobiography to draw a line before such an adventure. Hopefully, though, there will be a second book in the years to come.

DNH

TALES OF THE MOUNTAIN GUNNERS

(Published by William Blackwood, Edinburgh. £5·50)

This book is not written in the manner of a regimental history, but is an anthology of stories told by those who served in, or knew well, the Mountain Artillery. These stories have been edited by C H T MacFetridge and J P Warren. The Mountain Gunners whose role was mainly on the old North West Frontier of India were immortalized by Rudyard Kipling in his famous ballad "Screw Guns".

This anthology does not confine itself to the prowess of the "screw guns" and their crews in theatres of war stretching from the Himalayas to the beaches of Gallipoli and the jungles of Burma, but embraces many amusing tales involving personalities, their much loved mules, and their horses. Their perilous tasks is aptly described by Kipling in these words from his famous ballad—"They sends us along where the roads are, but mostly we goes where they ain't: We'd climb up the side of a sign-board an' trust to the stick o' the paint."

Though this book is about the Mountain Gunners, for those who have served in India or in theatres of war with Indian units there will be immediate recognition of the same loyalties and teamwork, the same adventure, courage, initiative and mutual respect which existed in all arms and services who had the honour and privilege to serve with those fine soldiers; the reading of this book will be to many a nostalgic journey.

JES

Technical Notes

CIVIL ENGINEERING AND PUBLIC WORKS REVIEW—JANUARY 1974

The new year starts with a "new look" version of the publication which has now dropped the "Public Works Review" from its title. This edition contains a number of general articles on controverial national topics such as North Sea Oil and the Hunterston deep water port. A new "interview" feature contains an account of an interview with Sir Kirby Laing, the President of the Institution of Civil Engineers. The topics discussed range far and wide; even to the question posed by the interviewer "Too many colonels, not enough soldiers?" Perhaps readers should go to the January edition to find the civil engineering answer to that question!

CIVIL ENGINEERING AND PUBLIC WORKS REVIEW—FEBRUARY 1974

Design To Combat Fire. A comprehensive article by C J Langdon-Thomas on the basic principles of fire protection and the design of buildings against fire. The article outlines the legal responsibility of the designer in meeting the regulations and byelaws of Acts of Parliament and other statutory bodies. To design against fire, the designer must consider both passive and active fire precautions. Passive design consists of sub-dividing the building plan into both horizontal and vertical "fire tight" compartments and considering the position of the building in relation to other buildings to reduce fire spread. In addition, the selection of materials for the construction and finishing of the building including controlled ventilation facilities must be considered. Active protective measures such as alarms, detectors and automatic extinction systems are then added to the final design. The question immediately arises—can a high degree of active protection allow the use of materials with less basic fire containment characteristics and the relaxing of the "fire tight" compartment standards?

Whilst in America, active measures appear to be given greater emphasis in relation to life

safety—in the United Kingdom active protective measures are accepted more in the manner of economic loss considerations.

The article outlines the principle factors in designing with reinforced and prestressed concrete and structural steel. The author concludes that whilst full active and passive measures can be taken, their efficiency is obviously affected by lack of maintenance and most of all by the human factor which when an emergency occurs, may not allow correct use of all the protective facilities in the way in which the designer intended them to function.

Wind and Tall Buildings. The nature of the wind and its action on tall buildings has always presented a difficult problem of prediction to the civil engineer. Economic pressures at the present time are encouraging the more efficient use of materials and the design of more slender structures. The average bulk density of buildings has fallen dramatically and these overall changes in practice are the cause of the increased susceptibility of modern buildings to unacceptable movements in high winds. The article by Dr J B Menzies of the Building Research Station outlines the developments in design methods since the early 1900s when structures were designed against the "static wind load". After detailing the essential elements of the present Code of Practice CP3 on wind load design methods, the author outlines the current research and development of the "statistical approach" to the design of tall buildings for wind loads. This method makes better allowance for the variability of wind loading and its interaction with the building. Peak values of wind pressures are based on the mean wind speed and the random fluctuations about the mean. The variability of the structural properties of the building and its overall response to the peak wind pressures can now be predicted with reasonable accuracy. The mean wind pressure and structural response probability design method provides the designer with a means of assessing the risks that the safety and serviceability of a building may be damaged by wind action during the design life of the building. Current research is likely to confirm this method for wind load design for all civil engineering structures.

CIVIL ENGINEERING AND PUBLIC WORKS REVIEW—MARCH 1974

This issue is almost exclusively devoted to a special feature on Tunnels and Tunnelling. In this "environmental and social" age of the arguments for underground versus overground are beginning to gain more support. It is said that tunnelling is the only civil engineering technique which is getting cheaper as more specialized machinery and lining systems are developed to meet the increased demand. Articles on service tunnels and glass reinforced plastic lining methods make this issue an interesting summary of the state of tunnelling in the UK and its possibilities in the future.

JTS

ORDNANCE SURVEY

Annual Report 1973–74. HMSO. Price 98p net. This report covers a year during which the spotlight of public attention has been directed upon the Ordnance Survey to a greater extent than at any time in the past. Controversy raged over scales, over the "confusion" of the new symbols (footpaths and county boundaries!), the service being provided and the financing of Ordnance Survey. It is fair to say that the largely emotive criticism by the vociferous minorities has given way to more careful judgement which is substantially favourable. In future the Director General's post will not be filled by a Major-General on the Active List. On 6 April 1974 Major-General B St G Irwin became a Civil Servant and so there passed into history a tradition of military direction which has lasted since the Ordnance Survey began in 1791. As is customary the Report covers the progress made in surveying and mapping with supporting statistics and figures. It should be read by all who are concerned with survey and maps. A copy is held in the RE Corps Library.

Professional Papers, New Series No. 27. "The Precise Alignment Survey of a Five Kilometre Radio Telescope Aerial Array for the Cavendish Laboratory, Cambridge University." The performance of this radio telescope is largely dependent upon the precision of the location of the individual parabolic dish aerials and consequently upon the precision of the alignment survey. This paper gives an excellent account of the methods used (and why!) and the accuracy obtained. The paper is held in the Corps Library.

EEP

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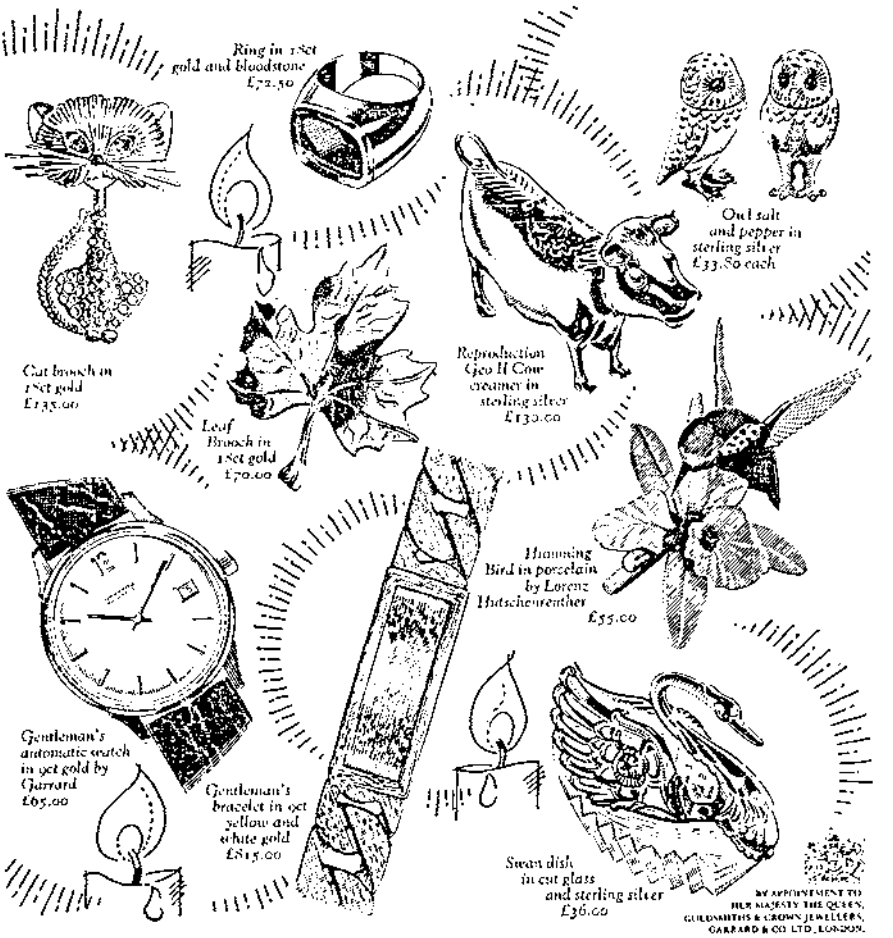

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