

THE ROYAL ENGINEERS JOURNAL

INSTITUTION OF RE OFFICE COPY

DO NOT REMOVE

Volume 99

MARCH 1985

No 1

THE COUNCIL OF THE INSTITUTION OF ROYAL ENGINEERS

(Established 1875, Incorporated by Royal Charter, 1923)

Patron-HER MAJESTY THE QUEEN

President	
Major-General P C Shapland, CB, MBE, MA	1982
Vice-Presidents	
Brigadier D L G Begbie, OBE, MC, BSc, C Eng, FICE Major-General M Matthews, CB, CBIM	1980 1983
Elected Members	
Colone! R C Miall, TD, BSc, FRICS, ACI Arb Colone! A H W Sandes, MA, C Eng, MICE Lieut Colone! J Morgan, RE, MISM, MBIM, MASMC Major R G Taylor, RE, B Sc Major M R Wills, RE Captain W A Ford, RE Lieut Colone! J S Bettridge, TD, FIPHE Brigadier F G Barton, CBE, BSc Lieut Colone! K J Drewienkiewicz, RE, MA Brigadier P F Aylwin-Foster, MA, C Eng, FICE, FIHE	1982 1983 1983 1983 1983 1983 1984 1984 1984
Ex.Officio Membero	1004
Brigadier C W Woodburn, MA	E-in-C b) PB7 RSME urvey blonel gr Gp Svcs DPCS
Brigadier-General Dato Chen Kwee Fong, DPTS, KMN, AMP, PJK	
Malaysian Armed Forces Brigadier V P Yadav Indian Engineers	1978 1981
Brigadier Khurshid Ghias Ahmad, S Bt, BSc, FIE(P) Pakistan Engineers	1981
Lieut Colonel A T J Roseveare, BSc Zimbabwe Engineers	1981
Lieut Colonel S D Jameson, RNZE Royal New Zealand Engineers	1982
Major-General J A Stewart, CD Canadian Forces	1982
Colonel J A Crocker, B Tech (Civ E), MIE (Aust), RAE Australian Military Forces	1983
Major R C Hart, RE BAOR	1984

į

.

Secretary and Editor RE Journal

Colonel G W A Napier, MA 11	198
-----------------------------	-----

Bankers

Lloyds Bank, Ltd, Cox's and King's Branch, 6 Pall Mall, SW1

PACE

THE ROYAL ENGINEERS JOURNAL

© Published Quarterly by The Institution of Royal Engineers, Chatham, © Kent ME4 4UG. Telephone Medway (0634) 42669

Printed by Mackays of Chatham Ltd, Lordswood, Chatham, Kent ME5 8TD

	· · · · · · · · · · · · · · · · · · ·	
Volume 99	MARCH 1985	No. 1

Contents

		11100
1	EDITORIAL	I
2	SEARCHLIGHTS IN THE CORPS OF ROYAL ENGINEERS. By Brigadier	_
	B Chichester-Cooke (with appendices)	2
3	EXERCISE PIGS BRIDGES SALUTES LOSS OF INDEPENDENCE. By Captain	
	R J Wright (with photographs)	7
4	PROMOTION IN THE FIELD. By Major (QM) A F Skidmore (with photo-	_
	graphs)	12
5	HAPPY MEMORIES. By PAE (with photographs)	16
6	ENGINEERING GEOLOGY RELATED TO MILITARY QUARRYING AT STANLEY. BY	
	2 Lieut M S Rosenbaum (with photographs)	26
7	A FULL HOUSE. By Lieut Colonel M J Payne (with photographs)	- 33
8	A POST-WAR GAMBLE IN MOGOK. By the late Lieut Colonel J J D Groves	35
9	IRONMAN OR IRONWOMAN OR JUST PLAIN RUSTY? By Captain S M	
	Springman (with photographs)	41
10	"THE OLD YAKHDAN". By Colonel G C Clark	46
11	MONTE PIANO AND THE WAR IN THE DOLOMITES. BY Lieut Colonel J E	
-	Nowers (with maps and photographs)	47
12	MEMORANDUM	52
13	A BRIDGE TOO FAR-AND ONE GONE FURTHER. By Captain A D Macklin	
	(with photographs)	53
14	AN INTRODUCTION TO COMPUTER COMMUNICATIONS-PART I. By Captain A	
	P Sowerby	56
15	EMBROIDERED CUSHION, BY CO RMRE(M)	59
16	CORRESPONDENCE	
	MEMOIRS (two letters)	60
	EX WATERLEAP 83	61
	UBIOUE-VERSATILITY	61
	WHAT'S IN A NAME?	62
	THE SOLADRON SERGEANT MAJOR	64
17	MEMOIRS	
- '	COLONEL R E HOLDEN	65
	COLONEL H M WHITCOMBE MBE	66
18	BOOK REVIEWS	67

Authors alone are responsible for the statements made and the opinions expressed in their papers 4,250

Editorial

"THE OLD ORDER CHANGETH . . . "

It is the prerogative of each generation to claim that "things will never be the same again"; that the changes they are witnessing are in some way exceptionally fundamental. However, by any standards, the scene the Army finds itself in in 1985 is very different from a year ago and offers the Corps something of a challenge.

Only the unlucky few who have been directly involved in the reshaping of the MOD really appreciate the need for the radical nature of the thinking behind it, but the arguments for keeping the Corps much as it is seem to have been presented with some eloquence as the empire remains reasonably unscathed. But it is an empire that has no right to existence per se. As the E in C remarked in his address to the Corps AGM (*Journal September 84*), he was not putting up a defence for the Corps but for our "customers" in the Army and other Services. They need a two-star E in C—and, by extension, they need a Corps capable of giving them the support they need when they call for it.

The paradox is that although they need Sappers, only we can tell them what they need. Perhaps the most revealing aspect of the discussions in the Year of Studies has been just how much education is necessary at all levels at all times to ensure that the nature of Sapper support, and the disastrous consequences of its absence, are fully appreciated.

Certainly in the combat engineering field the time is ripe for some clear thinking and exposition. Some formation commanders are questioning the role of minefields. Is there a hint in General Sir Nigel Bagnall's comment in his recent address to the RUSI when he said of the British Corps that "... they encase themselves in minefields..."? We need to be able to demonstrate our role in an age of new mines technology and changing tactical concepts and educate people away from the idea that laying mines is the Sappers *raison d'etre*.

As to construction engineering, 1984 has seen the end of the Military Works Area in the Falklands. Despite the QMG's generous public recognition of the role played by the Corps, the need to maintain the dual trade capability of our soldiers and the professional engineering structure again becomes questioned as soon as peacetime soldiering becomes the norm. It is also of note that the Resources side of the Corps, so vital to everything in the Falklands, is the only side to have taken a cut in the LEAN LOOK studies.

We therefore set out on 1985 with no VCGS in the MOD, with an E in C but one whose very existence has been challenged, and with a spirit chastened by the need to prove the value of our contribution to defence and the justification for our traditional structure. These are radical changes indeed.

At a humbler level 1985 will be a year of change in Institution affairs, too. The move of the Museum due to reopen in the Ravelin Building in May marks the first step in a major advance in Corps affairs. 1985 also finds your Journal in the hands of a new editor. Philip Howard in *The Times* offers a journalists cynical definition of an editor: ". . . a person employed on a newspaper whose business it is to separate the wheat from the chaff, and to see that the chaff is printed."

Whatever the justice of this view, I am certain that the quality of this Journal will continue to depend on the readiness of members to contribute to it and to enter intc debate in its columns. Taking the analogy a step further, I much look forward to the harvest.

Searchlights in the Corps of Royal Engineers

BRIGADIER B CHICHESTER-COOKE, CBE, TD, DL



Very early involvement in Radar, then seen only as a crude early warning aid, inevi-tably ensured an Air Defence future for "Chi" Cooke. When it was formed, he commanded 337 AA Coy, later to raise, train, and deploy for war, 338 Coy. Having filled in after Dunkirk by devising and erecting the beach-landing obstacles of the Romney Marsh area, he assumed command of 33rd AA Bn east of London on the day of the first night raid in 1940. From being President of the Inter-Services Scientific Committee (researching AD Radar), he was promoted Brigadier in 1942 as AD Commander Industrial Midlands, based on Sheffield. In 1944, command of defences against the VI

involved a new-style automated, computer controlled, co-operation between guns, searchlights and fighters that reached an 81% destruction rate. Convinced that the AA future lay with natio controlled rockets, the post-war tasks of establishing credible air defences in London and Paris brought frustrations enough for him, in 1951, to pack his bag and make for the City. He laid the first RE yacht mooring at Upnor in 1934 and, but for the war years, has kept a boat there ever since.

This article tells the story of searchlights in the Corps up to the end of World War2. A further article on lights in the Corps post-war, written by Major R G Selby-Boothroyd TD RE (V) will appear in the June Journal.

This story of the searchlight in the Corps goes back a long way. As early as 1892 it was involved with them at Portsmouth, Plymouth, and other ports as the essential adjunct to the submarine mining defences, and the Coast Artillery. By 1897 there were detachments at all the important ports. These were made up of locally available Volunteers supported by a small Regular nucleus to train them and maintain the equipment. At the time of the Boer War the Electrical Engineers sent out to South Africa a unit of 8 Officers and 55 ORs for searchlight duties. By 1906 a mobile searchlight had been developed mounted on, and operated from, a motor vehicle rare in those times, and by 1907 there were Electrical Engineer units in London, Two. Severn, Clyde, Tees, Forth and Mersey.

But in 1908 the creation of the Territorial Force to replace the Volunteers caused a major reorganization of the whole Army, with the new emphasis being on Field Divisions organized as such. When the changes were complete there survived only two Electrical Engineer units, one in London and one in Tyne.

No anti-aircraft role was envisaged for the searchlight until the threat of raids by Zeppelins manifested itself in 1915, at which time the responsibility for the Air Defence of Great Britain was that of the Admiralty. For this it had available a number of 13-pdr guns which were speedily mounted on lorries and manned by the RNVR. Some Naval searchlights were distributed, to be manned by local Special Constables. But unhappily the results were distributed, to be manned these slow, cumbrous airships, and when the enemy started to raid with the faster (70mph) Giant

Brigadier B Chichester Cooke CBE TD DL

and Gotha aircraft something more organized and effective was demanded by the Royal Flying Corps.

Fortunately the Corps had in 1915 formed a Searchlight (S/L) Battalion based on the existing London and Tyne units, for an AA role, and now that the need had arisen was able to expand into a number of AA Electrical Engineer Bns and take over, from the "Specials", the whole searchlight responsibility and give the new layout communications, which the old one never had. The effect of all this was very soon evident. On 19 May 1918 the enemy sent some forty aircraft to attack London by night. There were twelve air-combats against illuminated targets in which three were destroyed in the air; three were so badly damaged that they failed to return; one landed in Essex damaged, and three came down damaged by shell fire. These were losses sufficient to deter further attacks on London, and the reputation of the searchlight as an air defence weapon was truly established. In the 1914–18 war a searchlight unit was also sent abroad to see service in France, Italy, and Palestine.

At the end of the war in 1918 there were twenty-six Searchlight Coys RE (622 searchlights) deployed in the UK which, by December had fallen to eleven, these being four each in the two London Electrical Engineer Bns and three in the Tynes. When the new Territorial Army was formed, these eleven Companies continued in it and, although faced with much disinterest and neglect were kept alive by the enthusiasm of a few Officers and ORs during the inter-war years. Having no Field Force role they were mavericks.

Their problems were not helped by inter-service frictions between the War Office and the Air Ministry. Even the then new 3in AA Gun had no ability to provide aimed fire; only to put up barrages which were claimed to deter the enemy aircraft and make it fly high with diminished bomb accuracy, and so the "killer" was far more likely to be the fighter, which depended by night to have searchlights to show it the target. But for this facility to them, the War Office was reluctant to pay the bill. It looked at one stage as though the searchlight would become RAF, but there was a sudden realisation that without searchlight help the guns would not be able to judge where to put their barrage, and the mood changed and searchlights remained with the Corps.

A Committee was set up in July 1934 to consider the Air Defence of Great Britain. Some Government witnesses, perhaps promoted by the Treasury, were pessimistic and believed that "the bomber will always get through one way or another" and regarded it all as a waste of money, but searchlights were declared by the Committee to be an absolutely essential part of any adequate night defence organization and indeed, until the advent of airborne radar aids to night fighters very many years later, far more emphasis was placed on the need for searchlights than for AA guns. The Committee indicated a requirement (then regarded as fantastic) for 100 S/L Coys, which is 25 AA Bns operating 2400 lights. At that date the total searchlight availability was the 1st AA Bn RE (Regular at Blackdown), plus the neglected 26th and 27th (LEE) AA Bns TA and Fortress Detachments at Kent, Tyne, Dorset, Carmarthen, Essex, Cinque Ports and Devon/Cornwall, all TA.

It was one thing for a recommendation to be made, and quite another for it to be implemented. However thanks to the determination of a handful of senior, mainly Sapper, officers like General Tompson, and a few far-sighted politicians like Churchill, Lord Nathan, and Hore-Belisha, pressure was exerted to get action on the Committee's report, with the result that by the end of 1937 the AA strength of the Corps had been increased to:

 $= 96 \, \text{S/L}$

= 2592 S/L

Regular: The 1st AA Bn RE

Territorial Army: Twenty-seven AA Bns RE which was achieved in this way:

In 1935 it was decided by the Cabinet to create in London, as a start, the 1st AA Division, which actually formed on 15 December 1935. There were at that date two TA Field Army Divisions in the London area, the 47th and the 56th. The plan was to reorganize these into only one Field Division, converting the surplus regiments to Anti-Aircraft. Because AA equipment is more bulky than that of field units, the Regiments selected were to be those with the most commodious accommodation. It was a bold idea beset with many potential problems because, while the selected Gunner units were merely changing weapon role, the London Regiments all had an infantry history running back over centuries, many being of Tudor foundation or descended directly from the "Trained Bands". The invitation to them to convert to AA Bns RE had to be put with great tact and understanding. Being TA they had to convert voluntarily, there being no lawful means to compel them, and even if the unit agreed any individual had the right to claim transfer if he wished.

To the great credit of everyone it was a total success. The Corps, in absorbing twenty-five very old and historic Regiments, did so with great wisdom, understanding, and welcome, which won an immediate respect and appreciation from the newcomers. The incoming Regiments were to have their old titles incorporated into their new ones; they were to continue to wear their traditional badges and buttons but adopt the Sapper Grenade collar badge; they were to retain any distinctive features of their uniforms if they had any; and they were to keep their Colours with the right to carry them on parade annually on Remembrance Sunday or when celebrating any special Regimental anniversary. A series of guest nights were held at the REHQ Mess to dine in the new chaps, when all the right things were said.

On 16 February 1936 nine London Regiments converted to AA Bns RE to provide the searchlight element of the 1st AA Division, and they are listed in Appendix A. At that date the only units in possession of any AA equipment were the 1st AA Bn at Blackdown, the 26th and 27th (LEE) Bns in London and the recently formed School of AA Defence at Biggin Hill, that held by the 26th and 27th being not of the most modern kind. All these together exerted immense efforts to guide and instruct this massive reinforcement, which had no equipment at all, because none existed. However being pushed in at the deep end well suited the TA mentality, and enthusiasm grew and the impossible was achieved. And later, in a less frantic way and as instructional equipment became available, further AA Divisions were formed and more Infantry Regiments converted, as shown in Appendix B and two new units formed as in Appendix C.

Thanks to herculean efforts by everyone concerned, at the time the Munich Crisis came in 1938 all these twenty-seven AA Bns RE TA were well established and in a high state of training that allowed them to deploy to war stations smoothly within twenty-four hours of the issue of the codeword. They had the full 25% of their war equipment held in unit HQs, and the remaining 75% in Mobilization Stores, specially built and located in their deployment areas often 50/60 miles away. (The present RSME REME Workshop at Wainscott was one of these).

Of course the Munich Crisis stimulated public anxiety about AA Defence so that within a few weeks such manpower gaps as existed in AA units were filled, all being recuited to war establishment plus 10%, which was the target. Apart from the 1st AA Bn, there were then in the Corps twenty-seven AA Bns TA, making a strength of 108 Coys, which is 2592 searchlights and some 42,000 AA Sappers TA. Because of its specialist requirements and its deployment organization into small detachments of twelve men distributed at two mile interval and distance, the Searchlight Arm TA only accepted selected recruits, and thus became "the thing to get into". It attracted skilled and professional men of the highest calibre, over 50% of whom had been commissioned by the end of 1940 into all Arms, there being no room for them in the Corps. It is illuminating to reflect that in the post-war years they rose to the occasion again, to provide for the Nation cabinet ministers, a Prime Minister's husband, about twenty MPs, a Lord Mayor of London, and Lord Chief Justice, several law lords and Judges, a posse of Peers, two Ambassadors and a massive number of well recognised public and industrial figures, plus without doubt many other things we know nothing about-contact by the Corps with the majority having been lost.

The searchlight deployment at the outbreak of war in 1939 was achieved quickly and smoothly, the average elapsed time between civilian workplace to deployed in action stations being less than twelve hours. While some S/L Units then faced months of inactivity, others closer to Europe were soon engaged with the enemy. German pilots who flew over England and dropped a bomb got a badge for it and were quick to recognise that places that jutted out, like Thanet and the Romney Marsh could be flown over quickly under the Radar cover to get the coveted distinction. While things hotted up of course when the Battle of Britain started, searchlight detachments armed only with an AA Lewis Gun in Essex and Kent took a steady toll of unsuspecting low flyers, one AA Coy alone being credited with five destroyed before the Battle and seven during it.

In December 1939 the enemy started air-laying magnetic mines in the Thames Estuary. To deter him a fleet of well known paddle steamers was assembled at Sheerness, which included the *Medway Queen*, the *Queen of Kent*, the *Queen of Thanet*, the *Thames Queen* and the *Saxon*, to which were later added the *Crested Eagle*, the *Golden Eagle* and the *Royal Eagle*. Each ship had a searchlight manned by Sappers of the 34th (Queens Own RWK) AA Bn RE, two Bofors Guns, and in the case of each of the three larger Eagle ships, an early experimental radar set. Deployed at night in the Estuary they made life difficult for the mine layer aircraft.

When the Army had to be evacuated from Dunkirk all these ships went over. The *Royal Eagle*, for example, evacuated over 3400 men in three trips. The *Crested Eagle*, leaving Dunkirk Harbour after being loaded with wounded was bombed, crippled, and her Captain and deck officers all killed. The Searchlight Detachment commander, Corporal Lew Goddard took over the wheel and control of the ship and beached her, while Lance Corporal Vane went forward and destroyed the then very secret radar. The two NCOs directed the removal of the wounded from the ship, their services being recognised be awards of the DCM and the MM respectively. The close interest that their former Infantry Regiments continued to take in their "converted" bns, which they only regarded as lent, is indicated by the fact that when Dunkirk was recaptured the Queens Own RWK Regt recovered the wheel from the hulk of the *Crested Eagle* and have it in their museum at Maidstone today.

After the Dunkirk losses there was urgent need to increase military manpower, and large numbers of men were called up at short notice. They were assembled into batches of about 300 and sent off to the only available accommodation that could contain such numbers, mainly the Militia Camps. These had been built pre-war either as AA Gun Sites (like Tower Hill Camp) or as administrative & training centres for the Militia. By 1940 they were either operational AA Gun Sites, or the HQs of Brigades, Searchlight Regts, or S/L administrative centres.

No attempt was made to grade these men or select them before deciding where to send them and no attention was paid to the fact that for searchlight operations certain characteristics and skills were required. In an isolated detachment of only twelve men each has a job to do and must be able to do it. For example a "Listener" on a Sound Locator was useless unless he had perfectly balanced binaural sense, something enjoyed by less than 20% of people. A "Spotter" required abnormally sensitive night vision. The technical qualifications of the "Electrical Numbers," operating and maintaining complicated equipment alone in remote places needed to be adequate. None of these attributes were needed humping ammunition on a gun site but nevertheless all those arriving at gun sites were enrolled as Gunners and all those at S/L camps were Sappers, making any interchange impossible.

In the event, one Searchlight CO who had the necessary contacts consulted the Cambridge Psychological Laboratory, knowing that it had done some work on personnel selection without managing to arouse any official interest. Professor Thompson readily moved in with a team out of whose testing 161 men of the 300 sent to the S/L unit were graded as unsuitable for it, and 120 sent to a gun site were classified as more suitable for S/L work. But nothing could be done about it.

But out of all this, certain things happened:

(1) The AA Gunners, who now had increasing numbers of the 3.7 in AA gun, the Vickers predictor, and the B&S AA Rangefinder, were still only able to engage a target when they could see it, if they wanted to provide predicted fire. The fact that

.

night illumination of their targets was provided by another Corps, whose primary responsibility was to cooperate with Fighters, created strong pressure within the Gunner world to have searchlights of their own.

(2) The searchlight commitment within the Corps had now become very considerable and while its operational factors were largely undertaken by ADGB its conflicting obligations to both Gunners and RAF were clearly going to produce problems that distracted from its true role of Military Engineers. Just as the RFC, the Tanks, the Signals and others had in due course gone their way, pressures from the Gunners to take over the whole lot in 1940 were not resisted, except by the units that did not relish being converted once again. But the "rebadging" of the twenty-seven AA Bn RE into S/L Regts RA was completed by early 1941, at which point the enormously important and successful story of the AA Searchlights in the Corps came to an end. To create out of such small resources such a highly efficient and, perhaps it is not too much to say "sparkling" new Force, almost 100% of which were voluntary TA personnel, would only have been possible within a Corps that understands and values individual efforts in a fast moving technical development. The later story of the radar controlled searchlight and the final defeat of the enemy bomber belongs to the same chaps wearing different badges, but anyway the day of the AA Searchlight is over. Once properly developed, Radar did its job far more economically.

(3) Scientific Personnel Selection as developed at Cambridge was then adopted in the Army at the point of entry and saved a deal of frustration and mis-employment.

Units Converted on	16th February 1936 Appendix A
Previous Title	RE Title
26th (London Electrical Engineers)	
AA Bn RE TA	Unchanged
27th (London Electrical Engineers)	
AA Bn RE TA	Unchanged
7th Bn The Essex Regt TA	28th (Essex) AA Bn RE TA
The Kent Fortress Engineers TA	29th (Kent) AA Bn RE TA
4th Queens Surrey Regt TA	30th (Surrey) AA Bn RE TA
6th London Regt (City of London Rifles) TA	31st (City of London Rifles) AA Bn RE TA
7th City of London Regt TA	32nd (7th City of London) AA Bn RE TA
19th London Regt (St Pancras) TA	33rd (St Pancras) AA Bn RE TA
20th London Regt (The Queen's Own) TA	34th (Queens Own Royal West Kent) AA Bn RETA
21st London Regt (The First Surrey Rifles) TA	35th (First Surrey Rifles) AA Bn RE TA
5th Bn The Middlesex Regt TA	36th (Middlesex) AA Bn RE TA
Units Later Converted	as AA Divisions Formed Appendix B
The Type Electrical Engineers TA	37th (Tyne) AA Bn RE TA
4th Bn The King's Regt (Liverpool) TA	38th (The King's Regt) AA Bn RE TA
4th Bn The Lancashire Fusiliers TA	39th (Lancashire Fusiliers) AA Bn RE TA
3rd Bn The Sherwood Foresters TA	40th (Sherwood Foresters) AA Bn RE TA
5th Bn The North Staffordshire Regt TA	41st (5th North Staffordshire Regt) AA Bn RE TA
4th Bn Robin Hoods (Sherwood Foresters) TA	42nd (Robin Hoods, Sherwood Foresters) AA Bn RI
5th Duke of Weilington's Regt TA	43rd (Duke of Wellington's Regt) AA Bn RE TA

3rd B 5th B 4th B 5th Duke of Weilington's Regt TA 5th Leicestershire Regt TA 4th Royal Warwickshire Regt TA 4th Lincolnshire Regt TA 4th Bn Durham Light Infantry TA 4th Bn The Hampshire Regt TA 5th Bn The West Yorkshire Regt TA

5th Northamptonshire Regt TA

51st (Scottish) AA Bn RE TA 58th AA Bn RE TA

> Newly Formed Units Appendix C Formed in Dundee, Aberdeen and Cowdenbeath Formed in Harrow. Raised by the celebrated Lt Col Edward Boggis, and known throughout AA Command as "Boggis' Lot"

44th (Leicestershire Regt) AA Bn RE TA

46th (Lincolnshire Regt) AA Bn RE TA

49th (West Yorks) AA Bn RE TA 50th (Northampton) AA Bn RE TA

45th (Royal Warwickshire Regt) AA Bn RE TA

47th (Durham Light Infantry) AA Bn RE TA 48th (Hampshire) AA Bn RE TA

n RE TA

Exercise Pigs Bridges Salutes Loss of Independence

CAPTAIN R J WRIGHT RE, B Sc



The author joined the Army in Jun 77 and served a Short Service Limited Commission with 21 Engr Regt for nine months before taking up a University Cadetship. After completing a Degree in Geography at London University he attended POSUC 9 and 73 YO Course before being posted to 73 Indep Fd San RE. He is now serving at the Junior Leaders' Regt RE.

EXERCISE PIGS BRIDGES was a battlefield tour with a difference mounted by 73 Field Squadron to commemorate its loss of independence on 1 June 1983. The aim was to run the route taken by 73 Field Company from their D Day landing to the conclusion of the campaign in North West Europe. To complement the running the exercise would study the Company's operations initially as part of the "Assault Group Royal Engineers", and then as a Heavy Bridging Unit. In order to gain first hand knowledge of the campaign and the various tasks it was planned to take Old Comrades from the Company on the exercise.

The exercise was the idea of the Officer Commanding, Major W J R Hughes. He initiated the planning in December 1982 with the aid of a brief Company History and a motoring atlas of Europe. Sets of 1:250,000 scale maps were requested and copies of the Company War Diary and Operation Orders obtained. Unfortunately, the maps were slow to materialise and outline permission was not granted until April 1983 while the Squadron was in Canada on *Ex Warpaint*. I returned to Osnabruck on 27 April with orders to plan and command the exercise.

The proposal was for twenty-four members of the Squadron, running in relay, to cover the route taken by 73 Field Company from their landings in Normandy to the end of the war in Europe. The runners would be supported by a small support party who would also host members of the 73 Old Comrades Association. The exercise dates were 19 June to 4 July which gave little time for the preparation and task. The cost was to be met by the Squadron PRI and individual contributions from exercise members. The final aim was to raise £2,500 for the British Lambless Ex Servicemans Association.

Planning started with a time appreciation which allowed two days to drive to the start point and a day to recover from the north east of Germany, leaving only thirteen days for the task. Once the maps and war daries had arrived I was able to extract place names, there being no grid references in the documents, and attempt to work out an exercise route. Diary information was sketchy and often referred to routes like CLUB and DIAMOND, the details of which were unspecified. A provisional route of about 950 miles was compiled giving a daily target of eighty miles for twelve days with one day in reserve. The provisional route was then driven in reverse in an attempt to locate the task sites and spot potential camp locations. Having located the D Day landing beaches, JIG GREEN EAST and WEST at Le Hamel, on which the Company landed at H hour on 6 June 1944 the route was retraced. The result was the production of a detailed route card with two sixty mile, and ten eighty mile days, with a confirmed camp location at the end of each day's run. The bridge and other task

Captain R J Wright RE B Sc

sites were located as accurately as possible by talking to local people although in a couple of cases information was slightly confused.

Having completed the ground reconnaissance detailed planning was possible. The first task was the selection of personnel and the formulation of the transport and stores requirements. We opted for a total of twenty-six runners made up of four teams of six drawn from the three field troops and a joint team from the Head-quarters and Support Troops. Two additional runners, a Sapper and myself would initially run as extras and then fill in any gaps caused by injury. Three of the four teams would run each day manning early, middle and late shifts while the fourth team rested and assisted the support party. Running would start at 0700 hours with each team taking a four-hour stint with pairs running eighty minutes at a stretch. It was hoped that each pair would cover around nine miles in the time giving us the daily total of eighty miles. Running by time was thought to be the fairest method allowing the pair to go for a best effort regardless of weather, terrain and fatigue. The dress for the runners was DMS boots, puttees, lightweight trousers, stable belts, and running vests.

The runners were supported by motorcycle and a ³/4-ton Land-Rover, which transported the running shift, marked the route, and acted as a mobile base and safety vehicle. A second Land-Rover was used to deliver the oncoming shift and recover the shift that had been running. The remainder of the exercise travelled in the Squadron mini-bus along with the Old Comrades. Finally three four-tonners transported the camp, rations, fuel, personal kit and a spare motorcycle.

In the meantime, the war-time Chief Clerk and Honorary Sccretary of the 73 Old Comrades Association, Mr John Thomas, was busy recruiting volunteers from his members. He was to collect a team together and get them to Cherbourg where they would be collected by the Squadron. They would then live, eat and move with the exercise. Moving by mini-bus they would support the runners and have the opportunity to go off in search of memories along the way. The party was:

Mr L C Bolton	73 Fd Coy
Mr L Pitt – 72 F	Fd Coy
Mr H Stocks 7	73 Fd Coy
Mr E G Sargear	nt 73 Fd Coy
Mr J Thomas	73 Fd Coy 🍈
Mr W C Davis	73 Chem Coy
Mr G Morgan	73 Fd Sqn
Mr C Thomas	•

Pay Clerk LSgt Fd Tp Spr 3 Plt Medical Orderly Sgt Chief Clerk prior to D Day SSM

NW Europe 44-45

Son of Mr J Thomas (photographer)

The exercise deployed on 19 June 1983 travelling to the British Forces Antwerp HQ at Emblem for refuelling and a rest period before facing the long journey to Mouceau en Bessin just south of Bayeux. By the evening of 20 June 1983 the exercise was complete with the Old Comrades collected and everybody ready to go. The following day was a built-in safety valve for problems en route and was scheduled as a rest day and battlefield tour.

The battlefield tour started at Arromanches, which on 6 June 1944 had been the key point on *GOLD* beach and the site of the Mulberry Harbour. At the Arromanches Landings Museum a conducted tour set the picture for *Operation Overlord* and the invasion of Europe. We then moved four miles east to Le Hamel where the bulk of the Company had landed at H hour on 6 June 1944. Their initial task was mine and obstacle clearance. During D Day they cleared 2,000 yards of beach under enemy artillery and sniper fire losing six men in the day. A further three lives were lost at Jerusalem Crossroads when a party was bombed by an American Thunderbolt as they moved forward as part of the Bing Force. Working with the Inns of Court Regiment they had been tasked with seizing and destroying the bridges over the R Orne to hinder any Germany counter-attack on the bridgehead. Having walked along the beach and allowed the Old Comrades to study the village for landmarks we moved west to Port en Bessin. At Port en Bessin they had been tasked with clearing mines and booby traps after it had been tasken by 47 Royal Marine Commando. The task

THE ROYAL ENGINEERS JOURNAL



Photo 1. The first pair of runners set off from the Normandy beaches

cost the Company a further five lives while trying to clear a belt of "S" mines. The port had changed very little and the Old Comrades were able to describe the incident and subsequent rescue operation. The Company had then moved to build the Bayeux by-pass and conduct route maintenance in the local area. The day finished with a moving ceremony at the Commonwealth War Cemetery at Bayeux where the members of the Company lost in the first week of the campaign are buried.

The 22 June was the first running day and in common with the final day had a sixty mile route. The start at Le Hamel was witched by local people and the French press. Mr G Morgan marched the whole exercise up the beach from the waters edge before handing over to the first pair of runners. The route took them through Arromanches, past Jerusalem Crossroads, through Villier Bocage and finished at Falaise. Running was interrupted at St Marc d'Ouilly to visit the site of the Jacqueline bridge over the R Orne. The bridge, built on 18 August, was a 110ft treble single Bailey named after the twenty-two year old waitress of the village cafe. Jacqueline was still alive and



Photo 2. The 694ft CI 40 bridge over the R Seine at Vernon

Exercise Pigs bridges salutes Loss Of Independence 1,2

together with the village was ready to greet the exercise members. The occasion was marked with a presentation of flowers and an invitation to the mayors parlour.

Day 2 was a full eighty miles, and the hilly terrain and very hot weather gave us an idea of what was to follow. Despite the conditions the runners did well finishing the day at Damville, south of Vernon, ahead of schedule and confident that they could meet the daily targets. The night was spent as guests of a farmer who believed the Company to have repaired his farm and cleared his land after the RAF had bombed it mistaking it for a Luftwaffe airfield.

The highlight of Day 3 was the GOLIATH bridge over the R Seine at Vernon. The Company reached the town on 26 August and after the initial infantry assaults took twenty-six hours, assisted by 72 Fd Coy, to build the 694ft Cl 40 Bailey pontoon bridge under fire and in pouring rain. We found the bridge site, and sitting on the home bank received a thorough briefing from the Old Comrades. For the runners it was a bad day having the hottest weather coupled with a very hilly route.

Days 4 to 6 lacked bridging history but followed *DIAMOND* route along which the Company had passed in the first week of September 1944 maintaining the route as they went. Amiens and Arras were the highlights of Day 4 and Day 5 took us out of France and into Belgium just south of Tournai. The ground was now far flatter but the stress of continual running was beginning to show. With only 380 miles covered both reserves were required to replace injured runners on a full time basis. The injuries were partly caused by over enthusiasm and the natural competitiveness of the runners. By the end of Day 6 the total was 460 miles and things had calmed down as we could not afford to lose another runner.

Day 7 put us in the area that the Company had reached by 4 September 1944. At that stage the Company had taken on the maintenance of the bridges over the Albert Canal before moving to Bourg Leopold to join the bridging column for the advance over the Rivers Maas and Rhine. The advance was halted at Arnhem and the Company fell back to Valkenswaard to work on *CLUB* route and strengthen *JOE's* and *JACK's* bridges to Cl 70. It was not until November that bridging was required again and the first was a 175ft Bailey over the canal at Lanklaer which was followed by boom defences above the Maas bridges at Berg and Bourg Haren. By mid December preparations for the Maas assault were gathering momentum and the Company was trailing the Cl 50/60 raft. Work maintaining the routes continued and on 1 February the great thaw set in and the roads collapsed under the traffic load.

On 11 February the assault started and the Company worked on the GENNEP Cl 40 bridge being responsible for the portion of bridge over the river proper and all anchorages. However, on the 13th the river rose over its flood banks isolating the bridge. Viaducts were then built to reach the bridge turning the 806ft bridge into 4,008ft, the longest military bridge of the campaign. The Company then moved onto Well, building a 751½ft Cl 40 and then to Venlo to build a 1,024½ft Cl 70 bridge.

Unfortunately time was too short to visit each site and we confined our study to the Gennep bridge reached on the afternoon of Day 7. After the customary briefing at the bridge site the exercise moved into Germany spending the night at RAF Laarbruck.

Next day we reached the Rhine crossing at Xanten which is described as follows in the Company History:

"The advance party moved up to the bank on the evening of 23 March. It hour was at 0200 hours on 24 March. After a colossal barrage the assault moved over and the Company advance party was able to reach the bank by 0830 hours. Enemy fire was heavy until the arrival of airborne troops who destroyed the enemy gun area. Work on the bridge stopped between 2000 hours and 0530 hours and the bridge was completed and open at 1630 hours. The bridge was 1,0641/2ft long."

After the Rhine crossing the campaign developed into a headlong route of the Germany Army across the North German plain, and conditions improved for us as the weather became cooler and the runners sensed they were on familiar ground. On Day 9 we reached the Lingen bridge over the R Ems where the Company had built a

Cl 70 consisting of 2 × 110ft treble double spans onto a central pier.

Next day we ran through Nienburg to Celle on the R Aller and the site of the CORBEL bridge, named after the brickwork on the piers. The day ended at Hohne with the Old Comrades visiting Belsen where some of them had worked for a few days clearing up after the liberation. This visit brought back their most unpleasant memories and although distressed by what they saw were thankful to be reminded of the horrors.

From Hohne we moved north across the Luneburg Heath to Artlenburg where the Company built its final bridge of 9461/4t over the Elbe on 29-30 April 1945. That evening we had just sixty miles left to the finish at Rensburg.

The war in Europe ended at 0100 hours on 9 May 1945 with the Company at Lubeck. They then moved north to Rensburg on the edge of the Kiel Canal. After extensive work on the destruction of warlike materials the Company was disbanded on 31 August 1945. Our final running day which took the total to 920 miles ended in the field in which the Company had held its final parade.

The return to Osnabruck was marked by a memorable reception at Quebec Barracks. The Old Commides were collected in the bucket of a Medium Wheeled Tractor and followed the runners into camp to the applause of the remainder of the Squadron who had just returned from exercise in the Black Forest. The final night was spent celebrating in the Squadron bar before the Old Comrades left, tired but happy men bound for home.

The exercise proved to be a very good test of the fitness and determination of the runners, as well as a very informative battlefield tour. The Old Comrades were given the opportunity to fulfil a lifelong ambition and rose to the challenge with tremendous energy, humour and comradeship. The unsung heroes were however the support party who tirelessly moved the camp, fed and looked after us.

We all learnt a tremendous amount about ourselves, the history of our Squadron and the quality of the Corps. To conclude, the exercise achieved all its goals including raising over £2,500.

Promotion in the Field

MAJOR (QM) A F SKIDMORE RE



The author was commissioned in 1977 and his first tour was as a Wing Captain at A A Coll Chepstow. He then spent a period at RSME before becoming the Training Officer of 38 Engr Regt. This was followed by 2¹/₂ years at the CETC in Hameln before going to Dover to command 66 Junior Leaders Squadron.

MANY of us know the feeling well. The "Boss" has had a good idea and naturally, everyone agrees that it is simply splendid! Now, if you happen to be a Captain and your particular "Boss" is a Brigadier, then obviously the idea is even *more* splendid than splendid!!

Major A F Skidmore RE

11

The idea in question was born at Corps Rear Headquarters during one of the many occasions that the cellars of Bielefeld are occupied by this fast moving and forceful organisation. The "Boss"? Well that was the Comd Engr 1 (BR) Corps, Brigadier N H Thompson. The idea was what we, "The Sappers", were going to do with the BCR's on the 1984 jaunt, known generally as *Ex Lionheart* or *Spearpoint* and also, as it happened, *Full Flow*.

Now, before you throw your hands up and say "here we go, yet another glorious insight into the exercise", let me reassure you—you are correct, but it is one with a difference. It will also be of interest for all you budding generals to know that there really is no quicker way to command and promotion, and you do not have to attend Staff College to achieve it!

You may well ask what exactly is a BCR? We were told that a Battle Casualty Reinforcement (BCR) was, normally speaking, an ex-regular soldier, now a reservist, who had either volunteered as such, or actually had a commitment to the reserve. To fulfil this, most of the reservists reported to a Centre in the UK, had their kit checked (they are issued with a limited amount), and if all was well, having been paid a small bounty, returned from whence they came. It had been decided that as a part of *Lionheart*, and for the first time since Suez in 1956, (there is bound to be someone who will write to the Editor and claim differently) to "call" some 4500 of these reservists. Of this number, the Corps was expecting a total of 240 plus.

It was known that these individuals would take part in the exercise for a maximum period of one week and were to be "pushed". None of this sitting around, carrying out mundane tasks, such as guards and cookhouse duties, but to be placed as far forward as possible and to quote the Corps Commander "they are to be thoroughly tried and tested". There were times when it appeared that it was us that were being "T and T'd" but, on reflection, that is what we eventually managed for our reservists.

The Staff of the CETC were to man and run a Holding Wing at Sennelager, where all the BCR's were to report. This was the sorting house for the reservists, some of whom would pass through it rapidly, on their way to the forward divisions. The only action required by us was to put them into parties of the correct number and trade, appoint a draft officer and send them off. Give or take the odd hitch, that is what happened. However, these particular parties only numbered 100 or so in total. The remaining 120 had to be used and that was where the CCRE's idea came into play. It was to form an *ad hoc* squadron of reservists and I was to be allowed the privilege of commanding it. This squadron could then be deployed forward and used in some worthwhile role. Command structure, vehicles, food, G1098. Batco, resupply—no problem—sorted out in a jiffy. Reflect if you will on that lot and the artistic licence used when I say "sorted out in a jiffy".

The plans were drawn-up, re-drawn and eventually scrapped, but by the time we, of the CETC, arrived at Sennelager, we knew what we intended to do. There had also been some "marking of the cards" by certain Sappers, one of whom is located at York. He recalled how he had been helped on an earlier exercise (*Crusader*). Thinking that the command team of Skidmore and his SMI, WO1 Opie, had gained experience on that particular exercise building an HGB over the Leine, he recommended a repeat of the dosage. (That last remark is bound to draw a letter from the Chairman of the ex Support Squadron Commanders' Committee). In fact this did fit neatly into the 4th Armoured Division's plans and a crossing site just below Schloss Marienburg was selected, but more of this a little later.

The BCR's eventually arrived in our location at Sennelager and to many of the staff it turned out to be something of an old boys' reunion. The SMI met a reservist and having eyed one another up, they both realised that they had been Sappers together, so long ago that the exact date was lost in the mists of time. To give an idea of the cross section, some of the BCR's had been out of the Army for ten years whilst others as little as eighteen months. Geographically, they came from the length and breadth of the UK and just to underline there were five striking miners, (one Welshman, one Geordie and three Scots) and a Conservative MP. Allowing for the extra

THE ROYAL ENGINEERS JOURNAL.

long hair, but not an ear-ring in sight, it was very quickly apparent that whilst the material was in some cases a little rusty, it was good quality, requiring a small exercise in dusting and polishing. This we set about doing and their first forty-eight hours after arrival were spent on military training. In this period dry weapon training, live firing, first aid, NBC and special to arms (STA) matters were covered. During STA we concentrated on our current family of mines and we were, very naturally, able to give them an update on other new equipments and drills and brief them daily on the state of the exercise. The three field troops were all commanded by Warrant Officers (OMSI's) from the Centre, with Staff Sergeants (SSI) acting as Troop SNCOs and the Corporal Instructors filling the role of Section Commanders.

Their third morning at Sennelager was spent on battle procedures and preparing for the move forward. It must be admitted that the vast majority of them had responded incredibly well and readijusted to military life in a commendable way. They were, by this time, ready to go and aided by a multiple *Chinook* lift, we were moved forward. For many of them it was not only their first helicopter flight, but also the first time they had experienced contour flying. The various shades of grey and green were proof of this and some were later to admit that the thirty minutes spent flying down to Schloss Marienburg were not the best part of the exercise, however, they did agree that it was better than "tabbing".

The landing was unopposed and once clear of the LZ all troops moved into prerecced defence positions and proceeded to dig-in. Many of the BCR's had not actually believed that they were destined to dig and live in their trenches for three and a half days. They soon realised that this was in fact to be the case and along with the twenty-four hour ration packs which, just to encourage them were all curried chicken, they started to wonder, not for the first time, about what they had let themselves in for. It was also at this time that my ego received its first boost. I was contacted by the commander of the *Milan* platoon of 2 CG and asked if I was the commander of a unit known as "Skidmore's Own". If so, he was pleased to report that he was under command, complete with his platoon and could we decide on where I wanted



Photo 1. HGB under instruction

Promotion In The Field (1)

13

to deploy some of his posts. Knowing instinctively (!) that they (*Milan*) required a minimum distance of 400m and had a range of just below 2000m, we soon agreed on their siting and I was able to report that the squadron was secure on the ground and could defend not only the existing road bridge but also the proposed HGB crossing site.

Work also now commenced on the HGB which for the technically-minded, was to be "45.7m DSR CL 70 complete with level ramps". By late evening on the first day, most of the launching nose had been completed and BRAVO Troop under WO2 Willard, moved back into their trenches to sort themselves out and sleep. Meantime ALPHA Troop had carried out a recee on the road bridge and had a stores bid prepared and sent off. The remaining Troop, CHARLIE, had assumed responsibility for the rear defence area on the western bank of the R. Leine and had also started work on digging-in by hand not only themselves, but also a MEXE shelter, which would be used as a firing position for both bridge demolitions when they in turn were complete.

It was during the 'wee small hours" that an officer arrived from HQ 33 Bde with fresh orders for us. We were to leave the Royal Hussars battle group and join the Royal Scots Dragoon Guards. Would I "pop along" to the Royal Scots DG Tac HQ and make my number. This was quickly accomplished and having been offered a very large dram of 20 year-old "homebrew", I left with the leader of their armoured recce troop. It was almost as an afterthought that I was informed that they also (the recce troop) now came under my command! Returning with the troop leader, having gone over the ground with him, he disappeared to collect his troop and I was confronted by a Gunner. He was part of an FOO party, where would I like them situated, no, we were still on radio silence but they did have other means. With his questions answered I thought it time to review the situation. The SMI appeared right on cue, with a brew and we made our plans for the fast approaching day. The dawn came and with it the need to stand to, carry-out all the normal procedures and get on with the work in hand.

The reservists had coped very well up to now and BRAVO Tp were very soon "slinging steel". The HGB grew apace and the road bridge was prepared for demolition. During this extremely busy time naturally, many other things occurred. The crane operator had to be whisked away to be present at the birth of his child, he returned shortly afterwards. Three large buses carrying VVIPs including the CGS of the Australian Army, arrived to view this unusual experiment. Some of the visitors were doubters, but having been briefed and then allowed to talk to the reservists, they left undoubtedly impressed by what they had seen and obviously with a certain amount of food for thought. We were also visited by the "Peace People". Their first visit drew the comment from a JNCO that the only thing they appeared to leave in peace was hot water and soap! It was also generally agreed that most of them looked as if they were candidates for a sheep dip and certainly even after two days in "Noddy" suits, most of our soldiers smelt sweeter. The German Civil Police (GCP) arrived and invited them to leave and as visitors, they were followed by the E-in-C-General Matthews. During this time we seemed to be inundated by senior Sapper officers, but everything returned to near normal by late afternoon and it was then that I rashly changed the ETC of the HGB. Progress on the bridge had been very good and I thought it could be ready by midnight. Events were to prove me wrong and the bridge was not completed and ready for traffic until 0330hrs.

Before we had reached this point however, I had attended the CO Royal Scots DG orders group and once he realised that "Skidmore's Own (Horse)" as we had now become known, were so strong, he promoted me. In fact I had as a Captain, roughly twice the number of men under command than he had. In principle he believed that One Star was nearly right and really, who was I to argue! (I am still waiting for the CCRE to agree to pay of higher rank). The final addition to the unit awaited my return to the squadron location, where a platoon from the BW joined us. However, enough of this particular period, except to say that the forces under command were

THE ROYAL ENGINEERS JOURNAL

then in excess of 240 ranging from inf, armd recce, gunners and obviously, the reservist squadron and my own staff.

Eventually and I suppose inevitably, all good things must come to an end. Having built the HGB, prepared defensive positions in depth and put a bridge demolition party on the road bridge, we received a warning order to hand over the defence of the area and bridges. It was during this period that things really began to hot up. The enemy, in the form of a company of German panzer grenadiers, were landed on the Marienburg feature with the intention of seizing the road bridge. Their attempt failed but as everyone was quietly congratulating themselves, a most awe inspiring sight occurred. Two B52 USAF bombers literally came whispering out of the eastern sky at less than 500ft. It was their way of letting us know that we had been hit and in reality, the first we would have known of them would have been when their bombs went off around us. So with a gentle waggle of their wings they departed, leaving one or two very sober thoughts behind.



Photo 2, Completed HGB.

The reservists it will be remembered, were only going to be in BAOR for a total of even days and they were already in Day Six. So with a certain amount of reluctance, the handover of obstacles took place and then to all intents and purposes, the squadion disbanded, thus ending any thoughts one might have had of staging a coup. The staff of the Centre returned to Sennelager where we were to become responsible for all the documentation and administration of reservists returning to Heathrow.

In conclusion, did we learn anything and was it really all worthwhile? You would expect me to say "Yes" to both of these questions and I shall not disappoint you. We earnt a tremendous amount about our reservists and they themselves had posed a number of original questions and had submitted some good ideas. They believed that heir own commitment should be much greater in terms of training and preferably, his should be carried out with either Regular or TA units in the UK. That they found he test physically demanding was never in any doubt. I think that one of the other mportant lessons learnt or even re-learnt, was the great strength and profess

Promotion In The Field (2)

15

HAPPY MEMORIES

sionalism displayed by my Warrant Officers and NCOs. The Corps Commander in a television interview said that the great strength of the army lay in its JNCOs. I obviously would not wish to disagree with that statement, but would like extend it a little to cover our (the Sappers) Warrant Officers and SNCOs who, certainly in this case, responded in a way we almost take for granted. They adapted to fresh demands, trained the reservists in a number of different tasks, mostly non-engineer, and more importantly, led the JNCOs and allowed them to learn much from this experience.

Personally, I will always remember this particular phase of my career. I still cannot believe that anyone should have trusted me with so many men and so much equipment. The experiment worked and I shall always be grateful in spite of my original misgivings, to have been a part of it all. As a footnote however, the "Skidmore/Opie Team" are not taking any further HGB bookings, but we can recommend a certain party if there is a demand!

It would be wrong of me not to acknowledge the assistance given to us in bringing the Brigadier's idea to fruition. The CO of 25 Engineer Regiment (Lieut Colonel A D Piggott) was a tremendous help in reassuring me personally and providing back-up on the ground, as was Captain B J Cooke of HQRE 4th Armd Div, and to complete the picture, Colonel P J Sheppard at last got his wish of having the CETC under command, if only for a few hours—Gentlemen thank you all!

Happy Memories

PAE

I VISITED villages in the Western Punjāb on three occasions. The first visit was in answer to an invitation from a very senior Viceroy's Commissioned Officer, who was about to retire. This lasted for over a week. The other two tours were partly the result of suggestions from troops in my Company who were going on leave in December and January and would be in their villages. Perhaps the icy cold weather in Quetta in these months may have added extra force to these promptings. On these two latter occasions I stayed for only two or three nights in the same village, occupying a house in the village or a nearby rest house or $d\bar{a}k$ bungalow. On each occasion I had been authorised to approve up to thirty recruits, subject to medical examination. I could have found ten times that number.

Most of the villages were not sited conveniently at the side of a main road or near a railway station. Transport was by slow passenger train, by country bus, by tonga, on horseback or even on "Shank's mare".

My last two trips coincided with the fast of *Ramzan*. As this occurred in the cold weather with late sun-rise and early sun-set no particular hardship was felt by those (not myself) who were observing the fast. For me it had the great advantage of ruling out possible giant repasts and possible competition between hospitable hosts in this line. Nevertheless the number of hard boiled eggs and cups of sweet and milky tea that I had to consume must have been of a very high order.

"Sahib; when you are in Kohāt and are able to get some leave you must come and stay with me in my village of Dogah." So said Honorary Captain and *Subadar Major* Mohd Din, OBI, Croix de Guerre, who was shortly due to retire. Thanking him for his courtesy I wished him luck.

A year later my Company was in camp on the banks of the Kabul River. It was the month of November and I pondered over what I should do for Christmas. It was too late to reserve a block for shooting in the Salt Range and Christmas in Kohāt somehow did not appeal. Then I remembered this invitation. After a gap of over a week I received a reply from Modh Din, who was evidently delighted with my suggestion and who wrote to hope that I would spend several days with him in his village. Apparently I would be the first British Officer so to do.

To reach the village of Dogah one had to take the night train from Kohāt to Rāwal Pindi and there change into a very slow "passenger" train (the name for slow trains) which would take me to Khārian, whence there was a trek of seven or eight miles to Dogah.

When travelling by train in India one did not wear one's "best suit"; khaki shirt and shorts with tweed jacket sufficed. It seemed to be a very long six or seven hours to Kharian but at last the train began to slow down. I put my head out of the window to see if there would be a welcoming party. To my horror I saw that across the centre of the platform was a red carpet stretching from the train to the exit. "Good Heavens, is the Governor on the train?" was my immediate reaction. I looked again and by the rate by which the train was coming to a halt it quickly dawned on me that this carpet was for me; no Governor but a rather junior Subaltern. Then appeared Mohd Din, wearing spurs, sword and medals. He took up his position on the centre of the carpet, flanked by a Jemadar and a Havildar, similarly attired, and standing slightly behind him. As I alighted all three came to the salute while the rest of the passengers on the trained enjoyed "the show". I was greeted most kindly by Mohd Din and his two "aides" who were relatives, and the four of us moved towards the exit. The platform, normally crowded at the time of arrival of a train, was singularly empty. Apparently intending passengers which their friends and relations and various hangers-on had been forbidden to enter until we had cleared the platform and, herded together outside, were peering through the railings to see what was happening. Just outside the entrance to the station was a small posse of mounted men with ponies for our four selves. A camel had been brought for my bearer and baggage.

After more greetings from the men with the ponies, the talk, of course, veered to the land, its crops, its methods of irrigation and so on. I was now in a new land and was viewing close at hand that country through which one passed so quickly in the train. The country appeared to be flat and rather featureless up to the Mirpur Hills about twenty miles distant. The fact that the harvest had been garnered and the cotton picked gave a rather desolate appearance. Here and there in the distance one could see a huddle of small mud-brick houses, constituting a small village. Instead of walls and hedges the fields were demarcated by low mud walls, only a foot or two in height. There were occasional well-heads around which women from the small villages were drawing water for the preparation of the evening meal. "Wait until you see the well in my village" said my host. "I have had it properly constructed from real bricks."

As the road to the village had existed for countless years it was lined by short stunted trees which gave a pleasant shade as we passed along. Nearing Dogah the *Jemadar* trotted ahead towards a group of villagers who were standing at the entrance to the village and who were then marshalled into a line. I could now see what was expected of me and turning to Mohd Din I reminded him that I could not speak Punjābi. "It is alright, Sahib, they know it." Dismounting from our ponies he introduced each of this group to me with a few introductory words. Most of them seemed to have been related to him in some way.

We did not have far to go to reach the house, which had been set aside for me as it was the first on entering the village. Mohd Din explained. "The house in which I am now living is in the centre of the village but I shall occupy this house when a new guest house, now under construction is completed. Meanwhile this is my guest house". I was to occupy the new guest house some years later.

My temporary abode appeared to consist of a high brick wall, making a rectangular structure. Only one side, that nearest to us, was pierced by any opening as it had a door with a small window on either side. I now appreciated the fact that I would in truth be occupying a real Punjābi house, albeit one of a high standard. Beside the door was pitched a small tent. "Your bathroom." Peering inside, facing me was a double seated commode, almost a Victorian antique. This was a kindly thought as I

HAPPY MEMORIES

had wondered what the situation would be in this respect. What I did not then realise was that on each occasion that I entered the tent my progress would be watched by small boys seated at the other side of the narrow street.

As I entered the house I looked straight ahead at an open courtyard although on either side were two small rooms. One of these was to be my bedroom. On either side of the courtyard, and at the far end, wide verandahs concealed the entrince to sundry small rooms and store rooms. One of the former was to be my dining room. Hanging from the verandah arches at the far end were wide "chicks" made of split bamboo. These were to hide the *ramana*, when the house was occupied, from any visitors who may be entertained at the entrance. Some steps led up to the roof, "And which is your land?" I enquired. My host waved his arm in a semi-circle, "As far as you can see", he proudly pointed out.



Photo 1. A home for two nights

It might well be asked what was to be done when anchored in the village for several days. We paid visits to neighbouring villages, riding as much as twenty to thirty miles in a day. In each of these we were received with much respect as Mohd Din appeared to be well known throughout the area. On occasion the Deputy Commissioner had visited the area but, as far as could be gathered, no British Officer had ever visited the area in the manner in which I was touring. I hoped that I was a fitting representative. Mohd Din was of the Awan tribe and was proud of the fact and I soon began to understand when he introduced villagers in a rather peculiar manner that they were not of his tribe. One afternoon I was taken out on a *shikar*. After some search a large swarm of birds, not unlike blackbirds, was spotted. I was handed a gun. Not quite clear as to what the procedure should be, I gave a loud shout in order to get the birds to the wing and, rather shamefacedly, brought down two. This was apparently quite contrary to custom. I should have crawled as close as possible, and should have discharged my piece when I had twenty to thirty birds suitably in line!

It was Christmas Day and my host had greeted me accordingly when we met in the morning. That evening I was changing affer a bath when my bearer rushed into my room and started to pull out my suitcase from under the bed. "The Captain Sahib is coming to have dinner with you and has changed into Mess Kit", he explained. I thanked my lucky stars that I had a dinner jacket with me. I just managed to change in time when my host arrived at the door of the house, accompanied by a small crowd

Happy memories 1

of admiring villagers. A very kindly gesture and we ate our Christmas meal together, accompanied by a gramophone which had only two records.

During my visit some snow had fallen on the Mirpur Hills which had fallen as heavy rain on the lower altitude of the plain. Many *nullas* had filled and had become rivers, causing villagers to make wide detours when on their normal business, often the matter of ten to fifteen miles. Great was the rejoicing of two Sappers in my company when, later, I was able to corroborate their reason for being late back from leave.

Again a small mounted posse accompanied me to the station when my last day arrived and astonished passengers watched the Stationmaster at Khārian almost bowing me to my compartment. My host and friends saw me off with many kind words which I tried to reciprocate with the sentiments which I then felt.

I had promised Jemadar Qadir Baksh that I would visit him in his village of Gohora. The difficulty lay in finding the best route to Gohora from Lahore. The village was on the eastern edge of the Salt Range, on the right bank of the river Jhelum at a distance of about a mile and not far from the site of the battle of Chillianwalah of the Sikh Wars. But the train was on the other side of the river and at some distance from the river itself, which was about half a mile wide. I therefore embarked in a "country train" at Lala Musa to travel as far as Malakhwal where both the train and myself would stay as trains were not permitted to cross the bridge over the river at night. One really had to travel in one of these slow country trains, which made long stops at a number of wayside halts, in order to appreciate what a big feature in the lives of the locals was the arrival of the train. It seemed as if the whole of a village would foregather on the platform to chat with passengers and to ascertain if any relatives or friends were travelling. Passengers disembarked from the train and intermingled with the locals; some purchased food and fruit from platform vendors until, at the end of about twenty minutes, a loud whistle would herald the resumed departure of the train when there was a general scurry by the passengers to regain their seats.

The train eventually arrived at Malakhwal at dusk. Fortunately there was a First Class "retiring room"; holding some chairs, a table and a *charpoy* or two; and a door led to a bathroom. Overcome by the arrival of a British Officer the Stationmaster immediately fussed around to see that I was comfortable on his station where again, luckily, there was a refreshment room of sorts. The locals were of the Janjua tribe and rated themselves high in the social scale as they chatted to me while I was awaiting a meal. It was soon apparent that, in the Islam of that part of the world, while all men were equal there were some who were more equal than others!

It seemed that no sooner had I bedded down in the retiring room that I was being roused by the Stationmaster as on this trip I had not brought a bearer. The train would be leaving in half an hour's time. It would take only twenty minutes to arrive at Harānpur on the other bank of the Jhelum river where Jemadar Qādir Baksh was due to meet me. It was the early morning when we arrived at Harānpur where a smiling Qādir Baksh was awaiting my arrival. As it would be a journey of twenty miles or more to his village he had hired a bus. We would travel in this to Pindi Saidpur where we were to change to horses for the remaining seven miles. It was not fitting for a Sahib to arrive in a bus!

While by now I was becoming used to some ceremony on arrival at a village, I was hardly prepared for what was to meet me at Gohora. As we arrived a large number of villagers, who were grouped in front of a building, which in fact was my host's guest house, split into two halves leaving an avenue between ourselves and the building. On a table in the centre of this avenue was a gramophone on a small table. As soon as I had dismounted the gramophone blared forth the National Anthem with all its verses. As the last notes faded away I thought to myself that breakfast would now be the item of the day as it was after ten o'clock and I had had nothing to eat since early evening. But not a bit of it. The crowd relaxed slightly and then one moved to the gramophone when the record was turned over to strike up "God save the Prince of Wales" with all its verses. At last the ceremony was over and I was able to chat to a

number of the villagers while a meal was being put out in the rest house. This building of which my host was extremely proud, was more normal in its lay-out. Behind a wide verandah was a main room with the usual furniture. At the end of this was a bedroom from which a door led to a bathroom. Soon; tea, *chapatties* and eggs appeared and at last I was left to have a sort of "brunch".

Naturally, as I had come to expect, talks with villagers turned on the matter of recruits, and I had to explain that numbers were limited and that all of whom I might approve would have to be subjected to a medical examination in due course. It was often sad to see the looks in the eyes of both the young hopefuls and their fathers when I said that I would not approve of youths, who were clearly not up to standard. "But, Sahib, you will put his name in your book?", they enquired anxiously. I soon gathered that it was a matter of prestige for me to enter a lad's particulars in my book, even if he was not acceptable and I could not help feeling rather cowardly when I entered the names of "rejects" on a separate page, watched by a satisfied parent. My host, however, assured me that this was the only solution.

As I did not have my bearer with me a "stand-in" had been appointed. That evening when he brought my meal he included a flat-sided bottle. As I was travelling in Muslim country I made a point of not having any alcohol with me. But Qādir Baksh knew that Sahibs liked whisky so he had sent a man on a pony on a twenty-mile trek to bring me some. With great pride I was asked to help myself and, of course, a refusal would have been the height of discourtesy. Carefully I poured a small "peg" which I diluted well with a liberal addition of water. Never have I partaken of such firewater and the roof of my mouth seemed to be alight. I had to finish the glass but two days later when I left this village I contrived to leave behind this bottle of virulent hooch.

I had been invited by Honorary Captain and *Subadar Major* Mohd Din to stay with him once again. But to get to Dogah from Gohora was no simple matter. Leaving Gohora on a horse I changed to a country bus a few miles away which would take me to Jhelum, thence another bus would take me to a forest rest house on the outskirts of Khārian, which I had observed on a previous visit.

To travel on one of these buses was quite an exciting affair. On the chassis of a Chevrolet lorry had been constructed a long rectangular body, roofed and with the sides enclosed by some form of expanded metal. Behind the driver was a transverse bench—first class—but inside the body two long benches extended along each side so enabling passengers to face inwards. These benches, designed to take seven or eight passengers usually held at least ten or more. Beside the driver sat his mate, whose job it was to take fares, to crank up the engine when the starter failed, to secure baggage and so on. Most of the baggage was carried on the roof—small bedding rolls, baskets of live chickens, the odd goat or two and various packages of foodstuffs. Inside the passengers squeezed themselves in and I noticed that women, in their *bourkas*, were seated well inside the vehicle. Silently they sat, clad in their pleated shroud-like tents, which they were obliged to wear when out of doors from the age of about ten upwards. It was horrible to think that these women had to live inside these unhygienic tents for the whole of their lives.

The taking of the fares could be quite a noisy matter. Everyone knew the fare, more or less, but that did not exclude haggling with the mate, and all other passengers joined in the argument at the top of their voices.

Jhelum market place, like so many of its kind, was a crowded square in the centre of the city. Around the sides were all manner of small shops, from which much noise of haggling and argument over prices issued. In the middle of this market place were standings for buses and *tongas*, the latter being small pony-drawn traps which were common over the whole of India. But everywhere were flies, small flies, flies of all description, flitting from foodstuffs to horse droppings and worse, from meat to vegetables to one's face. At last I found the bus which was supposed to take me to my destination. It would not necessarily leave at the scheduled time but when it filled up. So there was no opportunity to leave this crowded and rather dirty scene until the billed time of leaving arrived. In due course, much shouting indicated that the time of departure had arrived and with a little inducement I had the whole of the seat behind the driver to myself. He was a chatty sort of chap who could with advantage to me have been a little more informative. He knew exactly where I wished to leave the bus but said no more.

We chugged along the road with occasional stops to disembark passengers, again a matter of much shouted advice by all, and eventually arrived opposite the *Thāna*, or police station, opposite where my bungalow should have been. I now left the bus and started to make for the bungalow. But now there was no Rest House. All that could be seen were ruins of foundations. A local, passing by, told me that it had been demolished by orders of the Deputy Commissioner some months ago. So on a late afternoon in the middle of January I was stranded on the Grand Trunk Road, literally with nowhere to go. Perhaps that is not quite true as I immediately made for the *Thāna*, a Beau-Geste-like small fort with crenelated walls and with two massive-looking iron gates under a small arch. This building held the small police force of about a dozen constables which was responsible for law and order in that area.

I asked to see the *Thānadār*. He was the Inspector in charge of this force. He looked puzzled when I told him of my predicament and most dubious when I asked if he could accomodate me temporarily. Fortunately he knew of Mohd Din but to find me a room for the night was quite a different matter. "Well, Thanadar Sahib," I remarked to his horror, "You will have to put me up in one of your cells." I must say that I had forgotten that there would probably be many tiny creeping inhabitants in addition to myself. At last a look of relief appeared on his face. "Sahib there is a small room above the archway that has not been used for years. I will have that prepared for you", and in no time at all two Constables were raising clouds of dust from this haven. At the same time he summoned a youth to whom I gave a note, instructing him to cover the six or so miles to Dogah without delay. Now the Thanadar, this outrageous problem having been solved, became hospitality itself. Tea, chapatties and boiled eggs were sent to my room together with a hurricane lamp. And we waited. Night fell and clearly there would be no relief until morning. But shortly after daylight sounds of ponies were heard and Mohd Din arrived with the usual company of half a dozen mounted villagers. Apologies all round for not having come on the previous evening but he had only got my message that morning. What had happened to the lad with my note? He had also returned and eventually confessed to staying the night at home instead of obeying instructions. Soon loud wails were heard as the result of a Constable administering chastisement for disobedience of orders. After shaking hands with most of the police force I mounted my pony and was soon away to Dogah.

This time I was accommodated in Mohd Din's new guest house, which was being built at the time of my last visit. My host pointed out with pride the various arrangements making it suitable for Western ideas. This time there were real bathrooms, leading from the three rooms.

This second visit was to be of only two or three days' duration and I particularly asked that we might visit the village of *Subadar Major* Sardar Khān who had recently retired. There was just the slightest hesitation in the reply as my intended host was not an Awān. Nevertheless our arrival was greeted with much delight. Different from other houses Sardar Khān had built his house round two sides of a courtyard, so visitors were able to sit on a verandah, facing the courtyard without entering any part of the house. Sardar Khān was always very go-ahead and had recently installed in his courtyard a small hand pump so that his family did not have to compete with others at the village well. Again there was the usual exchange of memories with, of course, tea and eggs.

On return to Dogah Mohd Din sent his son to chat with me. Poor lad, he did not then know that he was due to lose a leg in the Middle East in a few years' time when serving in a Bombay Field Company.

HAPPY MEMORIES

My next port of call was to the village of Bulani in the Chib country and about fifteen miles distant. Earlier I had been told that the Chibs usually furnished recruits to the cavalry and that the few Sappers in Bulani were the exception.

Although now all were Mussulmäns, the Punjäbis for the most part traced their origin to Hindu tribes which were in occupation of that part of the world before the Muslim invasions. One or two tribes were descendents of the original invaders and considered themselves to be far superior to the descendents of those Hindu tribes who had been converted at the time of the invasion or later. Those, whose origins were Hindu, even in the twentiety century, still retained the social status inherent from their Hindu caste. There were many, of course, who had not been included in the four main Hindu castes and still retained a very low status in life. As an example. A Musselmän Sapper whose caste was barber was promoted on the field of battle for gallantry to the high rank of *Jemadar*, ie an Officer. Nevertheless when there was a village council this, now, *Jemadar* was not allowed to sit with the other Viceroy's Commissioned Officers in chairs at the centre of the council but was magnaminously allowed a chair so that he could sit with the lower caste villagers on the fringe.

Feroz Khān was one of three brothers who lived in Bulāni and the fact that "their" Sahib was coming to stay with them afforded great satisfaction. So; instead of the usual posse of ponies there arrived a bus, hired by them especially for me. It was a winding lane to Bulāni through now very broken country with small hillocks rising to forty or fifty feet high in either side. Without any warning to me the bus suddenly stopped and, while I looked out to see what the obstacle might be, a veritable flame of fireworks sprung up in front of the bus. Amazed at this happening I waited to see "what next?". I had not long to wait. My host came to the rear of the bus and invited me to descend. On the summit of a nearby hillock was gathered a group of very superior-looking villagers, all in their very best clothes. As I got nearer I noticed that all were wearing medals. Hearing that a British Officer was visiting the area they had ridden from as far as fifteen miles to greet me. Feeling rather humble I slowly walked along the line to have a chat with each, (my Punjābi was improving), then with more fireworks we continued our trip to Bulāni.

There was a tremendous welcome at the village from the other two brothers with sundry relatives and, of course, a tour of the village had to be made. Here I learned of an interesting custom, dating back to Hindu days. On the top of a neighbouring hill lived an ancient Hindu saint, who was much venerated by the villagers. Even now, this reverence was maintained as each year the villagers processed to the top of this hill to sacrifice a cock to the memory of this ancient saint.

On the following afternoon I was greatly honoured by the village headman. He had convened a meeting of the village at the bottom of a small mound on which were placed two chairs, while the villagers sat in a semi-circle facing these "thrones". My hosts conducted me to the circle where I was taken over by the headman, who led me to one of the chairs. He then proceeded to discuss with me various topics of interest to all, finishing up with loudly giving his views on Indianisation. We had certainly "gone back" by a century as was evidenced by the arrival of the local postman, or $d\bar{a}k$ runner, who instead of wearing the normal apparel of the Indian postman carried the mail in a bag on one shoulder while the other hand grasped a spear.

Jhelum was only six or seven miles from this village and to reach the cantonment one crossed the long bridge over the river of that name, about half a mile long. As usual I was accompanied by a small troop of villagers while my baggage was carried on a camel. As we arrived at the $d\bar{a}k$ bungalow a party of American tourists regarded our coming with considerable surprise. Unfortunately I was unable to hear their remarks as they were about to leave. I supposed that they regarded the whole proceeding as another sign of British oppression of the natives.

My reason for coming to this haven was, first, to allow the *dhobi* to "have a go" at my clothes. My second reason was that in trips of this nature one wanted now and again to escape and to collect one's thoughts. As I encountered the *khansāmah's* roast mutton (probably goat) and baked custard I wondered how many hard boiled

eggs and how many pints of sweet milky tea I had consumed up to date. I also tried to make out what made the many villagers who I had met, "tick". Theirs seemed to be such uninteresting lives, controlled almost entirely by the harvest, governed in turn by the weather. I remembered the pride with which a retired *Subadar* had announced to me that he had a son at Sandhurst; and the sadness of a retired *Subadar*, who bore a testimonial that his grandfather had helped the British at the time of the Mutiny, when he had been told by the MO that his son was not fit for the Army. Could I not really help to put right this matter in order that four generations would have served the Raj?

Another promise that I had made was that I would visit Naik Talab Din in his village. This was rather more easily said than done as the village of Khandoe was in the Salt Range. So, once again I set out in a "country train" which caused me to arrive at Chakwāl in the evening where there was a reasonably comfortable dāk bungalow. Next morning a similar train took me to Bhaun and a fine District Rest House. As usual there were long halts by the train at small country stations and I would disembark to chat with the locals. Again there were very few topics to discuss; the land and the effect of weather, the heavy interest charged by local money lenders and questions about myself such as whence had I come, where was I going and why. It was sometime before I began to understand the reason for their initial shyness. The only contacts that they had made with British Officers, if any, was when the area was visited by the Deputy Commissioner when they sat on the fringe of large audience while the great man sat on a chair in regal state some distance away. As soon as they realised that I was not he, chatter became more open.

Bhaun was in Ghakhar country. They were a proud race, tracing their history for many generations to the initial invasions by Islam. As soon as I had arrived at the rest house Sapper Mohd Abbās arrived, accompanied by his father and an uncle. Again there was the usual promenade of the village where I was taken into one or two houses, obviously of the "better off". Here to show their opulence they had hung on the walls all sorts of domestic utensils, chiefly of copper. Apparently this was a local custom. During this trip the two old men talked to me of Mohd Abbās' coming marriage. He was to marry a cousin of another uncle, now deceased. By so arranging this marriage certain lands would still remain in the family. Land; always Land.

The next morning Naik Talab Din arrived from his village. He had walked the ten or so miles. "But, Sahib, you will have only to walk for four miles." A bus took us to the little township of Kallar Kahār, which was the centre of local administration having the office of the Tahsildar, one below the Deputy Commissioner. Before setting out I had made up one roll of bedding and clothes, leaving a suitcase at Bhaun. From Kallar Kahār we set out on the four mile walk to Khandoe, followed by a local lad with my belongings. It was broken terrain. Not far to our left the hills suddenly flattened out to make a more gentle slope towards the plain area, some miles to our right. But the many natural deep gullies, many of them leading streams downhill, made the traversing of this broken terrain a slightly arduous walk. In a number of gullies water came cascading down from the hills, which was put to good use by various enterprising farmers, who had installed small water mills at varying distances for grinding their corn.

A small house of mud brick and stone had been put aside for my use. I entered a small courtyard and ducking my head below a rather low lintel was almost blinded by most fearsome tobacco smoke. There were two rooms, one leading to the other and in the outer room, seated on several *charpoys*, were a number of pensioner Sappers, some of whom had been with me in my Company some years earlier. Nearly every one had brought his own *hookah* and had been awaiting my arrival for an hour or so. Hence the smoke. Again the same old stories but accompanied by various fables of what had happened on this or that occasion in days gone by in the Company. They also told stories of local interest. On the way to the village we had encountered quite a deep cleft running down from the hills. Apparently many years earlier the village

had been visited by a *faqir*, who for some reason or another took a dislike to the village and caused this cleft. There was implicit belief in this story.

After they had left I explored my habitation. Here again was the custom of hanging domestic utensils on the walls, chiefly plates and saucers. From behind a plate something moved. Carefully moving the plate to one side I encountered quite the largest spider that it has ever been my displeasure to see. This called for a reconnaissance of the other ninety plates on the wall.

Next day we toured the area on foot. Here they were Awans of the Salt Range and considered themselves socially far above the Awans of the plains. As we returned in the late afternoon there were the sounds of a horn, blown in a village some distance away. "That is the *mullah* telling us that the day's fast is now over," replied my host, whom I next saw as a very worried Subadar Major a month or so after Partition.

Situated on the Southern slopes of the Himalaya Range, Mirpur District was of a very different kind of country to that which I had encountered earlier. There were more trees and as we got higher there were large pines which gave out that fine scent that is only met in these forests. There was no train but this time the bus made few halts and arrangements seemed altogether to be less haphazard. A Sikh Forest Officer was already installed in that Rest House but there was ample room for two. This time my host was Jemadar Khudā Dād who quickly arrived with all sorts of foodstuffs to supplement the Rest House diet. A slight rain in the night caused that briskness in the air, only to be met where there are forests of pine trees. Being the lower slopes of the Himalayas the country was very broken so our progress next morning was of necessity on foot. Here the houses were constructed on the hill sides and all had verandahs facing south, so giving some protection from the blizzards that swept down from the tops of the hills and also affording reasonably protected private sleeping areas in the very hot weather. Again; we chatted to elders and at the village school the master made a long speech in rather mutilated English after which the children, all in their very best, gave three cheers. That evening the local Zaildar and sundry village officials came for a chat and entertained me with rather different topics, such as local blood feuds, tribal customs, trouble with the police and various stories regarding the village past. In fact; quite a pleasant change from subjects in earlier places.

I had always wanted to visit the Haripur district and now was the opportunity. We had a number of men from this hilly region. They were Gujars by caste, a low social grade, but to me they appeared to be far superior to the Gujars of the plains. It would be interesting to find the reason. The train from Rāwal Pindi passed through the village of Taxilā on its way to Haripur. As this area was well known in history on account of the remains of a city, built by Alexander the Great, and Buddhist relies from the time of the Emperor Asoka, it would be well worth a visit, as was born out in conversation with villagers in Haripur a day or so later. And it was interesting to hear Hindu visitors alleging that I was saying my prayers to Buddha when in fact I was carefully centering my camera at ground level.

A very persistent *longa-wallah* ran up to me on the platform at Haripur. "Sahib, you must come in my *longa*." He was another pensioner in this small township where there was a strong *esprit-de-corps* among quite a number of Bombay Sapper pensioners, several of whom came to the *dāk* bungalow, shortly after my arrival to greet me and to tell me of their proposals of my entertainment. About a dozen of them had come into Haripur a day earlier and had hired a house to await my arrival.

As always, a tour of Haripur was essential, one of them pointing out the local lock-up where he had had to spend a month or so for some minor misdemeanour. Every year there was a big $m\bar{e}l\bar{a}$ or fair in Haripur when the Deputy Commissioner presented a cup for the winners of the tug-of-war. Happily they told me that a Bombay Sapper pensioner team had won the cup for the past five years. The real entertainment of the trip was now to come. Three hawks had been borrowed and we now moved on ponies to a suitable piece of country where these birds of prey would be put up against partridges. Unfortunately the *chikor* or hill partridge had not yet

THE ROYAL ENGINEERS JOURNAL

arrived as they put up a real fight against the hawks and, I gathered, formed the source for much gambling on the result.

The hawks were awaiting our arrival at the appointed rendezvous and were sitting quite peacefully on the arms of their temporary owners, who wore no special gauntlets. There was one from each of China, Nepal and India and I was persuaded to allow the Chinese bird to be placed on my arm to test its weight.



Photo 2. Ready for the chase

We now arrived at some broken country, covered with small thorny bushes and scrub. Lurcher-type hounds that accompanied us were put into this small jungle to put up some partridge. Suddenly there was a loud "whirr" as is only made when a partridge is "put up" and a bird ascended rapidly from the scrub. With loud shouts of "Ai, Aiyah" our little group of horsemen galloped after the bird while one of the falconers put up a hawk. In next to no time the unfortunate grey partridge had been grasped by his pursuer's talons and had been brought to ground in the scrub. Here we could hear a screeching noise from the hawk and also the sound of little bells that had been attached to its legs. Again the procedure was repeated until in a rather unsporting fashion we had gathered about twenty partridge.

While we were hunting our partridge my baggage had been moved to the nearby village of Mang where I was to occupy the house of the schoolmaster, who had moved out—bag and baggage—to an adjoining building. On my arrival he made a small speech of welcome as I entered the village. In due time food was cooked in an adjoining house and brought to me over the wall of the courtyard to my house. The principal course was, of course, partridge which had conveniently had its throat cut in conformity with Muslim law. Never did I think it possible that a game bird could be so tough.

Several retired Viceroy's Commissioned Officers and some local headmen came that evening to entertain me with conversation. This took the line of encounters in previous villages until I chanced to say that I had stopped at Taxilia for a few hours. Then there was a loud complaint. Now and again when ploughing their fields local farmers turned up some ancient artefact, pieces of pottery or an occasional metal utensil. Obedient to orders these were handed in to the local Archaeological authorities for a small reward. Bat worse was to follow. Very shortly they were ordered to abandon that plot of land so that intensive search might be made and inadequate compensation was paid. "Bat, Sahib, we want the field for crops and we do not want

Happy memories 2

the money which is quite insufficient." It was grain that they required and in this hilly area space for fields was limited.

Haripur had been the scene of my last visit and as I reviewed in my mind the events of my tour I gazed at a glorious Punjäb sunset from my seat in the slow train that would take me to Multan to join the express to Quetta. The Western sky was full of glorious gold, crimson and violet hues, slowly becoming more dusky with the crimson deepening. Then I spotted something higher up. Again I looked. Yes; it was a small sliver of light in the shape of a crescent. It was the new moon, the moon that heralded the end of the fast of Ramzan. I put my head out of the window. Clearly I was the only person that had spotted its arrival. "Chand aya hai. Chand hai," (The moon has arrived). I bellowed. First a few heads came out to see what the noise was about. Then more and more. Soon, in flagrant disregard of railway warnings, most of the passengers seemed to be with their heads thrust through windows and sounds of happy laughter echoed over the train. We now were approaching the township of Samasatta and as the train came to a halt most of the passengers converged on my carriage to offer their Id congratulations. To see the new moon was fortunate; to be the first to see the moon was even more lucky. To be a British Officer and give news of its arrival was even better. And as I stepped down from my carriage to reciprocate in these congratulations, garlands were slipped over my head, presents of fruit arrived in my carriage and there was general rejoicing on the platform. Shortly a worried stationmaster appeared. Would I get back into my carriage as he wanted to restart the train. A final shake of hands with all on the platform. What a happy ending to such memorable events.

Engineering Geology related to Military Quarrying at Stanley

2LT M S ROSENBAUM RE(V), PhD. ARSM, DIC, C Eng. MIMM, FGS



2Lt Rosenbaum is a geologist in the Engineer Specialist Pool which is administered by CVHQ RE based at Minley Manor. He was commissioned in 1983 and has worked for the Army, Navy and Air Force in Germany, Ascension Island, Gibrathar and the Falklands as well as in the UK. In civilian life he is a lecturer in engineering geology at Imperial College in the University of London.

INTRODUCTION

"The upper quartitic sandstone (of the Lower Carboniferous Port Stanley Beds) is the most conspicuous rock in the Falkland Islands. It is well seen around Port Stanley in the gaunt barren ridges whose presence does much to chill the optimism of the stranger arriving at these inhospitable-looking shores" (Baker, 1924). These sentiments were not doubt echoed by the Task Force as they entered

These sentiments were not doubt echoed by the Task Force as they entered Stanley on 14th June, 1982. However, there was little time to reflect on this wilderness as the extent of the war damage became known. The first priority was to reopen

T M S Rosenbaum RE ARSM DIC C Eng MIMM FGS

the runway at Stanley airfield which had been cratered by bombing. The craters had been temporarily backfilled during the war but now required a more permanent repair with properly graded and durable fill. The second priority was to extend the runway to permit the use of long distance air transporters, and this would require a considerable volume of fill material for pavement foundation construction. Then followed a succession of demands for durable fill including roads, jetties and concrete aggregate to rehabilitate the Islands and to secure their defence. The urgent requirement for the supply of fill became a primary consideration for the Royal Engineers who were tasked with the location and supply of suitable material.

GEOLOGY OF THE STANLEY AREA

A number of geologists have passed through Stanley and described the nature of the local geology. The earliest scientific account was presented by Darwin, who passed this way 150 years ago (Darwin, 1845), and systematic mapping has been carried out in the field by Baker (1924) and from aerial photograph interpretation by Greenway (1972). Consequently the Royal Engineers realised that the most likely suitable rock material for construction purposes would be the highly silica cemented sandstones ("quartzites") of the Port Stanley Beds. They therefore looked for an exposure of suitable looking quartzite nearest to the craters to be infilled and found such a place at the north west side of the runway at Stanley airfield on the Pembroke Peninsula. Here the quartzite formed pinnacles of resistant rock standing up to 5m above the general ground surface. Excavation by blasting commenced immediately and Mary Hill Quarry 1 was born. The subsequent development of Quarries 2 and 3 in the vicinity is described at the end of this paper.

Recent field mapping by Rosenbaum (1983) has shown that all the rocks in the vicinity of Stanley are sedimentary, laid down under water or on land by water or wind. The sequence of rocks here can be summarised as follows, with the youngest beds at the top:

RECENT	Wind blown sand	(sand)
	Beach sand	(sand)
	Alluvium	(silt and sand)
	Peat	(peat)
	Marine clay	(silt and clay)
PLEISTOCENE	Stone-runs	(gravel, cobbles and boulders)
LOWER CARBONIFEROUS	Port Stanley Beds	(highly cemented sandstone: "quart-
		zite")

Engineering Geological Characteristics of the Rocks in the Stanley Area PORT STANLEY BEDS

The Port Stanley Beds comprise all the bedrock outcropping on land within 12km of Stanley. These beds consist predominantly of strong to very strong, very thinly to thinly bedded, pale grey, well sorted, medium to coarse grained, highly silica cemented sandstones with occasional crossbedding and with close to medium spaced fractures. These sandstones are generally referred to as quartzites and this terminology is retained for this paper. However, there is no field evidence to suggest that these rocks have ever been metamorphosed. It has been reported by Baker (1924) that some intercalated shales also occur but surface exposures are very rare and their volume appears to be insignificant.

The quartities are gently folded in an East-West direction with a wavelength of the order of 2 km and superimposed on these are a number of small scale minor folds with wavelengths of the order of 100m. Such small scale folds can be observed on Mt Challenger. Two such folds have also been reported at Mary Hill in Quarries 2 and 3. The folds appear to have steeply dipping limbs and relatively tight hinges giving a general strike of 090° and dips on the limbs of 70° to 85°. Dips in the hinge regions are more gentle but maintain the same strike, indicating that the folds are not plunging. However, all the folds have asymmetric 'Z' shapes with the South dipping limbs less.

steep than those dipping North. This implies that the whole of the Port Stanley Beds in the Stanley Region are lying on the South side of a major upfold (anticline) whose axis lies in the region of Port Salvador. It can therefore be predicted that the Port Stanley Beds in the vicinity of Stanley are underlain by older geological strata at a depth of several hundred metres (the Fox Bay Beds—sandstones and shales—will immediately underlie the Port Stanley Beds) and that to the South in Bluff Cove they will be overlain by younger strata (Lafonian sediments, such as the Lafonian Tillite and the Black Rock Slates).

The folding of the Port Stanley Beds was followed by minor faulting which has caused displacement of the quartzite along discrete zones which are between 0.1 and 2.0m thick. Each zone contains extensively crushed quartzite reduced to sand to fine gravel sized fragments and is bounded by planes bearing the marks of sliding (i.e. scratch marks, slickensides and thin dark coloured sheets of silica produced by recrystallisation arising from frictional heat). In the West face of Quarry 2 at Mary Hill four well developed such faults are exposed striking 070° and dipping 45° to 55° South. They contain slickensides plunging 35°S towards 180° and their degree of fracturing suggests significant displacement has taken place along them. This fault zone has significantly broken up the rock in the vicinity and is probably one of the major causes in the production of fly stone that affected the airfield runway during the blasting of Quarry 2 and Quarry 3 which contain slickensides. These surfaces are striking at 090° parallel to bedding and are probably the result of bedding plane slip (caused by adjacent beds sliding over each other as a fold develops).

Joints are well developed in the Port Stanley Beds and are generally orientated perpendicular to bedding. In Mary Hill three prominent joint sets were apparent with average strike/dip/dip direction orientations of: 090°/50°S, 000°/90°, 090°/50°N.

The Port Stanley Beds have been subjected to weathering which has produced this typical profile:

Depth	Weathering of Quartzite	Description	
Ground level	Highly	Pervasive orange-brown and dark grey staining with frequent white "bleached" zones. Major- ity of rock has been significantly weathered by disintegration of rock cement.	
0.5m	Moderately	Pervasive orange-brown and dark grey staining. Up to 50% of rock is significantly weakened by disintegration of rock cement.	
5.0m	Siightly	Orange-brown staining on many natural fracture surfaces. No significant weakening of rock.	
15.0m	Unweathered	No discoloration or weakening of rock.	

Subsequent erosion has removed most of the highly and moderately weathered quartzite, particularly on hill tops and areas exposed to wave action (including during the recent geological past when sea level was up to 69m higher than its present level).

Weathering usually proceeds uniformly down from the surface, so that the weathered zones are approximately parallel to the ground surface. However, where the beds are steeply inclined, weathering will proceed more rapidly down the less resistant beds thus forming a very irregular weathered profile. Subsequent erosion of the more weathered material will produce a highly irregular ground surface with pinnacles of less weathered (more resistant) quartzite standing proud of the ground. Such pinnacles are common in the Stanley area, eg at Mary Hill. Therefore, more

weathered rock may be expected to occur beneath the ground between the rock pinnacles.

Up to 0.3m of sandy silt similar to highly weathered quartzite is frequently found overlying the rock surface and is probably a residual soil derived from the quartzite by the weathering process.

STONE-RUNS

Conspicuous blankets of cobble and boulder sized blocks of quartzite mantle many of the slopes below the quartzite ridges west of Stanley. These are between 1 and 3m thick and are believed to be the result of solifluction activity (summer thawing of the surface zone of permafrost which existed during cold periods in the geological past, leading to downslope movement of near surface materials). This activity caused the transfer of blocks of quartzite, prized from the ridges by frost action and accumulated as scree downslope, to the valley beneath and thence towards the sea. Transfer of blocks for distances of several kilometres could be achieved by this process over a very large number of years.

The striped appearance of the stone-runs appears to be caused by zones of smaller fragments providing sufficient anchorage for plant colonies to grow. The linear distribution of such small fragments directly reflects the fracture spacing in the source region and the subsequent downhill migration. Whole hillsides are mantled by the stone-runs, but in-the valley bottoms they become constricted by the topography. Where drainage is impeded or finer grained material has accumulated, the vegetation cover is complete and in places a peat blanket has developed on top of the stone-run material.

MARINE CLAY

The rise in sea level referred to above was responsible for depositing a blanket of up to 3m of firm, slightly over-consolidated, fissured, green grey, sandy clay weathering to an orange and grey mottled clay at the top. This clay appears to be thickest in the Pembroke Peninsula (including Mary Hill) but is also present elsewhere in the Stanley area. Natural erosion will have reduced its thickness except where it has been protected within hollows in the pinnacled rock head surface caused by weathering. This clay will soften when exposed to water but retains its cohesiveness and is difficult to remove from rock surfaces by machine. As a result it causes significant contamination on rock used for aggregate and tends to clog machinery if allowed to remain on the rock during processing.

PEAT

Significant accumulations of peat up to 5m thick have developed on poorly drained land, and where the water table is at or above ground level, throughout the Stanley area. It is principally a fibrous moderately decomposed peat with a moderate water content and an apparently low inorganic (ie soil) component. The peat could probably be easily separated from any rock used for aggregate but would nevertheless have a nuisance value and therefore is usually removed from the rock head prior to excavation.

RECENT SAND AND ALLUVIUM

Loose fine sand is found on modern beaches and appears to be derived from reworking by wave action of sand eroded from weathered quartzite. Air-dried fine sand is blown inland for distances of up to 1km in the Pembroke Peninsula where it forms a surface cover of up to 0.3m thickness. Immediately inland from some of the beaches a much thicker accumulation can develop giving rise to wind blown sand dunes up to 15m high. Such a sand dune is being currently excavated for fine aggregate at Yorke Point.

Small alluvial deposits also occur but their volume appears to be insufficient for development as a source for construction materials.

ENGINEERING GEOLOGY RELATED TO QUARRYING

All rock quarries in the Stanley area have to be excavated in the Port Stanley Beds and will have an overburden consisting of up to 3m of peat, clay and sand which will require prior removal. The stability of quarry slopes, particularly at depths greater than 10m, is a major factor in the control of quarrying operations. The greatest risk of major slope failure is along faces into which planar geological features such as faults or bedding planes dip. Large slab failures can then occur. Major slope failures could also occur at the intersection of planar features to produce a wedge shape which can slide into the quarry. Such wedges could be bounded by bedding planes, faults or joints.

Minor slope failures due to sliding or toppling of rock are an occasional nuisance in all the quarries around Stanley, but they do not significantly interrupt the quarrying operations. Minor slope failures in the overburden also occur but are also not troublesome provided the overburden has been stripped from above the quarry beforehand and stockpiled in areas remote from the quarry workings. The minimum width of overburden stripping behind the line of blasting is taken as the distance equal to the height of the face. The time of greatest risk of slope failure is immediately after blasting during or just after a period of large rainfall.

Groundwater flows into the quarry from fractures in the rock and from seepage from the overburden. However, the flow is relatively slow and can be adequately drained by grading the quarry floor at 1:100 away from the face. If ponding should develop, the use of a conventional pump from a collector sump is sufficient to remove the water. Early problems of dewatering were encountered where there was a sunken quarry floor, or a floor dipping down towards the working face, and these are now avoided.

The presence of fractures in the quartzite exerts a close control on the drilling. The drill bit tends to follow fracture planes which are parallel to or within $\pm 10^{\circ}$ of its orientation thus causing a non-linear drillhole, particularly if the fractures are open (eg due to prior blasting or natural erosion). This effect becomes important with deeper holes since comparatively large gaps can be left between holes, and consequently that rock may not receive sufficient blasting energy. A closer spaced drillhole configuration has to be employed if such hole deflection significantly affects rock blasting.

The presence of open fractures orientated within $\pm 10^{\circ}$ of the drillhole can easily lead to jamming of the drill bit. If a high torque is applied at this stage there will be a high risk of drill rod breakage. This is avoided by 'light' drilling through zones of suspected open fractures. The effect of blasting in slightly weathered and unweathered quartzite is mainly to open pre-existing natural fractures and to dislodge the fracture blocks to form a rock pile at the foot of the slope. Blast induced fractures will only develop in the immediate vicinity of each explosive charge. It follows that the size of rock brought down by each blast will be directly determined by the spacing of natural fractures.

The energy from blasting must be confined in order to be effective, so the efficiency of blasting will be greatly reduced by the presence of open fractures or fractures infilled by significant quantities of soft clay or loose sand. Here a large proportion of the blast energy will be lost by absorption due to gas expansion in the fracture zone or by reflection back towards the quarry face (where excessive fly stone could be created). A similar response to blasting is effected by moderately and highly weathered rock and uncemented sediment.

The orange brown staining observed in weathered quartzite is caused by oxidation of pyrites in the quartzite to limonite in the presence of water. Similar oxidation of pyrites may be expected to occur if this material is used as aggregate and left exposed for a period of about 10 to 20 years. It does not significantly affect the strength of the aggregate and merely produces a slight discoloration when used for construction purposes.

MARY HILL

The major quarrying operations in the Stanley area are currently concentrated in the area of Mary Hill, in the Pembroke Peninsula. Here the influence of engineering geology on quarrying can be readily appreciated. The rapid opening of Quarry 1 has already been referred to, and initial methods of working were dictated by military operational requirements. The pressure of demand for rock was so great at that time (mid '82) that interruption of supplies while Quarry 1 was properly developed was unthinkable. It appeared that Mary Hill, to the west of the quarries so far discussed, would be a suitable site for the new quarry but could not be put into full production immediately.

However, Quarry 1 is only a short distance east of the quarry opened by Johnson's a decade ago to provide fill and aggregate for the original construction of the airfield. During that 10 years 3m of flooding over the quarry floor occurred due to the high water table which, together with the dumping of explosives during the war, prevented this quarry from being used initially. Nevertheless the reserves of rock in Quarry 1 were totally inadequate for the demands being made upon it for military construction parposes and so the decision was made to move the quarry to a new location on Mary Hill where greater reserves could be obtained. The old Johnson's quarry was therefore cleared, drained and re-opened to provide an intermediate source of rock supply, and now became known as Quarry 2.

Once a face had been developed at the new site in Mary Hill (thus becoming



Photo 1. West end of north face of Mary Hill Quarry 2 near RAF Stanley, Falkland Islands. The prominent plane dipping out of the face is a fault probably associated with bedding plane slip causing minor displacement in the medium fractured quartities of the Port Stanley Beds. 2m thickness of recent deposits overlay this rock but have been stripped prior to the development of the face. Note the rock fill on the quarry floor designed to provide a dry working surface and permitting drainage of water to a sump from where it can be removed by pumping (the pump is located at the bottom left of the photograph). The Scale is provided by §1. J. Harris of & ZRE.

Mary Hill 1

Quarry 3) rock production could be transferred to it, thus permitting the conversion of the Quarry 2 site into an excellent working area for the crushing and grading plant which had hitherto been operating in a very exposed and muddy site on the south side of the quarries.

The geology of the Mary Hill quarries can now be described and this is illustrated by the photograph which shows the western end of the northern face of Quarry 2. The topography consists of low hills of quartzite up to 1km across rising to 35m above sea level and mantled with an overburden consisting of weathered quartzite and several metres of marine clay, peat and wind blown sand. The rock head is highly irregular due to differential weathering and subsequent erosion of steeply inclined beds of quartzite. The resulting pinnacled topography was flooded during the Recent marine incursion which rose to about 69m above present-day sea level (Adie, 1953). A green grey clay was deposited during this marine phase which mantled the topography. Subsequent erosion has reduced its thickness to less than a metre in places, but in the protection of the hollows between the pinnacles up to 4m of clay is preserved.

The water table in this area is high due to the relatively impermeable ground and the cool, damp climate. Thick deposits of peat have generally developed over the marine clay except at Mary Hill. This could be the result of drying and erosion by the strong onshore winds at this exposed site since the ground in the region is now overlain by about 0.3m of wind blown sand. 1km to the north of Mary Hill the wind blown sand has built up dunes of considerable height and these are currently being exploited as a source of fine grained sand aggregate.

The specification for most rock supplied by the quarry requires less than 5% fines contamination and so the clay, peat and sand overburden must be removed from the rock head before excavation can proceed. The removal is a difficult process which has to be achieved by small dozers or hand tools since the site has a topography too gentle for efficient water sluicing and too restricted (by the rock pinnacles) for the operation of large plant.

Once the overburden has been cleared, the quartzite is excavated by drill and blast techniques from two levels. The highly silica cemented quartz sandstone ("quartzite") comprising this rock makes the material highly abrasive for drilling. Very rapid rates of wear have had to be accepted for the drill bits and indeed this abrasion has caused similar difficulties for the crushing and grading plant.

The quartzite is extensively fractured due mainly to joints. The joints form three distinct sets, one parallel to bedding and the other two perpendicular to it. For the most part in Mary Hill the beds are dipping north at 80°. However, there are also minor folds with a wavelength scale of the order of 100m and two such folds have been excavated at Mary Hill. The folds are characterised by relatively tight hinges and long limbs. This has caused significant strains to develop in the hinge regions which are revealed as bedding plane slips. Extensive slickensided planes parallel to the bedding accompanied by highly crushed quartzite forming zones up to 2m thick have thus developed.

Such zones of naturally crushed rock have influenced both the drilling and the blasting. The drill bits tend to deviate on encountering an open fracture or bedding plane sub parallel to the direction of drilling and this consequently causes the drill to jam or even to fractured if the torque is not released. The presence of the extensively fractured and crushed rock leads to unequal blasting performance and, if this is not allowed for, excessive production of oversize rock and fly stone results.

The intersection of faults associated with the bedding plane slip with a free face in the quarry results in potentially unstable slopes, particularly where the dip is moderate as in the face of Quarry 2 portrayed in the photograph. However, large scale slope failures have not yet occurred since the face height is limited to about 10m by the relatively shallow depth of the present quarry floor. Nevertheless, wedge failures involving 300 tons of rock have occurred on the western faces of both Quarries 2 and 3 due to the intersection of the fault planes with joints.

CONCLUSIONS

The close control on quarrying operations in the Stanley area by the engineering geological properties of the ground has been demonstrated, particularly with regard to the hardness of the bedrock, the overburden characteristics, and the relatively high water table. Nevertheless, the Mary Hill quarries continued in full production under the operation of the Royal Engineers. The change from a Military Works Area back to normal peacetime conditions will require the transfer of work from the military to a civilian works force and the future of Mary Hill will have to be reconsidered in the light of plans for the development of the Stanley area as a whole. *ACKNOWLEDGEMENTS*

The author is grateful for the assistance provided by the Ministry of Defence in support of the fieldwork conducted in the Falkland Islands on behalf of the Commander Royal Engineers, and special thanks are due for the help given by the Officers and NCOs working there in July 1983, in particular those in CRE(Works)FI and 48 Field Squadron.

REFERENCES

- R J Adie, 1953. New evidence of sea-level changes in the Falkland Islands. Falkland Islands Dependencies Survey Scientific Reports, No. 9, 8pp.
- H A Baker, 1924. Final report on geological investigations in the Falkland Islands, 1920–1922. Stanley, Government Printer.
- C R Darwin, 1845. Journal of researches into the natural history and geology of the various countries visited during the voyage of HMS Beagle round the world. 2nd ed., London, John Murray.
- ME Greenway, 1972. The geology of the Falkland Islands. Brit. Ant. Surv. Sci. Rep. No. 76. NERC.
- M S Rosenbaum, 1983. Geologist's Report on Visit to the Falkland Islands with particular reference to quarrying in the Stanley Area. CVHQ RE, 65pp. (unpublished).

* * * * * *

A Full House

Is THIS A RECORD? The facing page photograph records a remarkable event in Corps history which must surely be unique. Gathered outside College Headquarters are Sapper representatives of each rank (except Sergeant and WO1) from Corporal to Major General serving at the Royal Military College of Science, Shrivenham.

They are, from right to left: Major General John Stibbon (Commandant), Brigadier Ted Willmott (Deputy Commandant), Colonel (Retired) Dan Raschen (who teaches Small Arms), Lieutenant Colonel Mike Payne (DS Engineers), Major Ian Hamilton and Captain Andy Pope (both 19 Army Staff Course Division I), Lieutenant Jo Ward (37 Degree Civil Engineer student), Second Lieutenant Lawrence Quinn (39 Degree Civil Engineer student), WO2 Don Kelly (Company Sergeant Major), Staff Sergeant Terry Reeves (Assistant instructor in ammunition) and Corporal Craig Liebenhals who is General Stibbon's house Corporal.

* * * * * *


A Full House

A Post-War Gamble in Mogok

The Late LIEUT COLONEL J J D GROVES MC, MA



The Author had just completed a final Post-War tour year in Burma as CRE 4 Corps Theops RIE consisting of his own four Companies and some 1000 Japanese "JSP's" also under command. The task was included in what was playfully called "The Rehabilitation of North Burma". In simple terms that meant the rebuilding of all the railway bridges demolished by ourselves, our Chindits and the Japanese. There were some 57 of them, including the Myikkyina Bridge some 850ft long in six vast spans. He had completed his final inspection and celebrated with a side trip to Mogok in the Shan Hills.

This article was written some forty years ago and submitted by Lt Col Groves at the end of 1984. It was particularly sad to learn of his death on 16 January, a few weeks before publication of the article.

THE SS Carrhage gathered way, and the docks and foreshore of Rangoon soon passed out of sight when we rounded the first bend of the estuary. Only the glearning golden pinnacle of the Shwe Dagon Pagoda remained in view for perhaps another half hour—until gradually it too was enveloped by the evening haze. That receding picture, as a traveller leaves Burma, must surely have stirred the imagination of all that have beheld it.

I realised then, in August 1946, that I was unlikely ever to see Rangoon again, and that it was a passing milestone in my life. Yes, I can remember distinctly feeling rather melodramatic as I watched that great symbol of Buddhist Burma shine clearly for an instant above the green raintrees, when a last revealing shaft from the setting sun had found it through a gap in the cloud-rack. Not that I was the least bit sorry to be sailing away. Far from it! I had the satisfaction of knowing that my task in Upper Burma had been adequately completed within the estimates of my Chief Engineer; I had taken advantage of every opportunity that came my way to explore the lovely country I worked in; and in my trouser pocket was a little wrinkled piece of tissue paper containing, perhaps, more solid delight for my wife than any of my future reminiscing was likely to give her.

But there was certainly quite a big "perhaps" about it. So I went along to my cabin to reassure myself.

Anyway it gave me a tremendous thrill each time I unscrewed that piece of tissue paper, and now as I tipped the two sapphires on to the white counterpane covering my bunk they winked up at me in brilliant defiance of any suggestion that they might be fakes. Well—there was no means of finding out just then, but I could scarcely have gained more satisfaction from the manner of their purchase, had I dug them out of the clay of Mogok myself.

Normally I had managed to make a complete tour, once a month, of the work upon 35

Lieut Colonel J J D Groves MIC MA

which my units were employed. Myitkyina was admittedly only some 300 odd miles north of my Mandalay Headquarters—as the crow might fly—but it was not quite as easy as that. By road it meant 550 miles of mountain, gorge and plain, once touching the China border on the upper Shweli River—four days at least; by air it was simple—provided always that an aircraft was available, and the pilot was not too fussy about flying conditions; the last alternative was via the Irrawaddy in a rather slow old diesel launch.

Each method had its own fascination. By road there was the great variety of lovely birds to watch out for: minivets, tree-pies, bee-caters, parakeets, giant hornbills and numerous others that kept me continually on the alert. Animals we saw only rarelynever forgetting that glorious meeting with the black panther on the Ledo road west of Mogaung! My Indian driver had crammed on the brakes as soon as the Jeep rounded the corner, and there he was, not forty yards ahead, trotting towards us. As we stopped I switched off the engine, stepped out and stood stock still by the front wheel—my gun in my hands. At the same time the panther had closed to within fifteen paces and lay crouched against the balustrade of a wooden bridge that carried the road over a little *chaung* which lay between us. How beautiful he looked! Deathly still—black as jet—cars flat back—just the tip of one canine gleaming white below his whiskers—wild orange eyes with the blackest pupil—and the last inch of his tail curling ever so slowly to one side. My own immediate and shameful thought had been to give him both barrels (No 6 shot was all I had) straight in his chest. Thank heaven I had thought better of it!

As we waited in frozen anticipation I could hear a troop of apes yelling at us from the trees above—but for a full two minutes neither I nor the panther moved an eyelid. I knew that my camera was in the pocket of the Jeep in front of my seat. Very slowly—I placed the butt of the gun at my feet and gripping the barrels between my knees—stretched out my left hand behind my back and said "Camera".

It was the sudden movement of my driver Moti Ram, which broke the spell. With a quick, sinuous twist the panther had turned and leaped down the bank into the elephant grass—and that was that! So I had simply taken a photograph of that bare wooden bridge before driving on!

The trip by air I always loved for its own sake. For one thing it was so refreshingly cool, but I delighted also in looking down upon the jungle tracks and villages which were unfolded below, and hoped that I might some day have a chance of walking through the elephant country which lies south of that big bend of the Irrawaddy, over which we flew before reaching Bhamo. But air travel, although I admit that it thrills me even now, always gives me a somewhat unsubstantial pleasure. It is simply that it fills me with a sense of complete detachment from the things which normally interest me on the earth's surface. But essentially it is a very pleasant and speedy means to an end—that is all.

I liked the boat trip best—even though the smell of diesel oil did get a bit oppressive. There was always something worth watching through my binoculars. A nesting colony of white egrets; a horde of bloated vultures squabbling over the carcass of a drowned buffalo calf; a family of otters sliding down a sandbank; or a wedge of huge pelicans coming in for their evening "trawl".

The formation flying of these great birds always held me enthralled. It was as though they all had their wing tips connected by invisible wires, and their flapping was governed mechanically by a central control—with predetermined intervals of gliding. "Flap-flap-flap" then glide —; "Flap-flap" glide ——; now one more "Flap" together—it was done in such perfect unison as they approached the river. Then all of a sudden, presumably the squadron-leader pelican would signal: "OK boys—now break it up!" Whereupon these monster amphibians would tumble out of formation in a trice, and each one wheeling and flapping independently, they would zoom in towards the fishing ground from all directions. Clouds of spray would shoot up as they touched down on the river apparently with both great webbed feet held out before them to act as brakes. Indeed their flight ended with a display of such hazardous aeronautics, that Messrs Saunders Roe would have held no brief for them at all.

There were also the giant Irrawaddy porpoises—but dash it, how I digress! These were not porpoises that I had tipped out of the tissue paper on to my bunk, but two sapphires—so I hoped!

I had carefully planned that excursion to Mogok—for which I allowed myself twentyfour hours away from the launch on my last trip down the Irrawaddy from Katha to Mandalay. Also my bank balance was abnormally healthy—because pay and allowances in post-war Burma were high, and we had absolutely nothing to spend them on.

It was about noon when we made fast to the jetty at Thabeikkyin, and I was lucky to find that the only lorry in the village was starting out for Mogok within an hour or so.

I had about fifty Rupees in my pocket, but I had also the sublime optimism of the fortune hunter. Not that I really believed the colourful yarns which filtered through the Messes around Mandalay. How priceless gems had been doled out to the officers of the first units to occupy Mogok after the Japanese retreat; how cigarettes were worth their weight in sapphires; well after all, was it not true that some of the principal stones of our Monarch's crown had come from Mogok? So surely I could find something worthwhile for my fifty Rupees. Indeed, "what a sucker"!

I enjoyed the twenty miles drive from Thabeikkyin nonetheless. The surface of that narrow winding road was surprisingly good and the Burmese driver squeezed every ounce out of the old lorry engine. The first few miles was through some dense primeval type of jungle, and then it gave way to a lighter growth as the road climbed steeply into the Shan Hills. Just as one breasts the final ridge the countryside opens out to reveal high scrub-covered uplands; on the left of the road are a number of small, white and graceful pagodas, and in the little valley beyond lies the village of Mogok itself.

I was to stay at the Government Resthouse by myself, but on the way up the lorry driver had told me that first he wanted to deliver letters to the only Englishman living in the village. I was curious to meet this man, who I imagined must be there in some official capacity.

So when we stopped by his neat looking bungalow, I was delighted to meet its quiet and intellectual occupant and readily accepted his suggestion that I stop for tea while the lorry took my baggage up the hill to the Resthouse.

He was a man of perhaps fifty years of age who had worked in Burma all his life and grown to love it. When the time came for him to retire, just before the war, he had decided to build his own house and settle in Mogok. He had no professional interest in the local trade in precious stones, but he had acquired from his friends among the native dealers a good sound knowledge of their business. In consequence many of the Europeans who came to Mogok in search of its gems often visited him first, in order to find out which of the various merchants they should tackle. Thus it was that this solitary European had achieved an important position of respect in the local community. During the war he had, I believe, slipped away to India to join the Army. Now that it was over he had only recently returned to his old home in the Shan Hills.

Rather apologetically I explained that I wanted to take back a small sapphire for my wife—to mark the end of my service in Burma. He was sympathetic but quite discouraging when I told him of my Rs50! Yes, some astonishing bargains had apparently been made immediately after the liberation—but in most cases it was the purchaser who would have the greatest cause for astonishment. He told me that most of the good, yet small, stones had already been sold. What the dealers had left were small ones of inferior quality, quite a lot of well cut fakes, and a few genuine stones too large to be ordinarily marketable locally.

This was discouraging, but I pressed him further; could he tell me of any dealer who might honestly satisfy my modest requirements?

To this he replied that he could certainly name a few who might do so—but I must remember that they were all likeable rogues, it was no use trying to forecast their honesty—for after all it was an important part of their trade to sell "dud" stones to those who were gullible enough to take them. I would simply have to take my chance!

So off I went to my Resthouse, feeling like the proverbial lamb approaching its doom.

To my surprise I found I was to have a companion there. A most robust and genuine super-American Major, with christian names, Earl Dwight, and a surname that ended with "-katz" or something like that. Anyway he was the most charming and entertaining fellow. Then serving in the US Army's War Graves Commission, he was hot on the trail of a missing US pilot who was known to have been suffering from malaria and beri-beri when last seen being lugged through Mogok by the retreating Japs.

We had an excellent supper together and a highly argumentative and amusing evening if I remember it rightly; but most of all was his sense of humour tickled by the notion of my ever getting my money's worth for the Rs50!

Next morning at about 7 o'clock I was roused by a babel of arguing voices on the front steps. By the time I was shaved they had sorted themselves out into a private bazaar on the verandah. There were about six different gem merchants squatting on their haunches each with a sort of bookmakers clerk chewing betel nut at his elbow. On the lawn in the background was a cluster of hangers-on composed of idle spectators, messenger boys and, for all I know, tick-tack men keeping in touch with the village at the foot of the hill.

Two of the merchants were broad-featured Shan tribesmen; perhaps three others were Burmese, from Rangoon or Mandalay, who had obtained licenses to trade at Mogok; and one was a Madrassi Indian.

Thank heaven for this last man—for he was the only one of the lot who could speak English, so straightway he found himself appointed to the strategic role of interpreter as well! To him I explained briefly what I wanted, and asked the bazaar to exhibit its wares.

The response of all parties was very lukewarm, and the suggestion politely conveyed to me that they had been lured out under false pretences; but gradually little wrapped packages were produced from loin cloths and hidden pouches, and some very dubious looking small stones were fastidiously arranged on the mats in front of each trader.

I was greatly relieved when the American Major made an appearance at that moment. At least I could put up a bluff by discussing with him the merits of these exhibits, as though I were an old hand at the game. I must say he acted the part excellently, or perhaps he really did know something about it. Anyway we rejected the whole lot, and I told the gathering that they would have to produce something better at half the price after breakfast.

An hour later business on the verandah was resumed. The American was busy in his room sorting out clues of the missing pilot, so I started by examining the Madrassi's wares. Then, when I passed on to look at the others, the Madrassi really excelled himself in his zeal as an interpreter. Each stone we examined minutely together, he lending me his magnifying glass—and in confidential tones he exposed to me the limitations of the rival displays! Everything I now know about "fakes" and flaws, natural and unnatural, I learned from that Indian during my next hour on the verandah.

He naturally tried hard to sell me his own exhibits, but I had decided as a first principle that I would buy nothing of his—so I am afraid I used him shamefully. He showed me how "Zircons" had been cunningly cut out of old mepacrin bottles; how Jeep tail lights became the basis of a thriving trade in "Rubies"; here were some natural flaws in an almost worthless but genuine sapphire; and there was a cunningly contrived "natural" flaw in a synthetic "Sapphire"—a kind of double-bluff in fact. It was quite fascinating and I was learning fast—but the one thing plain to me was that any genuine stone that my Rs50 could secure would be either absurdly small or very heavily flawed indeed.

Eventually I determined that I should at least see some really good stones, even if I could not afford to buy them. The whole tempo of the party changed at once. Messengers raced off down the hill, and the tick-tack men leaped into action.

And now my education entered a different phase. The Madrassi was still anxious to establish his comparative integrity, but he had to admit the good quality of some of the gems now produced—only occasionally giving me a warning nudge when I showed undue interest in a man-made masterpiece.

Then quite suddenly I saw the stone I wanted. It was an exquisite sapphire, oval in outline but beautifully cut with a rectangular top face, and deep enough to reflect the most lovely hues of brilliant blue. It weighed just over 4½ carats but had a small pock-mark in one of the unseen faces—a natural flaw.

I asked hopelessly what the Shan trader expected to get for it. When he told me—I simply had to admit I could not even begin to bargain with him. What a dismal culmination this surely was! So I thanked everyone and they politely packed up their exhibits to go. I longed to take that stone away with me, but I had misappreciated the whole business at the outset—so there, apparently, was an end to it.

Then with a final gesture, the Shan drew the Madrassi aside and, but dint of a very complicated palaver, he indicated his willingness to take a cheque. I could scarcely conceal my excitement as I fumbled for my cheque book, but a moment later when I showed him the account was with a Calcutta Bank, he said "India Bank no good!" so we were back at the starting line! *Impasse finale*—Hell!

The American Major then abruptly reappeared on the verandah and casually declared: "Waal, Colonel---if these guys want a cheque on a Rangoon account I've got one and I shall be mighty pleased to come in on the deal to help you". I happily took the plunge! Within five minutes we had exchanged cheques, and the sapphire--wrapped in its wrinkled tissue paper--went into my pocket.

Almost before I had time to thank him, my American friend climbed into his Jeep and resumed his quest for the pilot. I was still overwhelmed by his kindness and trust in me, and that was the last I ever saw of him.

The traders had ambled off down the hill well satisfied—and I still had an hour to wait for the lorry that was to take me back to the Irrawaddy. As I sat on the verandah smoking my pipe and wondering what the deuce had possessed me to take such a reckless gamble, a curious little party began to make its way up the hillside. An old white-haired Indian seated on a litter was carried up the path by two stalwart porters who deposited him literally on the steps, in front of me.

"You will I hope forgive my intrusion, Colonel" said he, "but when I heard earlier that you were interested only in cheap stones, I decided that I would not venture up this hill. For you see-I am an old man stricken with arthritis, and seldom do I leave my bed these days".

He spoke precisely, and in an educated voice—there was a dignified and rare measure of tranquillity in the bearing of this ancient, with his clean white robes.

"Then I am awfully sorry you have been dragged up on a wild-goose-chase now" I replied, "for I am afraid I have just bought the only sapphire I wanted—and that cost far more than I had ever thought of spending."

"Ah! yes," agreed the old man as I helped him on to the verandah, "It is just that I love to see, and to talk about good stones—and I could not help but be interested in your transaction this morning. I realise that I am too late now—but I wish I had known earlier that you were becoming interested in proper gems".

The old fellow intrigued me. He sat in a chair and gently fanned himself. He was in no hurry. I unfolded the tissue paper and tipped my stone on to the tablecloth.

"Thank you". He said it quietly, as though I had responded to his direct request. "It is kind of you to show me this". He then fixed a magnifying glass into his eye with professional ease and steadfastly examined my sapphire.

"You have made a good purchase" said he, "In Calcutta you would have had to pay nearly twice the sum for the same stone. In Paris or London a great deal more". This delighted me—then he added: "But I could have given you rather a better bargain". He made it sound such a casual afterthought.

At once I knew that this was the red herring! This was the aniseed lure—the trap baited by the maestro of salesmen!

I almost laughed as I tossed myself into his clutches—for after all, I had no more money, and my American friend had disappeared. So I was as safe as houses—in spite of myself.

"Show me a better bargain" I challenged.

He unbuttoned a little leather case, and with the utmost precision selected with a pair of tweezers a single sapphire which he laid neatly on the tablecloth beside the other one. My eyes must have popped.

"That would have cost you only a hundred rupees more than the one you bought an hour ago". His voice was kindly and consoling "Just 6.4 carats", he added.

Indeed it was really lovely. I turned it in the light and scrutinized it with his glass. "You can just detect a shade of that true impurity which we in the trade call "The Silk". You can see it in that bottom corner of the main face, only if you hold it so—". And he showed me the faintest variation in the intensity of reflected colour.

"That can never be immitated in a synthetic stone". He paused before continuing. "Of course I could not accept a cheque on your Calcutta Bank either. So as you say—it is now too late anyway".

By this time I was doing sums in my head, completely ensnared, but there was no way that I could conceive of pulling the noose tight around my own neck.

With much hooting of horns my lorry suddenly arrived to save me from this delightful old wolf. As I climbed in next to the driver, I paused, and offered to give him a lift down to the village, and he was duly loaded into the back.

Half way down the hill I stopped to bid farewell to the Englishman who had been so helpful, and given me tea on my arrival. Of course I wanted to show him my purchase—and suddenly it occurred to me, it would by rather fun to get his opinion also upon the old greybeard's stone, if he would let me borrow it.

"But of course" he agreed, when I climbed down from the cab,—and in I went to say goodbye.

First he took my own stone—and eventually said "I think its all right, and if it is, you got it at a reasonable price". The other he examined even more closely then "Yes—this is lovely. Why didn't you get it?".

I explained about the US Army Graves Commission.

"Well if he could do it, so can I" said he, with a glint in his eye.

I plunged again!

I had been at home for nearly a fortnight before a report came from Garrards. They had carried out tests which had satisfied them that the stones were both genuine. But it was only fair to tell me that one of their visiting continental experts had since had a look at them and at once declared "I think the smaller one is alright—though there is a doubt. But the larger—I am convinced is synthetic". What a blow!

But Mr Mann, of Garrards went on to say that he still had faith in their own tests, and he had wagered a bottle of champagne against the continental opinion. Would I consent to an ultimate ruling being given by the Board of Trade examiners?

This, I felt was indeed the final roll of the dice! But I could never be satisfied if I did not take it—to say nothing of my wife's misgivings!

Thank Heaven—Mr Mann won his champagne. But those two little sapphires were to me far more than a gamble that came off. They are still a reminder of a truly delightful tour of duty in Burma—and it is even nicer to have a wife and daughter that like them too.

Ironman or Ironwoman or Just Plain Rusty?

CAPTAIN S M SPRINGMAN MA, M Phil, C Eng, MICE



Sarah Springham was commissioned in 1978 having joined Cambridge University OTC in 1975. After graduation she worked in England, Australia and Fiji for consulting engineers Sir Alexander Gibb and Partners, during which time she became a Chartered Engineer. She was appointed OC RE Wing Cambridge UOTC for the first time in 1980, in between overseas postings. Since 1983 she has been studying for a Ph D in Soil Mechanics (lateral loading on piles due to embankment construction) at Cambridge, returning to her former post as OC RE Wing. She is currently European and British Triathlon Champion (Women).

It was 0655hrs on Saturday 5 October 1984. The scene was Kailua-Kona Hawaii, where 1153 men and women crowded onto the tiny beach adjacent to the pier. Clad merely in swimsuits, the throng of people bowed their orange and yellow capped heads to listen to the morning invocation delivered over the loudspeakers. Was this some kind of religious gathering, preparation for mass baptism by total immersion? Of course not. Nearby on the pier, endless rows of gleaming, expensive bicycles, racked in martial solidarity, indicated that an unusual event was taking place ... It was five minutes before the start of the Bud Light Original Triathlon World Championships.

This race was the first endurance triathlon. It began in 1978 of Oahu, Hawaii as a direct result of a drinking session in the wardroom of a US Navy ship. The argument centred on the male ego—of course! Who was the elite athlete the swimmer, the biker, or the runner? A mad proposition was mooted, why didn't these prospective supermen swim the 2.4 mile Waikiki roughwater swim, then ride the 112 mile round Oahu bike race, and then finish themselves off with the 26.2 mile Honolulu marathon? That should settle the question once and for all. Well, it didn't. It gave birth to the biggest fitness craze since the marathon. In 1978 some fifteen people started and thirteen finished. Later on the venue moved to Kona, Hawaii, to accommodate the ever increasing numbers of insane men and women who longed to become Irommen. Seven years later, the competitors were waiting nervously, wishing that they were anywhere but the start, and some 8000 had applied to be there in the first place! No longer were they swimmers or bikers or runners, they were triathletes.

So, these crazy fools were about to leap into the Pacific Ocean to begin this gruelling 140.6 mile race. Last minute adjustments to goggles heralded the countdown. The finely tuned muscles of the triathletes tensed, and as the cannon boomed out, chaos ensued. Those treading water at the front of the mass struck out towards the billowing orange sails of the marker boat, 1.2 miles distant. For those behind, it was a miracle if they could sight clear water. Even for the well practised lemmings, it

41

Captain S M Springman MA M C Eng MICE



Photo L. Hawaii 1984. Swim 2.4 miles-time 67min

was a most unpleasant experience. Goggles were knocked awry, and bodies were pummelled by errant limbs as the amphibians fought to breathe in their haste to swim. What a melee! The television crews and the bloodthirsty crowds drank in the scene greedily and recorded it on film galore. That churning mass of semi-naked bodies in primordial conflict with the sea was undoubtedly the most dramatic sight of all during that long day.

I watched these opening scenes as if in a daze. My mind and body felt completely remote from the action. Wake up! This swim was fraught with danger for the unobservant. Periodically, evasive action was necessary to avoid legs which were thrashing about perilously close to my nose. Beneath me, I could see the outline of a diver amidst shoals of prettily coloured fish. What a spectacle it must have been for them. At least the sharks and jellyfish seemed to have taken the day off, and the water was a warm 72°F—a pleasant change from the English Channel! By the turarround, the crush had thinned noticeably and it was easier to swim straight. After

Ironman Or Ironwoman Or Just Plain Rusty 1

sixty-seven minutes, I emerged from the sea, well pleased with my time. New records had been set, at 47,48 and 50,31 for both sexes, I was 25th girl, and about 200th overall.

They ran out of the sea, through the showers and grabbed their bags, throwing off bathers and donning cycling gear as they sprinted to their bikes. For over one and a half hours, the transition area was a shambles, and when the last triathlete had cycled away to an appointment with pain in the lavafields, the spectators dispersed thankfully for breakfast to muse over events to date.

Triathlon fortnight had been one of frenetic activity within a sixty mile radius of Kona. Humming with energy, this otherwise sleepy hamlet was bursting at the seams with the triathletes, their hangers-on and the voyeurs who, leechlike, feed on the agony of others. The peace of those reclining in the shade of the palm trees, sipping an exotic cocktail while watching a beautiful Hawaiian sunset, was repeatedly shattered as numerous bikers and runners sped past.

Meanwhile, the drink was much less stimulating out on the road. There were aid stations every five miles, manned by 3000 enthusiastic volunteers and the odd belly dancer! On offer was an un-nutritious mix of defized coke, guava jelly sandwiches and chocolate chip cookies, or the wonderful, all purpose, potassium rich bananas. Scorning the former, I washed down several pounds of fruit with copious draughts of water. What wasn't drunk, was sluiced over head and shoulders.

As I pedalled away, men appeared from nowhere to pass me at high speed. There was still no sign of the other British competitors. I had moved up five places and more importantly, brains and body were still under control. Tentatively, I recalled the borrific introduction to the island and the race, twelve days earlier.

As the aeroplane landed in Kona, the endless vista of tortured black lava rose to meet us through the shimmering haze. The heat and humidity was stultifying. Morale was not improved by the taxi-drivers and the hotel clerks who related, with relish, the horrors of last year's bike ride, which was undoubtedly, the key to the race. I had wondered why the record pace averaged only 22.4mph when the elite field included ex Olympic cyclists, and the course was reputed to be flat.

Further questioning revealed the awful truth. The course was of the undulating,



Photo 2. Hawaii 1984. Bike 112 miles-time 6hr 5min

Ironman Or Ironwoman Or Just Plain Rusty 2

switchback variety, winding through the heat emitting lava. But the phenomenal temperatures and depressing scenery paled into insignificance beside the legendary mumuku. This capricious bogey was not a Hawaiian devil, it was a powerful and unpredictable tradewind. At its worst, it gusted at 55mph from a steady 30 knots. Such were the conditions last year. At times cyclists were blown off their bikes, others dismounted to walk.

Jetlagged, it was a deeply dispirited triathlete who retired to bed that night. Little sleep was forthcoming. The sorry state of my bike was further cause for concern, with derailleur, chainset, and rear forks badly bent. The following day saw a visit to the busiest man in Kona. His job? To restore the numerous terminally ill bikes to a semblance of working order. Having achieved a modicum of success, he made a few recommendations on re-gearing my bike, which I tested out during a practise ride over the whole course the next day.

I had cause to thank him as I gratefully changed down during the Hawi ascent, into the mamukar. That it was a mere 15 knots was offset by the loss of strength ascribed to the swin, and the wilting temperatures of the hottest day this year, in which the tarmac reached an incredible 137F (60°C)! Small wooder that my feet hurt and sunburn reddened exposed skin. But, with the view that all things were sent to TRI us. I pressed on, catching many of those who had shot past me earlier on.

As I approached Kailua, I saw the race leader coming towards me, some 10 miles into the marathon. As a steady stream of runners went past, I counted the girls. The identical Canadian twins were closing fast on the leader. Last year they had finished first and second after a puncture had split them up.

At last, the 112 miles were nearly over. But with one mile left, the bike course produced a nasty sting in its tail, which reduced some triathletes to a walk. It was only a short hill, but it seemed to be almost vertical. Once at the top, it was all downhill to the bike-run changeover.

Those who were really racing went through the transition like an express train, and emerged looking as fresh as a daisy. The rest were trying to persuade their tired, rebellious legs that they really didn't have to run 26 miles, just a series of 1 mile efforts between lifesaving aid stations. It was the "T'll reward you if you're good



Photo 3, Hawaii 1984. Run 26.2 miles-time 4hr 5min

Ironman Or Ironwoman Or Just Plain Rusty 3

syndrome" all over again, only the prize was a cold sponge or three, a slurp of water or coke, a handful of ice and yet another mile to run. But the crowd support was superb for the first eight miles along the sea front. Cries of "you're looking good" when you patently weren't and "go for it" when you wanted to stop, encouraged even the most feeble straggler. Then we left Kailua to climb up to the lavafields and we were on our own again.

Some collapsed with dehydration, many slowed to a walk. One casualty was the leader for most of the race, who eventually finished 5th. The inexorable Dave Scott passed him on his way to his fourth victory in this event in a new record time of 8.54.20, after a 2.53 marathon. The Puntous twins also set new best marks, (10.25.13 and 10.27.28), to finish well in front of the other girls.

Shortly after the turnround, at 17 miles, the first Briton (male) passed me, ultimately beating me to the finish line by 3 minutes. I had realised that I was in 13th place (female), and within striking distance of three girls. With bit firmly between teeth, I speeded up to 9-minute miles! Other British ultra distance and marathon runners gave me much needed encouragement as I passed them coming the other way. But others were not so happy—victims of the ubiquitous enemy, cramp, for most of the day.

With less than a mile to go, I caught the second woman to move into 11th place. The red shorts of the girl in front were a tantalising fifty-five seconds ahead. Alas, I ran out of time. I had run the second half of the marathon some three minutes faster than the first, finishing in 11.22.24, about twenty-two minutes carlier than I had anticipated, and in 141st position overall.

Behind the winner, the remaining triathletes, 903 in all, crossed the finishing line, up to seventeen hours after the start and in various stages of exhilaration, exhaustion and dehydration. Some ran in, strong and proud, some walked, some staggered and a few even crawled. Such was their singleminded determination to complete the race. But, whatever their final placing, they were all winners. No-one could take away from their newly and painfully earned title, and the enormous respect accorded by the crowds to these endurance athletes—after all, they were now *IRONMEN*!

"The Old Yakhdan"

COLONEL G C CLARK OBE

WHEN I retired I, like so many other people before me, bought a cottage. It had been uninhabited for some time and the garden was just a mess, but that suited me well for I had been spending far too much of my time recently in various offices and some good honest toil was badly needed to reduce my waist measurements.

I had never been very interested in gardening before this so, once I started. I had a lot to learn. I had, of course, always known that flowers should be treated with reverence, but vegetables, or at any rate the ordinary types of vegetable, were, I imagined, quite simple things.

Take potatoes, for instance. What could be more honest and simple looking? I knew from my Army days that a certain unpopularity attached to the peeling of them, but they are easy to cook, pleasant to eat and, in my innocence, I was sure they were easy to grow. So, having cut some of the grass and made my surroundings look a little bit tidier, I dug my patch and started off—to learn.

There is no need for me to elaborate on all the tasks I had let myself in for. I can only warn those who are as ignorant as I was that potatoes are not the simple, honest things that they appear to be. However the day came, at last, when hot, tired and with an aching back, I looked on the harvest as it lay beside the rows from which I had lifted it. A final spell of hard-labour while I cleaned them and stacked them away in my shed, and all that remained for me to do was to eat them; or so I thought. With many other things to think about, I forgot the potatoes until, one morning some weeks later, when I was working hard in my garden, leaning on my spade, my "Daily Treasure" broke in on my thoughts with a tactful:— "Could you spare a moment, Sir?". With a horrid sense of foreboding, for my D T is one of those unlucky people who always seem to be discovering things which are best left covered up, I followed her to my garden shed. Not a word did she say until we had arrived at the corner where the potatoes were and then, in an awed voice, she said:— "Would you look at that?". I looked; and I looked again. There was no need to ask what I was required to inspect. From the top and sides of an old *yakhdan* in which I had stored some of the beastly tubers, a tangle of thick, white shoots writhed their way out to the light. So horrible was the sight that all I felt capable of saying was:— "Thank you! I will deal with that tomorrow." And I returned to my spade.

Tomorrow came, and with it came rain. There was no possible excuse which I could think of to avoid that horror in the shed. It just had to be faced. So, pulling the old *yakhdan* out of its corner, I got a box to sit on and, with a bucket on one side to take the horrors, and a box on the other for what was left of the potatoes, I set to work.

Now a yakhdan is a form of light box which was much used in the old days in India for carrying one's kit on shooting trips. It was of a size which, with normal packing, made up a fair coolie load. This particular one, of a type commonly made in Kashmir, consisted of a strong, closely-woven wicker frame over which was stretched a rough hide covering. My revolting potatoes had taken full advantage of this form of construction and the shoots had worked their way in and out of the wickerwork, between it and the leather and out through the many worn places in the covering. It took me a very long time to disentangle that mess, and even when I had at last got the yakhdan empty I was faced with the problem of clearing away the remains of the shoots wedged in the wickerwork. After some minutes of fiddling profanity I decided that the only thing to do was to rip off the leather and work from both sides. The resulting destruction did not matter for the original purpose of the covering, to keep the contents dry, had long since been made ineffective by holes. So I started tearing at that tough old leather and then—I stopped!

On a bit that I had just ripped off my eye had been caught by a scrap of blue label. The ink had faded but on it I could still just read the words "Passenger by S.S.....", and it was the name of that old P & O boat that had brought me to such a sudden halt. It was one in which I had travelled home on leave many years ago. If the old yakhdan had travelled with me then how many other miles had we trekked together? How many different places must we have seen?

Those chafes on his sides could have been started by hard, hair ropes binding him to the funny little wooden saddles that were used on yaks away up among the high hills of Spiti and Chumurti. Could he remember, as I suddenly remembered, the sweet-sour smell of a yak? Could he hear again, as I could, the wailing whistle of a snow-cock calling, in the bitter cold dawn, from high up on the hillside, to welcome the rising sun as it tipped with pink the surrounding ice-blue peaks?

And that jagged tear in his side, which had been so carefully stitched up—that might well have been caused by a sharp rock in Gilgit or Astor, or perhaps by some metal projection from a mule load of a Mountain Gunner Battery being rushed through a column in Waziristan, brushing everyone else to one side as they hastened to take up a new position (and how we used to curse those Gunners for their lack of manners on such occasions!). He must have been with me there and have heard, for the first time, the "tick-tock" of a sniper's fire and, on one thrilling occasion, the staccato "Ha! Ha! Ha!" of tribesmen running in on a camp under cover of darkness.

How many miles had we travelled together?

For there were other camps, easier and more peaceful, that we must have shared. We must have fished in Kashmire and known the pine-scented valley of the Bringhi and the flower-carpeted meadows of the Nowbug. Cold weather camps he would have known, when the duck were flighting and black partridge called from clumps of sugar-cane, challenging intruders to "Fix Bayonets and Fight it Out". He would remember creaking, jolting journeys in a bullock-cart along forest roads, with the dust squirting out in little jets from under the wheels; and the peace of nights spent in a Forest Bungalow with the jungle sounds all round one.

Dust, and grit and bits of withered grass and leaves had collected between the wickerwork and the bottom lining of leather. Could those be remnants of his old travels? Grit from Waziristan; shrivelled buds of the Artemesia which scents the Gurais and Astor valleys; scraps of reed and grass from the Ganges Kadir? Were these his treasured little souvenirs which he had guarded so carefully and carried with him all the way from his far-off homeland?

Well, we have finished our travels, I suppose, and the old yakhdan can rest. There are still some of those beastly potato shoots firmly embedded amongst his bones, but if I let him sit in the sun outside my cottage they will disappear in time. There will be a warm stone wall for him to lean his back against, and he can look across a meadow to a stream. It has got willows on its banks, and trout in its pools, and perhaps he won't feel too home-sick, for the streams in Kashmir have willows and trout too. And beyond the stream he can look up to a hill, not, perhaps, a very big hill compared with many of those which he has known—we would have called it just a bit of rising ground in the old days—but it does lift up to the sky and, as he warms his old bones in the sun, I am sure that, like any other "Hill-man", he will look at it and trace out routes to the top, and will wonder what beautiful green valleys wait for him beyond the sky-line. And, as he drowses away, I expect that he will remember others that we have explored together.

There won't, of course, be any snow-cocks to call to him from the hill as the shadows creep up the slopes, but I don't think that he will mind, for a thrush comes and sings to me in the evening from an apple tree. Could he want any more lovely song at Journey's End?

Monte Piano and the War in the Dolomites: 1915–1917

LIEUT COLONEL J E NOWERS RE, B Sc

In the First World War the Dolomites were the scene of a fierce campaign between Italy and Austria. This campaign is little-known in Britain since we were fully engrossed with the war on the Western Front. Most of the published accounts are in German or Italian. There are only general accounts in English, written from the point of view of Italy, our ally. Many traces of the campaign remain to be seen today, over 2000m above sea level. Monte Piano is particularly interesting because of the variety of military works there.

To reach Monte Piano travel south over the Brenner Pass into Italy. Leave the autobahn 40kms further on at Brixen and go east into the Pustertal. Notice that all place names and street signs are in Italian and German, a sure sign that the area has changed hands several times. The entrance to the Pustertal is guarded by the Franzesfest, a nineteenth century fortification dominating the only road. A short way further, on the south side of the road is a Roman milestone and the ground plan of a Roman way station.

In the valley leading from the Pragserwildsee is a most surprising relic—a concrete anti tank ditch built in the early 1930s by a mistrusting Mussolini against Hitler! Even now the local farmers cut the undergrowth and dig out the ditch each year. 60kms into the Pustertal, turn south at Toblach onto the Dolomite Road through the Höhlensteintal. Having crossed the Dolomite Railway which runs through the Pustertal, on the left are the remains of the spur line to Landro, built



Photo 1. Monte Piano from the North

Monte Piano And The War In The Dolomites 1915-1917

48

by the Austrian Engineers in the First World War. The rails have long since disappeared but the ballast is still there, under the grass, together with some interesting bridges over the side streams running into the Rienz. Halfway to Dürrensee, on the right, is an Austrian military cemetery. The soldiers buried here probably fell on Monte Piano and most graves are named. The bones of the large number of unidentified dead from both sides rest in the Ossuary in Cortina d'Impezzo.

Ahead, looming over the road is Monte Piano. It is an isolated mountain surrounded by deeply-carved valleys. Roughly oval in shape, it has two summit plateaus. The northern is 2301m high and is mostly bare rock. The southern is larger, a little higher, 2322m, and mostly covered with turf. The two summits are joined by a saddle, 2276m high, which falls away to either side to form re-entrants to the west and east between the two summits. The boundary between the Dukedom of Tirol and the Republic of Venice was fixed by a commission in 1753. It ran up the west slope of Monte Piano to the South Summit, then along the western and northern edges of the North Summit and east into the Rienz Valley. The commission thus left Monte Piano mostly in Italian hands.

At the northern end of Dürrensee one can begin the climb to the North Summit following the Pioniersteig, the route built by the Austrian Engineers. During the War it was developed for use by pack animals. Today many of the embankments have fallen away and it is now just a footpath, carried away in places by scree. On the way up, one passes a little cemetery on a small horizontal patch of ground hanging over the Rienz valley. In this area, bones are still appearing today.



Map 2. The immediate area



Photo 2. The Pioniersteig

The Pioniersteig reaches the summit in the area of the old Austrian Headquarters. The Austrians never had more than a battalion deployed on the mountain because of lack' of space. All around are the remains of the wooden barrack buildings—which at the time looked like swallows nests clinging to a wall, dry stone structures and man-made caverns in the rock. Secure accommodation existed for the battalion headquarters and two companies with electric power for lighting, heating and cooking—secure from Italian artillery fire but not from the danger of avalanche in winter. On Sunday 5 March 1916 the Padre was taking an open-air service in this area. A mass of snow fell from the West Face and buried two soldiers. The congregation immediately began searching for the victims. Moments later a massive avalanche of wet snow fell and buried the would-be rescuers. J50 men, and all the accommodation.

Nearby detachments rushed up to help. They succeeded in rescuing a few men with severe injuries. The wet snow was so densely compacted that the individual limbs of the victims had to be dug out with extreme care. Most of the soldiers suffered severe shock. One or two became delinious before they could be evacuated down the mountain. The search went on throughout the whole of the next day. A survivor was found seventeen hours after the accident. The site of the disaster was in full view of the Italians but not a single shot came from them during the rescue work. Among the dead was the Padre and the Senior Doctor.

Electric power was originally brought up the mountain to drive a cable railway. A hand-operated railway was built in 1915 about half-way up the mountain but it could only carry 80kgs and the upward journey took one hour. This was replaced by a heavy duty electrically-powered cable railway which ran from Landro through a middle station to a summit station near the Headquarters. The foundations are still there. The railway was 1450m long and climbed 820m. Two cars could carry half a tonne and the journey time was just twelve minutes.

Although the Austrians had secure accommodation for their troops below the rim of the North Summit, the routes over the plateau to the forward positions lay in

Monte Piano And The War In The Dolomites 1915-1917 2



Photo 3. The Austrian Headquarters at the top of the Pioniersteig

full view of the Italians. Monte Piano is overlooked by Monte Cristallio 3199m, Monte Cristallino 2786m and the Drei Zinnen 3003m, and Italian observers on these peaks directed accurate artillery fire onto the Austrians.

The Austrians decided to construct tunnels to give secure access. On the eastern side of the North Summit, a tunnel 130m long, 2m high and 1.5m wide, equipped with tramway, electric light and telephone system was built in mine months. Today the entrance to this, the Kaiserjäger Tunnel, has been restored but one can only go a short way in. On the western side of the Summit, the plateau was reached by a flight of steps cut into the rock. This was often under fire and so a 27m long tunnel was driven parallel through the shoulder. Today one can climb the steps and pass through the tunnel. The most ambitious project was to drive a tunnel 460m long direct into the forward positions. Although work began at three points simultaneously the tunnel was never completed.

The Italians drove a mine from the suddle under the North Summit with the intention of blowing the Austrians off the mountain. To guard against the Austrians breaking into the mine, bangalore torpedoes with ring main were laid in the galleries with the firing point at the entrance ready for immediate action. On the night of 13 July 1917 an amazing thing happened. A violent thunderstorm raged over Piano and masses of storm water poured into the positions. Suddenly a powerful explosion shook the tunnels. Lightning had struck the ring main and detonated the torpedoes. Today one can still crawl the length of the mine tunnel which was never finished. Its course and that of the Austrian counter-mine are marked on the surface by survey poles.

All over the summit are the remains of trenches, strong points and wire obstacles. One can find pieces of shrapnel and spent bullets. Built into the rocks are memorials to the various units engaged on Piano.

From the South Summit a trafficable road winds down the mountain to Misurina. How did the action on Monte Piano end? On 24 October 1917 the Austrians launched an offensive on the Upper Isonzo Front. It was so successful it threatened to cut off the Italians in the Tirol. On 3 November 1917 at 1700hrs the Italians

Monte Piano And The War In The Dolomites 1915-1917 3

abandoned their positions on Monte Piano to face the new threat on the Isonzo. The Austrians were left in possession.

When the First World War ended in 1918, Italy gained Tirol as far north as the Brenner Pass as part of its peace settlement.

Notes:

Many readers stationed in BAOR will drive South for their summer leave. Many will drive down the autobahn past Munich, over the Brenner into Italy, heading for the Adriatic or the Mediterranean. On the way, they will pass the Dolomites not knowing that many traces of the WWI campaign remain to be seen today.

I have limited this article to a description of Monte Piano. There are many other areas which reward investigation, such as the Drei Zinnen, Plätzwiese, M Cristallo and the Col di Lane, where the whole summit of the mountain was blown off by an Italian mine.

If this story has interested you and you wish to visit the area I recommend you buy a good map such as the *Compass Wanderkarte*, Scale 1:50000, Sheet 57 covers M Piano. If you want a guide book—and can read German—I recommend the series written by Professor Schaumann.

* * * * * *

Memorandum

of the 3rd item of Instructions for Care in the Handling of Explosives.—Dated 2nd July 1776.

This Memorandum, submitted by Major E M W Wagstaff is a translation of the original found in an office in the Copenhagen Military Garrison HQ which is located in Kastellet, an updated version of the Tower of London, in Copenhagen.

Every Person that is employed in or about the Explosive Towers, is enjoined to carry out his Work in such respectful Silence as befits a place where (unless the Hand of Almighty God in His Mercy be over the Undertaking) the smallest Want of Care may lead, not only to the Extinction of Life in all those present, but also to the transformation of this Building in an Instant, and all those Nearby, into an Heap of Rubble; and is therefore Exhorted to observe all possible Care and Discretion in the handling of Explosive Material, to this End acting in every Particular as he has been so Ordered herein and reminder therof. Each and every Person, moreover, whether or not he be Concerned with the Handling of Explosive Material, or the transport thereof, is most Gravely and Severely prohibited from allowing any Oath or Foul Language (whether from Ill-humour at his task, or from Improvidence of Spirit) to pass his Lips, and also from Uttering any Injudicious or Lewd Speech, whereby the Name of the Most High be brought into Profanation and Disgrace.

Any such as is found in Disobedience and Contempt of this Injunction shall Instantly, and without Forbearance of Excuse, be required to relinquish his Task, and be delivered up to the Guard for Detention. until the Day's Work be completed; whereafter he shall be Moved to Prison, so that he may be sentenced by the Court for his Crime.

A Bridge Too Far—and One Gone Further

CAPTAIN A D MACKLIN RE, BA(H)

EXERCISE NORTHERN QUEST is the name given to the summer deployment carried out annually by the Independent Field Troop RE (AMF(L)). As an element of the British contingent to AMF(L) the troop, part of 22 Engineer Regiment, spends three months each winter practising its arctic warfare role in Norway. Exercise Northern Quest is intended not only to provide excellent trade training for the troop during the summer but also to assist the Norwegian Government with minor construction work in response to their help each winter.

A Bridge Too Far—and One Gone Further: these were the names given to two bridges constructed near Voss in Norway by the Independent Field Troop RE (AMF(L)) during Exercise Northern Quest 84.

The troop's project this year offered a concentration of tasks in one area unseen in previous years. Whilst this cased troop administration, it created severe project logistical problems as all three tasks (the two bridges and their access road) were highly interdependent.

Flexibility became the name of the game from day one when it was discovered that the access road to the first bridge was no longer as substantial as it had been during the recce. Priority one task for the "road gang" became the creation of an improved road capable of sustaining a readimix concrete truck from the end of last year's road to the bridge 650 metres away. By working sixteen hours a day (in two shifts) the road gang achieved all but the last 70 metres in two weeks. This was largely due to the use of terram and tensor (which were used so extensively in the Falklands) to enable the road to be built over the peat rather than excavating down to bedrock.

Having reached this far, true engineer ingenuity was called for to cross the remaining 70 metres. The concrete was loaded from the readimix truck into a 400 litre skip mounted in the bucket of a Kubota (a small HMLC hired in UK). In this fashion it was transported across the remaining peat bog to the bridge where the excavator, supporting the skip on a strop, swung the concrete over the bridge formwork and placed the concrete. (Photo 1). By detailed planning and preparation of tools and materials for subsequent aspects of the construction, this delay in the arrival of the concrete caused minimal idleness on the bridge site. As a result, the abutment and wing walls were poured just eleven days after the concrete arrived for the first part of the bases (each of which were constructed in three parts).

The road finally reached the bridge one week before the end of the exercise. (Photo 2). Both were completed just one day prior to being opened by Major General Litleskare (GOC District Command Vestland).

That was a Bridge Too Far, but what of the "One Gone Further"? The troop went on to undertake the construction of another bridge 320 metres of soggy bog beyond the first one. At this stage it should be explained that our second bridge was to be constructed to one side of the existing water course. Once it was completed and the road built to meet it, the flow would be diverted beneath the new bridge by the Norwegians. The troop hence found itself in the curious position of being asked to build a bridge to carry a non-existent road ten metres to one side of the existing river. To add further elements to the challenge, the design was changed a week into the exercise and, from the start, our Norwegian hosts did not believe we would complete it! The troop rose to this challenge and our attached design draughtsman produced drawings that the tradesmen swept off his table and put into immediate effect. Transport of stores proved to be even more of a problem. The only two machines that could reach the site were the Kubota and the Hymac. With a skip capacity of 0.7 cubic metres and a turnround time of between forty minutes and one hour (plus an allowance for bogging-in which happened on average once every other run; the ground really was that



Photo 1. Engineer ingenuity-the last stage from the concrete truck to Prinsabotnelvi bridge

bad) the Kubota often worked twenty-four hours non-stop to transport all materials, less the "I" beams, to site. This called for extensive forward planning, especially as the materials had to be ordered several days in advance from the suppliers.

The concreting involved up to thirty men batching on site using one or two 150/100 litres mixers (the largest that could be transported to site) to produce up to sixteen cubic metres of concrete in one day. (Photo 3). Placing of the concrete by skips was only possible for parts of the task due to the height of the walls. For the remainder the Hymac bucket itself was used as a concrete container.



Photo 2. Road and bridge completed together just in time

A Bridge To Far-and One Gone further

THE ROYAL ENGINEERS JOURNAL



Photo 3. Granakko bridge in its early stages. Mixers at left of photograph produced all the concrete for the bridge

With initiative, ingenuity and plain toil, we confounded all doubters by completing the bridge five days before our return to UK, this in spite of one occision when we had to "down tools" for three days having been told that the money had run out!

There now stands, proud and tail (the deck is 2.3 metres above home bank ground level) in the middle of nowhere with no roads leading up to it, a bridge with a river running ten metres to its ide. (Photo 4). Whilst it may appear that the troops surveyor made a ghastly mistake, this was certainly not the case and the Independent Field Troop returned to England in mid-August having successfully completed its most recent exercise in the spectacular Norwegian countryside.



Photo 4. The completed bridge with the river beyond it! The surveyor may be seen hanging from the third tree, . .

A Bridge To Far-and One Gone further 3,4

An Introduction to Computer Communications—Part I

TRANSMISSION

CAPTAIN A P SOWERBY RE(V), MCIOB



The Author was commissioned in 1976 from the CW(C) roster. His first appointment was for three years as Resources Tp Comd and Diving Officer with 21 Engr Regt in BAOR. He later became Design Tp Comd and Diving Officer, The Queens Gurkha Engineers in Hong Kong. His article "The Penguin Chemical Energy Underwater Demolition Charge" was published in the March 1983 RE Journal. He retired from the Active List in 1983, at his own request, to make a second career in local government, but has retained his links with the Corps as a GE with 526 STRE(Wks)(V).

Thus article is the first of a series of six short articles on a subject which is becoming increasingly important and which, unfortunately, is not as well understood as it should be. This series should certainly help the basic understanding.

BACKGROUND

The last twenty-five years have seen a considerable growth in the use of computer systems, especially on-line systems, and this has brought computing to a wider public. Hectic though the pace of development has been, the change will be even more rapid in future years. Computers will continue to get more powerful, and the ever-widening availability of computing power will take the machines into areas that were difficult to imagine less than a decade ago.

The most obvious developments will be in speed and memory, and the combination of computing power and high speed data communication offers the potential for a revolution in the handling of information. Micro-electronics, telecommunications technology, and digitisation of different information forms hold out the prospect of a cheap, rapid, and almost insatiable communications network. We have seen a beginning with electronic banking and cable television. Just around the corner are electronic mail, on-line credit card sales, electronic funds transfer, electronic news gathering, and so on. For these developments to be successful, the network will need to be inexpensive, reliable, and easy to maintain.

The same can be said of data communications within organisations. British Telecom circuits are still mostly old-fashioned, unreliable, and relatively expensive and slow. Granted, modernisation of the British Telecom network, and the advent of Mercury will radically change this, but not everyone needs or wishes to become a telecommunications engineer. AIM

Many managers already find themselves dependent on computer systems, yet have difficulty in obtaining an adequate understanding of the subject presented in "Plain English", rather than technical jargon. The aim therefore, of this and subsequent papers, is to explain the basic principles of computer communications in a more simplified and comprehensible form.

46

Captain A P Sowerby RE MCIOB

SERIAL TRANSMISSION OF DIGITAL DATA

When data needs to be transmitted from "A" to "B", one of two serial methods is usually employed, depending on the hardware used, and the system architecture. These two methods are known as ASYNCHRONOUS (or START-STOP) and SYNCHRONOUS (or CONTINUOUS). In ASYNCHRONOUS transmission the data characters in a computer are represented as a binary code, each element of which takes the value of "1" or "0". A group of such digits (or BITS) form one character (or BYTE). Serial transmission works by sending these bits as a single stream along a single line or channel, diagrammatically:—

$A \rightarrow 10010110 \rightarrow B$

Serial transmission works by using two possible conditions to represent the two possible states 1 and 0. We call these MARK and SPACE (from telegraph jargon), and they can be likened to the "+" and "-" in electricity, or the "." and "-" of morse code, diagrammatically:—

Time Interval: 1 2 3 4 5 6 7 8

$$A \rightarrow MARK$$

SPACE
1 0 0 1 0 1 10

If the receiving device is tuned to the same time interval as the transmitting device, it will be able to recreate the byte in its original and intended form. We call this tuning process SAMPLING, and we need to ensure that the receiving device starts sampling at the correct point in the sequence, otherwise major errors and the corruption of data occur, thus:—

$A \rightarrow$	\rightarrow B
01101101	11011010
11100101	11001010
00001110	00011101

The above diagram shows sampling out of phase, therefore the data is corrupted. Asynchronous transmission prevents this from occurring by sending an extra mark interval at the end of each byte, and an extra space interval before starting the next byte. Thus, instead of eight time intervals, we now have a sequence of ten. The start of the first interval will now always signal a transition from mark to space; this tells the receiver to start sampling at the second interval. At the ninth interval it resets itself and awaits the next transition from mark to space.

The first and tenth intervals are called START BITS and STOP BITS. Collectively, they are known as FRAMING BITS. The complete sequence is known as a TEN UNIT ENVELOPE or TEN BIT CHARACTER (though this latter is strictly speaking incorrect as only eight of the bits relate to the character). Some hardware configurations use variations of this, eg Model 33 Teletype use two Stop Bits and therefore an eleven unit envelope.

For correct operation, both receiver and transmitter must be tuned to the same time intervals. The transmitting/receiving rate is measured in BITS/SECOND(BPS) and controlled by internal timing devices (sometimes called CLOCKS). Asynchronous transmission however does have one main drawback; it is inefficient to have to communicate 10 or 11 bits to convey 8 data bits, 20%-27% of time is wasted. Synchronous transmission, which is otherwise similar to Asynchronous transmission, eliminates the need for framing bits. Instead of restarting on each byte, the receiving clock runs continuously in time with the transmitting clock, and data is therefore transmitted continuously without a break. If any gaps exist in the data stream, they are filled with what are known as IDLE BITS or PADDING which the receiver is able to recognise as gibberish.

At the beginning of the data stream, the transmitter inserts SYNC BYTES which follow a pre-determined pattern, and which the receiver recognises as the signal that

a data stream is about to follow. Check information is carried along the channel with the data, and diagrammatically can be represented thus:—

$A \rightarrow DATA$ SYNC IDLE DATA SYNC BYTES IDLE BYTES $\rightarrow I$	E BYTES \rightarrow B
---	-------------------------

DATA CODES

Most terminals are designed to use one of two international data codes, either:---

- (a) The American Standard Code for Information Interchange (ASC II—sometimes called USA SC II—or ISO, which is virtually the same) or,
- (b) The Extended Binary Coded Decimal Interchange Code (EBCDIC).

There are others, but you are unlikely to meet them. If you do, you can legitimately plead ignorance without appearing foolish.

TRANSMISSION CHANNELS

These are either SIMPLEX, HALF DUPLEX or FULL DUPLEX.

SIMPLEX Data can only ever be transmitted in one pre-determined direction, that is, always $A \rightarrow B$, never $B \rightarrow A$.

HALF DUPLEX Data can be transmitted in either direction, but not in both directions at once. To change direction involves "turning the line around," in other words "turn around time".

FULL DUPLEX Data can be transmitted in both directions simultaneously.

In practice, most modern devices use full duplex channels, even if the data is transmitted in one direction only at a time. The possibility of turn around time therefore never arises. Future communication networks will make increasing use of satellite systems, and will in fact use full duplex techniques.

CONCLUSIONS

Both synchronous and asynchronous methods are in widespread use. Teletypecompatible equipment tends to be asynchronous, while data-orientated visual display units (VDU's) and remote job-entry batch-terminals (RJB's) tend to be synchronous, though this is not a golden rule! Speed and cost need to be balanced against each other, and these will ultimately influence ones choice.

ADDENDUM NOTES

(1) The opposite of serial transmission is PARALLEL TRANSMISSION, which is analagous to a multi-lane highway. It transmits the various bits that make-up one byte simultaneously, using several channels, diagrammatically:—

A	0	·····	В
	 1		
	 1		
	 0		
	1		
	 0		
	 0		
	1		

For reasons of cost and compatibility, parallel transmission is used much less commonly than serial transmission.

(2) Confusion often arises when discussing the hardware associated with data transmission:-

- (a) Asynchronous terminals are designed for asynchronous transmission, but may be suitable for synchronous transmission.
- (b) Synchronous terminals, while ideal for synchronous transmissions, will suit asynchronous.

Embroidered Cushion for Officers Mess CSME

COMMANDING OFFICER ROYAL MONMOUTHSHIRE ROYAL ENGINEERS (MILITIA)

THE Officers Mess of Canadian School of Military Engineering have recently replaced their dining room chairs with a set of beautifully made maple wood replacements. CO R MON RE (M) was able to conduct user trials on the new chairs and pronounced them strong, durable but a little on the hard side for those with less than generous backsides. The answer was obvious and R MON RE (M) presented an embroidered cushion for the President's chair when their composite troop visited last summer.

The Regimental Badge has been done in petit point and has required over one hundred hours of painstaking labour by Mrs Christine Smales (née Jackson) the willing volanteer for this task.



Embroidered Cushion For Officers Mess CSME

Correspondence

Major-General H E M L Garrett CBE 102 Madrid Road Barnes SW13

MEMOIRS

Sir—The December 1984 Journal included the memoirs of two most distinguished Sapper Generals (WOOLNER and HARRISON). Surely we could do greater justice to these two officers than recording less than a page on one and only fourteen lines on the other.

I suspect that the reason for this brevity was the ripe old age to which both officers lived, and the earlier death of most who knew them well.

There is to my mind a simple remedy, already used (we are told) by *The Times*. It would involve an officer who 'qualifies' for a memoir being asked on retirement to nominate a friend who should be requested to write (with the help of others if he thinks fit) a draft, lodge it with the Journal and update it fifteen or twenty years later on. The draft could then be 'topped and tailed' as necessary on the death of the officer.

The opponents of this suggestion argue that it would cause a great deal of extra work. I fail to see this, and I am anyway convinced that it would improve the system. We are not all fortunate enough to be known by MCAH!—Yours sincerely, HEML Garrett

> Brigadier D H A Swinburn, MA HQ Engineer-in-Chief Old War Office Whitehall London SW1A 2EU

MEMOIRS

Sir-Great minds think alike.

Since the Council has recently agreed to a new system, which should go a long way to meeting Major General Garrett's concern on this matter, the Editor has very kindly given me the opportunity to reply in the same edition.

The Council decided that, although the decision to publish any Memoir rests with the Institution, in principle certain categories of officers should be entitled to a Memoir. One such category includes all officers who reach one-star or above. All 'entitled' officers will be asked at the time that they retire, to complete certain details about their careers and interests and to suggest people who might be prepared to contribute to a Memoir. The information will be kept in a confidential record in the Institution and will only be provided to Memoir writers on the death of the individual concerned.

Whilst this procedure will put some Memoirs on a more formal organised footing it is not the intention to preclude other Memoirs that are submitted for those who might not otherwise be entitled. Any Memoirs received by the Editor will, provided they are appropriate, continue to be published, as now, after the death of any officer retired or serving whatever his rank. Yours—sincerely, D H A Swinburn

(Afternote: Major General Garrett has since pointed out that, welcome though the new system is, his scheme would have the advantage of providing a ready-made draft which might greatly improve the life of the Editor. Many thanks—Ed.)

Major W F Bullock RE Headquarters Engineer Support Jellalabad Barracks, Tidworth Hampshire, SP9 7BQ

EXERCISE WATERLEAP 83

Sir—The article (*Dec 84*) by Capt M P Carter makes interesting reading but invites comment from someone involved in the mounting of overseas engineer exercises. Let us not lose sight of the aim of the Waterleap exercise which is to undertake twelve weeks of project training. The tasks are planned by MWF to provide a balance of plant, combat engineer and artisan training which can be undertaken by the tasked unit working a 7-hour day and 5-day week. They do not plan on a longer working day or week because the squadron must have a reserve to allow for bad weather, slow progress and other problems. Each man is allowed five days' R and R and the plan takes this into account. 59 Sqn appears to have undertaken more training and outside commitments than planned and I wonder if they devoted the full amount of time and effort to the project.

Pre-project training is designed to get tradesmen back up to speed and is vital to the success of any project. Planning constants assume that pre-project training is undertaken. If a unit does not carry out effective training, is it any wonder that they discover that "tradesmen lacked experience and were unfamiliar with certain techniques required"?

I was also surprised to read that the tasks were "too technical". Are we not a technical corps and dare we call ourselves engineers again? Most of the building tasks could be done by competent DIY men and all of the tasks are taught to our tradesmen. The author's final sentence is also controversial. We are a dual-trade corps and 59 Sqn is no exception to this rule even if they also need commando and arctic warfare training.—Yours sincerely, W F Bullock

Brigadier H A T Jarrett-Kerr, CBE Trelawncy 38 Cooper Road Windlesham, Surrey GU20 6EA

'UBIQUE = VERSATILITY'

Sir—I was most interested to read Lieut Colonel Bruce W Reagan's article 'Sir Donald Bailey's Little Gem' (*Dec 84*), because it illustrated admirably the versatility of the Bailey Bridge, which was a basic factor from the inception of our design (I take the liberty of writing 'our', because I was privileged to be the chief designer under Donald Bailey). In my youth the basic modelling construction kit was 'Meccano'; for my granchildren it is 'Lego'—but the principle is the same: the maximum accuracy of factory made equipment components to achieve inter-changeability, and versatile designs. But instead of children playing with kits, it was men who had to carry and handle the equipment under stress of battle.

In the progress of design, two interesting developments occurred. The first, that the initial design was based on a double storey bridge, the possible use as a single storey being a bonus. Thus the first panels were designed with 4in rolled steel channels in one chord, and 3in channels in the other, the upper panels being inverted, so that the 3in chords were bolted together. The panels were still interchangeable, but the single storey bridge had only 3in channels in the top chord, and this was not an economic design. However under test the single storey bridge showed more promise than expected, so we decided to improve the single storey design, by making both chords of 4in channels, even though it made the panel heavier (570lb), and the double storey bridge a less economical design—a compromise that led to much greater versatility.

The other important development was the means of obtaining accuracy in manufacture, so as to achieve complete inter-changeability, particularly of the panels; this was done by extremely accurate assembly jigs, checked by even more accurate gauges, made necessary by the large number of manufacturers involved. Then, as Colonel Reagan points out, many applications were developed, such as the pontoon bridge, suspension bridge, and vertical towers for piers. There was no shortage of Sappers around to make suggestions, and to apply 'Ubique' to the uses of the equipment.

Colonel Reagan's experiences, and also Col Glendinning's ('One Engineer's War', in the same Dec 84 Vol) underline the vast amount of Bailey bridging that had to be produced. When I was on the Engineer-in-Chief's staff at the War Office in 1942, General Sir Charles King realized that unless massive production of Bailey bridging were initiated in the UK, there would simply not be enough material worldwide for the American Forces as well as for the British; therefore he managed to persuade the Treasury to authorize enough bridging production for the whole of the planned advance through Italy, and the subsequent advance through France and Holland of all the Allied Forces. Later the Americans developed their own 'Panel Bridge, Bailey Type', using US standard steel sections; it was intended to be completely inter-changeable with the UK produced Bailey, but it never quite achieved that, due to differing manufacturing tolerances; so it was decided to restrict the US Panel Bridge to the Indian and Far East theatres of war, in order to avoid any possibility of confusion.

Colonel Reagan's mention of the C-47 aircraft as being, like the Bailey, a major equipment factor leading to victory, reminds me that we would dearly have loved to design the bridge in light alloy, to save handling weight, but priority was rightly given to aircraft, and so we had to use high tensile steel, the welding of which was a very recent development.

Finally I fully support Colonel Reagan in paying tribute to my old friend and colleague, Sir Donald Bailey, for the brilliance of his basic concept, which made it possible for Sappers to make 'Ubique' = versatility.—Yours sincerely, H A T Jarrett-Kerr

Capt D W Taylor RE 53 Field Squadron (Construction) Waterbeach Barracks Cambridge CB5 9PA

WHATS IN A NAME?

UNITS THAT REPAIR DAMAGE TO AIRFIELDS

Sir,—Major C E E Sloan has recently suggested in the Journal that Squadrons with an ADR role should revert to the title "Field Squadrons (Airfields)". This would certainly remove the horrid title above, but merely trades one confusing title for another. Moreover, when abbreviated, the plural "s" is incorrectly placed if before the brackets, but looks silly if placed after the brackets. I don't mind what is inside the brackets, but I believe the whole suffix should go.

Field Squadrons (or Companies) have a role in the field of battle as opposed to Fortress, Survey, Training etc units. Currently armoured and amphibious units have anomolous titles which do not indicate their field role. But all these units have crisp titles that identify their role, and also identify them as Sappers. A Field Squadron (Airfields) would appear to be claiming two roles; this is confusing and belittles the dictum that all Sappers are three men in one. Comparisons with other arms might be useful: the RAC have Sabre and Reconnaissance Squadrons, but don't make any distinction in their titles; the RA have crisp self-explanatory titles; the R Sigs and RCT have plain "Squadrons", but tag on all roles in brackets; the Infantry have horrid type A Battalions. No one else appears to have hybrid titles like ours, and I hate to think what the Gunners would make of a Field Battery (Missiles).

In these times of financial stringency it is always worth emphasising an all-teethand-no-tail posture. Hence the obsession with retaining the word "Field" in our titles (even though field engineering long ago became combat engineering). Never-theless, as Major Sloan asks "What *IS* in a name?" Is an Amphibious Engineer Squadron less capable of laying mines by virtue of not having "Field" or "Combat" in its title? Are Air Defence Regiments RA less capable soldiers than Field Gunners purely by virtue of their title? I think not-mental attitudes and professionalism in training matters far more than warlike titles.

The practicalities of life are that the title "Field Squadron (Construction)" is longwinded, unrelated to our role and usually incorrectly rendered. One recent document to hit my desk gave us twenty-three different wrong titles (Const Sqn, Fd Const Sqn, (FD) Sqn, (F) Sqn etc etc). The very word construction is inappropriate when we are strong in E & M tradesmen and POMs, but weak in bricklayers and carpenters.

Many titles have been discussed to replace Field Squadron (Construction)/ (Airfields) and it certainly does ordinary field squadrons no good to be identified as "non-construction" units when they have an excellent capability for minor works in difficult circumstances. What we need is a title that identifies a unit that is 32% plant tradesmen, but whose machines are hundreds of miles away in big plastic bags. It ought also not disguise the fact that for 75% of the year we are employed interchangeably with normal field squadrons, exercising our NCOs and tradesmen in their secondary employment of combat engineering.

The current vogue is for us to become a Field Squadron (ADR). As applied to TA Squadrons this has the advantage of being accurate, but the appalling disadvantage of being incomprehensible; and the term "ADR" does not include our important E & M maintenance function.

An egalitarian solution would be to solve our problem by calling all Sapper subunits "Engineer Squadrons". I fear this would be vetoed by 59 Squadron and others.

The easiest solution would be simply to become "Field Squadrons" but this fails on two grounds: Firstly we are NOT the same as a Field Squadron, although we have a reversionary role. The parallel with units who support the Harrier force does not apply here, as their tasks are mainly "hands on" specialist combat engineering while our tasks use a different balance of tradesmen. Secondly our war role puts us shoulder to shoulder with field squadrons of the RAF Regiment who are actually armoured units equipped with CVR(T).

A functional approach to our peace time establishment produces: A large Plant Troop; a small MT Troop capable of moving either our men or their equipment (our twenty-five cross-country vehicles is 45% fewer than a tracked BAOR squadron—so much for the value of keeping "field" in the title to convince strangers that we have a field role); a combat engineer/GD/B&CE Troop. That composite arrangement would probably be called an Airfield Maintenance Support and Repair Squadron, so I will discount this approach.

Reinstating the (Airfields) identifies us with the RAF, but perhaps rather too much with airfield construction as it was twenty years ago—the role is now much more combat maintenance. Although 50 Squadron were involved in rebuilding RAF Stanley, they were one among many, and it was not a role which they routinely train for; that was the exception that proves the rule.

All good papers end with a positive suggestion, so having exhausted all other solutions I must propose (to follow the example of 28 and 32 Regiments) an Airfield Engineer Regiment, composed of Airfield Engineer Squadrons. Within Squadrons jargon is acceptable so we should have three ADR troops and (in war) an E & M team. This has at least the following advantages;

(a) It sounds good;

(b) The abbreviations are already in "Staff Duties in the Field";

(c) It is jargon-free plain English, except for the troop titles;

(d) It is clear to Army and Civilians alike that we are Engineers, and something to do with the RAF (it's amazing how many soldiers don't associate field squadrons with engineers);

(e) It avoids confusion with Field Squadrons, RAF Regiment;

(f) The Regimental and Squadron titles are sufficiently general to include ADR tasks, maintenance of essential services in a MWA, and combat engineering in support of the RAF;

(g) It identifies that we are not READILY interchangeable with field squadrons which have much more transport, four times our Clansman holding, and many more combat engineer NCOs;

(h) It confirms in soldiers minds our specialist role thus reducing the job disatisfaction in UK while our equipment is in Germany.

It is too much to hope that similar logic will be applied to other field squadrons, but I believe that this change would satisfy Major Sloan without upsetting anyone else unduly.—Yours sincerely, D W Taylor.

Lieutenant T W Wye RE 60 Field Support Squadron RE Waterbeach Barracks Cambridge CB5 9PA

THE SQUADRON SERGEANT MAJOR—A SUITABLE CASE FOR TREATMENT

Sir,—From Staff Sergeant, Military Plant Foreman in Nepal to Squadron Sergeant Major in the Training Regiments was my lot. With this in mind I would like to offer my opinions on the subject covered by Major A D Boyd-Heron in the September issue of the Journal.

With a background that was one hundred per cent "Plant", I considered myself completely unsuitable for the task alloted to me by REMRO. What a difference attendance on a course as described in the article would have made. I would have been more confident, undoubtedly more competent and far less likely to have committed the odd *faux pas*. On concluding my tour I consider that I was infinitely better prepared for an RSM post than I ever was for the SSM tour.

Surely the "Formal" training is being completed at the wrong stage of the Warrant Officer's career. Should not the SSM Course replace the RSM Course? Should it not include all subjects noted in the article and be coupled with the REMRO Warrant Officers' Course? An affirmative answer would improve the lot of the SSM without impairing the standing or quality of the RSM. His *REAL* training is completed during the SSM tour and *EXPERIENCE* is gained in most subjects, Mess business, Discipline, Welfare, Orderly Room procedure etc. The fact that *ALL* RSM's are appointed from the SSM Pool should not be missed. The cry of "over-training" will not stand up. I submit, that not a single subject covered in the article, or included in the programme of the Brighton Course, would be anything but beneficial, if not essential, to a Warrant Officer no matter what appointment he subsequently took up.—Yours sincerely, Tom Wye.

Memoirs

COLONEL R E H HOLDEN

Born 5 June 1913, died 21 June 1984, aged 71

RAYMOND ERNEST HOLDEN began his Army career on 3 June 1936, when he was appointed to a TA commission with 56 Divisional Engineers, at Bethnal Green, in North East London. Those who served with him in those days still remember him as an outstanding athlete.

The outbreak of WW2 found him in France, commanding 2 Section of 218 Army Troops Company RE. During the German breakthrough in May 1940, his Section was heavily involved in the confused fighting around Albert, between Arras and Amiens where, according to Walter Lord in his book, *The Miracle of Durkirk*, "... a party of English Territorials tried to hold up the German advance (of two panzer divisions) with a



barricade of cardboard boxes". In that battle, 2 Section lost half of its strength in killed, wounded or taken prisoner.

After bringing the survivors of his Section back to the UK, he commanded in succession, between November 1940 and November 1943, 752, 185 and 13 Field Companies.

At the end of 1943, he was posted to the Far East and, after a period with the KGV Own Bengal Sappers and Miners, he served with Special Forces, including the celebrated Force 136, until the end of the War. He spent the next eighteen months with Indian Airborne Engineers and was CRE of 2 Indian Airborne Division from May to October 1946. In 1946 he received his regular commission, back-dated to 1939.

He qualified at the Staff College, Quetta, in October 1947 and returned to Europe to take up the appointment of Brigade Major, 31 Lorried Infantry Brigade of 7 Armoured Division, in BAOR. Two years later, he joined 7 Armoured Divisional Engineers (soon to be commanded by Lieut Colonel Gerry Duke) as a Squadron Commander. He subsequently became the Regimential Second in Command, On promotion to Lieut Colonel in 1952, he became GSO1 (Int) at HQ BAOR until 1955, when he took command of 109 Engineer Regiment (TA) at Llandaff, Cardiff. After a tour as CRE Nottingham, he was promoted Colonel and, in July 1959, graduated at the NATO Staff College, then at Paris. From then, until his retirement, from active service, he held a series of senior staff appointments, One of these which gave him and his family particular pleasure was that of GSO1 HQ Scotland—be was the first Sassenach ever to have held the post! In October 1968, after a serious heart attack, he retired from the Army, to become RO1 (Q Ops) in NATO.

Raymond Holden enjoyed life and lived it to the full. He may never have realised how much loyalty and affection he inspired in those who served under him. Many young Regular and National Service officers, especially those who were with him in BAOR thirty-four years ago, will remember with gratitude his valuable guidance, based on his wide experience, his robust encouragement, and the friendship and hospitality offered so generously by him and his wife Jane. He is equally remembered by the older soldiers of the North East London Branch of the Royal Engineers Associ-65

Colonel R E H Holden

MEMOIRS

ation, some of whom served with him in France in 1939 and 1940. He always took a great interest in this Branch, and its members have not forgotten him.

About nine years ago, increasing ill health forced him to retire from his NATO appointment. For someone like Raymond who had always enjoyed a robust constitution, this must have been particularly irksome. He bore it all with great cheerfulness and fortitude, even after he became aware of the seriousness of his condition, which progressively worsened. He died in the Queen Elizabeth Military Hospital, at Woolwich, on 21 June 1984, courageous to the last.

Raymond was twice married. He married his second wife, Jane, in India in 1947 and she survives him. To ber and to his two sons, Michael and Alistair, we extend our deepest sympathy. Their sorrow will be shared by his many friends and by those who had the good fortune to serve with him.

CFC

COLONEL H M WHITCOMBE MBE

Born 15 August 1900, died 2 April 1984, aged 83

HENRY MAURCE WHITCOMRE was a descendant of the Evans family which gave four generations of Art Masters to Eton College. He was commissioned into the Corps in 1919, served in Burma for much of WW2 and retired from the Active List in 1951. He then worked in the War Office finding jobs for retired officers. For this work he was awarded the MBE. In his younger days he was a first class cricketer, (medium fast bowler and truly ambidestrous) playing for Essex in the early twenties and many service teams.

As one would expect he had sketched



and painted since boyhood and in the mid-sixties he began a series of paintings of vanished railway locomotives which are reproduced in his book After Rocket: The Forgonen Years 1830–1870. Working from little-known engineering drawings he brought to life twenty-four important vanished locomotives including Tamerlane. Jenny Lind, Plews, Vulcan and the Extra Large Bioomer. The paintings were exhibited in the Science Museum in 1981. He was co-author of the Army Manual of Map Reading and was a contributor to the RE Journal.

PGRPS-F

Colonel H M Whitcombe MIBE

Book Reviews

PIPELINES—DESIGN CONSTRUCTION AND OPERATION (Published by Longman for The Pipeline Industries Guild 1984. Price £24.00)

MANY publications on pipes and pipelines exist. None, however, has attempted to encompass pipelines of all types used for the conveyance of liquids, slurries and gases. This book seeks to fill the gap by providing a work of reference for all associated with the pipeline industry.

This is not a textbook, and consequently no attempt is made to present all the various formulae in common use relating to fluid flow, pipework thickness design, pipe stresses, anchorages and surge pressures. The reader is, however, referred to standard textbooks, codes of practice and specifications and many are listed in the Bibliography and Appendix. The book is in three parts; Design, Construction, Operation and Maintenance. The design section includes principles, materials, jointing methods, corrosion protection and statutory regulations. The construction section includes contractual procedures.

I found the book well laid out, easy to read and has achieved its aim in providing a ready reference. While it is primarily concerned with UK practice reference is made to overseas practice. It is a useful book to those unfamiliar with pipeline practice and will be a great aid to those in management positions. For RE, it will provide a reference book for those concerned with water, petroleum and sewage installations. LAB

FIELD GUIDE TO THE WAR IN ZULULAND AND THE DEFENCE OF NATAL 1879

J P C LABAND AND P S THOMPSON (Published by Univ of Natal Press. Price £6.75)

This book is an enlarged and revised edition of "A Field Guide to the War in Zululand 1879". The basic purpose of the book remains unchanged. It attempts to show the battlefields and fortifications of the Anglo-Zulu War as they are today, as well as to provide information on the background, course and conduct of the war. It is well illustrated with maps of the battlefields and fortifications. It is analytical in its approach which is very effective though this does reduce the readability for the general reader. For historians of the campaign this book should not be missed.

EEP

BOOK NEWS FROM INSTITUTION OF CIVIL ENGINEERS All books in this section are published by Thomas Telford Ltd and are obtainable from the Marketing and Sales Dept, 1–7 Great George Street, London SWIP 3AA.

THE MEN WHO BUILT RAILWAYS F R Conder. Price: £9.95

This book is a reprint of the 1868 edition then entitled "Personal Recollections of English Engineers". Essentially it is the reminiscences of an engineer engaged in the construction of railways in different parts of England, Ireland and Wales from 1833 to 1856. The author published it anonymously after he moved out of the railway business and this allowed him to say just what he thought of the engineers he was writing about. The portraits are never flattering, but neither are they merely ill-natured or unjust. Here there is no debunking of Robert Stephenson or Brunel whom he admired. The portraits are a clear-sighted view of his seniors by a junior who watched them at work. It will be enjoyed by all with a general historical or engineering interest.

BOOK REVIEWS

ICE CONDITIONS OF CONTRACT FOR GROUND INVESTIGATION

Prepared by ICE. Assn of Consulting Engrs and Federation of Civil Engr Contractors: Price £4.00

THESE Conditions of Contract and forms of tender, agreement and bond are specifically for use in ground investigation contracts and are based, where applicable, on the form and policy of the 5th Edition of the ICE Conditions of Contract. *Limited and special interest only*.

ICE WORKS CONSTRUCTION GUIDES

Ground Stabilisation, Deep Compaction and Grouting, D A Greenwood and G H Thomson: Price £2.75

This guide offers a sensible approach to the economic problems of developing sites with poor ground conditions. It discusses deep compaction and grouting for turning unsuitable soils into useful construction materials, with additional information on techniques, design and the possible hazards of these methods. *Essentially for* graduate engineers.



MORRISON'S ACADEMY

As the school prepares to celebrate its 125th birthday it continues to provide education for boys and girls from Primary 1 - Secondary 6. Of its 850 pupils 200 are in the Primary and 300 are Boarders (from Primary 4).

The school prepares secondary pupils primarily for the Scottish Higher Grade examination though the post-higher work includes CSYS, A level, Associated Board work in Music, Portfolio preparation in Art, while RSA examinations in typing are taken at different stages. Results in all external examinations have been highly commendable.

Situated in a most attractive Perthshire location and with extensive playing fields, the school offers a wide range of co-curricular activities to both Primary and Secondary pupils.

Application forms and further information may be obtained from the

Rector Morrison's Academy Crieff PH7 3AN






Make more of your money...

open a Naafi budget account



ASK AT YOUR LOCAL NAAFI SHOP





Do a little homework before you go`home'



Townsend Thoresen gives discounts for passengers on every trip and reductions for cars, motorised caravans and motor cycles on most sailings.

WHO HAS THE BEST ROUTES FOR YOU Townsend Thoresen has the right routes and plenty of sailings. Choose easy access from Germany via Zeebrugge to Felixstowe or Dover. Or go for speed via Calais – Dover. WHO HAS THE BEST SHORT BREAK BARGAINS Check out the great savings to be made on our 60 hour and 5 Day Mini-Tours.



Townsend Thoresen Forces Fares and 1985 Timetables are available now. Ask your Travel Agent or Townsend Thoresen, Graf-Adolf-Strasse 41, 4000 Dusseldori 1.



WHICH IS THE FASTEST FERRY HOME It takes just 75 minutes on

the record-breaking Blue Riband fleet between Calais and Dover.

TOWNSEND THORESEN