THE ROYAL ENGINEERS JOURNAL

AUGUST 1992 VOL 106 No 2

Guidelines for Authors

The Editor is always glad to consider articles for publication in the *Journal*. Guidelines for prospective authors are:

Subject. Articles should have some military engineering connection but this can be fairly tenuous, specially if an article is well written and interesting.

Length. Normally approximately 4500 words (five A4 pages single line text plus illustrations. Blockbusters can sometimes be serialised.

Clearance. The author must clear his article with his commanding officer where applicable.

Copy. Ideally text should be double space typed and include the author's pen picture, photo and captions for artwork.

Computers. Articles typed as straight text only, no indents or tabulation, using text wrap ie do not use enter/return key at end of each line and **saved to disc as an ASCII file** (check your word processing package manual for details on how to do this) with the file extension .TXT **are most welcome.** File on an IBM compatible 3.50 disc. Mrs Juliet Scanlan would be pleased to assist with queries – ring Chatham Mil 2299 or (0634) 842669.

Photographs should be black and white. Coloured photographs rarely reproduce well unless they are excellent quality with sharp definition. Slides are not acceptable at present.

Line Drawings, if possible should be drawn in proportion with the page size (145mm x 205mm).

Rewards can be generous. The Publications Committee has about £250 in prize money to allot for each issue plus valuable annual prizes. All authors receive £5 to help cover costs.

Pseudonyms may be used. They will not be revealed by the Editor under any circumstances.

Contributions should reach the Editor by:

6 October for the December 1992 issue
Early February for the April 1993 issue
Early June for the August 1993 issue

Submissions before the deadline will be particularly welcome.

All correspondence in connection with editorial matters should be addressed to the Secretary of the Institution of Royal Engineers, Ravelin Building, Brompton Barracks, Chatham, Kent, ME4 4UG

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Introduction

Until 1990 it was the custom for the Engineer in Chief to address the Annual General Meeting of the Corps. This forum had great advantage for those who could attend. However the number of serving officers able to do so was very small. The address was summarised in the *Journal*, several months later but, of course, less the audio visual component.

In 1991 two topics, the Gulf War and the reorganisation of the Army, were of such dramatic importance to the Corps that my predecessor briefed a distinguished gathering of senior serving and retired officers on 23 May. A report based on this briefing appeared in the August 1991 edition of the *Journal*. Now I believe the balance of advantage has finally swung in favour of a presentation prepared primarily for publication.

This gives me the opportunity of using some of the photographs which formations and units have kindly submitted specifically for this purpose and for which I am most grateful.

As a result of this decision I have adopted a different sequence of sections:

- Operations and Deployments
- Projects and Exercises
- Reorganisation
- Headquarters Doctrine and Training and Subjects Concerning Individual Training
- Equipment Matters
- Military Secretary
- Corps Affairs
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Operations and Deployments

Many may have thought that since Operation *Granby* the Corps has had a pause for breath. Nothing could be further from the truth. Whilst the localised intensity of effort has reduced, the variety and nature of deployments and operations have never been more diverse.

The Emergency Tour Plot continues to support Belize, the Falkland Islands and Northern Ireland. A squadron group of about 130 all ranks is committed to Belize, deploying for six months at a time. They supply the full range of combat engineer support to the roulement battlegroup, the Belize Defence Force and the RAF. The Falkland Islands' Field Squadron has been slightly reduced in size to about 200 all ranks, deploying for four-month tours. Repair of aircraft operating surfaces and maintenance of essential services at RAF Mount Pleasant, remain the primary roles, although last year saw the completion of the garrison swimming pool, a magnificent achievement. 51 Field Squadron started this project followed by 9 Parachute Squadron then 8 and 3 Field Squadrons. All were reinforced for the task. The Squadron continues to supply a small detachment of tradesmen for operations in South Georgia. Roulement to Northern Ireland still consists of two separate elements; a high risk search troop, and a small squadron in the construction role. Both deploy for a six-month period. The arrangements for support to Northern Ireland are due to change with 25 Engineer Regiment starting its move to become the resident regiment in August this year. In the longer term the need for routine roulement support will cease except for some residual search support.

Support activities to other overseas garrisons have continued as usual. Cyprus has been assisted by troops from 33 and 39 Engineer Regiments in the routine refurbishment of the United Nations (UN) patrol track. However the major operation on the Island, Operation *Bird Bath*, has been the setting up and running of a reverse osmosis farm to supplement the water supply for the Western Sovereign Base Area. Six reverse osmosis plants were installed by early July 1991 and produced over 39,000 cubic metres of drinking water from the sea before being put into light preservation in April 1992. The operation might have to be reactivated this autumn.

In Hong Kong the Queen's Gurkha Engineers have been kept busy in routine support of the garrison, with one major exception, a troop deployment to Western Samoa.

In Gibraltar a medium girder bridge (MGB) was deployed to overbridge a damaged section of road.

Assistance has been given to two of the more exotic parts of the Commonwealth. The Jamaican Defence Force are expanding their engineers to regimental size and the Force requested expert advice. A two-man team from HQ EinC spent two weeks advising on training, establishment and equipment tables. This has been followed up by a training team from 11 Engineer Group who spent three months running a basic combat engineer course.

An affiliation between 36 Engineer Regiment and the new Jamaican Engineer Regiment is in the offing which should lead to an attractive exchange programme.

The Turks and Caicos Islands also requested help with a project to build a series of causeways between the Islands. We have carried out an initial reconnaissance but, as so often with these projects, funding is a major issue.

Members of 32 Field Squadron visit South Georgia during their Falkland Island Tour.

Much of our work for the Civil Ministries cannot be discussed here, but I can illustrate our activities with two examples, Western Samoa and Angola, both mounted at the request of the Foreign and Commonwealth Office (FCO). In the first of these locations, no sooner had calm returned after a hurricane resulting in Operation *Patricia* last year, than a cyclone devastated the Islands again, leading to Operation *Furtherance*. At great speed the Queen's Gurkha Engineers deployed an enhanced troop and carried out a wide variety of tasks for the best part of two months. Support to Angola has centred on mine clearance advice. To date we have deployed three teams; firstly a small one from the Royal School of Military Engineering (RSME) to advise on what was required, then two teams of instructors (both from the Field Army) to train members of the former warring factions in mine clearance techniques.

Explosive Ordnance Disposal (EOD) often makes the headlines. This year has been no exception with Operation *Crabstick*. This task dealt with World War Two pipemines left buried under airfields when there was a threat of invasion. During 1991 sites in Shetland, Sussex and Dorset were cleared. Four outstanding sites remain. Routinely the Regiment was called out to deal with wartime Unexploded Ordnance (UXO) on many occasions. Often the suspected UXO ended up being discredited, but only after all the hard work had been done. Incidents at Guy's Hospital took three days of shafting and de-watering and another at Waterloo Station took 17 days of shafting before both were discredited. The Regiment was also involved in over 20 specialist search operations nationwide.

Support to the UN has continued unabated. Lieutenant Colonel Mike Warren is currently commanding a Mine Clearance Training Unit in Cambodia. His unit has a multinational headquarters, with a Russian second-in-command and training teams from eight different countries, including one from the Corps. The operation is likely

A water supply point in the tent city at Zakko — Op *Haven*.

to continue throughout this year and well into next.

The British support for operations in Yugoslavia with 24 Field Ambulance has been well publicised. However it will be less well known that for much of the planning time an engineer regimental deployment was likely to be the major contribution. However political priorities changed and a regiment did not deploy. The Corps is however represented by a troop from 3 Field Squadron in support of the Field Ambulance.

Finally in this section, there are two other deployments worthy of mention. The first was Operation *Haven* which was a deployment of troops to Northern Iraq. This was coordinated by the US, with UN agreement but not sponsorship, partly funded by the Overseas Development Agency and the FCO, run by an RAF based JHQ with the main deployed force based on 3 Commando Brigade! 59 Commando Squadron, with a team from the Military Works Force and 33 Engineer Regiment did much good work and earned the Corps considerable praise. The second was Operation *Pinseeker* which saw 21 Engineer Squadron (EOD) deployed to Kuwait to assist Royal Ordnance in battle area clearance. They spent six months deployed in fairly trying conditions earning great praise particularly from our US partners.

The world remains in a very unstable state. I believe that there will be no decrease in the number of requests for engineer advice and assistance. The UN is growing in confidence and is likely to become more involved. This will undoubtedly lead to more requests for help. Our reputation as always is extremely high. Our professionalism is very widely recognised and will be called upon again and again.

Projects and Exercises

Exercise *Waterleap* has now become a traditional annual event, carried out by a succession of six field squadrons in Canada. In 1991, 24 Field Squadron carried out works at the Military Training Centre at Aldershot, Nova Scotia. As usual the Military Works Force made a significant contribution. Exercise *Oakapple* replaced Exercise *Larchpole* as the annual exercise in Kenya, but now carries out work for the Aberdare National Park rather than the Kenyan Armed Forces. In 1991, 48 Field Squadron (Construction) constructed tracks, bridges, accommodation and ablution blocks. The Karuru walkway and viewing platform built during this period provides spectacular views across the Karuru Falls.

The aim of Exercise *Northern Quest* in Norway is to provide a balance between plant, artisan, and combat engineering training. This year the Independent Field Troop Allied Command in Europe Mobile Force (Land) (AMF(L)) deployed for seven weeks. Their tasks included a 66 metre timber range building, two defensive positions, and a kilometre of track.

In the Far East the Queen's Gurkha Engineers took part in four major and many more minor projects as well as Operation *Furtherance* mentioned earlier. The tasks included building and roadworks in Brunei (68 Gurkha Field Squadron): maintenance and repair of the Castle Peak Range Road (67 Gurkha Field Squadron) and a concrete slipway to the Wong Sek Pier (68 Gurkha Field Squadron).

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Decompression exercise trials tank — blacked out mask simulates nil visibility.

An echo from the past was heard by a troop from 68 Squadron who removed an ancient Tang dynasty kiln from the island of Chep Lap Kok to another site on the island of Lan Tau to prevent damage during the preparations for building the new Hong Kong Airport.

Two exercises intended to provide training for a possible military takeover of public utilities in an emergency have been mounted by the Military Works Force. Exercise *Jersey Lilley*, involved major maintenance and repair of machinery operated by the local electricity company. Exercise *Power Drive* deployed a public utilities team to Gibraltar.

This list is far from exhaustive. Among many other projects deserving more attention are the Sennelager Range Development and work for the Dümmersee Yacht Club (funded by the Club). Additionally, significant works carried out in Northern Ireland unfortunately cannot be described here because of their security classification.

Reorganisation

Since my predecessor's last report on *Options* matters, the new organisations for the Regular and TA Field Army components of the Corps have been widely publicised. Both Regular and TA units will be facing considerable challenges in preparing for the demanding and exciting roles that lie ahead. The Corps has come out of a gruelling period of staff work in better shape than might have been forecast during some of the darker days last year. The fundamental problem remains manpower restraint, so unit establishments will still be taut, and meeting our undiminished peacetime commitments will stretch resources. However I believe that we have managed to gain useful benefits from this comprehensive reorganisation. The close support concept is now firmly embodied in our regimental organisations, headquarters squadrons have been reinstated, and we have retained as much as possible of our key equipment making best use of manpower.

The cornerstone of the new organisation is our national contribution to the NATO Allied

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Bridge demolition exercise.

Command Europe Rapid Reaction Corps (ARRC). The British elements of the ARRC will consist of a large proportion of the 1st (British) Corps Headquarters, a Germany based division (1 (UK) Armoured Division), a UK based division (3 (UK) Division), and 24 Airmobile Brigade which joins a multi-national airmobile division.

Engineer support for 1 (UK) Armoured Division in war will come from 21, 32 and 35 Engineer Regiments, each having one armoured and one mechanised field squadron. For practical reasons the peacetime grouping of squadrons is dictated by quartering constraints. General engineer support for the Division will come from 28 Engineer Regiment, which will include two field squadrons, an amphibious engineer squadron and a field support squadron. Engineer support in depth is to be provided by 65 Field Park Squadron, which will be reinforced by elements of the Military Works Force from Chilwell and also by 71 Engineer Regiment (V) from Scotland. 33 Engineer Regiment (EOD) will provide an EOD squadron for each of the divisions, while the RHQ is to be considered as a Corps level asset.

3 (UK) Division, which is to be double-earmarked as the UK Strategic Reserve Division, is to be based at Bulford. Close engineer support for its two mechanised brigades will be provided by 22 and 38 Engineer Regiments, with a mix of armoured and field troops. 9 Parachute Squadron will continue to support 5 Airborne Brigade. General engineer support will come from 36 Engineer Regiment, with 20 Field Squadron, a Gurkha field squadron and 61 Field Support Squadron. On mobilisation these will be joined by 127 Field Squadron, which is to be formed by reroling a Royal Artillery TA Battery, and the newly raised 227 Amphibious Engineer Squadron. In peace these new TA squadrons will be commanded by the new RHQ 78 Engineer Regiment. 3 (UK) Division's depth engineer support is to be provided by 15 Field Park Squadron reinforced by Regular and TA Specialist Teams Royal Engineers, and the Royal Monmouthshire Royal Engineers (Militia).

24 Airmobile Brigade will continue to be supported by 51 Field Squadron, and 3 Commando Brigade will continue to be supported by 59 and 131 Independent Commando Squadrons as now.

Support for the Royal Air Force will involve a sizeable proportion of our resources. 12 Engineer Brigade will take under command a

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Bridge building exercise.

total of four regiments assigned to this role. This will include 39 Engineer Regiment and 73 Engineer Regiment, both providing engineer support for RAF units, including Harriers, deployed in northwest Europe and overseas. The eight TA Airfield Damage Repair squadrons on UK airfields will regroup into 76 and 77 Engineer Regiments. In order to reduce the reliance upon roulement units for engineer support to Northern Ireland, a small resident engineer regiment will be established in the Province. This will be formed progressively as space becomes available from elements of 25 Engineer Regiment, including 12 and 43 Squadrons. 33 Independent Field Squadron and 325 Engineer Park will merge into the new organisation. The Regiment's war role will be Home Defence on the UK mainland. The roles of 29 and 30 Engineer Brigade on the Continent have disappeared under the new concept of operations and sadly the Headquarters of 29 Engineer Brigade will disband, although its regiments have been re-allocated to new tasks. Headquarters 30 Engineer Brigade is to command 72, 75 and the new 78 Engineer Regiments plus 101 (London) Engineer Regiment (EOD), with the primary task of supporting UK and regional Home Defence forces. However, in order to provide greater flexibility of employment these units will be equipped and trained for general engineer support so that they could be reassigned to NATO if the need arose. Their future role will therefore be described as National Defence.

Central Volunteer Headquarters RE (CVHQ) will continue to be responsible for the preparation of Specialist TA units to meet their various roles in the ARRC, in support of the RAF or in National Defence. For the foreseeable future, the Jersey Field Squadron RE (Militia) will continue to be administered by CVHQ. For the next year or two, few regular or TA units will escape from a busy programme of reorganisation, re-equipping and re-training. Despite careful planning there will clearly be considerable disruption. There is still a lack of doctrine to guide planning and training for the new roles that we are to undertake. Filling this vacuum will be a high priority for the staff over the next few months.

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Students from the Army Apprentice College on adventure training in Weymouth.

Headquarters Doctrine and Training and Subjects Concerning Individual Training: There have been major changes within the training organisation in the past year. Adult and young soldier recruits, who are currently trained at Gibraltar Barracks, will from January 1993 be trained in one of the five Army Training Regiments (ATR) to be set up around the country. Our recruits, having first attended a Recruit Selection Centre — one of which will be in each of the new districts — will then join ATR Bassingbourn (near Royston in Hertfordshire) where they will carry out their ten week Common Military Syllabus (Recruit) training. This will however still be within a Sapper sub-unit, 28 Training Squadron, when it moves to the ATR from Minley. Junior Leader training has already closed at Old Park Barracks, Dover, and 87 Training Squadron has moved to carry out this training at the Army Apprentice College, Chepstow. The last of the one year courses will start there in late July. From April 1993, the Corps will change to the future Army pattern with Junior Leaders — who will have to be a minimum of sixteen and a half years old — undertaking a six month course. Eventually, in early 1994, this training will be moved to the future Army Junior Leaders Regiment (AJLR) at Harrogate, one of two to be formed, where our recruits will continue to be trained in a Sapper sub-unit.

Another important change to be adopted is in the future training of apprentices. The Executive Committee of the Army Board (ECAB) decided that from this September (1992) an Army Technical College (ATC) would be formed. This will be based on the present Princess Marina Apprentice College, Arborfield. After one year apprentices will then go on to complete their initial (Phase 2) special to arm training at their Arms School. So our apprentices will leave Arborfield and go, via their combat engineer training at Gibraltar Barracks, to the RSME to complete their trade training to Class 2 level. This is a major change from our current well tested system. However we have obtained agreement to keep our numbers at their present proportion of the total intake of recruits, and also that the apprentice must be trained to reach the level needed to obtain the current range of civilian qualifications. On completion of their training at the ATR, AJLR or the ATC, recruits will continue to carry out the combat engineer element of their Phase 2 training at Minley. TA soldiers will also continue to be trained at Gibraltar Barracks.

A further major feature has been the first full year of cash budgets. Whilst there have been many teething problems we have all learnt a great deal. The Commanders at Minley and Chatham have found much scope to improve the efficiency of their commands. If cash allocations are maintained at levels which enable us to run through the next very difficult three or four years, and if, in particular, sensible investment can be made in the fabric of our estate, then I am optimistic.

The future of the Army Training Organisation (ATO) is not yet finalised. Headquarters Doctrine and Training (HQDT) is taking an increasing part in the formulation of doctrine and the training that stems from it. The major problem is in finding the savings necessary to bring the ATO within the level of manning and funding for the post *Options* era. I, and my fellow Arms Directors, are being asked to make proposals to conduct future special to arm training with resources reduced by a quarter. I now have outline agreement to my proposal to concentrate combat skill training at Gibraltar Barracks, Minley, and technical skill training at Brompton. Chattenden Barracks will cease as

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part of the ATO. Its future as a field army barracks is not yet decided. Additionally HQ EinC, like so much of the MOD, will depart from London for a new home in Minley having been reformed in conjunction with the HQDT and having taken a 25 per cent reduction in staff numbers.

Equipment Matters

Current risk assessments are far from clear and the nature of future operations is unpredictable. Future concepts of operations based on a generic capability are being developed. Great emphasis is now being placed on tactical mobility rather than counter mobility. Operations in warm and hot climates seem more probable than in the past and arctic conditions must still be considered. Hostile electronic warfare and nuclear, biological and chemical attack must be prepared for. Following *Options* most engineer equipment was subject to 15 per cent quantitative cuts, but the programme overall remains soundly based. The outcome of the Long Term Costing 1992 held mixed blessings. The re-inclusion of 38 M3 rigs will give an amphibious capability beyond 1998 when M2 becomes obsolete. This was achieved by sacrificing a number of other prospects. An unfunded aspiration for a further 18 rigs remains.

The M3 came through exhaustive trials by 28 Amphibious Engineer Regiment and the Bundeswehr with flying colours. It is a very significant improvement on the M2 in every respect. I was extraordinarily impressed by the equipment when I visited Hameln last year.

The plan to mount BR90 close support bridges and AVRE conversions on the ageing Chieftain chassis has many critics. However only extra money can cure the growing disparity between Challenger/Warrior battlegroups and key elements of their support. Experience in the Gulf illustrated this very clearly. The lack of inherent mobility in our armoured engineers is now fully recognised. However the BR90 concept itself is outstanding. I have recently visited field trials as well as the manufacturers, Thompson Defence Products (Rolls Royce). I have been thoroughly impressed by the quality of the product and the high-technology professionalism of the manufacturer. The removal of development funding for the future mines programme had been unwelcome but not disastrous. The UK may have to withdraw from international concept definition for an area defence weapon. However I remain confident overall. The new Defence Research Agency (DRA) has come into being and has absorbed Christchurch and Fort Halstead. The future of Christchurch as a research location is under consideration although the functions it performs are themselves secure. This is excellent news when we consider what Christchurch has meant and still means to us. Their latest piece to emerge, BR90, is a world class leader in its field.

Military Secretary

Last year saw the promotion of Major General Scott Grant to Director General Training and Doctrine and Major General Peter Sheppard to Chief of Staff in HQ BAOR. Sadly as a result of *Options* we will lose the posts of Commander 29 Engineer Brigade and Chief Engineer BAOR whilst the Deputy Engineer in Chief and Director Engineer Services will combine to become Director Engineer Support from September. At the end of the year Brigadier Chris Elliott will become Deputy Commandant of the Staff College.

The Corps is well recruited with full manning at junior officer level. Entry into the Staff College in 1993 will be a near record 19 Sapper students. We continue to be well represented in key appointments.

Whilst I feel optimistic about the future, the Corps and the Army at large have *Options* and *Drawdown* to deal with. We have had the first phase of redundancy when we lost 65 officers, although thankfully only six were compulsory. However, the next two phases are likely to cut more deeply.

This, plus the inevitable gapping of posts and general turbulence will place a great strain not only on the Military Secretariat but also on commanders, individual officers and soldiers and their families. In all, I anticipate some difficulty in the short term.

The Corps continues to be well represented in the Honours and Awards Lists. In the New Year and Queen's Birthday List this year we have received public recognition by the following awards:

CB	–	3	
CBE	–	1	
OBE	–	5	
MBE	–	15	(2 for service in NI)
BEM	–	18	(2 for service in NI)

and were exceptionally well represented on the *Granby* Honours List last year. The Queen's Birthday List recognises the fine work done by 33 Engineer Regiment (EOD) including during the aftermath of the war in the Gulf.

Major General P F Fagan CB MBE was appointed Representative Colonel Commandant for 1992.

Corps Affairs

Corps affairs are a very important part of our business. By Corps I mean the whole spectrum, including the Royal Engineers Association (REA), Institution, the Museum and the Band. Though elements of the Corps have a certain amount of autonomy, with the serving element of the Corps declining in strength, we need to draw the organisation of Corps affairs more closely together. A new committee structure is being devised to achieve this.

Over the last few years, as it became clearer that the Army would shrink in size and with it our income from the day's pay scheme, Corps policy has been to build up a reserve so that we would not be faced with a sudden and sharp decline in our ability to support our activities in the years ahead. Thus at the end of 1991 our assets stood as follows:

	£
Corps	1,450,000
Institution	320,000
REA	3,100,000

We are in a reasonably healthy financial state and improving.

The Corps continues to recruit high quality young men for officer training and although *Options* has cast some doubts amongst potential candidates, the flow of applicants remains very healthy. The number of graduates with engineering degrees has improved but remains too low overall.

The development of the Museum continues steadily. By the end of 1990 the courtyard roof had been completed and sound effects introduced into the galleries. Major refurbishments of the earlier galleries were put in hand in 1991 with the help of grants from the Museums and Galleries Improvement Fund (£10,000) and the Area Museums Service South East England (£5000). At the same time the public facilities were improved and a refreshment room set up for visitors. However major funding continues to be a worry as the recession bites. Some curtailment has been necessary. An important new collection of Gordon memorabilia was acquired during 1990 on indefinite loan from Gordon's School. This includes items from both the Chinese and Sudan periods of Gordon's career. Some items will be included in the newly refurbished galleries. Another interesting acquisition is a GR1 Harrier aircraft, gifted to the Museum by MOD (Air), to go on public display during the summer of 1992.

A Joint Professional Meeting was held with the Institution of Civil Engineers at Great George Street on Monday 9 March 1992. A team from the Corps, led by Brigadier R A Bradbury, gave a presentation on the War in the Gulf. Immediately following the presentation, the Institution of Civil Engineers gave a reception for officers of the Corps.

The REA now has 110 branches including those in Belfast, Southern Ireland, Jersey, Guernsey and Bulawayo. A branch was opened earlier this year in South Australia. Its benevolent work continues to expand. Last year some 2000 individual cases were dealt with. The cases included aid to serving and recently discharged servicemen and their families, as well as many now elderly veterans of the Second World War and their widows.

The Band, under its Director of Music Lieutenant Colonel P R Evans, is now militarily and musically in top form and widely recognised as such. There is a good number of most promising young musicians backed by a nucleus of more mature members, which gives a very good balance of talent and experience. However even bands are not immune from change and the Adjutant General has to bring forward plans to cope with an overall reduction in Army musicians.

Colonel C P R Bates took over as Regimental Colonel from Colonel M R Cooper on 1 July 1992 on retirement. Colonel R I Reive OBE took over as Corps/Institution Secretary from Lieutenant Colonel F R Beringer on 20 July 1992 also on retirement.

Sport

As a Corps we continue to feature prominently in sporting activities and our competitiveness never wanes. In a year which goes through to the beginning of the Summer Olympics there are some splendid results to report; our

commitment and financial backing are paying off handsomely. We came out of the Winter Olympics with the top two British skiers. This was a magnificent effort on their part, but the excellent support and fine performances by other Sappers must not be forgotten. Notably, four out of the five comprising the British Biathlon Team were from the Corps. Of those, Sergeant Dixon (the best ever British Biathlete) broke his own British record for the event and improved on his 1988 placing moving up from 13th to 12th. His all round performance showed sheer guts, utter determination and absolute commitment, and quite fittingly he was awarded the BEM in the Queen's Birthday Honours List. He has not yet reached his peak and looks set to do even better in the 1994 Winter Games. Our other champion, Captain Hugh Hutchison, taking part in the Moguls, achieved 25th place, the best British result.

Corporal Williams, the Corps' outstanding fencer, has gone from strength to strength and has been selected for the British Sabre Fencing Team competing in the forthcoming Barcelona Olympics. He is a product of the Junior Leader Regiment, Dover, and the Corps is justly proud of his remarkable achievement. One of our top Pentathletes, Corporal Morgan, has not quite made it yet but has been selected as a reserve for the Olympics.

The Canoe Club did particularly well to keep its grip on the Devizes to Westminster Canoe Race; this year they won the overall K2 team event, despite only being able to field a relatively inexperienced squad against strong opposition. Significantly all the Corps crews finished, with the A team winning and the B team coming third. For the second year running Lance Corporal Beegan and Sapper Grewcock won the fastest Services crew competition, by coming fifth in the overall individual placings.

Our Rowing Club remains to the fore. It holds the majority of Army standard oarsmen, as it has done since 1846, and is the only Army club able to put together competitive crews at joint Service level. At this year's Regatta, open to all Service clubs, it had its most successful day ever and won the Open VIIIs and Open Coxed IVs (representing the Army), and the Open Coxless IVs, Senior Coxed IVs and Open IIs Coxless (at Service club level). 28 Amphibious Engineer Regiment went into the history books by winning the Army Challenge Cup for football and thus completing a hat-trick of consecutive wins. This is only the second time it has ever been achieved and the first time since the Sherwood Foresters did it in 1931. Also at Army level, Corps teams won the main competitions for skiing, fencing, swimming and badminton; additionally they won the dinghy event in sailing and the squash competition at minor unit level. We won the BAOR competition for squash and the UKLF competition for basketball, hockey (Major Unit and Women's Inter-Unit (PCD RE)) and minor unit boxing.

Captain Hugh Ward had the rare distinction of being part of a British team who were the first ever to walk unsupported (without dogs, resupply or air support) the 274 miles from Eureka in the North West Territories, Canada, to the North Geomagnetic Pole.

It has been another year of fine achievement.

Military Survey

Operations and Deployments. Though there have been no major deployments, Military Survey has been involved in a large number of overseas operations. These have included embassy protection in Africa, support to the civil powers in South America, post Gulf war operations in the Middle East, relief tasks in the Western Pacific and Bangladesh and UN operations throughout the world. Survey support has included the provision of mapping at various scales, moving map displays and information on obstructions for low flying aircraft.

Projects and Exercises. There have been no major exercises during the period but both 42 Survey Engineer Group and 14 Independent Topographic Squadron have deployed small survey detachments to support formation exercises.

Reorganisation. On 1 April 1991 most of the Military Survey assets in the UK became part of a Defence Support Agency (DSA) which comprised the following organisations: DG Mil Svy, D Svy Ops, MCE RE, STU RE, 42 Svy Engr Gp and 1 ASLS. Under *Options for Change,* the Military Survey DSA will reorganise to 11 separate groups including 42 Survey Engineer Group with 1 ASLS becoming a subunit of the latter. 19 Topogrphic Squadron will be reorganised as an STRE in June 1993.

Equipment Matters. During the last financial year, Military Survey made the initial purchase of

Electronic Total Stations to support field survey requirements. This purchase will be completed for the whole organisation, including provision for Military Works Force, during the financial year 1992/93. This financial year will also see the completion of the Global Positioning System purchase. By Christmas this year the defence Geographic Database system will have been installed at Feltham. There are a number of other buys due to be completed this year which include the provision of Desktop Mapping, an interim TERA capability and the refurbishment of the Mapstruck fleet. Office automation has been introduced throughout the Defence Support Agency and this should be on stream by Christmas. It is planned to re-equip field squadrons throughout the Corps with field survey equipment next year and it is hoped to make some provision for BETA.

Sport. Military Survey has also featured prominently in sporting activities.

Canoeing. Lance Corporal Gobbe won the RE, Army and Interservice K1 championship at 500m, 1000m and marathon. He is also the Scottish Sprint champion. He has set a new national record for the K4 1000m event and trained with and was a contender for this year's Olympic squad.

Hockey. 42 Survey Engineer Group reached the finals of the UK Major Unit championships but lost to 7 Royal Horse Artillery.

Sailing. Major Pyatt was a contender for the British dingy sailing Olympic squad and narrowly missed selection by coming 5th in the Olympic Selection Trials in Spain.

Shooting. 42 Survey Engineer Group won the Army Short and Long Range Target Rifle team matches.

Triathlon/Decathlon. Major McManners competed in the Triathlon World Championship in Australia in 1991 finishing in 288th place and again in the Decathlon World Championships in Frankfurt this year when he finished in the top half of the field in 213th position.

POSTAL AND COURIER SERVICES

Operations and Exercises. PCS has continued to operate exercise Forces Post Offices throughout the world and notably on operations such as *Hanwood* in Yugoslavia.

Re-organisation. On 1 July 1992 the Directorate Defence Postal and Courier Services amalgamated with its Depot at Mill Hill to form the first Defence Support Agency (DSA) in the Quarter Master General's area. The Director Def PCS is also the Chief Executive of the DSA; the launch ceremony was held on 17 July 1992 and was attended by the Minister Armed Forces. However, Postal and Courier Services are on the 'brink' of great change. Primarily from April 1993, PCS will leave the Royal Engineers and become one of the constituents of The Royal Logistic Corps. PCS Units worldwide are to be swept up under *Options for Change* and the Logistic Support Review into composite Royal Logistic Corps Regiments, however the function of PCS and the trade of its soldiers will remain discrete within the new Corps.

Equipment. A state of the art Electronic Letter Sorting Machine was installed at BFPO London in April 1992 and Lord Arran formally initiated electric mail sorting for PCS.

Sports. PCS reinforced the sapper domination in sport and PCD were runners-up in the Army Minor Units' football competition.

POSTSCRIPT

THIS report is a catalogue of continuing commitment and achievement and as such follows a well established pattern across the whole spectrum of Corps activity year on year but each unique in itself. That is the constant part of today's formula. What makes the formula special is the pervasive element of fundamental change. No part of the Corps is exempt. The consequence of change will be a smaller regular Corps with an increased reserve component. The essential element throughout will be the emphasis on generic military engineering with a sound mixture of combat and technical expertise at all levels. In my visits to units so far I, like my predecessors, have been greatly impressed by the enthusiasm, commitment and leadership. I have no doubt that the Corps will come out of the metamorphosis of *Options* in a sound and balanced way with a commensurate capacity to support the Army, the other Services and other government departments. Additionally, as the world moves on from superpower confrontation into a more fragmented and uncertain future, the generic capacity of our new structure will give an essential flexibility. I am totally confident of the future and all that it might hold for us by way of challenge.

Sollum Demolitions — 50 Years On

CAPTAIN E H R SCHMIDT

THE following is taken from the author's copy of his Demolition Report to the CRE, 13 Corps Troop RE for the dates shown:

(Prepared for Demolition 22/6/42, Blown 23/6/42 2300 hrs)

FORTRESS DUMP OF PETROL, OIL, AMMUNITION AND EXPLOSIVES

1. Petrol Dump. (Fortress Reserve)
   Petrol 140,000 galls approx
   AGO 40,000 galls approx
   These dumps were destroyed by fire.

2. Bulk Petrol Dump
   Only a few hundred gallons were left unissued and this was run to waste.

3. Ammunition and Explosive Dump
   Approx 12,000 rds 25pdr HE
   Approx 500 rds 3.7 AA
   Approx 16,000 rds 40mm HE
   Approx 2000 rds 6 pdr

   Unknown quantities of 2" and 3" mortar Grenades and 75mm shells.

   9,000 EP MK II AT Mines
   5,000lbs Gelignite
   500lbs GC and GC Primers
   4000lbs Ammonal

The demolition by fire of all this ammunition, and the detonation of all AT Mines and explosives appeared to be successful. A quantity of 2 pdr and SAA was not prepared for demolition due to lack of stores, but it is most probable that it was destroyed in the general conflagration.

The demolition of these dumps presented a unique problem, due to the following considerations:-

1. Intention to remain undetected until the last minute.
2. Dump not to be fired until Rear-Guard had withdrawn down Sollum Hill and the road had been blown.
3. Approx 80-100 small dumps of ammunition, widely dispersed, and 10-12 dumps of petrol and oil also dispersed, to be fired in quick time once the demolition had been started.
4. No Time Pencils available.
5. Demolition Party to be as small as possible.
6. Large quantity of Primacord available, which would only have to be destroyed if it were not used, as there was no MT for back loading.

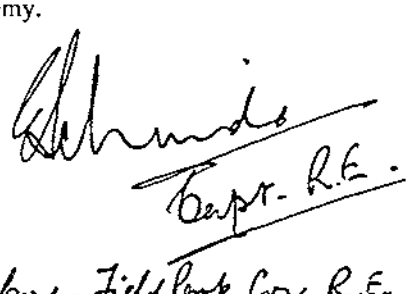
It was decided that as there was an adequate stock of primacord and safety fuze the dumps would be fired from 26 firing points each with 20ft SF and Pull Igniters, more or less on a central axis running West to East.

On each dump of ammunition, petrol and oil, the primacord leads from the firing point junction were Clove Hitched round three or more tins of petrol, and passed centrally underneath three or more tins of petrol, and three more tins of oil. As far as could be seen the fires started burnt for a sufficient length of time to explode many of the shells.

The same procedure was followed with the petrol and oil dumps and successful ignition resulted.

With a party of six Sappers I fired all the dumps in ten minutes.

P.S. On my return to Sollum in November 1942, I was able to inspect these demolitions. The opinion of three RE officers was that the demolition had been 100 per cent successful and that the entire dump had been denied to the enemy.



The Threat — To Be or Not To Be

LIEUTENANT GENERAL SIR DAVID WILLISON KCB OBE MC

General Willison served for 36 years in the Corps. He became a Colonel Commandant in 1973 and was Chief Royal Engineer from 1977 to 1982. His article stems from 15 years as an intelligence staff officer, culminating as Director General Intelligence in the Ministry of Defence 1975-1978.

MILITARY appreciations are normally predicated on the threat — the enemy at tactical level. The early nineties are noteworthy for the eclipse of the Soviet menace. The resultant major cut back in the British Army is often justified on the grounds that no major threat is discernible to British interests in the foreseeable future. For those recently entered into the Corps of Royal Engineers, let alone those now contemplating doing so, a key question is whether a long term career within the Army is assured. The aim of this article is to set out some of the considerations that lead me to believe that the answer to the question is in the affirmative.

It goes without saying that British tax payers should only be asked to pay for a level of Armed Forces deemed necessary to protect vital interests. These can broadly be defined as purely national commitments, participation in the NATO (North Atlantic Treaty Organisation) Alliance and acceptance of a measure of United Nations (UN) obligations in the military field. What are the prospects for each of these categories in the years ahead?

Residual national interests are largely centred on involvement in Northern Ireland. It seems unlikely that a political solution will be negotiated with the Irish Republican Army (IRA) for a long time to come. Equally, barring a decision radically to alter policy as regards emergency powers in order to quell the IRA, the latter are committed long term to keeping up their terrorist campaign. So a military presence is virtually certain to be required here for the foreseeable future at substantial strength.

Hong Kong is irrevocably set on being absorbed into China in 1997. Current force reductions take account of this contingency. Belize goes on and on because of lack of stability within Guatemala. This malaise looks insoluble indefinitely. So does the continuing military presence in the Falklands because the Argentinians seem wedded to the idea of taking over the Islands some day. Cyprus represents yet another virtually insoluble political problem between Greek and Turkish Cypriots. The continuation of the Sovereign Base Areas looks assured long term; their value in connection with Middle East emergencies was recently proved once again during the Gulf War. Gibraltar is now a very minor military commitment. Spanish aspirations still look unlikely to be acceptable to the Gibraltarians. Finally, basic home defence requirements must always figure in the minds of politicians of whatever persuasion.

Our main external military commitment must remain a contribution to the defence of Europe. There are signs of divided counsels in Europe about the future of NATO. The Germans are sceptical about the retention of foreign forces on their soil, not least because of the need for major training areas and facilities for formation exercises. The French are trying once again to erode American influence in Europe by

Lt Gen Sir D Willison KCB OBE
The threat - To be or not to be (p112)

ostensibly backing Western European Union or European Federal Forces or indeed anything that will weaken or remove NATO. Longer term I do not believe that America can abandon its major interest in the security of Western Europe. Equally I do not credit the French pretension that United States military power can return to its own shores now that the Soviet Union is no more. Nor do I think that a unified Germany will finally decide to go it alone in military terms. I therefore argue that an evolving role for NATO is going to persist. Such evolution needs to cater for military commitments arising outside the physical confines of NATO. British major participation in the projected rapid reaction multinational corps therefore would appear to be backing a winner.

The third category of possible future military commitments concerns global trouble spots. Given the American penchant for seeking UN sanction before initiating military action, participation by British forces seems bound to take place under the UN banner. Yet the immediate American reaction to the occupation of Kuwait was to put small forces into Saudi Arabia in anticipation of UN support. America is of course the only military great power left in being. Any British military effort is therefore certain to be mounted in conjunction with the United States forces and such other Allies as may wish to participate. For a long time to come these would appear to exclude Germany and Japan.

So far as the Corps of Royal Engineers is concerned the final build up of well over 3000 sappers from every component of the Corps to support a division of only two brigades in the Gulf gives us a vital yardstick for the future. No overseas operation outside the confines of NATO territory could be mounted without a similar scale of engineer backing.

Apart from this ultimate level of offensive operation to enforce UN resolutions, I foresee a number of requirements for troops either continuing or arising in the years ahead. Yugoslavia seems most likely to persist as an irritant for many years. Serbs and Croats are not going to sink age old differences quickly. Bosnians may yet need UN intervention. Albanians and Serbs may clash in Kossovo once Albania sorts itself out. To the South, Cyprus represents a long standing UN commitment. There are still UN observers in the Middle East and on the Indo/Pakistani border. Cambodia is the latest candidate for a build up of UN sponsored troops.

I turn finally to those areas of the world that may generate such pressures upon the Western Alliance of nations that military reaction may have to ensue. First and foremost must come the Middle East area from Casablanca on the Atlantic to Pakistan and from the Sahara to Central Asia, in short the Islamic countries and in particular the Arab states. Secondly I class the Commonwealth of Independent States (CIS), ex Soviet Union, as the other incipient source of menace to world stability. I exclude at this moment in time the Far East as I do not believe that China or Japan in their present mood have any intention of rocking the boat beyond their borders to a major degree. North Korea needs watching I appreciate.

The Middle East remains inherently unstable. Many regimes are essentially brittle and may suffer internal coups. There are huge sums of oil-generated money available. Too much of this continues to go into arms purchases regardless of the upshot of the Gulf War. The Arab Israeli dispute lies at the heart of the matter. The principal gain from the Gulf War was in my view the enhanced capability of the United States to pressurise Jews and Arabs at last to sit down round the same table. Negotiations have hardly begun. Progress will take many years. If America can persist, then it is possible that, in the medium to long term, a solution based on territory for stability may be reached. But meanwhile extremist Arab and other Muslim states are certain to keep trying to undo progress towards such a desirable end.

Islamic fundamentalism is a further thorn in the flesh of the Islamic body politic. Here one must distinguish between Shia and Sunni fanaticism. Shia extremism is centred on Iran with an Iranian outpost established in the Lebanon. The taking of western hostages has brought this strand of Islam into high relief in recent years. The release of these unfortunates does not in my view reduce the inherent menace of Shia extremists to fan the flames of both hatred of Israel and of America as the leader of the Western World.

Sunnis represent nearly 90 per cent of the Islamic peoples. Fundamentalism is less extreme in this huge mass of folk but takes the form of resistance to Westernisation of their way of life. Demonstrations in favour of the Iraqis during the

build up for the Gulf shooting war illustrated this tendency, notably in North Africa and Jordan. Algeria is in grave danger of ceasing to be a secular state and becoming an Islamic one subject to Sharia law.

The "bad men" of the Islamic world also need to be taken into account. First comes Saddam Hussein in Iraq. His continuing support is from the 40 per cent of the population who are Sunni Arabs. These have run the country since the British established it in 1922. Encouragement, however tacit, to Kurds and to Shias in the South, only causes these Sunnis to coalesce more around Saddam Hussein. How to bribe them away from this self preservation allegiance is the problem for Western diplomacy. Meanwhile Iraq remains an incipient rallying point for anti Israeli and anti American sentiment.

Syria is still ruled by an extremist element of the Ba'ath Party, although antipathetic to the similar regime in Iraq. Hafez Al-Assad has recognised the need to seek favour with America now that the protection of the Soviet Union is no longer available. But he will remain violently opposed to Israel unless and until the latter returns the Golan Heights to Syrian control. Qaddafi of Libya needs little write up. He remains at heart a supporter of terrorism at any point that he reckons can damage Western interests without endangering his own regime.

Islamic eyes have turned to the potential of medium range rockets to hit Israel, as Iraq succeeded in doing during the Gulf War. There is little doubt that such weapons are being procured by some Arab states. No doubt their attention is also being devoted to try and lure scientists and engineers from the collapsing military industrial complex of the late and unlamented Soviet Union. They would hope to develop yet more sophisticated stand off weapons thereby.

This brings me to my final point which is the progressive collapse into anarchy of what is now termed the Commonwealth of Independent States. At this moment in time it is impossible to forecast just how far disintegration of this tender plant will go. There is a rising tide of human misery in terms of unemployment and falling living standards that must lead to drastic solutions in due course. At the same time hopes in the constituent states are buoyed up by the heady atmosphere of doing one's own thing. In consequence wiser councils in favour of preserving at least some measures of centralised control over economic and military matters are being flaunted. Hardest hit are the Armed Forces themselves and the vast military industrial complex that has supported them. For many decades the best brains and the largest sums of money were devoted by the Soviet Union to that segment of their society. Now the millions of people involved are in dire straits. Their way of life, their perks, their jobs are vanishing since the failed coup of August 1991. I fear that it is from amongst these people that the leadership of the inevitable backlash against the on-going chaos will emerge. They constitute the back bone of the communist elite of the old Soviet Union. They, and other ex-communist cadres, still control many of the Republics outside the major cities. I feel strongly that we have by no means seen the last of the Soviet Communist Party, even though the labels have changed under which they operate. Indeed a number of the leaders of Republics are still ex-communist party *apparatchiks*. Their aim is to frustrate the Reformist democratic movement that is exemplified by Yeltsin and his followers in the largest Republic by far — Russia. Yeltsin is a remarkable man; it should be noted that by trade he is a civil engineer. But I fear the cards are too heavily stacked against him for success against the sheer weight of the old style communist supporters arrayed against him. In due time, therefore, I see nationalist movements, supported by the military, prevailing within the Russian Republic. Their allies will be numerous amongst the other Republics. A resurgence of central control amongst much, though not necessarily all, of what used to constitute the Soviet Union is therefore possible. This new political manifestation will necessarily be authoritarian if it is to succeed in quelling anarchy. It may well not feel beholden to the West. Its shadow may well fall with increasing menace upon the outside world. The latter, I suggest, will need to keep their powder dry against this very possible upshot of CIS disintegration.

To sum up my argument, I put forward the thought that the Middle East in the medium term and the CIS in the long term may well menace Western interests. Over and above military force levels for purely national interests, I therefore see the need for a substantial British military component trained to operate with allies, particularly America. The Corps of Royal Engineers must inevitably have a long term future within such a concept.

Jordan Revisited

BRIGADIER J CONSTANT MA EurIng FICE FIMechE MIEE

Background

Many readers have heard of the Arab Legion, whilst remaining unaware of its origins.

The Arab revolt against the Turkish Empire started in Mecca in 1916, when Hussein, the Sharif, direct descendant of the Prophet Mohammed, was encouraged by the British to raise his standard and to commit his sons to taking the whole of Arabia out of Turkish hands. Some 14 young British officers were seconded to these Arab forces, especially to help with their training and the supply of ammunition, though much of this aspect has been obscured by the writings of one of them, Lawrence, in the twenties.

Nearly 30 years after that, I was introduced to the British High Commissioner in Jordan (before we had an Embassy there). This memorable gentleman, Sir Alec Kirkbride, had been one of the 14, and had remained devoted to the Near East; his memories of the events during the Arab Revolt and, thereafter, were illuminating, as was his ability to describe in detail the characteristics and habits of every notable, royal or otherwise, in the whole region.

During the course of several such conversations at the British Residence, I began to see the uniquely famous "Lawrence" in a clearer perspective, so that I was not so surprised, in talking to some of the more senior Arabs, to find that "TE" did not occupy much of a position in their own assessment of history. I make this point, because I find that it still bears some validity in Jordan today.

To what extent the Arab Revolt really weakened the Turks is open to discussion, but Allenby's successful conquest of Palestine, and taking of Damascus, were certainly helped by these Arab forces on the Desert flank. How sad, then, for the latter, to be deprived by their British and French "allies" of all their expectations in the Northern parts of Arabia, whilst losing their homeland to the Saudis. One of the Sharif's sons, Prince Abdulla, retained Trans-Jordan, with its artificial boundaries, and a small population both of nomadic Bedu in the desert and hard-working farmers in the hills.

From these sources a little *Jeish Al-Arabi* developed, repository of the honour of the Arab cause, but British led. Very weak in the thirties, when Major John Glubb, late Royal Engineers, took it over, the "Arab Legion", as it was called in English, was, at one stage in 1941, described as the only ally on which Wavell could call to relieve Rasheed's siege of Royal Air Force Habbaniya.

Skilfully handled by Glubb, with some British Officers and Warrant Officers, the Legion developed, by the early fifties, into a force of one infantry division; much of its efficiency and subsequent success may truthfully be ascribed to the dedication and loyalty of these Britons.

Introduction

My own interest in Arabia rose from a visit in late 1942, nearly 50 years ago, when I had completed just two years in Egypt, with two forays into Libya, and had left the Eighth Army to become Chief Instructor at the Middle East School of Military Engineering at Gebel Maryam on the Suez Canal. Most of our effort there was devoted to teaching the equivalent of four engineer regiments recently arrived from UK, and corresponding numbers of other arms, about the mine warfare as then practised by friend and foe in the western desert of Egypt.

As the time for the break-out from the El Alamein defences approached, the numbers of our students declined and I found myself anticipating my next posting with interest. It was hinted that I might be going to Ninth Army in the Lebanon, where the threat of the Germans entering Turkey, with or without permission, was considered to be more than just possible. Any such action would, of course, involve our taking major defensive measures in northern Syria, so I suggested that, instead of my using some of the leave to which I was entitled, I should be permitted to drive round the area concerned, accompanied by my old friend Charles Bennett, my trusty batman Lewis, and a driver.

In the time available, it was a bit of a scamper, but permission was given, and off we drove, all taking turns at the wheel.

The Sinai Desert is hot by day, and lacking in general interest, so we drove in the night to Gaza and then up to Jerusalem, for a quick recce and


32°E
37°E
N
TURKEY
Aleppo
MEDITERRANEAN SEA
Latakia
35°N
CYPRUS
Hama
Krak des Chevaliers
Homs
Tripoli
LEBANON
Ⓢ Siyagha
Ⓑ Broumana
Ⓙ Jericho
Ⓚ Qasr Kheraneh
Ⓜ Qasr Mushetta
Ⓤ Umm Qais
Beirut
Ba'albek
SYRIA
Sidon
Damascus
River Litani
Mt Hermon
Tyre
Safad
Haifa
Golan Heights
Sea of Galilee
River Yarmouk
Irbid
Mafraq
Jarash
Tel Aviv
River Jordan
Zarqa
Amman
Jerusalem
Qasr Amra
Queen Alia International Airport
Gaza
Port Said
PALESTINE
Dead Sea
Ma'daba
SAUDI ARABIA
EGYPT
Karak
Mu'ta
Tafila
Gebel Maryam
Suez Canal
Sinai Desert
Hasa
TRANS-JORDAN
Wadi Arabah
Petra
Wadi Musa
30°N
Cairo
Ma'an
Naqb Ashtar
0 30 60 90 120 150 180 210 240
Scale in Kilometres
Aqaba
Wadi Rum

The Levant.

sightseeing; on down to Jericho and the Jordan Valley. The crossing into Trans-Jordan was imperceptible, except for the Allenby Bridge itself, so we continued to Amman — quite a small town, full of goats and camels, as well as some ancient ruins. North now to the River Yarmouk, where some defence lines had been planned, and into Syria on the desert route, as traditionally taken by the Prophet on his way to Damascus: what a wonderful view, as it first comes into sight across the desert — an oasis!

Amman. For the interest of sight-seeing tourists, a Beduin tent has been erected amongst the ruins of the Citadel, surrounded by the ever-growing modern city.

More sightseeing, both in Damascus and in the Beka'a Valley, where the French guide, showing us the ruins of Ba'albek, summed it up succinctly, as he said "Hot food at the Temple of Jupiter, wine at the Temple of Bacchus and then a call to the Temple of Venus — quite a nice evening!". I remember his words so well, though nothing like that happened to us. Homs and Hama — the enormous water-wheel, and the road where the water-channel appears to be flowing uphill. We found Aleppo to be an attractive city, where we were entertained by the Free French Squadron, occupying a delightful little palace. On to Latakia port and down the coast to Tripoli with several Crusader castles, especially the Krak des Chevaliers, shown to us by Brett Cloutman, a First War Sapper Victoria Cross, commanding his army troops company there.

Next we went to Beirut, with our expectations of a great night on the town; but NO luck, the dignitaries of Ninth Army kindly invited us to dinner at their headquarters, then at Broumana in the foot-hills of the Lebanon. Sidon, and the Litani River, where George More had won his Military Cross with the Commandos (See April 1992 *Journal*, p 80). Tyre and the mountains towards Safad, Haifa with the Middle East Staff College, and so on back to the Suez Canal, which we reached the very day the offensive from El Alamein started. What excitement; but my posting was, indeed, to Ninth Army, where I spent the next six months, including several more visits to Trans-Jordan.

The Arab Legion

In 1951, the latter country, officially known by then as "The Hashemite Kingdom of the Jordan", was not entirely strange to me when I landed at Aqaba with my private car and all my household kit. Leaving my wife and three children in our comfortable bungalow in Egypt, I took everything else in order to set up the house being built for us in Zarka, just North of Amman.

The ruler of Jordan, King Abdulla, had been murdered that day and the situation was very tense as I drove North up the unpaved Wadi Yutm, past the old station at Naqb Ashtar, and alongside the railway to Ma'an, Hasa and Amman. There I had to ask the way to Zarka, and I was viewed with grave suspicion on such an unlucky day; however, Amman had grown very little in the decade since my last visit, and I was able to find the road.

Once I had arrived in the old Trans-Jordan Frontier Force (TJFF) camp at Zarka, I was most kindly received by Major and Mrs Tony Condon. The TJFF had been disbanded and its facilities taken over by the Arab Legion, which had done well during the fighting in 1948. After George Horne's days (*Journal* March 1954) Tony

Jordan revisited (p117)

Condon had taken over and had, by the time of my arrival, built up a field squadron on the British model. This was flourishing, and my task was to expand it to support a full division of three infantry brigades. Highlights of my three years there are outlined in the *Journal* of June 1956; written just after the last of the British officers had left their commands in Jordan.

When Glubb Pasha died in 1986 I wrote an addendum to HM King Hussein's eulogy, also published in the *Journal*, and I thought that my association with Jordan had ended.

Invitation

However, soon after the beginning of 1992, the Jordan Embassy in London indicated that a group of representatives from the "old" Arab Legion would be invited to visit Jordan in the spring — the season of best weather. As it turned out, on our Easter Sunday, 19 April, five old warriors and three wives were flown out from London in great style, accommodated in the best hotel, treated like royalty and driven round in a "motorcade", with charming conducting-officers. This was goodwill with a capital "G"!

I found myself to be the "senior officer present", and ex officio the "leader" of the group, as well as representing the Engineer Arm. Lieutenant Colonel Johnny Dingwall was rep for the Armour, Lieutenant Colonel Keith Eddison for Artillery, Colonel Robert Melville for Infantry, and St John Armitage for the General Staff.

Programme

Our welcome began on landing at the "new" Queen Alia International Airport, out in the desert, as it had been; but now almost joined to Amman itself, so much expansion has taken place in the last 40 years.

Next morning, Monday 20 April, we visited the National Shrine, where I was permitted to pour water on the Olive Tree, symbol of peace, in a beautiful white-walled garden, otherwise covered by lavender bushes. The approach to the sanctuary houses an historical collection commemorating the origins and development of the Arab Revolt.

Spring in Jordan is a wonderful season, especially if the winter rains have been generous, and this year deep snow augmented the benefit. However, drought usually sets in by April. As if to bless our presence, a light shower fell as we left the Shrine.

The remainder of the morning was spent at the Armed Forces Joint Headquarters, where our host, Field Marshal Fathi Abu Taleb, the Chairman of the Joint Chiefs of Staff, gave us an impressive briefing on the political, strategic and economic situation there today.

We met most of the principal officers, including the Chiefs of Staff of the Army and of the Air Force. It was a pleasure for me, as a Sapper, that the Army Chief and the Head of Armed Forces Intelligence, both Lieutenant Generals, had started their careers in "my" regiment, although after I had left it.

Realising how much Amman had changed over the years, our hosts had thoughtfully laid on an afternoon tour of the town for us; we were immediately struck by the enormous expansion that has taken place since "our" day. Hills, which had been desert then, are now covered by houses, mostly wall-to-wall.

In spite of this vast increase in the population, they appear to have mastered the problems of sewage disposal, because there was no sign of pollution nor trace of smell; and the water is potable. Later, that evening, we had the pleasure of a delicious private banquet in the Field Marshal's home, where we were able to talk freely not only to all the senior officers, but also to their wives (in great contrast to conditions in "my" day there, when we never saw the ladies at any time).

On Tuesday 21 April, wishing to avoid the possibility of giving us a surfeit of military matters, our hosts had arranged for our whole day to be devoted to antiquities, starting with the Citadel of Amman. Occupied by so many nationalities in the last 3-4000 years, with ruins to match, a Beduin tent has now been added! It was on the Citadel that one of my squadrons, in 1953, set off the magnificent spectacle of the "royal fireworks" on the night of HM King Hussein's actual accession. Also included in our tour that day, the Roman Amphitheatre, cleared of animals and debris, which has been successfully restored; it is now used for recitals and festival performances, with amazing acoustic effects.

We continued out into the desert and because of the plentiful rainfall and snow this year much of it was remarkably green, therefore our drive across to two of our favourite desert castles,

Qasr Mushetta. Quite near the new Queen Alia International Airport, this 100 year old hunting lodge/palace of the Caliphs of Damascus is one of the biggest of the "Desert Castles" of Jordan.

Qasr Kheraneh and Qasr Amra, proved to be quite unusual; we returned for lunch to "Kan Zaman", an appropriate name meaning "In olden times ...", now a folklore restaurant converted from ancient stables.

Although our programme indicated a "free" afternoon each day, we found that lunch always took place rather late, and we were seldom, if ever, back at our hotel before 6pm. This was enjoyable, but had not allowed for the fact that, each day, one or other of "my" Arab officers was being kind enough to take my wife and myself to their homes to meet children and grandchildren; we rarely returned before midnight.

On Wednesday 22, suitably relaxed from our journey and now acclimatised, we were ready for another military day, so bearing my background in mind, the first item on our programme was to call at the Headquarters of the Royal Jordanian Engineers, where the Chief Engineer greeted us with details of their development and expansion to the present strength of four divisional regiments and a variety of base units.

Driven then to Zarka, we met the General commanding 3rd Armoured Division, whom I was particularly delighted to meet, as his father had been the Mufti (Moslem priest) of the Arab Legion; he used to visit my regiment frequently, especially when we were on the ranges. There appears to be no question of their clerics being non-combatant.

The General took us round the old Zarka military garrison area, which we had known so well; first to see the Third Tank Regiment, still in its original location, where Johnny Dingwall, in our group now, had received the first of the tanks coming into the Arab Legion in 1953. This visit also had a particular significance, not only for Johnny, but also because the Field Marshal had started his military career when posted to that regiment as a cadet in 1955.

On then to my old regimental camp where, in 1951/2, we had replaced the ancient flapping tents by mud-huts, built in their "spare time" by the soldiers volunteering for that duty. Now occupied by the Third Engineer Regiment, I noted that the previously spacious expanse for training was somewhat reduced and that our Engineer Officers' Mess, as well as my unusual two-storey office, had been appropriated by other units; nevertheless, a fine School of Military Engineering had been built on part of it as a non-divisional unit.

In our day, it was the duty of every officer and man to plant a tree on "Arbor Day" 6 January; seeing the results, with so many large trees in the old Camp, is quite encouraging for the future now that "green" ideas are much more

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Petra. Some of our group within the 2000 year old Nabataean ruins.

widespread. We passed the Artillery School, where Keith Eddison, had had his Regiment, and then moved on to the Prince Abdulla 1st Mechanised Regiment, where Bob Melville presented the Regimental flag, which he had flown when he himself had been commanding that unit in 1948; that surprise really "moved" our hosts.

We motored to Mafraq, open desert in our day, when the cumbersome Imperial Airways airpliners, coming from India via Baghdad, would land on the unpaved surface and take our children back to school in England. It is now the highly developed Royal Jordanian Air Force (RJAF) Base, named after King Hussein, and includes their Flying School, where we looked over the students' classes and saw some of the instruction, which included a form of "karate" with Korean instructors — a formidable sight. They had a squadron of Spanish CASA multirole fighter-type aircraft for the advanced combat training, and a squadron of the small Hughes 500 helicopters, in addition to the more basic types.

On the way back to Amman, we stopped again at Zarka; one by one, we identified the houses we had lived in. I do not know whether the occupants had been warned of the possibility, nevertheless each one kindly invited us all in for tea. My *beit*, as we invariably called it, was little changed in the 40 years, but the trees we had planted in the (then) desert had grown to some 15 metres in height.

On Thursday 23 April we took a trip to the Jordan valley. After inspecting the inevitable Guard of Honour, I laid a wreath at the memorial to the soldiers of Jordan, killed in action there in spring 1968, when the Israelis, having annexed the western part of Jordan the previous year, embarked on further expansion across the river and towards Amman.

Whilst enjoying the comfort of a small grandstand erected for the purpose on a foothill of the escarpment nearby, the general commanding the Royal 4th Mechanised Division gave us a detailed account of the Arabs' successful defence there. Then, to the Dead Sea, to see the lavish new hotel and spa complex and on to the replacement for the Allenby Bridge, demolished in the 1967 war; the wreck of the latter is still visible.

We were both amazed and delighted to find that Friday 24, in spite of it being their day of rest, had been chosen to give us what felt like a fairy-tale programme. Up in good time to be driven to RJAF Marka, the old RAF Amman, we were accommodated in two Super Puma helicopters and flown down the mountain chain

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southward from Amman; at Kerak, we were able to take photographs of the famous Crusader castle, as we flew round it. Then onward, and over the new "Military University" at Mu'ta, the scene of the very first Islamic victory in about AD 630. Next over another superb Crusader castle, Tafila, before we landed at Wadi Musa ("Winterbourne Moses") with its elegant new Forum Hotel.

Thence transported in "garries" through the famous "Siq" into Petra, where skilful excavation and restoration have increased its interest progressively over the years. Re-enplaning, we flew to the Wadi Rum and the "mountains of the moon", landing briefly on the flat top of one, before stopping at the naval base at Aqaba.

Here we were welcomed by the administrator of the whole of southern Jordan, responsible for the multimillion pound developments there, including the port, lines of communication, railway, hotels and tourism, etc. He had been "my" plant troop leader and had had the honour of teaching the young King Hussein to operate a bulldozer.

The Commander of the Royal Jordanian Naval Forces took us to sea in his new Vosper Thorneycroft Coastal patrol-ship *Abdulla*: a fine vessel with good endurance at a cruising speed of about 13 knots. We observed its significant short range "dash" capability, when we were permitted to handle the controls. Returning, we flew again in the big helicopters up the Wadi Araba and the Dead Sea, back to Amman.

Saturday 25, took us all to see the Royal Jordanian Geographic Centre, quite new and very well equipped as one of Jordan's "regional centres of excellence" collaborating with many other nations, including the UK, in survey and mapping. The Director General, previously a Sapper brigadier, had studied at Manchester and was justifiably proud of their progress in this field; he was running courses for nationals of several other Near Eastern countries. We were impressed by the fact that so much of the computation and other precise work was being undertaken by ladies, whom they find to be more painstaking than men (in a culture slow to recognise such discrimination).

From there we went to the Al Hussein Medical Centre, where we saw wards and specialist departments, all very well laid out in modern buildings with the latest equipment in the world, especially the magnetic-resonance scanning, x-ray and kidney machines, as well as facilities for intensive care and cardiac surgery. They have an impressive rehabilitation wing, and the centre as a whole has plenty of room for expansion, which they are likely to need, in view of their commitment not only to all the members of the Armed Forces, but also to their dependents. With the average age of Jordan's population being about 14 years, the future load is likely to be heavy.

We heard that HM King Hussein had expressed a wish to see us at the Basman Palace. There, after a short wait, we were shown into a smallish room, where HM was unaccompanied and gave our group, just the eight of us, a very informal half-hour during which almost every relevant subject was frankly discussed. The King appeared to have a minutely detailed grasp of both national and world affairs, being, as he is, (nearly 40 years after his father's sad abdication) one of the most experienced statesmen of today, although not yet 60.

Sunday 26 involved another early start for the five warriors, leaving the three ladies to visit some welfare works. We went to the base workshop for tanks, on the way to Mafraq: as modern a workshop installation as one could imagine, with lines for engine repair, gearbox modification, turret-testing, etc.

On the road again to Irbid, another city totally altered from the old days, and on to Umm Qais, the Roman City of Gadara, where the Gadarene swine rushed down the steep slope. At that same place, a small grandstand had been built, overlooking the Jordan Valley, the Sea of Galilee and the River Yarmouk, with the Israeli positions on the Golan Heights opposite. The Commander of the Princess Alia Infantry Brigade gave us a briefing about the operational situation in that area, before leading us through impressive new roadworks to Jerash. In the afternoon, we all looked round the antiquities of Jerash, where the ruins of the Graeco-Roman city have been lovingly restored and now form part of a very ambitious long-term project to demonstrate a complete classical township.

Monday 27 was our last full day in Jordan and our programme took us to the Royal Jordanian War College; with very well-found buildings, it was opened in 1986, and is academically allied to Mu'ta University. This establishment represents the highest level of military study in

Jordan, and it is reserved for Jordanian nationals only. To our surprise, I was presented with a gilded Arab sword, inscribed with text from the Qoran.

The Command and General Staff College which we visited next door, is also provided with excellent facilities; unlike the War College, it is open to students from other friendly nations.

Then we went on to Siyagha (Mount Nebo) and looked at the famous church, but the visibility was too hazy to see Jerusalem across the Jordan valley. We also visited Madaba Church and saw the mosaic floor-map of the lands surrounding the Dead Sea, in which Jerusalem is shown so vividly. After this very full morning, we returned to Amman, where the Field Marshal gave a splendid farewell lunch in the Armed Forces' Joint Headquarters to us all, including His Excellency the British Ambassador, Patrick Eyers and his lady, as well as the senior staff officers and their wives. This gave me an opportunity to make a formal speech of thanks to our hosts, expressing our pleasure on revisiting Jordan, and our appreciation of all the kindness and courtesy shown to us.

In "our" day the British Residence had been a villa with beautiful gardens, lovingly tended by Lady Kirkbride, but it has now become the palace of the Crown Prince Hassan; there our group were entertained to tea by his Princess Sarvath and himself in the company of the Field Marshal and his lady. Remembering the prince so well as a little boy of seven, who came to our children's parties, it was delightful to see him now as a confident statesman, debating with us on many political and strategic issues.

In the evening, we attended an impressive dinner at the British Residence, given to the Field Marshal and some senior Jordanian officers and their wives.

Came Tuesday 28, and I went to the Headquarters of the Corps of Royal Jordanian Engineers, to meet Senator Lieutenant General Khalid Terawneh, as the senior surviving of "my" officers. In a simple ceremony, I presented my Royal Engineers Regimental sword to the Chief Engineer, as a symbol of my personal affection for his Corps, which I felt I had in some way "fathered". The gift was suitably acknowledged and, after the farewells, we left in good time to drive in motorcade style to the Queen Alia Airport, for a comfortable flight back to London Heathrow with the Royal Jordanian Airline.

Conclusion

Our experience was memorable, not only for the breadth of its scope and for the material comfort, but also for the impression we received of law and order, environmental cleanliness and enthusiastic smiling faces. No longer did we see any obvious poverty, indeed, both military and civilian spheres appeared to be prosperous. As leader of the group, I inspected 13 Guards of Honour, all of which were outstanding in their smart turn out and drill.

It was interesting that so many of the officers can speak good English, and the educational standards of both officers and men were considerable. Perhaps, the most outstanding impression received was of the increase in size of the young soldiers and of the populace in general; they are not only taller, but much broader in the shoulder. A surprising proportion of the forces has undergone parachute training, and many of the navy have qualified as divers.

With its very limited natural resources, the lifeblood of Jordan has stemmed from its ability to trade through the expanding port of Aqaba and especially with Iraq; we were frequently reminded that the Gulf War, and its aftermath, have drastically reduced the volume of this trade and Jordan's economy is suf fering. Otherwise, little reference was made to that war itself; however, it is clear that Saddam Hussein's ability to incite a proportion of Jordan's Palestinian refugees gave the native Jordanians much worry, not only per se, but also for its emphasis on the divided culture now so evident.

Strong as is the resentment with the way the Israelis are gradually suffocating their Palestinian population, there appears to be respect, but not fear, for their armed forces, and just as much distrust of Jordan's Arab neighbours, especially Syria.

Time and again our hosts, from HM down to our personal friends, emphasised their respect for the dedication and loyalty given by many Britons to the foundation of the post-Turkish civilisation of Jordan, and especially in respect of the Armed Forces. Jordan has taken many steps forward, most of which have been possible because of the wisdom and long sight of her devoted servants, both Arab and British.

Early Days

MLC

A COMMON theme in *Early Days*, as these articles have appeared year by year, has been that in order to produce a monthly edition of the *RE Journal*, the Editor clearly had been forced to fill his pages with whatever he had to hand (such as extensive extracts from foreign military journals). The issues of 1891 were very much a case in point. No edition of *Early Days* appeared in 1991 due to the lack of articles in the 1891 *Journals,* which could have been of more than passing interest to the readers of a hundred years ago, let alone to *Journal* readers of 1991. The 1892 *Journals* were certainly a little more noteworthy, although, oddly enough, it was an officer of the Royal Marines rather than the Royal Engineers, whom the editor had much to thank for filling his pages.

This officer was Captain F C Ornby-Johnson Royal Marine Light Infantry. More than that is not known, except that Ornby-Johnson was able to translate from German into English in a quite excellently fluent and easy style. For instance, successive editions of the 1892 Journals contained many closely written columns on England's Lines of Communication, (to India, the Far East, Vancouver, etc, etc) by a certain Otto Wachs, Prussian Army, and translated by Ornby-Johnson. It is not the intention to repeat Wachs' observations here, except to say that the extent to which our "Colonial" ports were fortified was developed in some detail. But Wachs' priorities did not meet with universal approval. Major J F Lewis RE, writing from the Horse Guards, concisely condemns the whole series. "The whole set of articles", Lewis states, "illustrates the difficulty which a soldier of a non-maritime nation has in understanding the basis of England's power, which has been in the past and will be in the future — the Navy." One feels, however, that the *Journal* editor would merely have thought that Lewis was missing the point. The object was to fill pages and not to educate his readers!

Another rather similar series in the 1892 *Journals* consisted of an acrimonious exchange of arguments between Colonel G S Clarke RE and Major H Breton RE on whether resources should be primarily spent on ships or on land fortifications. Early on in the argument, which went on month by month, Clarke wrote: "He (Breton) deals copiously in history, but is careful to tell us afterwards that deductions are dangerous things ... and having thrown utter discredit on all Naval history by contemptuously dismissing the views of the great sailors ... he flies off on the airy wings of pure assumption." Good stuff! Clarke in subsequent exchanges is more courteous!

Two points appearing in an Italian and Austrian military journal respectively perhaps give some pause for thought. In a captain to major promotion exam, Italian candidates were asked "What qualities should a great general possess? Illustrate how these qualities are exemplified in the leaders of the present day." To write a confidential report of superiors obviously has possibilities for any budding major! The Austrian journal poses the question 'Whether it is better to give the command "Forward" or "Follow me"'. The answer given is that clearly the former is more effective when self-sacrifice is involved, for making the soldier feel that he is between the hammer and the anvil produces the better results!

Gordon and his doings were once more to the fore in 1892. A certain Mason Bey, who had served under the Khedive and was an expert in the handling of camels, contributes an interesting article on the Gordon saga. (This article was reprinted from the original which first appeared in the *United States Army and Navy Journal.*) As is well known, the relief force arrived too late, or to put it another way, its advance up the Nile was too slow, and the Mahdi got to Gordon first. Mason Bey goes into some detail about the mustering, hiring and handling of camels. If more had been hired — and they were available — and the planning of days marches, watering and feeding had been more expertly handled — and experts were available — the advance could have been much quicker. It seems the supply transport for the entire army was organised by Thomas Cook and Sons, but only as far as the Second Cataract. After that "each detachment" made its own amateurish, slow and inefficient arrangements.

This, it seems, was done to save money. As Mason Bey puts it: "What a sad reflection that such a life as Gordon's was lost, his army destroyed and the Central African Empire given over to savagery, for the pitiful economy of £26,000 and the glory of red tape." There is no comment on the accuracy of Mason's claim!

Still on the subject of Gordon, a critique of an article entitled *How Gordon was really lost* by Surgeon Captain Parkes, which was first published in the Nineteenth Century, was republished in the July 1892 *Journal*. Parkes' thesis was, to quote his own words, "if a steamer had left on the afternoon of the 21st January, as she could easily have done, she would at the same rate of progress have relieved Gordon on the 25th, and the fall of Khartoum would not have gone down to posterity as one of the blots on British history." Readers may remember that the relieving force did dispatch steamers which neared Khartoum, but only after its fall. One steamer, as suggested by Parkes, would have carried about 20 soldiers and it does not need much knowledge of the relief campaign to realise that Parkes' statement is indeed complete nonsense. Parkes had accompanied Stanley across Africa and had secured a share of the "wild notoriety" which Stanley's activities had received, especially from the cheaper press. Parkes is condemned as one of those who sought headlines to get themselves mentioned, even if their views were completely ill-informed. To quote again from the article in question: "The growing worship of mere notoriety is everywhere asserting itself in modern society, and one of its many evil results clearly appears in certain periodicals. Achieve notoriety of any sort and your views upon every possible subject will at once possess a marketable value. That the subject may be one which you have never studied or on which you have no claim to be heard, will not matter in the least. If the Archbishop of Canterbury could be induced to set down his views on the battleship of the future, the pages of a dozen magazines would be at his disposal."

The critique ends on a particularly condemnatory note. The author presumes that the likes of Parkes would have thought that if this lone steamer had in fact been dispatched and had arrived in time, at least Gordon could have abandoned his post of honour and saved himself when the steamer left on its return journey.

One wonders what the author would have thought of Society and the cheaper press today, when notoriety can certainly be a marketable asset. *Plus ça change* is always with us!

The July 1892 *Journal* contains a photograph and other details of the memorial for General Gordon placed in Westminster Abbey. This essentially consists of a bronze head, shield and scroll work with suitable inscriptions. The memorial "occupies the space over the belfry door, within the trefoil of the early English wall arcading, immediately to the North of the great West door.".

In July 1892 the *Journal* reported that "one of the links which connect the present generation with the Aldershot of the past, was severed when the RE Compound in the South Camp, now called Stanhope Lines, was abandoned and new Mess quarters occupied.". The new RE Mess was reported as being a palatial building with accommodation for 23 officers and six field officers, each of the latter getting two rooms, a kitchen and a servant's room. Although there was enough money to provide the Mess and quarters with "electric bells", there seemed to have been a general lack of furniture, and an appeal was launched to provide more. This appeal was well received and was closed when it had reached £308, a very reasonable sum for those days. It, no doubt, at least provided the necessary number of leather armchairs! Quarters for the men were also built but were not yet completed when the new RE Mess was opened. The new men's quarters would be a "great boon for the men after living so long in the cold and draughty huts, which are now almost tumbling down from old age.".

There was at the same time a change in the HQ Mess regime, this time at Chatham. In November 1892 it was announced that a "paid Secretary shall be employed" and an appeal was launched to all officers to keep their eyes open for a retired Army officer whom they considered suitable for the post. The Secretary was to be required to find security to the amount of £500 and the salary was to be £250 per year, rising to £300 after one year. This does not seem so bad, especially as all meals on duty were to be free (except for wine and cigars!). History does not relate whether the experiment in 1892 of having an RE Club Tent at Ascot was organised by Chatham or Aldershot. A combined lunch/tea ticket bought in advance was to cost ten shillings although a tea ticket

alone was to be 2s 6d. The organising committee had high hopes that the tent would be well attended and might become an annual event! 500 tickets had to be sold to ensure success. There was no further mention of this initiative in the 1892 Journals, so one remains in some suspense until 1893.

The 1892 Annual General Meeting made somewhat heavy weather in deciding to have painted a portrait of HRH the Duke of Cambridge, the then Commander in Chief and also the first Colonel of the Corps of Royal Engineers. The meeting was reminded that the Corps had always had various Colonels Commandant, "Full Colonels as they are called", but never had a Colonel of the whole Corps of Royal Engineers before him. The meeting unanimously voted that a committee be set up to ask His Royal Highness to sit for his portrait and to see to the completion of the project.

The RE Widows fund in 1892 appears to have been going through an uneasy time. It seems that young officers were not joining in the numbers hoped for, despite the efforts of many of their seniors to persuade them to do so. There also seems to have been a very poor investment in a large mortgage (Marham Farm, Norfolk) and pensions had been paid on the basis of a three to four per cent return on Consols, when in fact the return was more like two and a half per cent. A reduction in pension, therefore, had to be considered.

The *Journal* could at times get involved in some fairly abstruse subjects. One of them in 1892 was whether the direct rays of the sun really did put out fires, such as a domestic fire in a grate. As the first contributor ends his letter: "Will you, or any of the subscribers to your valuable *Journal*, solve this question?" It did not seem that the writer was a member of the Corps. He presumably thought that the *Journal* was that sort of publication! The first reply from Lieutenant Colonel Bailey RE, spelled out the well known fact that during combustion CO_2 is produced. Sunlight resolves CO_2 into its constituent elements "thus the sun arrests the process of combustion and the fire goes out." Another reply was that "Prof Bloxam" had gone into the subject exhaustively, on a proper experimental basis, and had found no truth in it. Another correspondent was of the opinion that since heat, light, etc travelled in waves, in certain circumstances the sun's 'waves' were of greater intensity than those emanating from the fire and somehow smothered the latter. This correspondence perhaps demonstrated more that the Corps had within its ranks those who relished such problems, mad if not married or methodist, rather than the Editor was once again filling his pages!

According to an Italian Military Review, King Edward III of England in 1349 wrote a message to the Sheriffs of London which included the sentence: "whence it is well known that honour and profit have accrued to our whole realm and to us, by the help of God, no small assistance to our warlike acts.". The King was referring to the populace having "in their sports before these times exercised their skill of shooting arrows.". The King was in fact displeased because the sport was falling into some abeyance and he went on to command "that everyone of the said city, strong in body, at leisure times and holidays, use in their recreation bows and arrows and exercise the art of shooting.". The Italian journal comments that the victories of Crécy, Poitiers and Agincourt were in large measure due to the official recognition of archery societies. All this is used as a background for extolling Italian "musketry societies". The hope being that Italian musketeers would create in Europe a reputation similar to that engendered by the early English bowmen!

There seems to have been only two ways of getting your obituary into the pages of the *Journal*. One way was to be very distinguished indeed, the other was to be quite junior, but to be killed by falling on your head, such as in pig-sticking or in some other violent way. Luckily, from the point of view of the Editor filling his columns, old age provided plenty of material, while the younger officers seemed to have been reasonably careful. If they survived long enough to be faced with a tour at the School of Military Engineering the *Journal* informed them that a four bedroomed house, in thorough "sanitary condition and elegantly furnished", was to be had at No 3 Mansion Row in Old Brompton. The rent 'on very moderate terms' is not given, but the rent for No 6 Mansion Row, a seven bedroomed unfurnished house, was £60 a year — all of £5 per month! The new Mess Secretary, mentioned above, no doubt in search of something smaller and cheaper should have found no difficulty in finding somewhere reasonable to live.

An Indian Interlude — 1942-43

MAJOR G V J M SMITH MBE MICE MIPENZ DipBIA

Victor Smith entered the Corps at the age of 15 as an Apprentice Engineer Surveyor at the School of Military Engineering in 1933. He went to the Royal Military Academy Woolwich as a Y cadet in January 1939 and was given a regular commission in February 1940. The following year, after four months as Second in Command of 208 Field Company, he served overseas with King George V's Own Bengal Sappers and Miners Group until February 1946, with periods as Officer Commanding a Field Company in Assam, Italy and Greece. He went overseas again late in 1947, to Kenya and Egypt before returning for No 2 Long Civils Course in 1950. He was Deputy Commander Royal Engineers Shoeburyness and Senior Instructor Roads and Airfield Wing in the School of Military Engineering before participating in the planning and construction of the H-Bomb test facilities during 1955-57. After retiring and emigrating in 1958 he enjoyed civil engineering in New Zealand and finally retired in 1982 from the appointment as Auckland District Civil Engineer.

This is a walk down memory lane of my time in India from November 1941, with King George V's Own Bengal Sappers and Miners. It covers the time when I learned much of Pathans and Sikhs, and completed four years of training for war. The time spent in Roorkee was brief, sufficient only to start Urdu lessons. My memory of it is vague. After the tense time in England following Dunkirk, waiting for the invasion with the dark night sky lit up by bombs dropped on London and watching the Battle of Britain, I was slightly shocked by the way in which life in Roorkee went quietly along, apparently at its pre-war pace. I remember feeling that war seemed very far away from this graceful mode of living, no rationing of food or drink, servants to attend to one's wishes, tennis, squash, polo and *shikari* for recreation.

The situation quickly changed in January 1942 after my posting as 2IC 33rd Field Squadron Indian Engineers in Sialkot under Major Archie Jack. There was an immediate sense of urgency, an insistence on high standards, coupled with the prospect of going to the Middle East as part of the 32nd Indian Armoured Division. We all had a great deal to learn in a short time. Our training was intensive but at last there seemed to be light at the end of the two year plus training tunnel. The squadron's Indian personnel were entirely Mussulman and mainly Pathan, particularly the *Subedars* and *Jemadars*. These Viceroy commissioned officers had no direct UK equivalent. Although similar to warrant officers in their duties, I sensed that their status was somewhat higher. It is probable that their duties included my training in their customs. Pathans have a delightful sense of humour and the twinkle in their eyes or shake of the head was often enough to keep me right on their ways. The Pathan greeting, "May you never be tired." and the reply "May you live long." reminds me of the Irish blessing "May the road rise up to meet you, may the wind be always at your back.". There are other similarities such as their logic! When I questioned one *havildar* (sergeant) about his willingness to fight his brothers on the North West Frontier, he explained that it was the custom (after gathering in the harvest) to raid a neighbouring tribe. He certainly did not mind fighting his *bhai bund* tribesmen on the Frontier adding "They are the foolish ones, I get paid for it.". Some months later when in Razmak, I was also told about the Garrison Engineer in the hospital there who, after being wounded by a sniper, was visited by a Pathan elder apologising for the mistake and adding "Sahib you should have let us know you were coming!".

Maj G Smith MBE
An Indian interlude - 1942-43 (p126)

The Road to Srinagar.

D4 on the road to Datta Khel.

Under Archie Jack our training was intensive and my evenings were spent, after Urdu lessons, working with him on training instructions and standing orders, sometimes to 2am. With *chota hazri* (small breakfast) at 6am, followed by the first parade, little time was left for recreation, but there was much satisfaction as the squadron developed. I had finally reached interpreter's standard in Urdu as a result of almost daily sessions with a *munshi* (teacher) but also because Archie decreed, after one month, that no one would accept any order or request from me given in English. Just to emphasise that order I was sent off on a one week exercise with a troop; there was not always perfect understanding of my Urdu but frequently much laughter.

After about six months and around April 1942 the squadron was deemed fit for action and leave was granted. I went with others to Kashmir but chose to go on a bear hunt when Archie proffered the use of his 300 express shooting rifle. We travelled from Jamnu to Srinagar in the local bus on a journey which I will never forget. Negotiating the zigzag Italian mountain roads in 1943 was child's play after this hair-raising experience! As we cruised along the valley floor I wondered what was left of the brake linings after the speed of the descent. After hiring a *shikari* party (guide, cook, mules and attendants) I was glad to leave Srinagar and head for the hills. The target was a red bear and three days later my guide found a trail which led up above the snow line. I clearly remember that the bear's footprints left steps in the snow which made it easier to climb on than on fresh snow. He was too fast for us, however, and after two or three days in his tracks my time was running out so we turned back. On the lower slopes traces of black Himalayan bears were found. I shot and wounded one as it galloped at speed across a valley floor. The following day we found it dead in the next valley with the bullet hole just behind the shoulder. It had managed to run some two or three miles over the ridge and I could only wonder at the stamina shown.

Shortly after that, late in July 1942, I was ordered to relieve Major Radcliffe-Smith as OC Faridkot Field Company, Indian State Forces in Razmak. He had been sent to deal with indiscipline in the unit and was required to resume his normal duties "soonest". Instead of going to war with a well trained, well disciplined and happy bunch of Pathans, I now had to learn about a bunch of Sikhs required to support an expedition against the Fakir of IPI. The duties of the Razmak Brigade, the Sapper support required, the form of sortie, the ways of tribesmen in Waziristan and details of the Fakir, are well described in Major General Partap Narain's article *On the Durand Line* published in this *Journal* in August 1990. This particular sortie was intended to reduce the Fakir's ability to be a nuisance when we were more troubled on the Burma front. The target was Datta Khel. Although about 15 miles over the "hills" from Razmak the access is from Miramshah and the Tochi River (all as shown in the Durand Line article). In addition to the

Monsoon earth moving equipment in Dinjan.

normal column tasks of water supply and demolition of towers, a D4 dozer was used, reputedly for the first time there, to improve access. As well as the demolition of the tribal towers, a small bomb was found and exploded.

I joined the unit as it returned from the operation and we moved to Peshawar. This improved communication with Faridkot and Roorkee. Changes of some personnel took place. I was fortunate to obtain secondment of a Bengal Sapper and Miner *subedar* and also a new 2IC, Captain Brij Mohan Das, later to be Engineer in Chief, Indian Army. With their help the discipline and administration was improved, as was my knowledge of Punjabi. One phrase was much used, *Jite' cha, ute' ra*, literally "That which you wish to do, that you will do.". It is a very much stronger exhortation than "Where there is a will there is a way", and I have used it to encourage myself as well as others. Sadly the evocative approach does not always work. There was a refusal to obey orders but no further serious indiscipline occurred after a Field General Court Martial sentenced the guilty parties to serve some months in the Faridkot State prison. When they returned they said "never again". Obviously the hard labour, which included turning millstones to grind the corn,

Bomb Demolition.

had been effective. By December 1942 the company had reached a stage in retraining at which I thought it possible to "show off" on parade. On Christmas Day we marched past the Raja Harinder Singh and held the company hockey final afterwards. The drill and turnout received a well-earned *shabash* from the GOC Peshawar Command. Jat Sikhs are a proud people who "stand tall", but it seemed that day they added some inches. On a visit to Faridkot to meet HH the Raja, I was very impressed by the conditions observed there, much better than those seen in towns and villages in the Punjab, in Kashmir and around Delhi. The people seemed smarter, more cheerful and content. More surprising, there were no beggars. It was explained to me that anyone who could not maintain himself was housed, fed and put to work on basket making or like tasks. As a welfare system this seemed both practical and economical. This "birthday" visit was a time for bargaining. The Raja was never happy that the company *subedar* was not a Faridkot officer and offered as placement his head of the State Police. I believe he was one of the smartest I had seen, almost the equal of the Pathan *subedar* in 33 Squadron and hence I could not say no. In return I was able to resist other requests and retain two British officers as Platoon Commanders. I now had a good team.

The early months of 1943 were critical times in training the unit to be fit for war. One success was the development of the driver's ability to bring his old "bus" back on exercises. It became a *Sharm-ki-bat*, a shameful thing, to require outside help to get home. NCOs and drivers became efficient at diagnosing and fixing faults, so that, when we drove across

India in platoon convoys, no one failed to reach our destination on the due date. On 1 June 1943 we joined the General Reserve Engineering Force (GREF).

Now we were to perform engineering tasks in an operational area, initially in support of the United States Airforce at Dinjan airfield. Dakota transport planes and Kittihawk fighters were operating there. Our first task was to construct a seven mile railway spur and sidings to serve the cargo handling area. Work was started using towed scrapers to raise the formation above the flat land, and our men to construct culverts. Small Sapper teams were used on repetitive tasks such as excavation, concrete bases, headwalls and beams.

Sikhs love competing and teams became very productive. I cannot remember the number of culverts per mile but it was very high.

We had just got going when down came the monsoon rain. It was my first experience of this Assam torrent. I had to stop my car as I could not see beyond the nose of the bonnet. The scrapers flopped down on their bellies, stuck in the mud after their first week I believe. Fortunately we were in the midst of tea plantations and some 500 available labourers were hired and replaced the scrapers. By directing the walking routes to cover each layer with a stipulated number of passes the compaction was, if anything, better than achieved with towed rollers.

The next problem arose when the Commander of American Air Command No 1, Brigadier General C V Haynes, visited and said emphatically that the railway spur should end on the other side of the runway from that shown on the issued work plan. Having been trained in survey at Longmoor, I produced a new plan and set out the desired route. We had a very tight completion date for the spur, so I ordered the clearance of tea bushes. I advised Headquarters in Shillong. I believe it was the CRE who arrived, the next day, to explain that tea bushes were costly as they take years to become productive and that only those essential to the job should be removed. He said words to the effect that my head would roll if the change was not confirmed in Shillong. Despite having a plan countersigned to authorise the new line, I was greatly relieved by his brief message next day, "Your head is safe.". We finished the spur within the time allowed, three weeks I think. Our Sikhs had worked very hard in response to the challenge, but that is typical of them. As teams completed their culvert tasks they were switched to the next task on the airfield. When the track was completed by others, it was used to bring in construction materials when the rains closed roads. It was then that the urgency of our first job was appreciated.

The only unit requirement given priority was the provision of shower and cooking shelters. With plenty of bamboo and 40 gallon drums around, these were quickly provided.

Sunday became a rest day except for paperwork, maintenance and emergency tasks.

I had one further problem: the cook went missing from the officers' mess; we joked that he had probably drowned. To relieve the monotony of *langar* (kitchen) food, British Officers and NCOs took their turn to cook bacon and eggs on Sundays.

In our second month at Dinjan, one Sunday recreation was a trip on a Dakota flying an airdrop of food. As a funday it was an interesting experience. To whom and where we went was never revealed but the continuous sea of green foliage covering hills and valleys gave me my only glimpse of the difficulties facing the 14th Army.

Later in life a civil engineer friend reminded me that if you don't have problems, you don't have fun. It was certainly an exciting two months with which to end four years of training for war and my Indian interlude.

On 2 August 1943 I was posted to 7 Indian Field Company Bengal Sappers and Miners India Engineers in Middle East Land Forces. Fortunately there was a three month ration of beer delivered just before I left. The three cans per man were quickly consumed by each of us. Later I realised that my successor would miss his August ration. I handed over to Brij Mohan Das on the 5th, hitched a flight from Dinjan to Calcutta on the 6th, in time for sightseeing before flying out on 9 August.

Epilogue

The year with Faridkot Field Company had a happy ending. In an official letter to Brigadier Westrop, GOC GREF on 3 September, Brigadier General C V Haynes, USA, Commander of America Air Command Number One, requested that official recognition be given to the outstanding manner of performance of the Faridkot Field Company during the construction of the

railroad spur track and siding to Dinjan Airfield. His letter continued "Working under difficult monsoon conditions this unit went ahead on schedule in a manner which reflected great credit to themselves and the Royal Engineers.".

This interlude, spent in units with men of differing religions, Mohammedan and Sikh, helped me to a quicker understanding of their strengths and weaknesses. The experience gave me respect and admiration for each of them. At one time the Sikhs seemed capable of the greater effort, but I believe the Mussulman can achieve more under the right leader. In the recent World Cricket Cup, Imran Khan demonstrated that. There was no happy ending for either Mussulman or Sikh when they returned in 1946. The partition of India is reputed to have caused some 400,000 deaths, most of them on either side of the present day Indian border with Pakistan. It is a sad situation with the conflict still not ended in Waziristan, in Kashmir and the Sikh homeland.

HRH The Duke of Gloucester GCVO

THIS painting of their Honorary Colonel was commissioned in 1991 by the Royal Monmouthshire Royal Engineers (Militia). It is on display in the Headquarters of the Regiment in Monmouth.

HRH The Duke of Gloucester GCVO (p130)

Engineer Aptitude Testing

LIEUTENANT COLONEL I M DANIELL MA BSc

Background

In the April 1991 *Journal* I gave an interim report on the work I had done attempting to produce a test of engineering aptitude for use as part of the Corps officer selection process.

The report covered the need for such a test and suggested that three psychometric tests of numeracy, mechanical comprehension and spatial awareness might be appropriate. The test sample and testing procedure were described and the procedure by which a measure of concurrent validity would be tested was outlined. The test results were to be compared with a measure of performance on the Young Officer (YO) course to see if there was any significant relationship between them.

This article carries on from there and uses the results obtained from 100, 101 and 102 YO Courses. The results are given and discussed before drawing any conclusions about the validity of the tests.

Results

Data. The biographical details of the YOs tested and the raw, uncorrected scores from the three tests were entered on data sheets provided by the test publishers. Interestingly, the test results were slightly below those achieved by graduates applying to join an engineering company but well above applicants for technical apprenticeships in the aircraft industry. This is broadly in line with what could have been expected from a group as diverse as the sample tested, suggesting that the tests are at an appropriate level.

Correlation. The degree of relationship between any two variables is the extent to which they vary together in a systematic way. This measure of correlation gives an indication of the statistical significance of the relationship. The biographical data compared with the raw scores from the tests and the number of O levels gained, correlated significantly with the performance on the civil and electrical and mechanical elements of the course. The age of the YO related to the performance on the more practical subjects, as did work experience, but to a lower level of significance. Because of this the number of O levels gained and the age of the officers were retained for further analysis.

Factor Analysis. Factor analysis is a statistical technique for assessing the internal associations between a set of data and for reducing the number of variables. As a result of analysing the scores from each module of the YO course it transpired that there were two performance factors, unsurprisingly one practical and one theoretical. These two factors and the variables retained from the biographical data were then compared with the test scores.

Regression Analysis. Regression analysis establishes the relationship between a number of variables and enables one to be predicted from the others. In this case the performance on the course was related to the test scores and the age and number of O levels gained. This analysis was carried out using the computer software DATANALYST. The numeracy score correlated significantly with the performance on the areas represented by the theoretical factor. When taken with the other variables, the number of O levels was found to be irrelevant against the performance on the theoretical modules but the age of the officer correlated significantly with the performance on the practical subjects.

Discussion

The results of the study carried out so far indicate that a significant relationship can only be identified between the scores from the numeracy test and the performance on the more theoretical aspects of the YO course. No relationship was found between the test scores and the practical performance. Since the research requirement is to investigate whether the tests could be used to assess practical engineering aptitude, the lack of a significant relationship between the test scores and the practical factor is a considerable disappointment. This may be due to one or more of three main factors:

- Tests
- Performance Indicators
- Sample

Tests

THE tests were chosen as a result of consideration of what engineering aptitude may be and an analysis of the skills required by a Royal Engineer YO. The test series used is a relatively new one and is as yet unsupported by validation studies of other groups. However the test publishers have an international reputation and their tests are generally regarded as being highly reliable. In addition the results obtained from the sample of officers tested are comparable with those obtained from other groups of similar ages and academic backgrounds. This suggests that the correct level of tests was selected and that the tests were properly administered. The tests are probably a reliable measure of the three attributes being investigated. What is not proven is whether the attributes are the right ones.

The other researchers in the area, Wittig et al (1984) and Mohan and Ummat (1987), found positive correlations between the results from similar tests and academic performance by undergraduates reading engineering subjects. It is therefore a little surprising that only the numeracy test showed any significant correlation with the more theoretical or academic modules. This could be because the tests are not assessing a specific aptitude but some general ability from three differing perspectives and that the numeracy test is the most dominant (Drenth and Algera — 1987). This may be a function of the design of the test series or of the actual tests selected. A more significant result may have been found had a wider range of six tests in the test series been used.

Performance Indicators

AN alternative explanation for the poor correlation is that the performance indicators themselves may be neither sound, reliable nor objective. All of the modules, less watermanship, have a theoretical component which is assessed at the end of the instruction by either a test or a piece of course work. The tests are set by the Royal Engineers Training and Development Team and are validated by them. However the final grade given for the module is a combination of theoretical and practical performance introducing an element of subjectivity.

The difficulty of establishing objective measures for practical skills is well established (Cascio 1987) since in many situations an individual's performance is influenced by factors beyond his control. Cascio considers that performance standards are an essential element of appraisal and that appraisal consists of two elements; observation and judgement. One element can be objective but the other will inevitably be to some degree subjective.

The close correlation between age and performance on the practical modules can be partially explained by the number of serving soldiers on the three courses tested. As a result of time spent in the ranks they tend to be older than average and the previous military experience and training, often within the Corps, is to their advantage for the practical skills. It also suggests that there may be some subjectivity in the assessment of these modules since the more mature candidates would be nearer in age and outlook to the instructors who are making the assessments.

In order to reduce the effect of the subjective component of the performance indicators, it would be better to separate the training and assessment functions, possibly by appointing an independent assessor to monitor standards and progress throughout the course. This would make the assessment more accurate and objective. Another alternative is to adopt an approach similar to Dobson and Williams (1989) based on the annual confidential report and come up with some measure of performance during a young officers first tour in command. This approach was rejected initially for practical reasons but could well form the basis for a follow-on study.

Sample

THERE are three reasons, due to the sample of YOs tested, which may also contribute to explaining the poor relationship between the test scores and the theoretical modules and the lack of any significant relationship with the practical modules. First the sample size is quite small, only 67 at this stage, and so the results are statistically suspect. Ideally a sample of over 100 candidates would be used.

Second since those tested have already passed through one selection system and have undergone common training before being tested, the actual sample is much smaller and more homogeneous than the original group of applicants for a commission in the Corps. This reduction of range can have a considerable negative effect on the validity obtained by the study (Campbell 1976).

The possibility of testing all applicants was considered initially but was rejected on the basis of cost and the time to achieve results from either training or on the job.

The final problem, by contrast, is that the group is too heterogeneous. Ghiselli (1966) argues that the groups can often be divided into sub-groups for which different relationships can be identified. Clearly with a small sample this would be impractical, but with a larger group, candidates could be subdivided by age or by academic background. However, since the aim of this research is to establish a test for entrance to the Corps, there would be disadvantages to this approach, as it could be seen as applying different standards for different categories of applicants.

Conclusions

The results of the research so far do not justify the use of the tests as a means of assessing practical engineering aptitude since the test scores do not correlate significantly with the performance indicators on the five practical modules on the YO course.

More significant results may be achieved if:

- A different or wider range of test is used.
- The test scores are correlated with different performance indicators possibly by assessing performance in the first command appointment as opposed to in training.
- The sample size is increased to at least 100 candidates.
- A more random sample is tested, say at the Pre-Regular Commissions Board stage.

However, the score from the numeracy test does correlate well with the theoretical factor consisting of the sum of the performance indicators in the civil engineering and electrical and mechanical engineering modules and may be useful for assessing suitability for further engineering training.

Thus unfortunately the optimism expressed in the Interim Report was not justified. A further two YO courses have been tested bringing the total sample to 99 and the additional data may change the results. However for the time being officer selection for the Corps will continue to rely on the traditional blend of experience, intuition and good luck.

Bibliography

Campbell J F 1976. *Psychometric Theory. Handbook of Industrial and Organisational Psychology.* Ravel McNully.

Cascio W F 1987. *Applied Psychology in Personnel Management.* 3rd Edition. Prentice Hall.

Dobson and Williams 1989. *Validation of Selection of Male British Army Officers. Journal of Occupational Psychology,* Volume 62 Part 4. December 1968.

Drenth P J D and Algera J P 1987. *Personnel Selection. Psychology at Work.* 5th Edition. Pan.

Ghiselli E E, 1966. *Validity of Occupational Aptitude Tests.* Wiley.

Mohan and Ummat 1987. *Aptitudes as Related to Academic Achievements of Engineers. Indian Journal of Psychometry and Education.* Volume 18(2). July 1987.

Wittig M A, Sasse S H and Giacomi J 1984. *Predictive Validity of 5 Cognitive Skills Among Women Receiving Engineering Training. Journal of Research in Science Teaching.* Volume 21. May 1984.

Operation *Granby*
Preparation and Development for War

COLONEL J D MOORE-BICK OBE MA(H)

Second Correction

Please note that in the December edition of the RE *Journal* reference was made to Lieutenant Colonel Nick Thompson (see pages 263 line 19 and 267 line 44). This should have read Lieutenant Colonel Nick Tomlinson.

United Nations Iraq-Kuwait Observer Mission

CAPTAIN L H WILLIAMS

Captain Williams joined the Royal Engineers in 1987. He served with 9 Parachute Squadron as a troop commander and in Berlin as an operations officer. During his tour of Berlin he was attached to the United Nations Iraq-Kuwait Observer Mission as a military observer.

THE war between Iraq and the coalition forces ceased on 3 April 1991 when a declaration of the end of hostilities was signed by General Schwarzkopf and eight senior Iraqi officers. They met in a tent beside the Kuwait/Basra road, five kilometres inside Iraqi territory, near the border village of Safwan. The tent was later to become November Three, an observation post with the United Nations Iraq-Kuwait Observer Mission (UNIKOM).

The authority for UNIKOM came from *Security Council Resolution 687* dated 9 April 1991 with agreement from both Iraq and Kuwait. UNIKOM had three main tasks:

- Monitoring the Demilitarized Zone (DMZ) and Khor Abdullah. The Khor Abdullah is a 50km waterway between Iraq and Kuwait; important, as it is the major waterway between Iraq and the Persian Gulf, once the Shatt al Arab was closed.
- Deterring violations of the DMZ through its presence.
- To report hostile or potentially hostile action mounted from either Iraq or Kuwait, to the United Nations (UN) in New York.

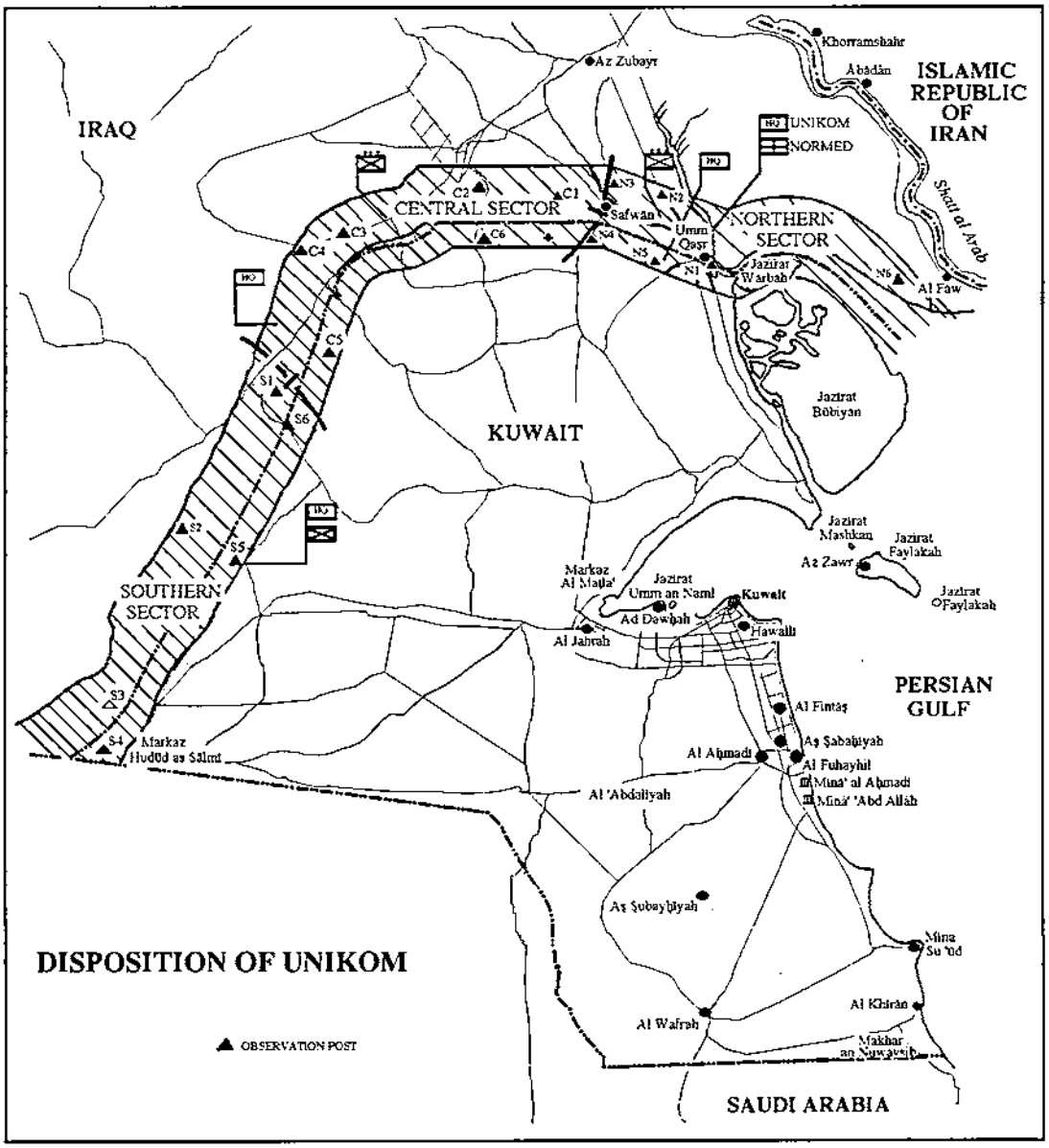
The 200km DMZ followed the Iraq-Kuwait boundary established in the *Restoration of Friendly Relations Recognition and Related Matters* of 4 October 1963, and extended five kilometres into Kuwait and ten kilometres into Iraq.

Major General Griendl, Chief Military Observer (CMO), from Austria, was given the task of establishing UNIKOM and reported directly to the UN Headquarters (HQ) in New York. He is an experienced UN officer whose breadth of service covered working for the United Nations Treaty Security Organisation and commanding the UN peace-keeping force in Cyprus (UNFICYP). His HQ consisted of the branches shown in *Figure 1* and he established three sectors, each with a commander.

Three hundred military observers were required for the mission, all with the rank of Captain or above. Thirty three countries sent officers, including some from within the North Atlantic Treaty Organisation (NATO), the Warsaw Pact and others from Africa, South America and Asia, providing an ideal opportunity for many different nationalities to work together.

Other support came from both military and civilian sources, *Figure 1*, with initial local protection set up by five infantry companies, one each from Fiji, Ghana, Austria, Denmark and Nepal. After the situation stabilised in June, a Canadian Engineer Regiment provided a quick-

Capt L H Williams
United Nations Iraq - Kuwait Observer Mission p134



reaction force, cleared ordnance, constructed temporary and permanent observation posts (OP), and carried out general maintenance of UNIKOM buildings and facilities.

The Chief Administration Officer (CAO) was responsible for all civilian staff apart from the personal staff and legal advisers to the CMO.

Civilians also consisted of many different nationalities including the existing UN employees and those locally recruited from Kuwait and neighbouring countries. Luckily the common factor was the ability to communicate in English albeit with varying degrees of success.

British observers were first in theatre, arriving on 17 April 1991 under Col P Grant-Peterkin OBE, the military adviser (MA) to the CMO. This was the first time British officers had been used as observers on a UN mission — perhaps they will become part of new UN missions in the Western Sahara (MINURSO), Cambodia and possibly Yugoslavia. Initial employment in UNIKOM was as liaison officers and clerks in

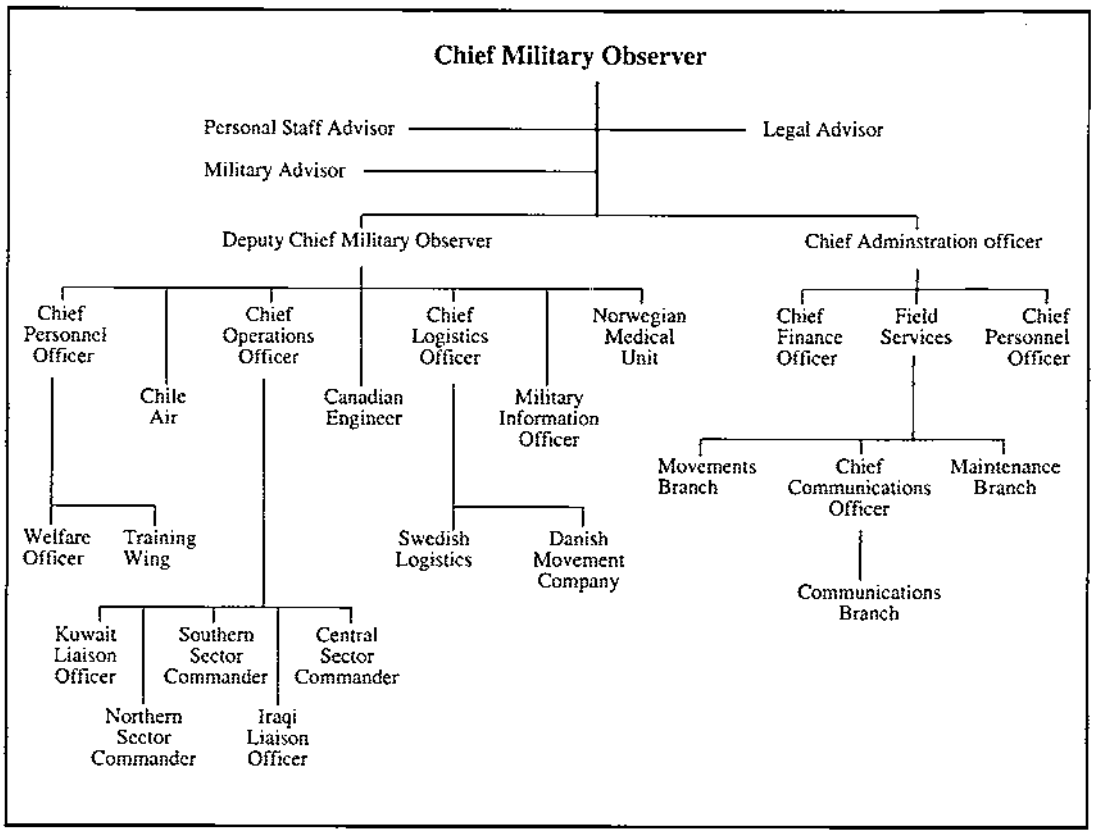


Figure 1 Command Structure of UNIKOM

the temporary HQ, and as managers in the clearing and repair of warehouses at Doha, the logistics base.

The military observers (MILOBS) were deployed into the DMZ which was divided into three sectors: North, Central and South. (See map on previous page).

The Northern Sector monitored the Khor Abdullah and the northern coast of Bubiyan island; the towns of Safwan (the site of a large refugee camp after the war) and Umm Qasr were also in the Northern Sector. UNIKOM HQ was to be located in Umm Qasr. Since the majority of UNIKOM operated from Kuwait this location for the HQ assisted the UN in maintaining its neutral stance.

Safwan hill was the dominating feature in the West of the Central Sector and the surrounding barren and undulating landscape held scattered remains of the Rumailah oil industry and the Republican Guard. Iraq had accused Kuwait of drilling diagonally across the border into its territory in the Rumailah oilfield, a factor in the initial dispute before the Iraqi invasion. A single cratered tarmac road, called the pipeline road, connects the Kuwait-Basra road with the southern part of the DMZ which followed the Basra-Yanbu oil pipeline from Iraq to the port of Yanbu in the Red Sea.

Large uncleared minefields were the predominant feature in the Southern Sector where the ground was open and had a maze of sandy tracks. Mines caused many civilian casualties during the clearing operations. Not much went on here although there was a sheep market which attracted the civilian population, and the sale of arms was a common trade. The DMZ ended on the Kuwait-Saudi Arabia border.

On 25 April 1991 the first OP was established on Safwan Hill and occupied by officers from Britain and America. OPs increased in number as sites were cleared of ordnance and occupied by observers in tents or disused buildings. Utilising equipment remaining in the

surrounding area the OPs became more habitable, and each sector produced its own system for resupply, relief, manning and patrolling. Later in September 1991 common systems were established for manning and patrolling throughout the three sectors, with tactical areas of responsibility (TAOR) for each OP and a series of common reference points. UN OPs became a common sight in the DMZ.

Safwan refugee camp was constantly monitored and in May 1991 the majority of the refugees was transported to Saudi Arabia.

Outbursts of activity occurred at Iraqi police posts as they were attacked by members of the Saudi Arabian Army and fifth columnists from inside Iraq. UNIKOM was appreciated more when it was realised that its presence prevented these attacks from escalating and this fact made the monotonous patrolling worthwhile.

During September 1991, Iraqi civilians began to enter the DMZ in order to collect mines in return for money supplied by the Iraqi government. The whole process was badly organised, with no instruction or medical cover and as a result serious casualties were incurred by many of the civilians as they removed mines without disarming them properly or failed to notice anti-handling devices. Casualties were brought to the UN posts in increasing numbers, particularly OP C4, often by-passing many other OPs en route, and it was whilst commanding OP C4 that I spent the most rewarding time of my tour.

The two medics attached to the OP could deal with no more than one serious casualty at a time and often the MILOBS would be called to assist. The majority of casualties had lost a foot, had multiple lacerations incurred in accidents some three hours before arrival and were suffering from shock.

The lessons I learnt in dealing with up to six serious casualties whilst maintaining control of a multinational team and the surrounding Iraqis, were many.

The main medical problem was to place an intravenous drip into a casualty suffering from shock, whose veins in arms and legs had dried out, blood only circulating around vital organs. The fluid had to be administered slowly using a drip otherwise wounds would start bleeding again. (A missing foot had its advantages as there was minimal bleeding from a very large wound.) Morphine was administered directly into the bloodstream where possible because with this method it took only two minutes to work whereas when administered into the muscle it took 20 minutes.

As many nationalities were involved in dealing with casualties it was essential that all personnel understood where equipment was kept and the terminology for it was standardised throughout the team. Orders had to be clear, without jargon and a set of detailed tasks was issued.

Iraqi civilians often carried mines on their person and in their vehicles. Observation posts were surrounded with concertina wire and a two metre high fence, enabling control of entry and exit of personnel and vehicles. However as mines were found directly outside the compound it was sensible for helicopters to land immediately outside the compound gates to prevent further injuries to personnel carrying stretchers.

Life for the observers was often boring during periods of inactivity. A good sense of humour was essential together with the ability to work with every sort of nationality in close proximity for up to six months. The routine short breaks in Kuwait City were looked forward to by all, especially after enduring the heat and wind of the desert in July and August where temperatures were often 30°C at night.

As time in the desert progressed, the eye became used to the environment enabling different types of fauna and wildlife to be distinguished; apart from numerous camels and sheep, for instance, a mixture of different coloured lizards up to one metre long, snakes, desert rats, scorpions, spiders and many wild dogs could be seen. A knowledge of various creatures' habitats and characteristics is important, especially in relation to dealing with a bite or sting.

Wild dogs were by far the major problem and hundreds were killed by UN forces in the first couple of months as they prowled around the OPs at night.

Despite obvious disadvantages a tour with UNIKOM provides a unique insight into world politics and an opportunity to serve in close proximity with many nationalities, some of whom Great Britain considered hostile until recent world developments. I can strongly recommend it.

Motivation and the TA Sapper

MAJOR A J WILLIS BSc FRGS AMICE MIMM

Having become part of the then Engineer Specialist Pool in 1974 the author's main activity was involvement in well drilling. An overseas posting with a civil engineering consultancy brought an eventful association with the Queen's Gurkha Engineers in Hong Kong.

Demands of work in the construction industry and management consultancy in South East Asia and the Middle East being incompatible with Territorial Army commitments, there followed a period on the Regular Army Retired Officer list. From there, on return to the UK, the author has been resurrected into 12 Brigade and is currently with 218 Squadron (Airfield Damage Repair) at Royal Air Force Honnington

Options for Change, propose a new and enhanced role for the Territorial Army (TA) and other Reservists. If current plans come to fruition Britain's 250,000 part-time TA and Reserve Forces will be allowed for the first time in many years to play an immediate front line role in hostilities short of full scale war.

According to a recent article in the *Sunday Times*, Ministers at the time of *Desert Storm* were reluctant to call upon the reserves. When they did the reserves were not always wholly prepared for conflict and as a result fewer than 2000 men and women could in fact be mobilised rapidly and appropriately. The Army has now, it is understood, commissioned a study to measure the efficiency of TA training, proposals have been put forward for improved cash bonuses based upon length of service, and a pension scheme may be introduced. In addition, the Prime Minister is understood to be prepared to back a recruiting drive. It seems that although the strength of the TA is expected to be reduced from about 75,000 to 63,500, the problem of retention and "value for money" of those recruited is still a troublesome issue.

In the midst of all this turmoil, then, what is it that does motivate a TA soldier to join? More importantly, what is it that persuades him or her to stay?

Umpteen recruiting campaigns have tried to get at the heart of the matter. There have been attempts to play down the "playing" soldiers image, with emphasis on the strong and vital component of the Army represented by the TA. "The truth is, they need us", ran the slogan. Others, a little more accurately perhaps, appealed to the Inner Man — Kipling's "If ... you'll be a man, my son.". Others still targeted employers, arguing that trained TA soldiers bring resourcefulness, responsibility and other valuable assets to any self-respecting firm. However, despite the hundreds of thousands of pounds spent on these campaigns they all seem to have hit wide of the mark.

Sitting in my Saracen, at 0230 hours, in the teeth of a pitch black Siberian Winter TACEVAL (Tactical Evaluation), experiencing the depths of discomfort because my NBC (nuclear biological and chemical) suit was becoming the consistency of soggy blotting paper, I listen to "World War Three" being played out over the radio, hoping to be declared "dead" very soon. I cannot believe that my divisional chief executive, on Monday morning, could think the entire exercise any more than proof of my lunacy and loss of touch with reality. It's quite difficult enough explaining to an understanding wife without eliciting pitying glances from fellow workers.

Maj A J Willis
Motivation and the TA Sapper (p138)

Something drives us to it — but what? A look at the basic theory of psychology might provide an insight. Maslow, in *Principles of Abnormal Psychology* (very apt), believed that Man is motivated to behave in certain ways because of a series of driving forces or needs which he divided into a hierarchy shaped simply like a pyramid.

Maslow maintained that the basic driving force was the need to survive, and this forms the foundation of the pyramid. Much of man's behaviour is driven by the need to find food, shelter and other essentials. These having been satisfied, behaviour is driven by a higher level of need, such as the need to feel loved and to belong, and to gain self-esteem. Having tucked those under the sociological belt, so to speak, Man can have the pinnacle, the very tip of the pyramid — the fulfilment of "self-actualisation". This is the need to find and realise an individual's full potential, and clearly rather more abstract than the lower levels of fulfilment.

We are to a certain extent trapped by the process of evolution here. At the outset of Man's development his every waking moment was fairly well occupied outwitting the elements and predators. His ability to aspire to higher levels of the pyramid was limited. Maslow's argument continues: that individuals will seek out situations which will stimulate and satisfy the drives listed above. But now the environment of modern civilisation permits a more rapid aspiration to the levels of self-esteem and self-actualisation. Physiologically, however, we are still to a larger extent than perhaps permitted, built for the role of "basic" survival — the exhibition of, fundamentally, the aggression that enabled tribal man to survive.

It isn't too difficult to see how joining the TA could help the fulfilling of higher and lower needs by providing situations that push a person a little bit further than "normal" civilian occupations. There is also the tantalising possibility of the ultimate situation — facing death as all skill, ability (and luck) are pushed to the utmost in conflict.

Those basic drives from the dawn of our evolution include the desire for conflict, or at least the desire to "win" in a basic situation, the recognition of which is hardly in dispute. As Benito Mussolini said: "Warfare is to Man, what childbirth is to Woman.". A little stark, but it opens the discussion to the problem that such needs and drives have to be channelled and controlled if dire consequences are to be avoided. It can be said that the TA provides the best of both civilian and Regular Army worlds by allowing outlets for these energies in a socially acceptable way which also provides an element of service to others.

Perhaps that's what it's all about. I spend a lot of time in my job attempting, hopefully with success, to meet deadlines. In one recent management development seminar the course tutor dwelt on the subject of job satisfaction. There seemed to be a variety of methods of measurement available, but one struck me in particular. Although rather subjective, there ought to be, he said, a feeling of elation, perhaps; a sense of continuing achievement, a "high" at the end of the day. Certainly the sense of satisfaction accompanies the achievement of a deadline. Some of my colleagues don't seem to be able to work unless they're under pressure. Living on this permanent high seems to be almost an addiction.

I'm told that's dangerous. Heart attack country. But when the stakes for which one plays in meeting the deadline are, say, the company winning an enormously valuable overseas contract, the feeling, when it's all over, is that of "really living".

The potential for tasks in which we become involved in the TA is of the same order, only greater — the outcome of a decision could at some time be literally a matter of life and death, and not play. This can be somewhat mind-blowing. It's an unfortunate fact that some men, after prolonged exposure to the environment of warfare, develop an abnormal belief that nothing outside of having their lives on the line is relevant to their existence. The sense of anti-climax after the company wins its contract, only enormously larger and unbearable.

In the TA there is the chance of finding a middle road through all of this. The point is that we are here because what we are doing is "different", it has an urgency and energy which gets the adrenalin going. And our job is to continue to provide the excitement, the dynamism, which can keep our Sappers interested, turning up for weekends, and — motivated.

Perhaps the slogan is right, they do need us, but it's probably more the case that to keep our sanity and sense of purpose in this material world, we need the Army.

Young Officers' Course Commandant's Essay

SECOND LIEUTENANT R G BEAUMONT BEng MEng

Second Lieutenant Richard Beaumont attended Southampton University between 1986-1990 as an Army Undergraduate, gaining a Bachelor of Electrical Engineering in 1989 and a Master of Engineering in 1990. He then attended the Standard Graduate Course at Sandhurst before being commissioned in April 1991. In June 1991 he came to The Royal School of Military Engineering for the Young Officers' Course and has recently joined 35 Engineer Regiment. He is a keen sportsman and is at present training for the Devizes to Westminster Canoe Race.

Introduction

During their course at Chatham each young officer (YO) is invited to write two essays the second of which is for the Commandant. There is a choice of titles available but Second Lieutenant Beaumont chose to answer the following question: *The 1980s saw the development of a more materialistic society, with those who grew through their teenage years in the period being known as 'Thatcher's Children'. Does this change bode well for the soldiers who are to be led by the Troop Commander of today?*

In his book on British Society, A H Halsey, Professor of Social and Administrative Studies at Oxford, stated that in all fields of study it must be remembered that British culture is deeply individualistic with a deeply embedded cultural assumption that the ultimate values are individual. The aim of this article is to examine whether the type of ugly individualism produced by the Thatcher era, namely materialism, is prevalent amongst the current generation of troop commanders and if so, whether it is a threat to the traditional qualities of leadership expected of young officers.

Every decade has its character or reputation, be it the youthful rock'n roll of the fifties, the anti-war psychedelia of the sixties or the stagnation and unionisation of the seventies. Each has drawn praise and criticism from those who inherit the products, namely the employable youth. Now that we are embarking on the nineties what are the products of the eighties really like?

In order to address this the influences that were present need to be identified. The eighties started with high unemployment, crippling union power, low international standing and a legacy of inept economic policy which had led to a weak pound and high inflation. Following the election of 1979 the country was under conservative rule with Britain's first woman Prime Minister, Mrs Margaret Thatcher, at the helm. Under that government's policy, the early years of the eighties saw a massive effort towards curbing the powers of unions, revitalising industry and therefore employment through economic lib-eralisation and emphasis upon the individual's efforts to succeed. Almost inevitably these polices ran foul of public opinion, as they to some extent removed the cosseted lifestyle which many had enjoyed, particularly in the nationalised industries. However, bolstered by the Falklands campaign, the Conservatives were returned to power in the 1983 election and continued with their policies. Union resistance to change came to a head and went into decline

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with the miner's strike of 1984 and then the long haul to recovery began. Throughout 1985, 1986 and 1987 British industry began to recover. Inflation and unemployment fell, the privatisation of nationalised industries released wealth and reduced financial burdens. This in turn led to an increase in the public awareness of share ownership. The revitalisation of industry led to a general rise in affluence which brought about a boom in tertiary industry. It appeared that the poorest part of society saw no change.

In June 1987 the Conservatives were returned to office again and it is this period which saw the growth of materialism characterised by the young city worker or 'Yuppie'. With the pound's strength and the growth of business, the financial marketplace became awash with young men and women in the 25 to 30 year age group who worked long hours and made a great deal of money. It was estimated that some 4000 employees earned in excess of £100,000 a year. A surplus of disposable income led to the purchase of houses, cars and even businesses, often if only to avoid tax. Further down the scale, the average worker received better wages, increased benefits and was able to move up the housing ladder, purchase more luxury items and go on better holidays.

However the bubble burst and as the financial markets crashed, the boom turned to recession. Unemployment began to rise. With the drop in disposable income, tertiary industry suffered and as the marketplace shrank so secondary industry suffered too. The housing market, no longer fuelled by a ready supply of first time buyers, began to stall and many people suffered the consequences of high mortgages well above the value of their property and insufficient income to pay them.

Thus the eighties saw a decline-to-growth-to-decline cycle. Alongside this were many other influences, most notably the increasing assimilation of Britain into Europe, the rise of AIDS (Acquired Immunity Deficiency Syndrome) and the gradual reduction of East-West tension. All have had a part in shaping those who grew up through the eighties, so what are 'Thatcher's Children' really like?

There are two stereotypes; militant student and yuppie. The former is anti-Thatcher, pro-CND, pro-animal rights, poor, likes marching through London about 'issues', believes the police to be 'racist pigs', does not eat meat and would like nothing better than to see a hunt master sprayed with aniseed and chased cross-country by his hounds. Meanwhile, the latter is overpaid, drives a GTi, enjoys talking about wine and shares over a nouvelle cuisine meal, and sees hunting as an excellent use of corporate expenses. He is invariably called Alex, Charles or Henry. Like most stereotypes they represent probably less than half a per cent of today's young people.

So what is the majority like? In order to provide a bench mark it is necessary to generalise. They are, in comparison to their predecessors, aware of money and its uses and although a general increase in materialism is apparent it is no more than is to be expected, given that they grew up in a period of relative affluence. They have firm views on what they want for themselves in the future in terms of career. Though ambivalent over religion they tend to have firm opinions on the way of politics though they tend to be left or right or neutral rather than left or right wing. They have a basic knowledge of world affairs, particularly of life and the environment. To paint a picture with one stroke they are aware, ambitious, and yet on matters of religion and politics largely apathetic.

Having now seen what the eighties has produced, what is it the Army wants? To go by its recruitment advertisement, the Army wants young men and women who reject the idea of the 1815 train from Waterloo and who are prepared to delay the writing of confidential reports till a fellow officer has been given a good thrashing at squash. Thus once again there is a stereotype, this time created by the 'glossy ads'. Although appealing in its imagery it does not reflect the real requirements. Having a good education is of no value if you can't apply it to problems of a military nature. Being fit, keen and enthusiastic is only an advantage if you can use it to lead men, and being a team man is no good if that's all you are.

Thus what the Army wants, and would like to get is a well educated, practical, fit, enthusiastic team leader who is motivated and can motivate. In addition he must be able to pass through Sandhurst and on joining his own regiment take over the command of 30 men and effectively manage their professional futures whilst keeping them fully prepared for any operational requirements. In addition he must be prepared to deal with any of the myriad of social, legal and personal problems that beset these men, with no

concern for the time and effort spent doing so. Thus while taking on and coping with responsibilities far beyond those entrusted to his contemporaries in the civilian workplace he must accept working a seven day week, 24 hours a day flexitime, and the professional difficulties of trying to do a job with an under strength troop and ageing equipment. Furthermore, he must live under the constant threat of terrorism and all for a salary that is soon overtaken by that earned by his peers in less demanding jobs.

This was in the past somewhat offset by the opportunities for travel, life in the mess and the whole package of 'being an officer' as it was seen by the public. However these sweeteners are gradually turning more sour as cuts, contractorisation and a decrease in world tension take their toll.

With all this in mind, the Army has undertaken a policy of positive recruitment. The drain to the city in the late eighties was stemmed with offers of gratuities for Short Service Commission officers and sponsorship for university, both of which ensured a continued influx of new blood. At the other end the MARILYN (Manning and Recruitment in the Lean Years in the Nineties) report brought about retention payments to safeguard the availability of middle management in the mid-nineties. Thus money was identified as the main weapon in achieving a full quota of officers.

With the recession, the problems of recruitment have lessened and so gratuities have gone and retention payments will continue beyond 31 March 1993 only if it is necessary to do so. The cynical view of this is that when the Army is short of officers it pays up, when it isn't it doesn't.

With this somewhat black picture of life beyond the advertisements in mind how does today's young officer compare with the Army's idea of today's young officer, particularly as applied to the Royal Engineers? Firstly, it is of paramount importance to state that the Corps is not the usual target of those who simply want a tick in the box on their CV. The Corps does not offer the immediate glamour of the cavalry or the historic infantry regiments, nor can it accept those without at least an aptitude for matters engineering. Furthermore, for a short spell as an officer prior to going to the City, seven months of YOs' course is a bit too much like hard work. This process has already removed a great majority of those who could be classified as true materialists, so what remains? The generalisation described today's young as ambitious, aware if slightly apathetic on religion and politics, so how do these fit? To start with, today's troop commanders have already completed Sandhurst and their YO course, a not inconsiderable test for the 'materialistic' young person, effectively filtering out those in it for themselves. Next, it is ambition that drives people to want to do well, to progress. In order to progress results must be produced that are indicative of ability. Put into context this automatically requires high professional standards in manner, appearance, organisation, written reports and leadership in the field, all of which are of benefit to his troop. Since the troop commander's success depends largely on his troop's performance, it is in his interest to ensure that they are treated well and managed correctly. Any troop commander who attempts to push himself too far above his station is soon likely to receive a reprimand from his superiors, his peers, his subordinates or frequently all three, thus a natural curbing of the over-ambitious exists. Furthermore, personal ambition gives the young troop commander a better understanding of those he commands who are more than likely equally ambitious, particularly if they are trade qualified.

One of the hardest tasks for any young officer is dealing with the problems of his men, the three most common being money, relationships and the law following not far behind. Since today's young officer is just as likely to have an overdraft as his men and is frequently a partner in a serious relationship, as opposed to the traditionally single subaltern, advice can probably now be given with a great deal more soundness than before. Put simply, the gap between officer and soldier has been reduced, difficulties that were either alien or taboo are becoming common to both, with no barrier to their discussion, allowing troop commanders to be more effective in the management of their men. Whilst this could lead to over familiarity, the distinction between being able to talk and of being on first name terms is still well understood.

Thus it would appear that today's troop commander is in a good position to command his men, but what of the future? As identified earlier, the Army's glamour is receding. Travel is becoming less frequent, pay for middle management is still behind that available in the civilian workplace. Furthermore, the problems

of getting into the housing market and the concerns of marriage, in particular a general rejection of the 'wife in tow' from tour to tour, is leading many if not most of today's young officers to keep their options open with no firm commitment to the Army as a career. In the final analysis the Army is just another employer that must recruit and retain, and with its high entry requirements that is not an inconsiderable task.

In conclusion, although today's generation of young officers may be considered materialistic, the very fact that they have passed through Royal Commissioning Board, Sandhurst, and Chatham would indicate that in the opinion of their elders they still have the characteristics and abilities to command an engineer troop and whilst those standards are maintained, then today's soldiers have nothing to fear.

The End of Mussolini's East African Empire

BRIGADIER M W BIGGS CBE MA CEng MICE

As Brigadier Fowkes and I drove out of the city after the Liberation of Addis Ababa on 7 April 1941, (See this *Journal*, August 1991, *The Liberation of Addis Ababa*, page 162), we thought it was all over bar the shouting; in fact it was to take another eight months, and cost us more casualties than had been incurred to date, to finish off Mussolini's East African Empire.

In our theatre of war, whilst Cunningham's forces from East Africa had broken through the Italian defence line on the Juba and swept through Somaliland and eastern Abyssinia to capture the capital, General Platt's forces from the Sudan had overcome stubborn resistance at Keren, where the Italians fought tenaciously and where the Duke of Aosta had committed his last and best reserves of Savoy Grenadiers and Alpini. Asmara and Massawa had fallen, and the Red Sea coast had been cleared, so that it was safe for American shipping to resume supplies to the Middle East — which had been Wavell's prime objective in mounting the campaign. The Emperor had raised his standard in the Gojam, and although the tribes did not exactly flock to join him until they saw which side was more likely to win. The remarkable actions of *Gideon* Force, under Sandford and Wingate, tied down Italian forces and helped to undermine the enemy's morale.

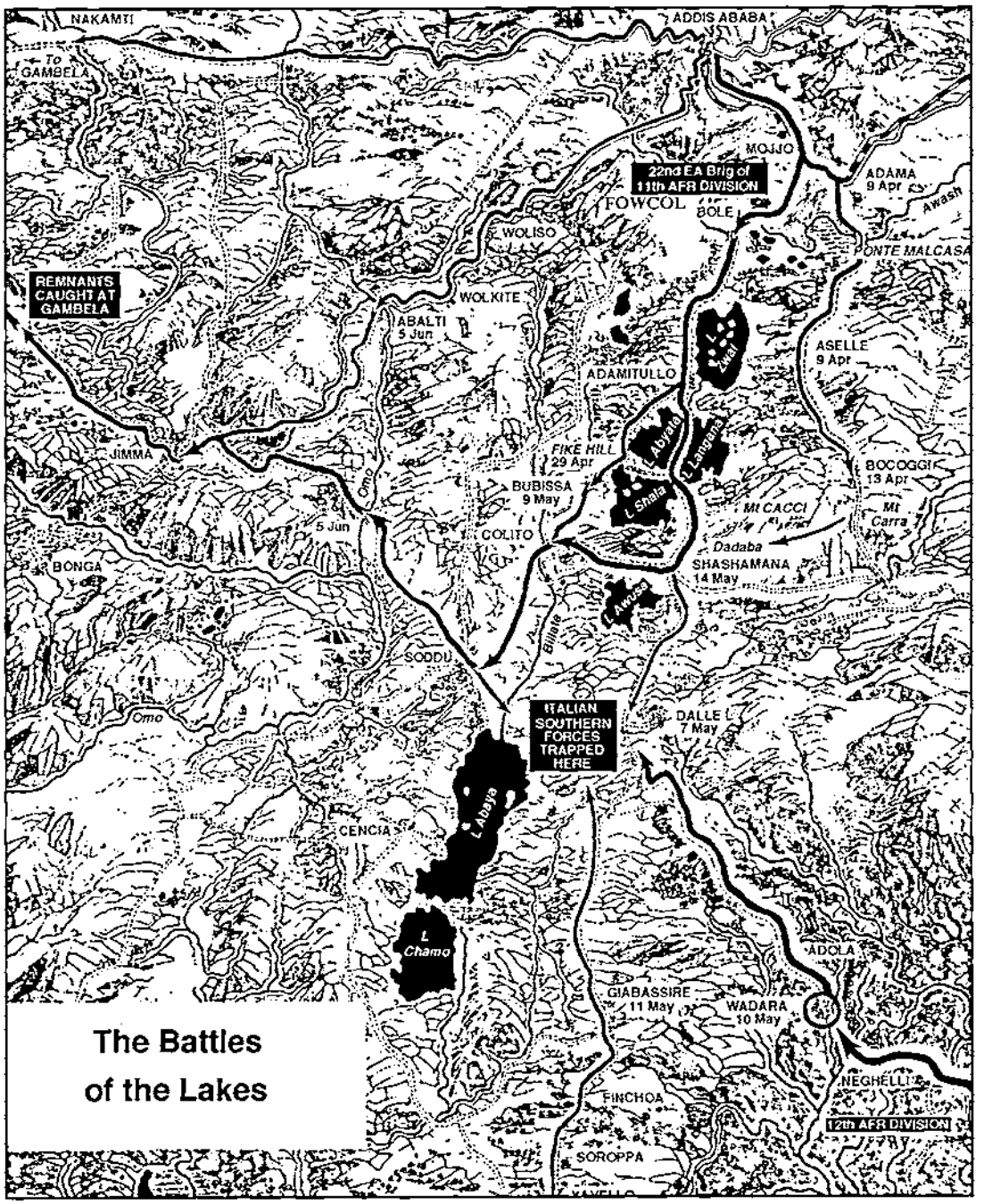
Mussolini had however ordered d'Aosta to fight on as long as possible to prevent the release of our forces to reinforce the Middle East. d'Aosta himself withdrew North to the stronghold of Amba Alagi astride the Via Mussolini, where he was joined by the defenders of Keren and other troops from Eritrea. There he was attacked from the North by the 5th Indian Division, under Major General Mayne, and from the South by 1st South African Brigade, from 11th African Division, who were under orders to get through and embark for the Middle East. After some fierce fighting in which our South African friends distinguished themselves, d'Aosta capitulated to General Mayne on 17 April, and d'Aosta and his garrison marched out with the honours of war.

The Battles of the Lakes

There remained seven Italian divisions, comprising some 40,000 men in southern Abyssinia, in a huge net between the remaining two brigades of our 11th Division and 12th African (12A) Division pushing up slowly from the South. The 1st South African Division had been withdrawn and sent to the Middle East, less one brigade retained as a reserve in Somaliland, and 12A Division had taken over the whole of the southern front. 24 Gold Coast (GC) Brigade were held up by fierce enemy resistance at Wadara (where the Abyssinians had held up the Italians for 11 months in 1936), whilst the 21st and 25th East African (EA) Brigades were pushing slowly up from Yavello and Maji, beset by movement and supply problems due to the rains which had already broken in the South. Indeed for a long period they were on half-rations, because vehicles were unable to move through the mud.

The Italian forces, under General de Simone, which had been opposing our drive towards Addis Ababa, had retreated southwards over the River Awash, destroying the Ponte Malcasa at Adama and the Ponte Macchi at Bole. At the former, after losing two armoured cars knocked out by anti-tank guns, 5 King's African Rifles (KAR) had managed to get across and clear the immediate South bank, but enemy 105mm guns, outranging our lighter artillery, continued to bring down harassing fire on the bridge area. When Brigadier Fowkes and I arrived at the scene, he turned to me and said: "You're a Sapper. Let's see what you can do to get our guns across.". I managed to remember enough of my fieldworks training to get a raft of empty oil drums built, upon which we ferried across the guns. When they came into action the enemy's fire ceased and they withdrew.

Meanwhile 54 EA Field Company had started to construct a makeshift crossing with a railway truck and captured lorries further upstream; when this was completed on 11 April, 5 KAR and supporting troops crossed and moved South into the hills to occupy Aselle unopposed. They were in time to save the lives of a hundred Italian civilians, mostly women and children,



besieged by Abyssinians in an experimental agricultural station. A little further on we came across the naked and mutilated bodies of a dozen Italian men who had been ambushed the previous night when trying to reach the safety of the farm, a grisly sight which did not raise our esteem for the roving bands of so-called "patriots" who accompanied our advance. It was the fear of falling into their hands which helped to undermine Italian morale, and led to their hastening to surrender to British forces when defeat seemed imminent.

Engineers with a reconnaissance force further South to Bocoggi and Cofole, reported that the road along which the Italians had withdrawn had degenerated into a sea of mud. Brigadier Fowkes therefore decided to switch the line of his main advance to the parallel road running South from Mojjo, which was reported to be better. 22 Brigade then had to retrace its steps via Ponte Malcasa and Adama to Mojjo, and thence South over the Ponte Macchi at Bole, which had by 24 April been replaced by a pontoon bridge. *Fowcol*, as 22 Brigade was again named, was woefully short of infantry, having only one and a half battalions: 5 KAR (less two companies left to block the Aselle road) and 1/6 KAR, as 1/1 KAR was employed on lines of communication (LofC) protection and rounding up scattered Italian forces which had been by-passed by our advance. Subsequently by 3 May it was reinforced by two battalions of the reserve South African (SA) Brigade. Our supporting arms included SA light tanks, field and anti-tank artillery, and even a brace of 60-pounders allegedly taken from a World War One memorial in Johannesburg, EA armoured cars, two mountain batteries, and our own 54 EA Field Company; last but not least we had Henfrey's Scouts, a patriot unit raised and led by a captain of that name, formerly of 3 KAR, which was invaluable in scouting ahead, bringing in information of the enemy and attacking and ambushing their convoys and patrols. We also had air superiority, thanks to the South African Air Force (SAAF) and RAF, although this advantage diminished as the rains increased.

Fowcol advanced down the road from Mojjo after the retreating Italians, whose rearguards put up stiff resistance from a series of defensive positions. The Italian tactics of putting all forces in the front line, with little in reserve, led to their flanks being repeatedly open to enveloping movements by our infantry. Our advance was also hampered by blown bridges and mines, and increasingly by rain turning the earth roads and tracks into mud and the low ground into swamp.

Adamitullo was occupied unopposed. From here two roads ran South on either side of Lakes Abyata and Shala; the eastern route was known to be passable, though it involved two river crossings, and led direct to Shashamana where the Italians were camped in strength, while the western one was a mere track and led past the foot of Fike Hill and thence on to join the Shashamana-Soddu road at Colito. As this was the Italian southern army's main route to escape westwards towards Jimma, they attached great importance to holding Fike.

Although *Fowcol* was so short of infantry that even minor operations seemed hazardous, Brigadier Fowkes was undaunted; despite having been warned of an impending counterattack aimed at cutting General Cunningham's LofC, he sent the two companies of 5 KAR to attack Fike. In a brisk and skilful action, in which one company demonstrated frontally while the other worked around the enemy's flank and stormed the hill with the bayonet, the strong position was overcome. Lieutenant Colonel Hurt was awarded the DSO for this and his battalion's brilliant action at the Awash gorge in the advance on Addis Ababa. The enemy counterattack fizzled out after one encounter in which three of our armoured cars were demolished.

The South Africans, assisted by 6 KAR, then successfully attacked the enemy behind the Dadaba Piccolo river, and went on to capture Shashamana and Dalle further South. The two South African battalions then reverted to divisional command and remained at Dalle to block the escape of the Italian division's retreating before 12A Division's advance from the South. In all these actions numbers of prisoners had been taken but subsequently, as pressure from 12A Division from the South increased, thousands more and much equipment fell into our hands until 21 EA and 24 GC Brigades met up with the South Africans at Dalle.

The Advance on Jimma

Fowcol's next task, in conjunction with 23 Nigerian Brigade advancing down the direct road from Addis Ababa, was to round up the large enemy forces in the southwest in and around Jimma. We therefore turned westwards from Shashamana to join up with 5 KAR; they had fought another successful action at Bubissa, in the Colito area, together with two other companies which had rejoined them. The Italians had taken up positions beyond Colito behind the Billate River, having first destroyed the bridge. 1/6 KAR, with artillery support, crossed the river and put in a bayonet attack on the enemy's left flank, clearing the whole forward position. Just when the battle appeared to be won, Italian medium tanks put in a counter

attack, whereupon Sergeant N Leakey (Kenya Regiment and 1/6 KAR) leapt on the leading tank and shot the commander and crew; he then went after another tank and was last seen climbing onto it. His action saved the day and earned him a posthumous VC.

It took the Sappers several days to repair the bridge after which *Fowcol*, joined by 2 Nigerian Regiment (NR) continued the advance to Soddu, where they captured two divisional commanders and staffs, 7000 officers and men, with six medium and four light tanks.

Both the roads converging on Jimma had to cross the River Omo, one of the three great rivers of Abyssinia. It flows in a deep valley (an extension of the Great Rift Valley) 2000 feet below the mountains on either side, the tropical climate and lush vegetation contrasting with the cold and clouds shrouding the mountains. On our route from Soddu the road to the river which zigzagged down the cliffs, had been extensively demolished and liberally mined, and was under observation by enemy artillery. The Italians had not made a road bridge over it but had operated a ferry on a cable, the approach to which was chock-a-block with wrecked and abandoned vehicles. A footbridge was blown up before 2 NR could seize it. The river was in flood, about 100 yards wide, flowing at some six knots and everywhere too deep to ford.

54 EA Field Company and askaris of 2 NR achieved wonders in getting the road down to the river open to traffic by 1 June, and subsequently in crossing the river itself. The Official History records that "the river was the scene of titanic and often heroic efforts. Satisfactory crossings were sought for in vain all along the steamy, mosquito-ridden jungles of the river banks; assault boat followed assault boat into the night, only to be swept away downstream into the darkness; the engineers fought by every means possible to bridge the six knot, 100-yard-wide rush of oily water; one of them, who swam the river naked, towing a rope, encountered and arrested two armed Italians upon the further bank.". On the night of 2 June 5 KAR, with the help of Sappers of 54 EA Field Company and experienced Nigerian watermen, managed to get three platoons across in assault boats a mile below the ferry, but this operation had to be suspended when all but one of the boats were swept away or damaged; they clung to the precarious foothold for three days against enemy patrol attacks and periodic shelling, whilst desperate efforts were made to find a better crossing elsewhere. Eventually three assault boats were repaired and used to get food to the bridgehead, and reinforce it with more troops. By daylight on 5 June two more companies of 5 KAR and two of 2 NR were across and that evening, supported by our artillery, 5 KAR worked their way up onto the western heights, swooped down onto the enemy's 105mm guns and put them out of action. The Nigerians meanwhile, cleared the river bank to establish another bridgehead covering the old ferry crossing. When the footbridge had been repaired by the Sappers, the remainder of 5 KAR crossed, followed by the rest of the Brigade. On 7 June, 5 KAR went on up the escarpment, using captured lorries to surprise the Italians who had blasted away 100 yards of the cliff face; askaris of 5 KAR spent the next two days, under Sapper direction, shovelling rock from above to fill the gaps, while a third was repaired by local tribesmen. Meanwhile 54 Field Company got a vehicle ferry working, upon which the Brigade transport began crossing, and then started work on a pontoon bridge. By this time there was a shortage of bridging material. Provision for the northern crossing of the Omo at Abalti had been made long before, but a crossing of the Lower Omo had not been anticipated. The only suitable material for this width of the river was pontoon equipment, available at Diredaua and at Berbera. One hundred yards of pontoon bridging equipment was sent up post haste (the bridging column driving day and night to get up to us) and, with the aid of makeshift piers on either bank, it proved to be just enough for our Sappers to bridge the river.

On the morning of 10 June Brigadier Fowkes went forward over the repaired demolitions, accompanied by a troop of armoured cars and a section of light tanks, to reach the Abalti-Jimma road at the Little Ghibbie. Here he was met by a company of 1/1 KAR, brigaded temporarily with 23 Nigerian Brigade, which had managed to force a crossing of the Omo after a similar struggle to ours. Italian envoys came out from Jimma to negotiate its surrender, and the town was entered unopposed on 21 June. Another host of prisoners, including 12 generals, was taken as well as a hoard of gold bullion worth a quarter of a million pounds. Although the remaining Italian forces retired further West, their situation was increasingly hopeless as they

were caught between a mobile column comprising 1/1 KAR and supporting troops, other British forces moving up from the Sudan, and patriots.

The operations in Galla Sidamo were the most strenuous, the most difficult and the most creditable of any undertaken by the EA Force in Abyssinia. Their real merit has never been recognised. The BBC referred to them as "minor mopping-up operations", apparently assuming that the occupation of Addis Ababa had virtually ended the campaign. Brigadier Fowkes, in an Order of the Day at the end of this campaign, recorded that *Fowcol*'s contribution, in an advance from Mojjo of some 400 miles, during which three major and two limited actions were fought besides numerous advance-guard and patrol engagements, was the capture of 12 generals, 25,000 prisoners, 85 guns and numerous small arms and other war material. At no time did the strength of *Fowcol* exceed 6000 men!

After the Rain

THE war in Abyssinia was not finished however. The rains had stopped play completely for several months after the fall of Jimma, but there still remained a sizeable Italian force in the north-west, centred on Gondar. To my delight my old boss, now Major General Fowkes and commanding 12A Division, sent for me to be his GSO2 (Intelligence) for the forthcoming operations against Gondar. As I was preparing to fly back up to Abyssinia, news came to me that my brother-in-law, Tony Coombe, had been killed. He had been promoted to command 54 EA Field Company, and was leading it northwards up the Via Mussolini to join the forces assembling for the Gondar operations when his African driver drove him over a precipice — a dreadful waste of a brilliant young Sapper officer who had already distinguished himself in the forefront of the battles; on one occasion, when reconnoitring a demolished bridge out in front of our advance, he was even captured by the Italians but released again when they themselves had to surrender. His MBE came through posthumously. He and his young wife had been married exactly one year. Two days later I flew up to Addis Ababa, where my first duty was to visit Tony's lonely grave, the first in the newly-consecrated British Military Cemetery.

Main Divisional HQ was in the city, but an Advance HQ was preparing to set forth to take active command in the field. I then had the interesting experience of accompanying Major General Fowkes to a levee in the Emperor's Palace. Haile Selassie had comparatively recently returned in triumph to his capital, and his surviving nobles had assembled to pay homage to him. This they did, crawling across the floor on their knees to kiss his feet. We British officers were allowed to march across the slippery floor, halt, bow to the Emperor, two paces left to bow to the Empress, and then retire backwards to the side wall — nobody was permitted to turn their back on the Emperor at any time. Standing against the wall and looking across the hall at the Abyssinian nobles, great Rases whose names had become famous for their resistance to the Italians, and who looked as if they could have eaten the little man on the throne for breakfast, one could not help wondering how Haile Selassie had outmanoeuvred them to become their Emperor in the first place, and had held on to the position until the Italians invaded and forced him to flee. One of his stratagems, I believe, was always to insist that the eldest son of a Ras stay at Court when the Ras was permitted to return to his own land, as a hostage for his father's good behaviour; a similar device to that operated in Tudor times to keep the great Dukes and Barons in order. Indeed one was irresistibly reminded of what one had read of feudal times. Afterwards we all drank *tej*, the national drink; although made from honey, the *tej* served in the Palace was dry as a good sherry.

Early in November I flew on up to Asmara en route to join Advance Divisional HQ which had been newly established at Amba Georgis in the mountains East of Gondar. We flew in a Dragon Rapide which developed engine trouble over the mountains North of Addis, where the terrain resembled the Swiss Alps without the snow, with no flat area larger than a tennis court for a forced landing. Eventually however we spluttered our way safely to Asmara, whence I made my way forward by road via Wolchefit to Advance Divisional HQ.

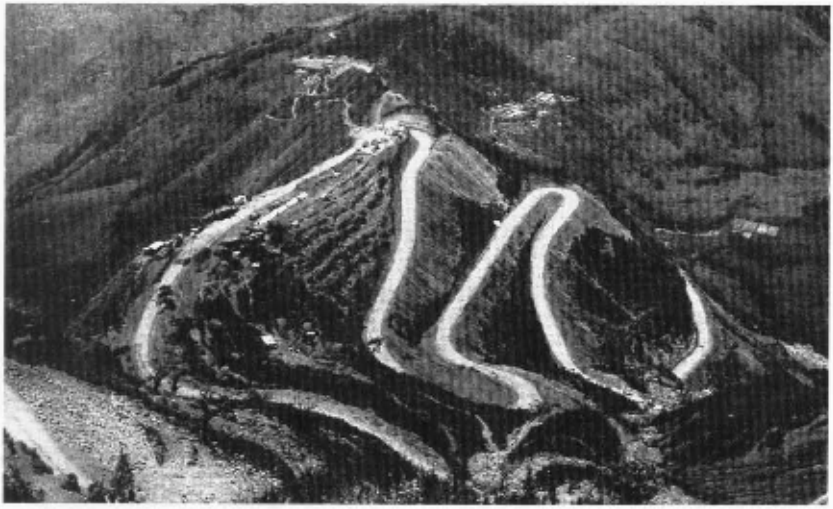
Finale: The Fall of Gondar

GONDAR lies on a plateau some 7000 feet high amid mountains rising to over 10,000 feet to the East, North and West. The plateau slopes away to the waters of Lake Tana, the source of the

Blue Nile. The surrounding area is (or was) fertile, and produced ample crops to sustain the 34,000 troops assembled by the Italian General Nasi for a final stand, under Mussolini's instructions to hold out as long as possible. A tough character, he had had ample time to prepare formidable fortifications with extensive minefields, especially on the main routes of approach. Although roads and tracks of sorts ran to Gondar from all directions, there were only two routes good enough for forces of sufficient strength to tackle Nasi's army; one ran northwest from Dessie via Debra Tabor and the other southwest from Asmara. The latter was blocked by the apparently immensely strong Italian position at Wolchefit, which had successfully defied General Platt's forces from the Sudan before the onset of the rains. The route from Debra Tabor was confronted where it entered the Gondar plain by strong positions astride it on the Kul Kaber-Ferkaber ridge.

At Wolchefit the Italian engineers had built the most amazing road up the near vertical escarpment, with 99 hairpin bends from the valley below to the top (see below); during its construction their workers had to be lowered down the face of the cliff in places to blast and excavate the formation. Driving up it later we stopped to drop stones on the roofs of following vehicles. From their positions on the summit, the Italian garrison of 5000 men with 30 guns could observe every movement and dominate the valley below. General Platt had assessed the natural strength of this position as double that of Amba Alagi and five times that of Keren. However, it had one weakness; it was distant and isolated from the main Italian force at Gondar. During and after the rains patriot forces, led by the gallant Major Ringrose, cut off the garrison from reinforcements and supplies and harassed their outposts whilst, when conditions allowed, the SAAF and RAF continued air raids upon them. This policy of attrition, combined with the assembly of new forces to attack them, so undermined the morale of the garrison that to our surprise and relief at the end of September they gave in and surrendered to 25 EA Infantry Brigade. South and EA Engineers set to work to repair the extensive demolitions, and had the road up the escarpment open to single-line traffic by 8 October.

East Africa Command had taken over all operations in Abyssinia on 22 September, with Major General Fowkes' 12 EA Division responsible for the assault on Gondar. It had then been decided that the Dessie-Debra Tabor route offered the best chance of getting into the heart of the Gondar area, and a column

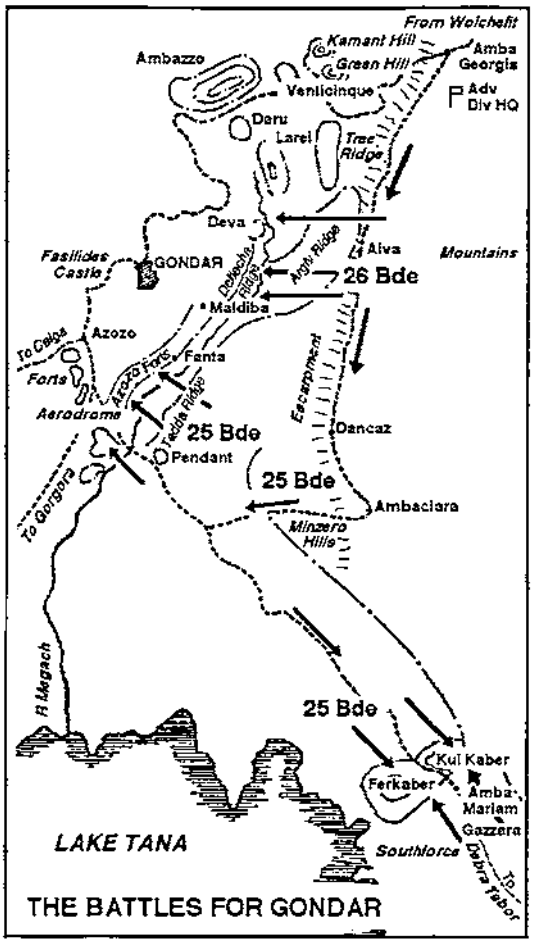


The end of Mussolini's East African Empire (p149)

named *Southforce*, comprising 1/6 KAR (of my old 22 Brigade) with 1 EA Pioneers and a battery of medium artillery set out down that route. However the rains continued longer than expected, and the road became so bad that, after the unexpected surrender of Wolchefit, Fowkes decided to change the main axis of his advance to the route from Asmara. The forces available to him were largely East African, comprising the untried 25 and 26 EA Infantry Brigades, with EA armoured car, artillery and engineer units (including 54 Field Company), but also some other invaluable supporting arms including our old friends 22 Mountain Battery, Royal Artillery and some South African Engineer Corps units. The heterogeneous force also contained one British battalion (1 Argyll and Sutherland Highlanders (1 A&SH)), Gunners and Sappers from the Gold Coast, a battalion of the Sudan Defence Force advancing from the West, a battalion of the Ethiopian army and even some Belgians. Last but not least the SAAF and RAF continued to maintain almost complete air superiority, using some of their less modern aircraft to do so, whilst several bodies of patriots under intrepid British officers harassed the enemy and co-operated with our regular forces.

When I reached Advance Divisional HQ at Amba Georgis, the two brigades were also concentrating in that area, and probing forward towards Gondar. Not surprisingly it was soon found that General Nasi had anticipated that the main attack would come down the road from Asmara, and had established his strongest positions in the Ambazzo area astride that road. In one attack by 1 A&SH on the Venticinque position, African Sappers of the accompanying demolition parties were reported as remaining very cool under enemy fire.

Meanwhile *Southforce*, advancing along the route from Dessie through Debra Marcos, had come up against the strong enemy position at Kul Kaber. 1 Pioneer Battalion KAR, whose task was to clear the road for passage of the column, (mostly at an altitude of 9000 to 10,000 feet) reported that at one point they had to tunnel through a single 1500ton boulder which the Italians had lodged on the road; at another, where the whole road had been blown away on the side of a severe escarpment, the gap was filled with a revetment of rows of 44 gallon oil drums.



First Battle of Kul Kaber

On 13 November *Southforce* attacked the Kul Kaber position at dawn. Although 1/6 KAR and 1 EA Pioneers made good progress initially, they were pinned down by Italian artillery and machine-gun fire all day, and had to withdraw under cover of darkness, whilst the patriot support faded away.

General Fowkes was now faced with the problem that part of his force, including most importantly his medium artillery, was separated by the Kul Kaber stronghold from his main body, whilst the latter, weak in artillery, was up against the enemy's strongest defences. His problem was solved by the discovery of an old disused track in terrible condition which led from Amba Georgis, South to Ambaciara along the escarpment to descend into the plain between Kul Kaber and Gondar. The Sappers, with infantry working parties, got to work on

it and by 19 November it was just passable; in some places so steep that tractors were needed to haul lorries up it, but it was screened from Italian observation (except in one place), and beyond the range of their guns. General Nasi, when I interrogated him after the fall of Gondar, and in a lecture he gave subsequently at the EA School of Infantry, said that one of his principal mistakes had been that he did not foresee that this track (which had indeed been used by the Italians when attacking Gondar in 1936) could be repaired and used for the northern column to join the southern. As soon as the track was passable, Fowkes sent 25 Brigade down it and the first that Nasi knew of this new threat was an occasional glimpse of their lorries passing along it, followed by reports from the commander of the Kul Kaber stronghold that he could see motor vehicles pouring down into the plain to his rear.

On 25 November the second battle for Kul Kaber was launched with attacks from the North by 25 Brigade and from the South by *Southforce* and the patriots. 2/3 KAR reached their objective on the ridge, but were shelled and counter-attacked off it. They were rallied by Major Trimmer and, with the help of 2/4 KAR, attacked again, recaptured the ridge and beat off three more counterattacks. *Southforce* was also successful and by 3pm white flags signalled that the Italians had had enough. Trimmer was awarded an immediate DSO. The way was now open for *Southforce* and its important medium guns to join up with 25 Brigade and face the southern and weaker defences of Gondar.

My main job as GSO2 (Intelligence) at Advance Division HQ was to get out a Daily Intelligence Summary each night, to be distributed to all units in the Division at first light, based upon all the information collected from units, air and artillery observation, agents and deserters etc.

We appeared to have complete air superiority from early in the morning when our aircraft arrived from airfields far to the rear, until they left to return to them in time to land before dark, giving our camp a peaceful existence broken only once when one of them decided to shoot us up in error; fortunately not causing too much damage and no casualties. It seemed unbelievable that any pilot could mistake our tented camp up in the mountains in rear of the escarpment for enemy targets in the plain below — but similar incidents occurred repeatedly throughout the war — and most recently in the Gulf.

When Wolchefit capitulated, I took a truck and, accompanied by the newly arrived Commander Royal Artillery (CRA), drove across the Ambaciara track to pick up information from the battlefield — identifications from prisoners of war and bodies, maps and other documents and even codes. On our way back, towards dusk, we were being attacked by an aircraft. I jammed on the brakes and we scattered off the road as it swooped repeatedly upon us. Sadly the CRA was fatally wounded when a bullet severed his femoral artery, and he died in my arms in the back of the truck before I could get him to the Field Ambulance. I was most fortunate in receiving only a minor flesh wound from a bullet — it hit the Beretta sub-machine gun with which I was futilely trying to fire back. The enemy fighter was the last to fly in the Abyssinian campaign; it had been kept concealed and safe in an underground hangar at Azozo airfield and had been brought out for one last flight after our planes had left the skies over Gondar to return to base.

Fowkes was now able to decide upon his plan for the final attack on Gondar. After a personal reconnaissance which showed that the country towards Azozo was suitable for attack, he decided to launch 25 Brigade in this direction, and simultaneously to attack Deflecha Ridge from the East with 26 Brigade, whilst 3/6 KAR was left to contain the enemy in the Ambazzo area. There had been little previous activity in the Deflecha area, and it was hoped that an attack there would be a surprise; 26 Brigade had to go onto a pack basis at short notice, using local mules and donkeys, and descend into the valley of the River Megach and up the other side to reach their objectives. The attacks were carried out on 27 November, being observed and, to a certain extent, controlled by General Fowkes from a Battle HQ in slit trenches on the very edge of the escarpment, where there was a wonderful view of the progress of the battle.

By the end of an exciting day success had been gained and Gondar had fallen, but at appreciable cost. 25 Brigade and the patriot units fighting alongside them burst through the Azozo defences and swept irresistibly towards Gondar; indeed the patriots with their blood up and regardless of casualties over-ran one position

after another, and swept on into the city itself. Major Yeatman with a squadron of the EA Armoured Car Regiment following up hard took the unconditional surrender of General Nasi before the rest of 25 Brigade arrived to take control, round up the thousands of prisoners and restore order. Meanwhile 26 Brigade had been having a very sticky time, fighting their way forward through extensive minefields under heavy artillery and machine-gun fire. Although they eventually reached and occupied all their objectives, they incurred many casualties.

During 25 Brigade's attack, the bridge over the River Megach, blown by the Italians, had been replaced by Sappers so that our armoured cars could cross, whilst on 26 Brigade's front, Sappers had the daunting task of locating and clearing ways through enemy minefields. One of the conditions of surrender was that Italian engineers should provide information about and help to clear their minefields. Our Sappers and theirs worked for a long time on this dangerous and tedious task. Amongst other devices found were locally made "flame fougasses" dug into the side of the main road intended to blow up any armoured fighting vehicles which might have come along.

My flag had again come in useful, but was soon replaced by a bigger and better one, which flew over Nasi's former HQ in the old Castle of the Facilides. The Crown Prince, representing his father the Emperor, who had been with us at our HQ for some days before the final battle, addressed a great crowd of Abyssinians from the balcony of the Facilides Castle, supported by the Divisional Commander. Shortly afterwards a big victory parade was held in an open space outside the city, at which all units of all types and nationalities were inspected by, and marched past, the Acting General Officer Commanding in Chief EA Command, Major General Wetherall.

The official history records that "the Gondar operations caused the heaviest casualties of the Abyssinian campaign... Instead of a disorganised and retreating enemy, the askaris faced a series of static positions of great natural strength, manned principally by European troops, under the best of the Italian generals. The British artillery was about a quarter the strength of the Italian and never exceeded 24 guns; the infantry were required again and again to attack well-defended artillery positions and forts, across open country where the enemy had had ample time to lay minefields.".

Immediately after the fall of the city, Advance Division HQ moved into Gondar, and I occupied as my office a nice house, which had belonged to the Italian commander of a colonial infantry brigade, and enjoyed the luxury of his double bed. Accompanied by my Italian-speaking IO, I interrogated General Nasi. Although naturally depressed at the end of his prolonged resistance, he gave me his personal views on the recent operations, which I passed on to General Fowkes. Amongst other points he made was that his intelligence of our troop strengths and movements was very poor, relying almost entirely on native informers, who were unreliable and probably never went anywhere near our positions. He particularly deplored the difference in locating our units, compared with the British Somaliland campaign, in which he claimed that they had both wireless interception and our ciphers.

Tailpiece

When my work was finished, I took advantage of a call for drivers to take surplus vehicles back to the rear, and volunteered with another officer to take two trucks all the way back to Kenya. When they arrived, they turned out to be flats with no surrounds except for a single rail. We therefore took the double bed from the house to form solid surrounds to contain our batmen and baggage. It took us a fortnight to drive all the way back to Nairobi, via Asmara, the spectacular Via Mussolini to Addis Ababa, where we stopped briefly to report in at Main Division HQ; thence through the Lakes and Mega to the Northern Frontier District of Kenya. We arrived in Nairobi on Christmas Eve, and set up the double bed in the drawing-room of my father-in-law's house, where my wife was living. It made a very welcome Christmas present!

A Walk With Heroes

Field Marshal Sir John Fox Burgoyne GCB 1782 — 1871

THE view from my office window is magnificent. I only have to glance outside into Whitehall to sense the history of the place. As the sun climbs high over Big Ben, bathing the Cenotaph in strong summer light, the problems of today are thrown into sharp perspective by the patina of the past. My mind drifts back as I gaze across the street at Gilbert Scott's richly ornamented Italian palaces which house the Treasury and the Foreign Office and radiate the very essence of 19th Century Imperial power and glory. They look so dignified today that I find it hard to imagine the unseemly public squabble over their architectural design which became known in 1857 as "The Battle of the Styles". The fact that it took the personal intervention of Lord Palmerston to resolve the dispute is somewhat unedifying. But perhaps Prince Charles would have approved.

From up here on the seventh floor of the Ministry of Defence (MOD) I can see the comings and goings at Downing Street (1720) and the Cabinet Office (Parry, 1845) beyond which lies the lush, emerald sweep of Nash's landscaping masterpiece, St James's Park. Nash was as much a town planner as architect, and here in 1834 he performed a miraculous transformation from the muddy cow pasture acquired by Henry VIII in 1532 into this metropolitan oasis of rare beauty, rich with flowering shrubs and magnificent trees. From my window the park appears so dense as to almost totally obscure his disastrous bungling at Buckingham Palace (1825) which is probably best forgotten anyway. Further to the right, rising high above the elegantly domed portico of Melbourne House (1788), home of that reforming Commander in Chief the Grand Old Duke of York (1763-1827), and set between the monumental Corinthian columns adorning Nash's colossal Carlton House Terrace (1830), my eye comes to rest on the single pink Aberdeen granite column, erected by Benjamin Wyatt in 1831, which supports Westmacott's seven ton bronze statue of the Grand Old Duke himself. According to contemporary wits, 124 feet was only just high enough to keep him out of reach of his many creditors. His column marks the South side of Waterloo Place, and just as soon as my in-tray allows I set out from beneath the shadows of the North Door to seek enlightenment there.

Turning left, I cross Whitehall beside the lead bust of King Charles the martyr on James Wyatt's entrance to the Banqueting House and pass beneath the watchful eye of twice Secretary of State for War, the Duke of Devonshire (1833-1908), who stands definitely in the middle of Horse Guards Avenue. Stepping quickly over the new tarmac marking the base plate of the IRA's Downing Street attack on 7 February 1991, I walk through the arch and onto Horse Guards Parade. With an eyes right to that giant amongst Victorian military heroes, Field Marshal Viscount Wolseley (1833-1913), and an eyes left to his two equally distinguished companions Field Marshal Earl "Bobs" Roberts VC (1832-1914) and our own Lord Kitchener of Khartoum (1850-1916), I leave the parade ground for the preposterous pelicans, lyrical vistas and brilliant flower borders of St James's Park itself.

Turning right I cross the Mall and ascend Duke of Yorks steps to Waterloo Place. And there on the leafy West side of the square, dark against the Decimus Burton's dignified Athenaeum (1827), stands the object of my study: Field Marshal Sir John Fox Burgoyne, 1782-1871.

Reflecting on the life of this remarkable Engineer I am struck by the astonishing span of history covered by his 89 long years. On his birth in 1782, the Declaration of Independence in America (1776) was still as fresh in people's minds as the Falklands War is today. Yet by the time he died at 5 Pembridge Square on 7 October 1871, the first shot of the Great War was just another 43 years away. Throughout his life war and conflict were recurring themes: war with America (twice), France (thrice), Spain, Netherlands, Russia, the Indian Mutiny, and Abyssinia. Political revolution swept through Europe. Empires rose and fell. At home no fewer than 30 prime ministers came and went. Mozart died in Vienna when Burgoyne was nine years old. Marx was writing in London. Science and the Industrial Revolution were changing the face of the war for ever: the infantry advanced from flintlock to breech-loader, the machine gun was perfected, telegraph and photography appeared, aircraft and balloons flew, steam railways revolutionized the mass movement of men and material. In the year Burgoyne died, France was humiliated, Germany born and Britannia approached the zenith of her Imperial Glory.

Like soldiers everywhere, Burgoyne was swept along by the tide of history. Born the eldest of General John Burgoyne's four illegitimate children he was gazetted to the Royal Engineers on 29 August 1798. It was in action that he first made his name and for the next 68 years, from 1800 when he sailed to Malta as a Lieutenant, to 1868 when he retired as Inspector General of Fortifications, his whole life was dedicated to the service of his country. But what made Burgoyne so great? And why is he, the first of only five Royal Engineers' Field Marshals, not better known? Perhaps his selfless modesty is the partial answer to both questions, but there is more to it than that. Above all it was, I believe, the brilliance of intellect, the depth of his professional knowledge and the awesome scope of his achievements which marked him out for History. Like other Sappers of his day, Burgoyne was a prodigious innovator whose influence spilled over from the military to the civilian world, enriching everything it touched. But unlike other famous men he sought no personal glorification in public honours; for him service was its own reward. His early years were spent with Sir John Moore and the Duke of Wellington. During the Peninsular War he acquired a profound knowledge of fortifications and played a leading role in most of the major actions of that campaign: Corunna (1808), Fort Conception (1810); Cuidad Rodrigo, Salamanca and Badajoz (1812); Vittoria and San Sebastian (1813). At the end of the war he was sent to America with the best of Wellington's army and saw further action at New Orleans and Fort Bowyer (1815). Returning to Europe in 1815, he just missed the Battle of Waterloo but was offered a civil knighthood in recognition of his previous distinguished service which he indignantly refused as a slight to the Corps.

In 1831 events took a different turn when he was appointed Chairman of the Public Board of Works in Ireland, a civil post which he held with distinction for 15 years. On the coronation of Queen Victoria in 1838 he was promoted Major General and finally awarded the KCB he had rightfully earned in 1814. Recognition may have come late, but Burgoyne was content to wait with paitence and humility. His reward came in 1845 with his appointment as Inspector General of Fortifications, a post which he held for an astonishing 23 years. On appointment he was already 63 years old but still in good health, extremely vigorous and fond of field sports. His opinion was much sought after on a wide variety of public policy issues, and he sat on numerous commissions ranging from the introduction of the Penny Post to the siting of Waterloo Bridge. He wrote papers on reservists and the defence of the realm, and he championed the cause of rifles for the infantry. At a time when lessons of the Peninsular War were being forgotten in the parsimony of successive governments, Burgoyne managed to secure the re-arming of the Royal Sappers and Miners with the new percussion carbines and achieved significant increases in officer and soldier establishments. Would that we had him now! He was gazetted Lieutenant General in 1851 and made a (Knight) Grand Cross of the Bath in 1852.

For most men 54 years in harness would have been more than enough, but not for Burgoyne. The final stage of his long career began at the age of 71 when in 1853 he sailed with Lord Raglan

for the Crimea as *de facto* second in command of the British Army. He selected the initial landing site at Euphoria, 45 miles from Sebastopol on the northern side of the unfortunately named Kalamita Bay, and he subsequently advised the flank march South after the battle of Alma. Once in camp before Sebastopol, Burgoyne insisted on the necessity of reducing the Malakoff redoubt as the key to a successful assault on the city. However, the siege did not go well and the press was becoming a major influence on the conduct of war. William Howard Russell's reports in the *Times*, combined with the impact of photography and the immediacy of telegraphy, brought home to people in England the scandalous state of affairs in that first winter of the war. Aberdeen's resignation as prime minister was not enough to appease public opinion which demanded a military scalp as well. Burgoyne's tactical approach was not appreciated at home and he became the scapegoat. He was recalled in February 1855 and reached England in April to find himself virulently assailed in the press. Although disappointed by the injustice of his recall, bitterness was not in his nature and being convinced of the wisdom of his judgement he stuck by his guns and resolved to wait for events to unfold. When Sebastopol finally fell in September 1855 to exactly the assault proposed by Burgoyne — via the Malakoff — the tide of opinion turned and he became once again a national hero. Honours were showered on him: he was made a Baronet in 1856, created a Grand Officer of the Legion of Honour, promoted to full General, and presented with the Freedom of the City of London. In 1865 he was appointed Constable of the Tower of London and when he finally resigned as Inspector General of Fortifications in 1868 aged 86 he was promoted to Field Marshal. All his hopes for the future were then invested in his only son, Hugh, a Captain in the Royal Navy and one of the first recipients of the Victoria Cross. When Hugh was drowned in the Bay of Biscay in September 1870 Burgoyne had little left to live for and passed quietly away a year later on 7 October 1871.

On examining his statue more closely I am touched to see that it was commissioned in 1874 from Sir Joseph Boehm by Burgoyne's sorrowing brother officers of the Corps and erected here in Waterloo Place, within sight of the Crimean Memorial, in 1877. The Field Marshal stands very alert and erect, every inch the dignified old warrior. His penetrating gaze seems fixed on MOD Main Building just visible across the park. His bearing and expression suggest the quiet self confidence and determination of a man who enjoys complete mastery of his profession. He has the composure of one tested in the heat of battle and not found wanting.

So what can we learn from Burgoyne today? Dedication; vision; modesty; certainly. And beyond that, perhaps we can find the inspiration to persevere through present difficulties without losing sight of what we know to be right for the future. Patience was one of his greatest virtues: Burgoyne never gave up. He was eminent in war and wise in council to the last. When finally he sank to rest at the age of 89 he was buried in state at St Peter's Church in the Tower and honoured with great ceremony and affection as the Army's most venerable hero. The inscription on the base of his statue quotes from Coriolanus: "How youngly he began to serve his country: How long continued!"

Pondering the future, I return to the MOD and wonder whether we shall ever see the like of Field Marshal Sir John Fox Burgoyne again.

This is the third of the series written and photographed by Col T H E Foulkes, featuring 19th Century personalities.

A walk with heroes (p155)

No 1 and No 2 Military Ports

MAJOR S P MURPHY BSc(Eng) CEng MICE

Major Shaun Murphy was commissioned into the Royal Engineers in August 1972 and has had tours with 5 Field Squadron, 33 Independent Field Squadron, 3 Training Regiment and the Royal Monmouthshire Royal Engineers (Militia). A three year period was spent at RAF Leuchars setting up the pilot scheme for the Airfield Damage Repair Squadrons (V) prior to attending the Long Civil Engineering Course at RSME where he completed attachments to Monks and John Burrows and Partners. On completion of the course a tour in command of 27 Training Squadron was followed by a tour in command of Military Engineer Services (Works) Northern Ireland. In October 1989 he was posted to Military Engineer Services (Civil Firms and Public Authorities) and attached to the Royal Navy on the staff of the Chief of Strategic Systems Executive.

Operation *Dynamo* was completed over the period 25 May to 4 June 1940 during which time 338,226 troops were evacuated from Dunkirk. Eighteen days later the Germans and French signed the Armistice at Forest of Compiègne bringing half the West coast and all the North coast of France under German control. The ports on the South and East coast of the British Isles were now within easy range of enemy aircraft and thus became virtually closed. This put a greater burden on the remaining deep water ports, some of which were very vulnerable to enemy action as they were dependent on lock gates. The Ministry of War Transport was extremely concerned and realised that the situation would be untenable if any damage occurred, especially in the light of an expected increase in military use of the ports. Furthermore, the military use of existing facilities was extremely wasteful. Their traffic did not require the sheds and warehousing associated with berths, essential for commercial cargoes.

The Ministry of War Transport suggested to the War Office that the situation could be alleviated by constructing new deep water berths solely for military use. On 15 July 1940 Major General G S Szlumper CBE, Director General of Transportation and Movements, authorised a reconnaissance of the West coast with the following terms of reference:

> "To investigate the use for WD traffic of ports not now being used to full capacity and to report on the improvements and additional facilities required".
> "To investigate the practicability of the construction of a new military port on the West Coast of Scotland with the object of freeing existing port facilities, now in use

It was determined that an assessment had to be made on the existing ports' capacity to handle the five main classes of military traffic (personnel, general stores, ammunition, petrol and MT). The assessment of their ability to accept greater use was not so easy as the quantity of traffic or the type of ships to be used was unknown. The approach adopted was to assess the additional quantity of traffic the port could accept. Investigations were also undertaken to see if the addition of shallow berths could possibly release deep water berths at other locations.

For the construction of new port facilities the following special factors were considered:

- Any new port would have to be established separate from, and not forming part of, any

Maj S P Murphy
No 1 & No 2 Military Ports (p156)

existing port so as to avoid any conflict between civil and military labour.

- Provision would have to be made for the housing of military personnel required to construct and operate the port.
- Anchorage facilities would be required for ships awaiting berths.
- Rail facilities would have to be provided and the consequences of the intensification of traffic and extension of the system on the trunk system would have to be assessed.
- Good road access would be required.
- The possible continued use of the facilities after hostilities had ceased was to be borne in mind but was not to prejudice either the facilities to be provided or the site to be selected.
- The time factor was all important.

The reconnaissance party consisted of: Major B G White RE; Major T Grimble RE; Mr I D Campbell of the Ministry of Shipping; Mr G E Stevens of the London Midland and Scottish Railway (LMS) Company. Captain W H Whittle RNR and Mr P O Reynolds, both from the Ministry of Shipping, were also in attendance. The Admiralty were informed of the reconnaissance and the local Naval Area Commanders were represented at the ports examined or were consulted about them. The importance of the task can be judged from the speed with which the reconnaissance was undertaken, as the following ports were visited over the period 15 to 21 July 1940 with a follow-on visit to Irvine on the 8 August 1940: Barrow, Maryport, Stranraer, Ayr, Troon, Ardrossan, Gare Loch, Craigendoran, Oban and Irvine. In all cases the port and local railway authorities were approached.

The results of the reconnaissance along with additional information from the Ministry of Shipping were presented and discussed on 27 August 1940 at a meeting chaired by the Deputy Quartermaster General (Army), Major General Riddell-Webster, and representatives of the War Office, the Admiralty, the Air Ministry, the Ministry of War Transport and the Ministry of Shipping were present. The examination of the ports revealed that many of them were underutilised. Only Barrow had the ability to handle all the classes of military traffic required and a reasonable number of berths was available although they were separated (two berths in the Devonshire Dock and three in the Anchor Line

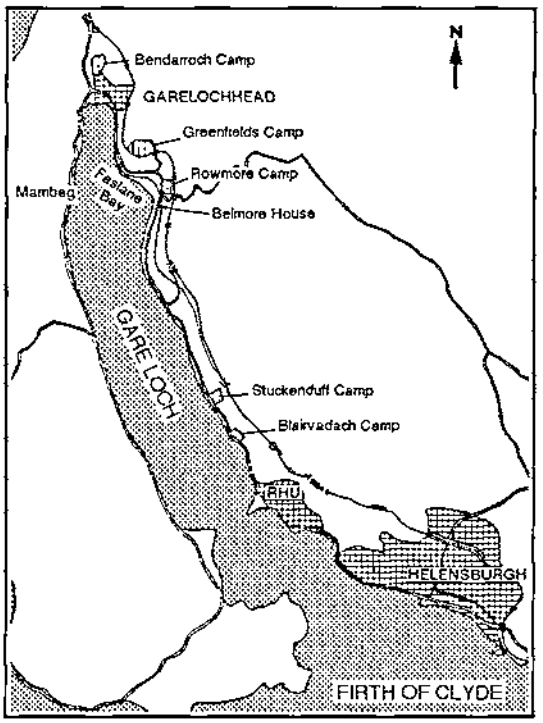


Figure 1 Sketch of Gare Loch Area.

Basin); however, the port required extensive dredging. The overall conclusion was that the solution for alternative port facilities could only be achieved by new construction. Of the various locations considered the sites at Gare Loch and Stranraer (See *The Sappers Biggest Construction Job?* April 1992 *Journal*) were identified as possible locations and detailed surveys were required to determine whether the seabed and other physical features were suitable for the rapid construction envisaged. The Faslane site at Gare Loch was favoured as it was evident that: partial use could be made of the port during its construction; the rail access to the site was shorter than at the Stranraer site and; the anti-aircraft protection was easier as the site was within the Clyde Defence Area. A sketch of the Gare Loch is shown at *Figure 1*.

The decisions arrived at were endorsed at a meeting held on 28 August 1940, when it was agreed that the provision of a new port would release the existing six berths currently in use by the military. The Ministries of Shipping and War Transport could not justify the construction of new berths for civil traffic but they did require the return of the berths currently in military use.

Final Location	No of Cranes	Capacity (tons)	Radius (ft)	Gauge (ft in)	Original Location
No 1 Military Port — Faslane					
Lighterage Wharf	11	1.5	35 – 45	10 0	Deptford
MT Wharf	1	3	60	14 0	Town Quay Southampton Docks
	1	15	42		
	1	5	35	29 6 3/8	WD Standard Crane on a gantry
Deep Water Berths	9	5	86	18 0	Southern Railway Southampton Docks
	11	2	86	18 0	
	1	1.75	80	18 0	Hay's Wharf Southampton
	1	2	50	18 0	
	1	10	45	18 0	Fenning's Wharf
No 2 Military Port — Cairnryan					
Lighterage Wharf	4	2	40	12 0	Boston Harbour
	2	1.5	50	15 3	Parkeston Quay
	2	3	50	13 3 3/4	Garston Docks
South Quay Lighterage Basin	2	5	35	29 6 3/8	WD Standard Crane on a gantry
North Quay	2	6	65	13 6	Ministry of Supply Contract
	2	3	65	13 6	Royal Docks London
South Deep Water Wharf	2	6	65	15 0	Ministry of Supply Contract
South Deep Water Wharf	7	6	65	15 0	Ministry of Supply Contract
	4	3	65	15 0	
	3	3	65	13 6	Royal Docks London

Table I Cranes at the Military Ports.

Consequently both these Ministries fully supported any War Office pro-posal to construct new berths for military traffic submitted to the Treasury. Initial costs were estimated at £3000 per site for the detailed survey with £125,000 for the lighterage wharf and between £1.5M and £1.75M for the full development of one port. Informal Treasury approval was given for the expenditure of £7000 on the detailed survey of the site at Cairnryan and the Gare Loch site at Faslane Bay.

Concurrent with the funding exercise and the detailed survey, work was well under way in augmenting the prewar Sapper maritime organisation which had in practice little experience in either harbour engineering or port operating despite the existence of a small number of Dock Operating Companies RE. The Directorate of Transportation established a central staff which was responsible for the design and control of any construction. Steps were also taken to raise Port Construction, Operating and Inland Water Troops. However, with such a tight programme neither the design capacity nor the construction force was in position. The assessment of the detailed surveys was passed to a panel of consulting engineers: Sir William Halcrow and Partners; Messrs Code, Wilson, Vaughan-Lee and Gwyther; and Sir John Wolfe, Barry and Partner. The panel concluded that both sites were viable. War Office Memorandum Number 1209 of 15 November 1940 was submitted to the Treasury Inter Service Committee and outlined the proposed development which was for three new deep water berths at Faslane and Cairnryan both to be capable of future expansions. The work was to be undertaken in two stages — first the provision of the lighterage berths in advance of the main berths and second the main deep water berths. In conjunction with Phase One, the railway facilities were to be provided and the whole construction was to be completed with military labour. This latter point was subject to the acceptance of the Ministry of Labour. Both sites initially were to be requisitioned with the question of purchase to be considered under the policies dictated by the Defence Powers Compensation Committee. It was believed that the sites should be purchased as reinstatement costs would prove to be very high. Billeting in the areas was negligible and thus camps had to be provided for construction and operating staffs. The estimate for Phase One of £650,000 (including £300,000 for the camps) was accepted by the Treasury Committee provided that an identified difficulty with the Admiralty over the use of the Gare Loch for submarine activities could be reconciled. Subsequent to the meeting, the Ministry of Labour accepted the use of military labour with the proviso that sites were declared prohibited areas for civilians.

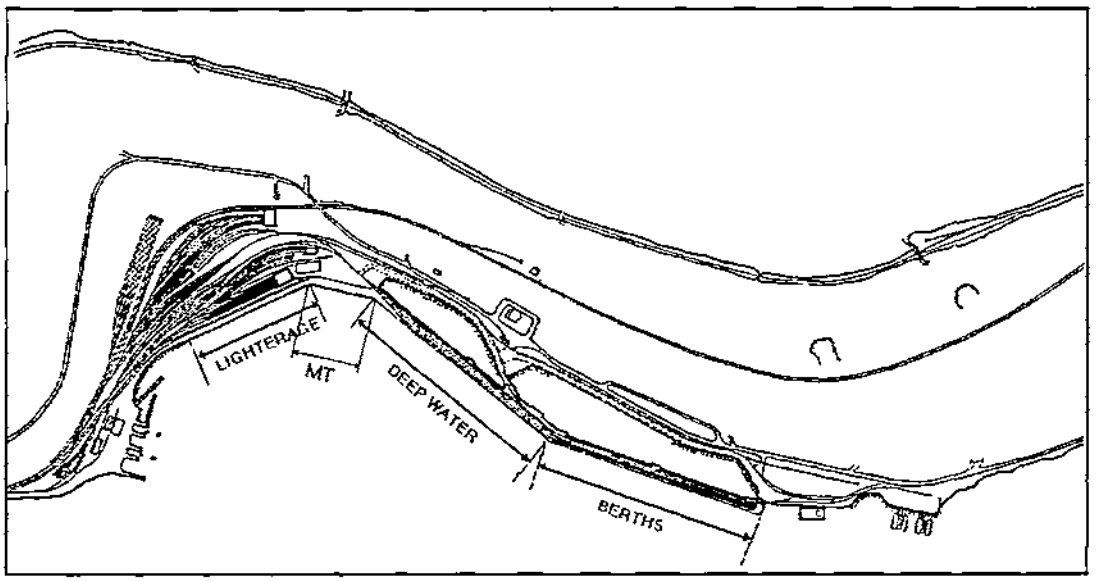


Figure 2 General Layout of No 1 Military Port.

After financial approvals had been granted the panel of consultants started basic design work with additional work being undertaken by War Office staff. The initial design approach was based on the intention that the ports would only be required until cessation of hostilities. Economies were therefore made in construction and normal civil practice was not followed. Nevertheless, there could be little compromise on the stability of the structures and thus economies were made in the use of materials and construction methods: timber was not treated; paintwork systems were reduced; bare copper conductors were used on the jetty and extensive use of spikes was made instead of plating. To save timber (a scarce and expensive commodity) composite concrete and timber piles were used.

Cranage requirements for the ports had to be met by using cranes that could be removed from existing ports, a factor which put a further constraint on the jetties' design. Providentially the Admiralty were demobilizing the South and East coast ports and their cranes were to be removed or destroyed. The Directorate of Transportation was requested to remove the cranes at Southampton. These cranes had a gauge of 18ft, a radius of 86ft and weighed 115tons. In addition to those at Southampton, cranes were removed by Sappers from London, Boston, Deptford, Liverpool and Harwich. These were supplemented by WD cranes and Ministry of Supply contracts. A summary of the cranes procured for Faslane and Cairnryan is shown in *Table 1* on the previous page. It should be noted that there was some variation in the gauges of the cranes which put a further constraint on the design of the wharves. Additional to the jetty cranes a 150ton floating crane was moved from Southampton for use at No 1 Military Port at Faslane. This crane proved to be invaluable during the construction especially in placing precast concrete elements. Both ports were to be served primarily by rail. No 1 Military Port was connected to the London North Eastern Railway (LNER), West Highland Line by a 2.75 mile double track spur via exchange sidings, whilst at Cairnryan, No 2 Military Port was connected to the London Midland & Scottish (LMS) main line by a 6.5 mile spur. Extensive marshalling facilities were also provided at each port. To improve the main lines' capacity the LNER carried out improvements on the line between the take off point and Helensburgh by providing longer loops and extra sidings. Similarly the LMS undertook major works to increase the capacity of their single track line between Stranraer and Carlisle.

Major roadworks outside the port areas were required at Faslane where the Helensburgh to Garelochhead road had to be diverted from the seafront to behind the projected port.

This involved the construction of bridges and level crossings as well as 1.75 miles of road. The

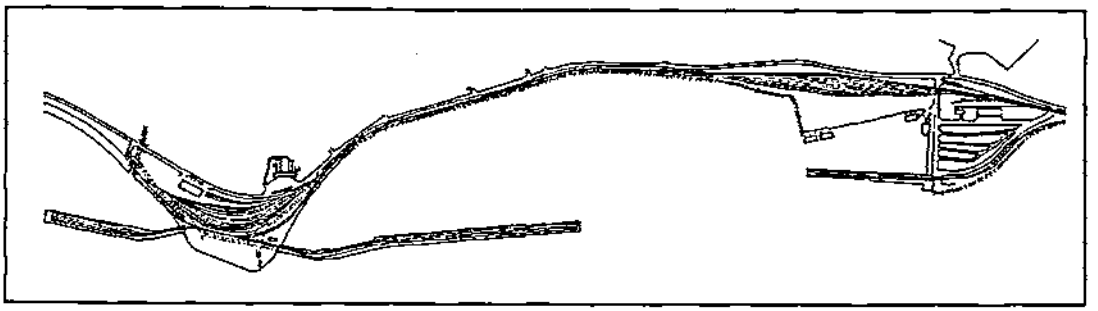


Figure 3 General Layout of No 2 Military Port.

Ministry of War Transport Roads Division gave instructions that the road had to be constructed to its full specification including pavements but, this was subsequently relaxed due to the urgency of the project. At Cairnryan the local authority widened the road through Cairnryan village and diverted another minor road so as to provide additional land for railway sidings. Within the port areas a large number of roads was provided.

The absence of billeting was referred to earlier and it was necessary to construct camps. A total of eight camps was built at Cairnryan and five at Faslane. One of these camps is still in use today, the Greenfields Training Camp at Garelochhead. The overall capacity of the camps was 4000 in each location.

Initially the ports were to provide three deep water berths but, whilst construction was underway, the required number of berths was increased to six at Faslane and five at Cairnryan. The final layouts of No 1 Military Port and No 2 Military Port are shown in *Figures 2* and *3*. Construction started in December 1940. By the end of January 1941 the workforce had built up to 1000 at Faslane, whilst the initial workforce at Cairnryan was 40 strong.

The design for both ports was based on using reinforced concrete for the front section of the deep water wharves with the remaining parts of the structure based on 14in x 14in timber piles. As a saving on timber, composite piles were used, see *Figure 4*, although initially full timber piles were used until the concrete casting yards were established. For the main wharf fronts the reinforced concrete decks were supported by screw cylinders at

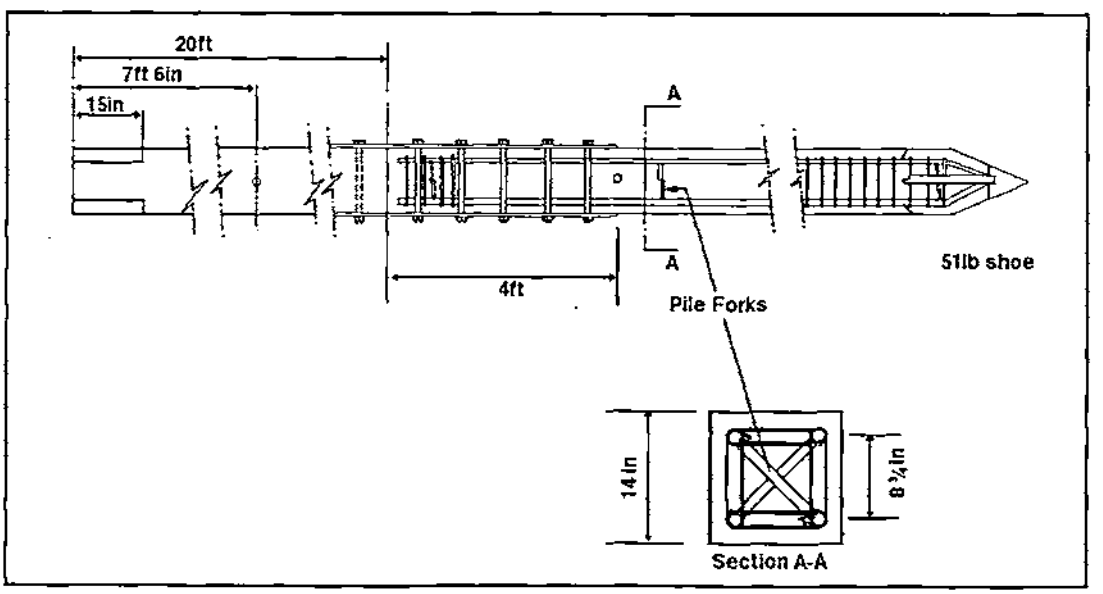


Figure 4 Composite Pile.

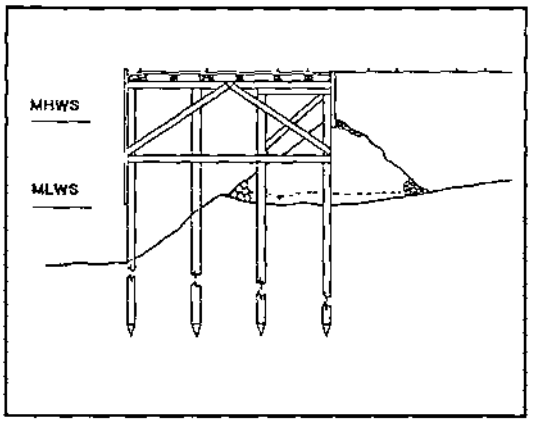


Figure 5 Lighterage Wharf Faslane.

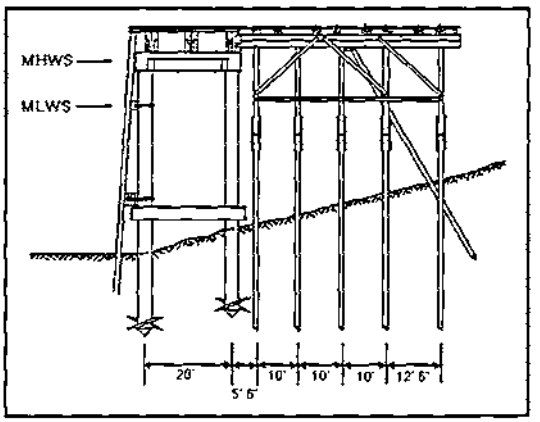


Figure 6 Deep Water Berth Faslane.

relatively wide spacings and unbraced. This method was believed to provide fast construction. The cylinders used were 3ft and 3ft 6in in diameter at Cairnryan and Faslane respectively. The original design concept was for the cylinders to be of steel or cast iron. In an attempt to economise on materials, the design was modified with the cylinders being manufactured from 12 gauge corrugated sheet and made 12ft long. The bottom section was bolted to the cast iron screws with additional lengths being welded on as the piling progressed. The thin walls of the cylinders could not take the torque so mandrels were placed into them to transmit the torque. On completion of driving the cylinders were dewatered, reinforcing cages inserted and concreted. This modification saved on steel but it increased the dead load considerably and, as will be made clear later, could not be used at Cairnryan.

Construction of the maritime structures at Faslane commenced with the lighterage wharf which was constructed from 14in x 14in piles at 10ft centres with cappers and bearers being of the same material. Construction loads were heavier than service loads and had to be carefully monitored. Work commenced by building out two embankments into Faslane Bay from which the piles were driven. The principle of working at multiple points was used wherever possible so as to maximise progress. As construction progressed rockfill was side-tipped on the landward side of the wharf and precast slabs were placed to retain the infill of the reclaimed area for the marshalling yard and, more importantly at that stage, the precast concrete yard. The cross section of the wharf is shown in *Figure 5*. To save time full screening of the rockfill was not undertaken. However, due to fines erosion, settlement took place which necessitated remedial works and the placing of large 2cwt armour stones.

The deep water berth at Faslane was constructed on the five fathom line to minimise dredging requirements and a cross section of the jetty is shown in *Figure 6*. The timber back jetty was constructed by a floating pile driver placing the initial line of piles. A special piling frame running on temporary rail lines was used to position the remaining piles of the bent. This method enabled the decking to be placed quickly. A machine developed for the assembly, pitching, screwing and concreting of the piles also used the temporary rails on the timber part of the jetty. Again the construction loads were in excess of the service loads and this dictated that the timber piling machine had to be a minimum of 75ft ahead of the screwing machine. Early progress was good with the expected drive depth of 14ft being achieved for the first fourteen bents, this depth progressively reduced over the next ten bents until the penetration achieved was only 6ft. Cylinders that would not screw were founded on piled footings of 12in x 12in timbers driven hard and the cylinders set into a concrete pile cap, see *Figure 7*. This method was continued for the first three berths but for the three berth extension the piled footing method was used throughout. Although it was not intended to brace the jetty, cast ledgers were positioned

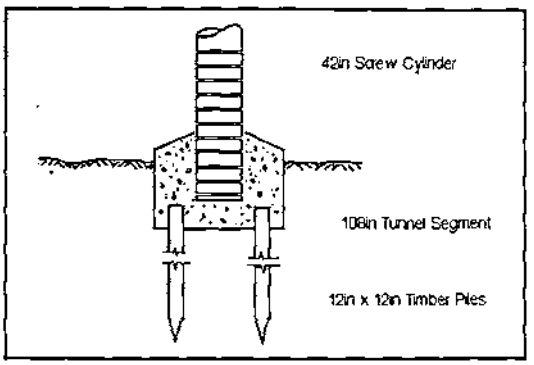


Figure 7 Piled Footing.

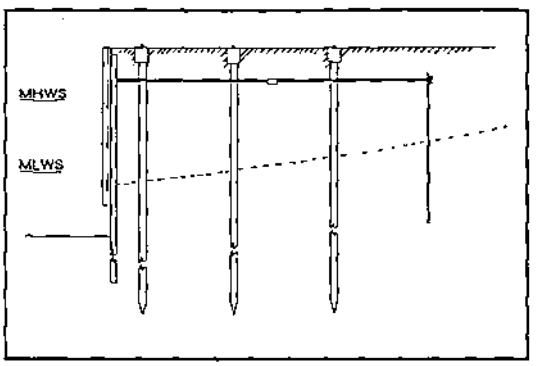


Figure 8 MT Berth Faslane.

when piles were out of their vertical tolerance and additionally the timber bents were provided with rakers. Despite the problems encountered the average progress on site was three piles every two days and a maximum of 40ft of jetty per day was achieved.

Two other wharves were constructed at Faslane, both of which were of interesting design. Firstly, the MT Wharf, which was between the lighterage wharf and the deep water jetty, had a sheet pile sea wall and anchor wall. The space between the walls was filled with the arisings from the marshalling area levelling. To reduce the surcharge on the retaining wall the crane rails were supported on reinforced concrete piles supporting concrete sleeper beams. Unfortunately during the filling the pile toes kicked out on the southern end of the wall. This required the withdrawal of the piles and longer piles were then driven. The typical cross section of the wharf is shown in *Figure 8*. Secondly, the 150ton floating crane berth was built in the water and the landward area required reclamation. A trestle of 14in x 14in timber piles, which supported a permanent rail track at the general rail level for the port, was constructed. From this a sheet pile sea wall and anchor wall were driven and rock was tipped on the seaward side of the anchor wall to provide initial support prior to the back filling of the area. To reduce the overall surcharge the cope edge of the berth was kept 6ft lower than the rail level. To provide adequate mooring facilities for the crane a substructure of reinforced concrete piles and beams was used to support the bollards, which is illustrated in *Figure 9*.

As with Faslane, the Cairnryan construction started with the building of the lighterage wharf. This wharf provided both the lighterage facilities and a ferry boat berth. Generally the same type of construction as Faslane was used, utilising 14in x 14in timber piles, cappers and bearers. Additional fendering had to be provided to cater for the high sides of the ferry boats and this is illustrated in *Figure 10*. The southern side of the lighterage basin was constructed of sheet piles tied back to concrete blocks at 5ft 3in centres. As in Faslane the crane rails were supported separately to reduce surcharges, the seaward support being 14in x 14in concrete piles

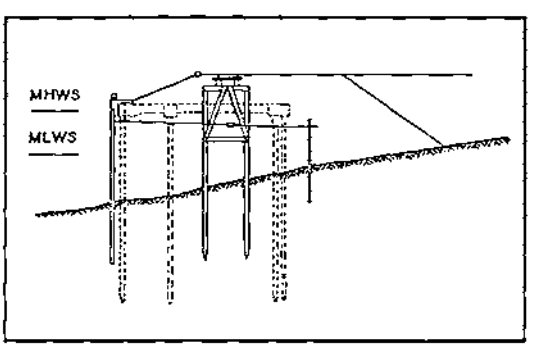


Figure 9 150ton Floating Crane Berth Faslane.

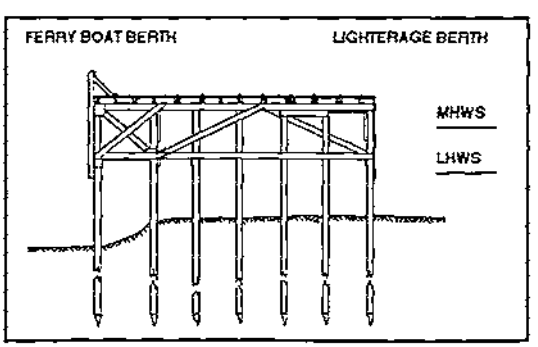


Figure 10 Lighterage Wharf Cairnryan.

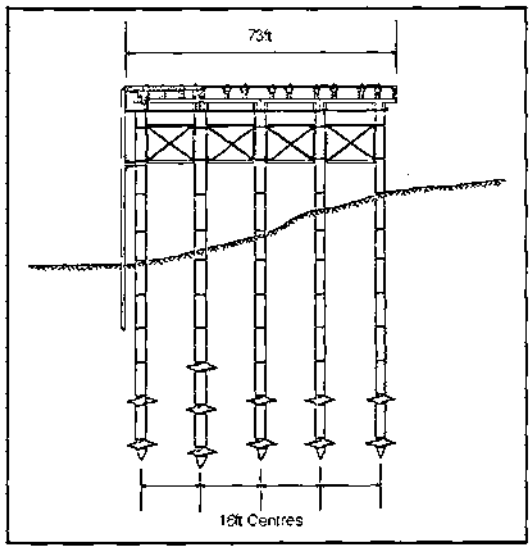


Figure 11 Southern Deep Water Berth Cairnryan.

supporting sleeper beams, whereas the landward rail was on a ground beam.

The main South deep water berths proved to be far more problematical than at Faslane. Whereas there had been difficulty in screwing the piles at Faslane, the exact opposite was the case at Cairnryan. A test drive of a pile showed that no set could be obtained at 90ft. Test loads were applied to sets of four piles to determine a suitable method of construction using the existing design but adequate bearing capacity could not be achieved. The original design of the jetty had to be abandoned in favour of using screwcrete piles throughout, but at closer longitudinal and transverse centres than was used at Faslane. The conditions dictated a further design change and the thin walled screwcrete piles were not used and the original design concept of hollow cast iron cylinders was reverted to. This was later changed to hollow steel cylinders in order to make further savings in weight as there was undue settlement. This was subsequently overcome by the insertion of an extra screw in the pile, or on more heavily loaded piles, a third screw was inserted. The principle of the deck design was the same as at Faslane and the cross section of the jetty is shown in *Figure 11*. *Figure 12* shows the contrasting design of the northern deep berth. The design used the 14in x 14in composite piles with 14in x 14in timber cappers, bearers and rakers. The decking was

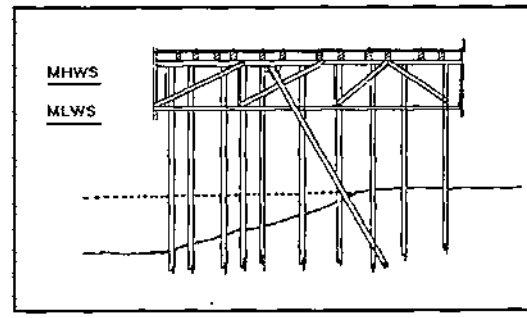


Figure 12 Northern Deep Water Berth Cairnryan.

12in x 6in timbers and the space between the rails was filled with 2in timber flatting. The bents were nominally at 10ft centres but the front four rows were placed at 5ft centres. The jetty was constructed on the three fathom line and required dredging back to five fathoms.

Problems were encountered with the precast piles in that they spalled and cracked whilst being driven. Investigations into the casting procedures and concrete mixes employed were carried out as well as the handling and slinging of the piles on site but all seemed to be satisfactory. Further investigation into the cause identified that the problem was caused during the pile's quarter mile journey by rail from the precast yard. The unsprung bogeys passing over the joints in the site rails were causing vibrations in the pile. Alterations to the support mechanism rectified the problem and no further failures were encountered.

The siting of the deep water berths on the five fathom line at Faslane avoided much heavy dredging. Nevertheless there was an amount of cleaning up to be done prior to construction. The main dredging was carried out at the entrance to the Gare Loch at Rhu Point which was only deep enough to allow the passage of the ships using Faslane at high tide. The entrance was dredged to 30ft below Chart Datum for a width of 400ft. This work proved invaluable allowing large merchant ships, as well as battleships, to use the Gare Loch. In all, 150,000 cubic yards of material were removed from the entrance and 50,000 cubic yards in the port area. In Loch Ryan the dredging was more extensive with 550,000 cubic yards being removed. This was dredged from the jetty frontages, anchorages, turning circles and entrance to the Loch, which had a 500ft wide channel dredged to 24ft below mean lower

Figure 13 Faslane Lighterage Wharf.

water springs. This work was undertaken by dredgers under WD control and the opportunity was taken to train Sapper personnel, who were ultimately embodied in the Dredging Companies RE which were later established.

The Directorate of Transportation made full use of the projects when forming the Port Construction, Repair and Operating force. Personnel were trained and the specialist companies formed on the project. The range of Sapper units employed on the works is given below:

Troops lent to Director of Transportation:
- General Construction Company
- Artisan Works Company
- Electrical and Mechanical Company
- Road Construction Company
- Quarrying Company
- Boring Section

Troops under Director of Transportation:
- Port Construction and Repair Company
- Port Maintenance Company
- Port Artisan Company
- Mechanical Equipment Company
- Port Repair Floating Workshops
- Railway Construction Company
- Railway Operating Company
- Railway Survey Company
- Railway Mobile Workshop
- Crane Operating Company
- Inland Water Troops Operating Company
- Inland Water Troops Workshop Company

It could be argued that even if the ports had not been used, the benefits and experience gained by the above units during the construction were invaluable when deployed to other theatres and especially during construction of the Mulberry harbours for the invasion.

The projects were vital to ensure adequate port facilities and were completed very quickly. The layout and method of construction enabled the ports to be brought into use before they were completed. At Faslane the lighterage wharf was operational in July 1941. *Figures 13* and *14* show the wharf and marshalling yard in their completed state. The deep water berths were first used by the Royal Navy to load boom

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Figure 14 Faslane Marshalling Yard.

defence stores in May 1942. Final completion at Faslane was achieved in December 1942, 23 months after starting. The problems encountered at Cairnryan were reflected in the completion dates of December 1942 for the southern deep water berth and July 1943 for the whole project.

As in all major projects financial matters were to the fore and the works came under scrutiny of the Select Committee on National Expenditure after rumours of profligacy on both sites. The Committee visited both Faslane and Cairnryan and their investigation concluded that the works were conducted in "...a most efficient manner and full accounts kept which, in their experience, it was unusual to find in such cases.". The final accounts were completed and the total cost of construction was £4.5M, in excess of the original estimates but the variations ordered during construction nearly doubled the originally planned capacity of the ports.

In conclusion it is appropriate to make some comment on the use made of the ports. Both ports were situated in military areas and enabled secret operations to be easily undertaken. A large amount of the tactical loading for the North Africa landings was carried out at Faslane and the first midget submarine was launched there; the King and Queen embarked at Cairnryan for their visit to Northern Ireland: Mr Churchill embarked at Faslane prior to his attendance at the Quebec Conference. Faslane, having a heavy lift capability, discharged many merchant ships' heavy deck cargoes prior to their proceeding to normal ports. At the latter part of the war, tankers were loaded with aircraft on their decks which were unloaded at Faslane. The Royal Navy found both ports of value, both HMS *Malaya* and HMS *Vanguard* had their guns mounted at Faslane, although naval use was not allowed to interfere with the ports' primary function. After the war Cairnryan became a breakers yard and also the base for one of the Larne ferries whilst Faslane also became a breakers yard where both HMS *Vanguard* and HMS *Victorious* ended their days. Over the years the yard contracted and has now closed with the area of No 1 Military Port being subsumed into the Clyde Submarine Base, Faslane.

Acknowledgement

The author is indebted to the Institution of Engineers and Shipbuilders in Scotland, the Public Records Office, The Corps Library and the Photographic Officer HMS *Neptune* in the preparation of this article.

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The New 36 Engineer Regiment Training Area

MAJOR M G MCALPINE BSc CEng MICE

Major Mike McAlpine was commissioned into the Corps in 1978 having gained a civil engineering degree at Queens University Belfast and having had three enjoyable years soldiering with the Ulster Defence Regiment. He joined the Corps determined to see something of the world, however, his first tour as a troop commander with 35 Engineer Regiment saw him back in Northern Ireland for a six month tour of Londonderry. Later he was more successful in his ambition to serve overseas with three tours in German plus 18 months in America during professional engineer training. Following Staff College two years were spent as Commander 1 (BR) Corps' exercise planner before moving to his present appointment with 50 Field Squadron (Construction).

Introduction

THE first phase of construction of the 36 Engineer Regiment training area within Invicta Park, Maidstone was completed by 50 Field Squadron (Construction) in January 1992. The idea was conceived by the Commanding Officer some 18 months beforehand when he discovered that the existing bridging hard had fallen into disuse. Following experience in the Gulf, the desirability of having a local training area suitable for low level training prior to deployment was reinforced and this article gives a brief account of how the idea came to fruition. Although in itself a small project, presenting no major engineering challenges, it is hoped the reader may be interested enough to be tempted to come to Maidstone and try the facility.

Background

DURING the final stages of preparing for deployment to the Gulf in March 1992, the Commanding Officer explained his desire to have the existing training area within Invicta Park, refurbished and expanded. The plan was to develop the site into a facility upon which section level training could be conducted with minimum prior planning and preparation; and to allow basic combat engineer training to be undertaken as the necessity arose.

50 Field Squadron (Construction) was given the job of devising a suitable plan based on the old training area but this was provisionally put to one side when in March 1991 the Squadron moved to Saudi Arabia and Kuwait. Experience gained during preparation for, and deployment in, the Gulf led to the final design adopted for the new training area.

Fortunately the Gulf deployment had been anticipated before the warning order to move was received. Training had already been underway for some weeks. The warning order specified Battlefield Area Clearance (BAC) and support to the Logistic Support Group (LSG), based in Al Jubayl, as likely tasks. We were hampered in our preparations in England by a shortage of fuel, transport and areas upon which to train. What was needed was a back door training area to prepare squadrons prior to emergency deployment.

Within 36 hours of arrival in Al Jubayl, the squadron was tasked with providing BAC, water and electricity supply and sewage disposal in Kuwait City, to support camp structures for a 1500 man camp constructed to house the 1 Armoured Division battle group remaining in Kuwait. All material and equipment were to be acquired locally, which meant working with US electrical voltages and

Maj M G McAlpine
The new 36 Engr Regt Trg area (p166)

unfamiliar kit. Being a Construction Squadron, we had a major advantage in having our own integral electrical, mechanical and construction specialists in the form of Clerks of Works and Garrison Engineers. Without these experts the artisan tradesmen would not have been able to make their "Heath Robinson" arrangements work as efficiently or as safely as they did — a civilian electrician was killed in the Kuwait City power plant during this time doing much the same sort of thing that we were doing. Class 2 artisan tradesmen had problems in keeping equipment running, and Class 2 electricians in particular, even with a sound theoretical knowledge of generators, were unable to produce a safe electricity supply from generators found in Kuwait.

Before returning to Maidstone the squadrons resolved to be better prepared to meet this type of challenge in future. To that end, while other units had been busy scouring the battlefields for Iraqi tanks to serve as trophies, we instead recovered as many types of electrical generators as could be found with a view to incorporating them into the new training area. Also recovered were heating, ventilation and air conditioning units and camp structures, some of which had been left over from the construction of the camp in Kuwait City.

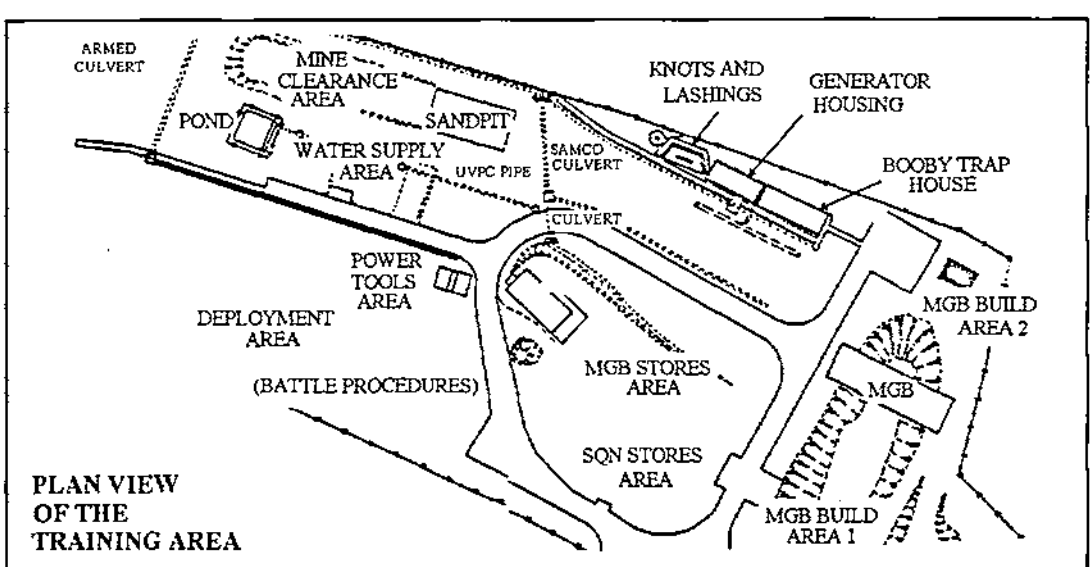
Training Area Design

After much discussion the following requirements were agreed:

- Construction of a building to house and run the generators recovered from Kuwait.
- Provision of an electrical load to use the power generated.
- Construction of a water source to allow the building of a water point during training.
- Construction of a mine clearance area where prodders and magnetic detectors could be used to locate targets.
- The building of an area to allow the use of power tools.
- The refurbishment of the existing bridging gap to include the construction of a permanent Heavy Girder Bridge for use as a demolition target.

A sketch of the plan view of the area is given below — it has already proved its worth. 20 Field Squadron based successful exercises in the area and enquiries have been received from the Territorial Army, particularly those new regiments forming in the South of England. Not a glamourous project perhaps but one which demonstrates what can be done to provide a worthwhile training facility at low cost and with some good engineer construction training to boot!

The Commanding Officer was talking only the other day about the next phase of construction; he is keen to keep up the momentum of the project. Has anyone seen Officer Commanding 20 Field Squadron?



PLAN VIEW OF THE TRAINING AREA

Geology of Gibraltar:
School of Military Survey Miscellaneous Map 45 (published 1991) and its Historical Background

COLONEL E P F ROSE TD MA DPHIL MIWEM CGEOL FGS AND
MAJOR M S ROSENBAUM BSC PHD ARSM DIC EURING CENG MIMM CGEOL FGS

Ted Rose

Mike Rosenbaum

Both authors have served together in the RE Specialist Advisory Team (V) (formerly the Engineer Specialist Pool).

Ted Rose was its Senior Geologist for some 16 years in total; additionally appointed Commander RESAT in April 1987, his tenure as a Colonel expired in April 1990, and it was thus time to transfer to RARO. Mike Rosenbaum then became Senior Geologist, on promotion to Major.

Both authors lecture in the University of London. Ted Rose is a Senior Lecturer (in stratigraphy and palaeontology) at Royal Holloway and Bedford New College. His doctoral thesis (at Oxford) was based on fossiliferous limestones in Cyrenaican Libya, and he has supervised PhD research projects in many other limestone areas overseas, including Thailand, France, Malta and Gozo, Sicily, Antigua, and most recently Oman. He contributed the chapter on Geological Maps and other Information Sources to Military Engineering *Vol XV:* Applied Geology for Engineers. *His association with Gibraltar combines these two interests: limestones and geological mapping.*

Mike Rosenbaum has recently been promoted to Senior Lecturer (in engineering geology) at the Imperial College of Science, Technology and Medicine. His doctoral thesis (at Imperial) was based on the geotechnical properties of mudrocks, and he currently directs a number of PhD projects dealing with aspects of engineering geology. His particular research interests concern the rapid assessment of ground investigation data and the application of computer techniques to geological mapping.

Both authors have served under Corps auspices on Gibraltar, contributing to a number of projects relating to hydrogeology and engineering geology (particularly slope and tunnel stability). The geological map and background research described here fill an information gap perceived during the course of this Corps work.

IN 1991 the School of Military Survey printed the first detailed geological map of Gibraltar ever to be published, culminating nearly 250 years of military observations on the Rock, and 130 years of Sapper effort.

This recently published *School of Military Survey Miscellaneous Map 45* is more than just a single map of Gibraltar. Prepared during training courses in cartography, side one of this 870 by 615mm sheet actually depicts four

Col Rose TD & Maj Rosenbaum
Geology of Gibraltar (p168)

multicoloured geotechnical maps: solid (bedrock) geology at scale 1:10,000; plus Quaternary (superficial) geology, geomorphology and roads, and engineering use of geological features maps, all at 1:20,000. Additional information includes a locality diagram for the Straits of Gibraltar area; four geological cross sections through the Rock; a reference list giving bibliographic details of all major geological works on Gibraltar; a brief introduction to the history of the Rock; and basic map compilation, production and geographic data.

Side two of the sheet provides another map: a combined bedrock/superficial geology map at 1:10,000 scale. This side illustrates the geology of Gibraltar at a glance by 16 panels of coloured figures or photographs together with explanatory text which surround the map: five panels at the top set the geology of Gibraltar in a regional context both geographically and in stratigraphic time; eight panels beside the map illustrate and describe the geology at key localities marked upon it; three panels at the bottom illustrate and describe major features of the Gibraltar Limestone, its associated Shale formations, and the Quaternary geology.

The sheet as a whole thus condenses a wealth of important information into a minimum of space in a way attractive to the eye — in the best traditions of specialist military mapping. Design and cartography were by Staff Sergeant D N Johnson, in an exercise steered largely by Captain R L Dykes as Assistant Instructor Cartography. Scanning and printing were by 42 Survey Engineer Group. The task developed basic cartographic skills in a combination little practised by Military Survey, and was therefore technically challenging. The success is evident.

Not immediately apparent from the map, however, is just how much background military effort, especially Sapper effort, has contributed to this present understanding of the geology of Gibraltar. Some additional credit is due.

For the first recorded geological observations, made nearly 250 years ago, that credit is due to a Gunner! Thomas James served for some six years on the Rock between 1748 and 1755 as a junior officer (Captain Lieutenant) in the Royal Artillery, before active service against the French (at the Siege of Rochefort 1757) and revolutionary Americans 1775-6 (notably at Bunker Hill). His massive 787 page book on the History of the Herculean Straits (James, 1771), published whilst he held the rank of Lieutenant Colonel (on the way to Major General and Colonel Commandant RA), contains numerous good geological observations although associated with what must now be judged to be some very obsolete ideas.

An infantryman gets the credit for taking up the geological cause in the next generation: Captain Ninian Imrie of Denmuir. Although erroneously credited to the Royal Artillery by Busk & Falconer (1865), he actually served with the Second Battalion of The First (or Royal) Regiment of Foot (subsequently the Royal Scots), which was stationed on Gibraltar from 1784 to 1793. His "mineralogical" description of the Rock (Imrie, 1798) was published following his return to Edinburgh and promotion to Major. It is the first strictly geological account of Gibraltar, stimulated by the intense geological debate then current in Edinburgh which did so much to advance earth science in general at this time. Imrie achieved the rank of Lieutenant Colonel in the army in 1798, although still only a Captain in his regiment, and it was as a Captain of Foot that he transferred to half pay in 1800 — and to his estate in Fifeshire, and to some very productive geological studies in Scotland.

The next geological observations were made by James Smith of Jordanhill (Smith, 1846). He was for a time an officer in the Renfrewshire Militia and, according to the Dictionary of National Biography, happened to be on duty at the Tower of London during the once celebrated imprisonment of the MP Sir Francis Burdett, a determined and in his day highly emotive advocate of government reform and of free public speech. A memoir based on information from his son records that, prior to 1812 "He served for some years in the Renfrewshire Militia, then a permanently embodied force. In the prevailing dread of a French invasion, he was for nearly a year quartered with his regiment in the South of England. He threw himself into the profession of a soldier with the same ardour that distinguished him in every pursuit that pleased him, and he retained throughout life a strong interest in military matters." (Smith, 1880, p.xxv). However, it was as a civilian yachtsman rather than a soldier that Smith visited the Rock.

The near-contemporary "military" geologist was another infantryman, Joseph Frederick Brome. Brome arrived in Gibraltar on posting from Dublin in 1839 as a Lieutenant with the

Charles Warren, whose 1865 topographical map provided the basis for the very first geological map of Gibraltar. [Photograph taken when Warren held the rank of Lieutenant, as on Gibraltar; from Corps Museum archives].

46th (South Devonshire) Regiment of Foot (subsequently the Duke of Cornwall's Light Infantry, now 1st Battalion, The Light Infantry). He sold his commission in 1842 when the Regiment moved on to Barbados, but served as governor of the military prison on Windmill Hill, Gibraltar, for the 22 years 1846 to 1868. During the latter years especially "Captain" Fred Brome made good use of his time and his prisoners to excavate Gibraltar caves. For this activity he was highly commended by the Governor and in contemporary geological literature (eg Busk & Falconer, 1865; Busk, 1869) — and dismissed from his post. He returned to Britain to govern the military prison at Weedon, Northampton, in 1869, but the prison was abolished that same year. He died in despair, on 4 March 1870. His studies on Gibraltar caves earned him a fine obituary in the first volume of the internationally-respected scientific periodical *Nature* (Busk, 1870) and an entry in Boase's (1892) *Modern English Biography* — but left his widow and eight children facing penury.

Gibraltar caves stimulated another Gunner, Alexander Burton-Brown, into exploration and geological publication (Brown, 1867) — and did not do his career any harm at all. He served on Gibraltar from 1861 to 1866 as a subaltern, before later overseas postings to Ceylon, Singapore and India, achieving the rank of Colonel in 1890 and half pay followed by retired pay soon afterwards.

But none of these very creditable studies resulted in any sort of geological map — for a geological map must be based on an accurate and detailed topographic map. This, at last, was to be the major early Sapper contribution. The Corps is justly proud of its former Colonel Commandant General Sir Charles Warren GCMG, KCB, FRS — greatly distinguished by his lifetime of military service, his notable archaeological work in Palestine, and (arguably!) for his tenure of the post of Chief Commissioner of Police for the Metropolis during the time of the Jack-the-Ripper murders in London. But as a young officer Warren had spent over six years on Gibraltar, from January 1859 to July 1865 — a formative period rating a whole chapter in his biography (Williams, 1941). Four years were spent making a trigonometrical survey of the Rock, from which a map and 30 foot model were constructed. It was this map that made possible the detailed geological survey undertaken by Professor A C Ramsay and Dr J Geikie in 1876, which we have already described in this *Journal* (Rose & Rosenbaum, 1990). Indeed, although Warren returned from Gibraltar to England to serve as Assistant Instructor in Surveying at the School of Military Engineering, Chatham, he received an appointment from the War Office in September 1865 to assist Professor Ramsay in making a geological survey of the Rock. This plan fell through, hence the civilian survey of 1876 on behalf of the Colonial office. His contributions to geological investigations (Warren, 1865) were, however, recognised in March 1866 when on the proposal of Professor Ramsay, together with R G Austen and R Etheridge, "Lieut Charles Warren RE, Gibraltar" was elected a Fellow of the Geological Society (of London).

The Ramsay & Geikie (1876, unpublished) geological map drawn on Warren's base map was to influence construction work on Gibraltar for over 60 years, until tunnelling work during the 1939-45 War proved it inadequate. We have

Col Rose TD & Maj Rosenbaum
Geology of Gibraltar (p170)

already described (Rose & Rosenbaum, 1990) how a new geological map was then prepared as a Sapper initiative (Greig, 1943, unpublished). 1950672 Sapper Alan Launcelot Greig undertook the work, and its importance is such that we should document a little more about the author. Born 6 May 1908, Greig had enlisted in the Corps at Edinburgh on 18 April 1941, as a driver, and was posted initially to No 2 MT Depot. He embarked for Gibraltar on 15 September 1941, and on arrival on 27 September was posted to 180 Tunnelling Company. There his geological expertise was recognised, and he was re-posted as a Sapper rather than driver, and attached to HQ No 3 (Transport) Engineers, on 30 September 1942, credited with Draughtsman Topographic A III as a trade. He achieved Draughtsman Topographic A II in July 1943, and brief transfer to the Chief Engineers Pool, but returned to Britain on 26 November. In Britain he received a series of survey postings, punctuated by two periods in hospital in 1945, prior to his discharge on 3 April 1946 as "Permanently unfit for any form of military service". He left with the testimonial that "He has passed a Trade Test of Draughtsman (Topo) A II and has given very satisfactory work in this trade. He has performed his duties conscientiously and willingly. He is honest, sober and trustworthy.".

We have recorded other biographical details elsewhere (Rose & Rosenbaum, 1990), but add here an extract from a letter he wrote on 15 May 1988 to a former postwar geotechnical colleague, Mrs Margaret Dobson BSc (a geology graduate of Bedford College London). He comments on his Gibraltar service in wartime: "As I was known to be trained I was asked (more or less unofficially) for my views on the local geology but since I had absolutely no access to any existing literature and only 2 sq miles to view (mostly standing on end) my ideas could only be very superficial. It is, of course, a complex branch of the Alpine systems and soon afterwards old Bailey came over from the Natural History Museum to have a look round. He is (or was?) one of the leading Alpine authorities and eventually produced the very workmanlike paper which you refer to. The limestone, much resembling Carb[oniferous] Lime[stone] in hardness and appearance is incredibly unfossiliferous so my only claim to fame is that I did manage to find a few small identifiable Ammonites of (hopefully) stratigraphical significance." This must rate as his dying testimonial, for this modest man (who had declined recommendation on Gibraltar for officer training) died very shortly afterwards, having "just turned 80" according to his letter (although Imperial College records give his date of birth as 6 May 1907 — hence our former (Rose & Rosenbaum, 1990) reference to his 81st birthday). "Old Bailey" was Sir Edward Battersby Bailey, Director of the Geological Survey of Great Britain, who as a Royal Garrison Artillery subaltern had been twice wounded in World War One, and lost his left eye and much use of his left arm but gained a Military Cross, the French *Croix de Guerre* with palms, and appointment as a *Chevalier de la Legion d'Honneur* — before "retirement" in the rank of Lieutenant. He rated this Sapper's efforts significantly more highly, formally paying tribute to him as one who had "opened up a new chapter in geological research in Gibraltar" (Bailey, 1952). Perhaps more of our Sappers deserve, but few actually receive, such lasting and authoritative commendation by name for their Corps work.

The story of how Greig's unpublished geological map was superseded in 1947 by a more detailed map, constructed by Captain G B Alexander RE, has already been told (Rose & Rosenbaum, 1990). Additionally, a hitherto untold story can be pieced together from British Geological Survey files, from copies of the correspondence sent by Bailey from the Edinburgh office of the Geological Survey to the then Chief Palaeontologist, Dr C P Chatwin, in London. These relate to Alexander and his work on Gibraltar. The early letters are euphoric: there is "hope it will lead to profitable collaboration" (27 August 1946); request to the War Office to "send Alexander here for official discussion" (3 September 1946); report that "Alexander and I have had a very good talk over Gibraltar" (15 September 1946); pleasure that "we are in luck to have a good man like Alexander on the spot" (18 September 1946). Then doubt sets in: "I have had a long letter from Alexander... At the moment I have not gathered a very clear idea of what he is getting at" (18 November 1946). Then despair: "That amazing Alexander has completely disappeared" (1 October 1947). But he obviously reappeared: "I have been South and had two day' talk with Alexander... I naturally want to help Alexander as much as possible" (23 March 1948). And finally despair once more: "It's no use waiting for the disappearing

Alexander" (16 December 1949). Bailey therefore abandoned his initial plans for a paper on Gibraltar written in collaboration with Alexander, and published an account as sole author (Bailey, 1952) although with all due credit to Chatwin and to Greig and to assistance from Natural History Museum palaeontologists. Alexander thus left Gibraltar and the Corps with no written text in explanation of his unpublished geological map, an embarrassment which the Chief Engineer had to explain to the Governor.

In 1978 an attempt was made to rectify the deficiency by bringing Alexander's map up to publication standard. Under Territorial Army geologist supervision, a Military Works Force draughtsman began to redraw and revise the map, but this work focussed attention on a number of inconsistencies and uncertainties in the original draft. So the project was deferred, pending the further work to which we have already referred (Rose & Rosenbaum, 1990).

Now at last the Corps has been able to produce the long-awaited map. Unlike the map of Greig this map has been authored by geologists with ready access to the now very extensive geological literature. Unlike the map of Alexander, it does have a written text in explanation, for the Gibraltar Museum has near-contemporaneously published a substantial descriptive text to accompany it (Rose & Rosenbaum, 1991). Moreover, rather than shred the surplus of their "exercise" maps, the School of Military Survey has generously donated them to the Museum for local sale, thus maintaining the long-standing Corps support for charitable objectives on the Rock. Both map and memoir are therefore available to the Gibraltar community as well as the Services.* The job, at last, is done, and Corps honour satisfied — a timely contribution to the future development of the Rock, as its resident military presence numerically declines.

Acknowledgements

We are grateful for provision of information in correspondence to Brigadier K A Timbers (The Royal Artillery Historical Trust), Dr Linda Washington (The National Army Museum), Major W H White (Regimental Museum, The Duke of Cornwall's Light Infantry), Lieutenant Colonel J L Wilson Smith OBE (Regimental Headquarters, The Royal Scots), Miss E A Ingpen (The Royal Society of Edinburgh), and G McKenna (Chief Librarian and Archivist, The British Geological Survey), as well as military manning and record offices. Access to archives and published information sources was expedited by librarians at the British Museum (British Library Humanities and Social Sciences), the Natural History Museum (British Museum, Natural History), the Geological Society of London, and the Public Record Office at Kew, as well as at Royal Holloway & Bedford New College and the Imperial College of Science, Technology & Medicine (both University of London).

References

Bailey, E B 1952. Notes on Gibraltar and the Northern Rif. *Quart J geol Soc Lond*, vol 108, p157-175.

Boase, F 1892. *Modern English Biography*, containing many thousand concise memoirs of persons who have died between the years 1851-1900 with an index of the most interesting matter. 2nd impression 1965. Frank Cass & Co Ltd, London. Volume I, A-H.

Brown, A B 1867. On the geology of Gibraltar, with especial reference to the recently explored caves and bone breccia. *Proc Royal Artillery Institution*, vol 5, p295-303.

Busk, G 1869. On the caves of Gibraltar in which human remains and works of art have been found. *Trans Int Congress Anthrop prehist Archaeology, 3rd session Norwich 1868*. p106-167, 12 pls.

Busk, G 1870. [Obituary] Captain Frederick Brome. *Nature*, vol 1, p509.

Busk, G & Falconer, H 1865. On the fossil contents of the Genista Cave, Gibraltar. *Quart J geol Soc Lond*, vol 21, p346-370.

Greig, A L 1943. *An account of the geology of Gibraltar*. ii + 18pp, 2 figs, 3 enclosures. (Royal Engineers Gibraltar, unpublished).

Imrie, Major [N] 1798. A short mineralogical description of the Mountain of Gibraltar. *Trans Roy Soc Edin*, vol 4, p191-202.

James, T, Lt-Col RA 1771. *The History of the Herculean Straits, now called the Straits of Gibraltar, including those parts of Spain and Barbary that lie contiguous thereto*. Rivington, London. Vol 1, 379 pp, vol 2, 408pp.

* Copies of the Geology of Gibraltar map may be purchased from: The Librarian, School of Military Survey Library, 42 Survey Engineer Group, Denison Barracks, Hermitage, Newbury, Berkshire, RG16 9TP. Copies will also be issued by the Librarian, for Service use, on receipt of a written justification.

Ramsay, A C & Geikie, J 1876. *Geological map of Gibraltar* Scale 1:2,500. Eight sheets mounted as one sheet, hand coloured, on base map of plan of the Fortress and Peninsula of Gibraltar surveyed 1865 by Lt Charles Warren, RE (plus three sheets comprising seven geological sections). (British Geological Survey, unpublished).

Rose, E P F & Rosenbaum, M S 1990. *Royal Engineer Geologists and the Geology of Gibraltar.* The Gibraltar Museum. 55pp. (Reprinted from the *RE Journal*, vol 103 (for 1989) p142-151, 248-259; vol 104 (for 1990) p61-76, 128-144).

Rose, E P F & Rosenbaum, M S 1991. *A Field Guide to the Geology of Gibraltar.* The Gibraltar Museum. 192pp.

Rosenbaum, M S & Rose, E P F 1991. *Geology of Gibraltar.* School of Military Survey Miscellaneous Map 45.

Smith, J 1846. On the geology of Gibraltar. *Quart J geol Soc Lond*, vol 2, p41-51.

Smith, J 1880. *The voyage and shipwreck of St Paul.* 4th edition, revised and corrected by Walter E Smith, with a preface by the Lord Bishop of Carlisle and a memoir of the author. Longmans, Green & Co, London. xlviii + 293pp.

Warren, C 1865. Notes on the caves of Gibraltar. *Quart J geol Soc Lond*, vol 21, p371.

Williams, W W 1941. *The Life of General Sir Charles Warren GCMG, KCB, FRS Colonel Commandant, Royal Engineers.* Basil Blackwell, Oxford. 450pp.

Sapper Rock

MAJOR A P BURNSIDE
OC 1ST FORTRESS SEPCIALIST TEAM RE

HISTORIC ties between the Sappers and people of Gibraltar are well known and continue to thrive.

The most recent contribution to the local community was the presentation of 4000 copies of a *Geological map of Gibraltar* by Colonel Tony Reed-Screen OBE, to the chairman of the Gibraltar Heritage Trust, Mr Joshua Gabay, on Friday 17 January 1992 — see photograph left.

The maps will be sold by the Gibraltar Museum to raise money for the enhancement of Gibraltar's heritage. With comparable maps on sale in UK at a cost of £8.50, there is good earning potential which will be a welcome and timely contribution to the work of the Museum.

Preparation of data for the base maps was undertaken by Colonel Rose RE(V) and Major Rosenbaum RE(V). Both have a long and distinguished association with the geology of the Rock and worked on the production of the maps in their spare time. These are the first detailed geological maps of the peninsula to be published and complement well the booklet on the *Geology of Gibraltar*.

The School of Military Survey undertook, as an exercise, production and distribution of the map during training courses and it is a first class example of their work.

The geological research and map production are excellent examples of the versatility of the many branches of the Corps of Royal Engineers.

Sapper Rock (p173)

Engineer Stores Park, North West Frontier

MAJOR N S MILLER TD FICE FRTIP

Major Miller, who last published an item in the April 1989 Journal, *came across these notes and photographs about a special project in Persia in 1944. The project was special because it was carried out in the Khyber Pass by Pathan tribesmen, (noted more for their lawlessness and ferocity than for their engineering skills), at short notice and in double quick time.*

The project was secret but Major Miller does not know what the intention was and can only say that in the end efforts, stores and materials were wasted as the results were not used although the tank lorries came in handy in a country where water was always needed in odd places on works duties.

PESHAWAR was the garrison town at the southern end of the famous Khyber Pass in Baluchistan (then northwest India). The cantonment and military installations were enclosed within a barbed wire perimeter. No entry was normally permitted during the hours of darkness.

The Engineer Park was situated some half a mile outside the perimeter off the road leading from Peshawar via the Khyber Pass to the Afghan Frontier and thence over the Plains of Kandahar to Kabul, the capital.

The Park was rail connected by a branch off the line through the Khyber from Peshawar to Landi Kotal near the Frontier, all a part of the 5ft 6in gauge North Western Railway. There was a piped water supply. The Park, which carried a vast quantity of engineer stores seemed to me to be strategically placed to serve a force engaged in defence of the Khyber or in a campaign against Afghanistan or any other similar activities. Apart from many large storage sheds it had several lengthy sidings some with high-level platforms, road and rail served. It was thus equipped for the movement of troops and animals, evacuation of wounded and the like.

The level ground in the vicinity was suited for the establishment of tented camps, hutments or installations with a water supply available. Electricity was obtained from Peshawar via a power line connection.

INSTRUCTION FROM CHIEF ENGINEER NORTHWEST ARMY

IN October 1944 a directive was received from the Chief Engineer to the effect that the Engineer Park had been tasked to equip 120 three-ton lorries with water tanks for a secret project in (what was then) Persia. Reference was made in correspondence to cisterns to avoid any misunderstanding with the fighting vehicle, the tank.

A detachment from the Royal Indian Army Service Corps arrived later with some 20 lorries and drivers, an officer, NCOs, cooks and the like and set up camp within the barbed-wire perimeter of the Park. Armed sentries were provided.

The 500 gallon Braithwaite tank parts, all other stores and timber were to be drawn from Park resources on Chief Engineer's authority.

The lorries were three-ton Dodges obtained from the USA. The load of water, cistern and other parts totalled less than three tons.

RECRUITMENT AND FORMATION

RECRUITMENT of labourers for the project was undertaken by the Park Head clerk, one Ramatulla Butt, a Pathan, who was a gentleman in every sense of the word. He was reliable, capable, of good family and well connected with the local *Maliks* (district chiefs).

After an assessment of the trades needed, men arrived each day like magic. (It must be remembered that the Khyber was peopled with fierce men liable to shoot or knife you without hesitation.) Then I had no time to think how skilled artisans were obtained, but looking back I think it was an after-benefit from the building of the famous Khyber Railway when many of them must have learned to be blacksmiths or pipe fitters. I was authorised to open an Imprest Account for payment of the civilians for the duration of the job.

OFFICERS AND NCOS

I WAS a municipal engineer myself and at that time, by a stroke of fortune had, as a second in command, a certain Lieutenant Simmons RE, who in civilian life had a builders, contractors and plumbers business in North London. He organised and supervised the work and was blessed with a flair for explanation, patience and encouragement, though he could speak no *Pushtu* to our primitive tradesmen.

The Workshop Company on Parade.

Braithwaite Tank Assembly.

Further assistance in control was afforded by two Indian Sub-Divisional Officers (SDO). In the civilian staff of the Military Engineer Services an SDO was equivalent to a Warrant Officer Class II (Military).

Strength and Composition

So far as I can remember and from a study of the photographs, the Workshop Company was improvised something on the lines set out below:-

OC Engineer Park	1
2IC Engineer Park	1
2 SDOs Engineer Park	2
Chief Clerk Engineer Park	1
4 Sections of Artisans x 12 (local recruitment)	48
4 Overseers	4
Total Strength	57

Job Completion Estimated

Each lorry was equipped with a 500 gallon Braithwaite tank, fitted with a 2in diameter galvanised steel tail pipe with brass tap and detachment handle. 6in x 6in timbers with crossed ends, lap-jointed. Ends drilled and bolted down to lorry floor. All the stores were drawn from Engineer Park.

Estimate
One lorry completed daily by each section
Four Sections ∴ $\frac{120}{4}$ = 30 working days
Six day work week ∴ $\frac{30}{6}$ = five weeks

Safe Estimate — Six Weeks

With competition between the sections encouraged, some sections were completing two lorries most days while others were averaging over one per day.

The end result, was that all 120 were completed in one month which earned praise from the Chief Engineer, North Western Army in his letter reproduced below:-

No. 774/154E-Z
HQ North Western Army
Rawalpindi Dated 16 Dec 44

The Commander Royal Engineers (2)
Peshdist
Subject:- JOB 240

I desire to place on record my appreciation of the work done by OC Engineer Park, Peshawar (Captain N S Miller RE) and his staff in equipping 120 lorries with cisterns for Karchi Camp. The work was carried out very satisfactorily and completed before target date, a most important desideratum, not always obtained in these days of overload.

(Signed) E W Pert
Brigadier
Chief Engineer, North Western Army

A few of the tanks were "ready made" galvanised steel. The *chokra* (small boy) was specially employed to go inside and caulk the leaking joints.

Engineer Stores Park North West Frontier (p175)

Memoirs

CAPTAIN P R KNOWLES MA MPHIL. MICE MIHE

Born 13 September1928, died 18 December 1991, aged 63

PETER Knowles was a member of Roberts Batch (Intake 2 Royal Military Academy Sandhurst) and was commissioned into the Royal Engineers in December 1948. He served with 9 Airborne Squadron RE before going up to Jesus College, Cambridge. From there he joined the Gurkha Engineers with which he served until retiring from the Corps in 1960 to take up an academic career.

Peter rose to be Senior Tutor for Industrial Training at the University of Surrey, responsible for placing students with industry during their degree courses. The University still benefits from the system established by him and from the many contacts he made at home and abroad as well as the good will he fostered. He was an acknowledged authority on steel design and his publications in this field of engineering are regarded as text books.

During his time at Surrey, Peter obtained a masters degree to add to his other academic qualifications.

A keen golfer and member of the Royal Engineers Golf Society, for which he played on a number of occasions, he also maintained his links with the Corps on a professional basis.

Although highly qualified academically, Peter was a modest, kindly man with a delightful sense of humour. He was supported in everything he did by his wife Trilby, and by his family, to whom go our deep sympathy in their loss so soon after Peter's retirement.

AGS

BRIGADIER WILLIAM JOHN REED

Born 22 January 1926, died 9 February 1992, aged 66

JOHN Reed was commissioned into the Corps in January 1946 from the Engineer Officers Training School at Kirkee, and his first appointments were in "Works" in Singapore. At the end of 1948 he was posted to the newly created 23 Field Engineer Regiment, first in Hameln and then in Dortmund, as a troop commander. He later became the Intelligence Officer in Regimental Headquarters. John's very quick mind, "unflappability" and unfailing courtesy made him an ideal choice for a grade three staff job at Headquarters, 2 Division at Hilden, but within months he was picked to join Brigadier Pike, the new Chief Engineer of Headquarters 1st British Corps on its reformation in June 1951, at Bad Oeynhausen. John was always "tickled" that it was Brigadier Pike who had been Chief Engineer of 1st Corps on its disbandment in 1945.

John spent over two very successful years there as a SO3RE Intelligence, but much more momentous for him, was the fact it was in Bad Oeynhausen that he met Patricia, the daughter of the Chief Signals Officer of Headquarters, British Army of the Rhine (BAOR), and embarked upon a long and extremely happy marriage.

From late 1953 to mid 1956 the Corps sent him to the Officer Cadet Squadron, School of Military Engineering as instructor and then second in command to train National Service Officers. It is quite clear that those responsible for the posting had already recognised John's flair as a trainer of men, which he maintained throughout his career. He set standards of integrity, application and style, to all who came into contact with him.

A posting to the Engineer Training Brigade at Aldershot, as the SO3 Training, was cut short to attend the 1957 Staff Course at Camberley, which was followed by a grade two post in the War Office in Engineer Training.

He returned to BAOR to command 2nd Field Squadron in Münster during 1961 and 62. His encouragement of contacts with German civilians and military was well in advance of what was then fashionable. He delighted in taking part in a German Army river crossing exercise on the Rhine, thereby becoming the first British unit to be under German command since at least Waterloo and

probably the Battle of Nations at Leipzig in 1811. Then followed a short stint as Secretary of the Nye Committee on the reorganisation of the War Office.

With his talents, he was a natural selection for the directing staff at the Staff College, Camberley, and the three years there no doubt stood him in good stead for his next two difficult and demanding jobs as CRE Operations in Aden for six months, and CRE Gulf in Bahrain. As a member of the inter-service committees working on the emergency plans for the British Forces in the Gulf, he was much admired and gained a reputation for his simple logic and clear concise solutions to the many difficult problems they faced.

He spent just over a year on the staff of the Chief of Defence Staff before returning again to Germany as CRE of 1st Division in Verden for over two years, and then back to the Ministry of Defence again as the Colonel of MO2. A tour on the British Defence Staff in Washington as British Liaison Officer to the US Corps of Engineers was interrupted by his promotion to Brigadier and he returned home to be Commander of Aldershot Garrison.

It was during that final tour that his keen sense of history inspired his desire to preserve something of Victorian military Aldershot for posterity. He was the leader in setting up the Aldershot Historical Military Trust and on retirement in 1980 he became Director of the organisation and the driving force in what today is a very successful military museum. In later years he was active also in the more recent project to link all Aldershot's military museums in one vast scheme and as Chairman of the executive committee was working at his desk two days before his sudden death.

All those whose careers touched John's, remember him as the very epitome of a gallant Christian gentleman. He will long be remembered as a marvellous host with a delightful wit. Many in the Corps and the Army have benefited from his wisdom and teaching, so kindly given. Our sympathy goes to his wife, Patricia, and their three daughters.

GBS

DAVID BELL MBE

Born 6 February 1921 Died 2 March 1992 aged 71

DAVID Bell, who has died aged 71, lost both his hands and his eyes while serving in the Second World War and went on to show remarkable courage and enterprise in setting up his own business, taking two university degrees and working for disabled people.

While serving with the Royal Engineers in the desert, he was wounded before the "Battle of Knightsbridge" in June 1942. He had volunteered to clear a minefield and a booby-trap blew up in his face.

Bell was injured so badly his comrades thought he would not survive. But he managed to tell his rescuers how to put a stone in the crook of each elbow and bind up his arms to staunch the blood. He then led them back the way he had come, before lapsing into unconsciousness. He remained in a coma until August.

Bell was taken out of Tobruk by the last ship and evacuated to South Africa, where surgeons fashioned a pair of "tweezers" out of the remnants of the thumb and forefinger of his left hand — although he was unable to read Braille.

Field Marshal Smuts, who visited Bell in hospital, was so impressed with his character that he presented him with his Victory pin.

David Bell was born in Edinburgh on 6 February 1921 and began his career as a draftsman with SMT Edinburgh, the omnibus company. After Munich he found he was unable to enlist in the Services because he was in a reserved occupation.

But eventually he wangled his way into the Royal Engineers and was sent out to North Africa with the 1st Field Squadron.

In June 1943 he returned from South Africa to the St Dunstan's Rehabilitation Unit in Church Stretton, Shropshire. "Give me ten years," he said "and I'll show what I can do."

During his time at St Dunstan's he became a proficient typist and intended to make his living as an interpreter or translator — he spoke fluent French, German and Afrikaans.

In 1943 he became engaged to Sibyl Page, a voluntary worker, and they were married in 1945. He then decided to go into business as a tobacconist and confectioner.

St Dunstan's built equipment which took change and delivered goods: he worked these with his "tweezers" with astonishing precision. His business was supported by St Dunstan's and it soon thrived. In 1950 he went up to Edinburgh University. His fellow undergraduates established a group which would recite lecture notes and read set books to him. Thanks to his astonishing memory, he graduated with an MA in 1952 and a BComm in 1955.

Bell kept in touch with the university as honorary president of the Commerce Graduates and as a member of the Council's business committee in the 1980s. He was also a member of the Edinburgh Merchant Company and Edinburgh Senior Chamber of Commerce.

He sat on the BBC Scotland Appeals Committee, hospital boards and was a vice president of the National Federation of the Blind.

In 1962 he became a founder Chairman of the Edinburgh Ex-Tablers' 41 Club, and was elected President in 1983. In 1957 he was the subject of BBC Television's *This is Your Life*. In 1972 he was appointed MBE for his work for disabled people.

He is survived by his wife, a son and a daughter.

MAJOR GENERAL D C T SWAN CB CBE

Born 2 September 1900, died 7 March 1992, aged 91

MAJOR General D C T Swan CB CBE, was Director of Fortifications and Works at the War Office, 1953-55.

His memorial stands — unattributed to him — in the woods of Rheindahlen in Germany, between the Dutch frontier and the Rhine. In the early 1950s, as Chief Engineer BAOR, he supervised the planning and early phases of the construction of the vast complex which houses the headquarters of NATO's Northern Army Group, the British Army of the Rhine and the 2nd Allied Tactical Air Force. Later, as Director of Fortifications and Works, he oversaw its completion.

Swan had already made his contribution to military history in Burma as the Commander Royal Engineers (CRE) of the 1st Burma Division during the thousand mile withdrawal from Rangoon to India in 1942; and as Chief Engineer of the 15th Indian Corps in the British counter-offensive, which won Burma back in 1944-45.

Dennis Charles Tarrant Swan — nicknamed affectionately 'Duck' Swan by his colleagues — came from a family which had long associations with the Sappers, India and Burma. His great, great grandfather, a lieutenant general, retired as Chief Engineer, Ireland, in 1802. His grandfather, a major general, commanded the Deccan Horse during Robert's march from Kabul to Kandahar in 1880. And his father, Lieutenant Colonel C T Swan, commanded units of the Madras Pioneers during the Boxer Rebellion in China, in the Burma wars and in Mesopotamia during the first world war.

Educated at Wellington College and the Royal Military Academy, Woolwich, Dennis Swan was commissioned into the Royal Engineers in 1919 and learnt his soldiering with a field company at the Curragh and with a fortress company in Cork harbour during the Irish "troubles" of the early 1920s.

By 1924 he was on his way to India to follow in his father's footsteps in the Madras Sappers and Miners. He stayed with them for almost ten years

Maj Gen D C T Swan CB CBE

on the North West Frontier in South Waziristan with the Manzai Brigade's field company.

When he arrived back in England in 1935, the expansion of anti-aircraft units to meet the perceived German air threat was already under way. He became Brigade Major of the 40th Anti-Aircraft Brigade in northwest London.

When war came in 1939, he went over to France with the BEF as a lieutenant colonel in charge of the construction of the underground headquarters for Lord Gort's GHQ at Doullens. Just before the German offensive in the West began, he was appointed Commander Royal Engineers to Martel's 50th (Tyne & Tees) Division. He took part in its abortive counter-attack at Arras, which made Rommel's 7th Panzer Division pause momentarily; and then executed 50th Division's demolition plan to cover its withdrawal to Dunkirk.

He spent almost a year back in Ireland at Lisburn, near Belfast, developing the unused contingency plans for a British invasion of the Republic to pre-empt German landings. As soon as the Japanese entered the war at the end of 1941, all available officers with Indian Sappers and Miners experience were hurried back to India. Swan was appointed CRE of 1st Burma Division.

He was soon engulfed in executing demolition plans to cover the withdrawal northwards up the Irrawaddy in the face of the Japanese advance, and in organising the Irrawaddy flotilla for the British evacuation of southern Burma. He survived the disastrous battle around the oil-fields at Yengangyaung when the division was all but destroyed as a fighting force, and then organised the Irrawaddy ferry-crossing at Samaikon to the West of Mandalay, enabling what remained of his division and much of the 17th Division to fight their way up the valley of the Chindwin and thence back to India.

Swan returned to Burma in 1944 as the Chief Engineer of Philip Cristison's 15th Indian Corps, which, after the severest fighting, eventually defeated the Japanese in the Arakan, took Akyab and advanced with a series of amphibious landings down the Burma coast, reoccupying Rangoon in May 1945. 15th Indian Corps was then withdrawn to India to play the leading role in Operation *Zipper,* the invasion of Malaya.

The dropping of the two atomic bombs on Japan turned *Zipper* into the unopposed reoccupation of Malaya, Singapore and the Netherlands' East Indies. Swan was present when Mountbatten took the Japanese surrender in Singapore, and went on to be the Chief Engineer of the British occupation forces in Java and Sumatra.

In 1946 Swan returned to Europe as Chief Engineer of 7th Armoured Division's area of occupation in northwest Germany around Hamburg and Verden; and by the time the Berlin airlift began in 1948, he was Deputy Director of Engineer Works at HQ BAOR, responsible for the construction work needed to increase the British air supply effort.

Two years later he was promoted major general and appointed Chief Engineer Northern Army Group and BAOR, and started the building of its permanent headquarters. His last appointment in the army started in 1953 when he became Director of Fortifications and Works at the War Office.

After he retired in 1955, he spent five years as managing director of a firm dealing in tractors and earth-moving machinery. He was president of the Institution of Royal Engineers from 1961 to 1965.

When the Soviet army invaded Afghanistan in 1979, he protested by returning to the Soviet ambassador in London the insignia of the Russian Order of the Patriotic War (1st Class), which he had been awarded for his contribution to the Allied war effort.

In 1930 he married Patricia Ethel Mary Thorne, who died in 1960. They had a son and a daughter.

BRIGADIER J C WINCHESTER CBE MC

Born 3 January 1912, died 11 March 1992, aged 80

Brig J C Winchester CBE MC

JACK Winchester was an officer of outstanding ability with a well-founded reputation for efficiency. Educated at Wellington, the Shop and Cambridge, he was an all-round athlete. He captained the Royal Military Academy rugby team and represented his school, the Shop and St Catharine's College, Cambridge, at rugby, boxing and hockey.

Commissioned into the Corps in 1932, his first posting was to India, to 3 Company of the Bengal Sappers and Miners with which he fought in the 1937 Waziristan Campaign. No problem ever daunted him and he had an extraordinary capacity for getting through a great deal of work rapidly and without fuss. He soon became known as a fine leader and a highly competent officer. A good linguist, he quickly learned to speak Urdu and Pashto well (and later German, Arabic and Swahili). He enjoyed the active life of India and particularly fishing and shooting trips in the hills and forests of the Himalayas. On these he was a splendid companion, amusing, resourceful and unflappable. Although tough and decisive he was a remarkably modest and sensitive man, totally free of any trace of pomposity. He went out of his way to help others and many of those who served with him or under him have recalled examples both of his modesty and his unobtrusive assistance.

The advent of World War Two found him in Wana on the North West Frontier, but in 1940 he was posted as Adjutant Royal Engineers to 5 Indian Division in the Sudan. In 1941 he was promoted as SORE to the Chief Engineer there and took a leading part in supporting the Sappers during the desperate fighting at Keren. When the OC was wounded he was given command of 20 Field Company of the Bombay Sappers in the middle of the final battle of Amba Alagi where the Italians surrendered. After a spell in Cyprus, 20 Field Company went to Iraq where General Slim was then commanding 5 Division and took part in the operations to oust Rashid Ali. In May 1942 things were not going well in the Western Desert and Winchester and 20 Company found themselves switched to Egypt and involved in the battle of Gazala and then the first battle of Alamein where Rommel was stopped. For his efforts during this period he was awarded the MC.

Winchester then returned to the UK to command 241 Field Company in Scotland. A year later he attended the Staff College and in the summer of 1944 was posted as OC of 9 Airborne Field Company, then a glider-borne unit. With them he landed at Arnhem in September and became acting CRE of the 1st Airborne Division there when his CRE was sent on a mission to get reinforcements. After distinguishing himself in heavy fighting he took a prominent part, when his CRE had returned, in helping the survivors of the Division to withdraw. On return to the UK the only survivors of 9 Airborne, out of the eight officers and more than 200 men who had taken off two weeks before, were Winchester and 56 Sappers. The company was reformed and, with the 1st Airborne Division, after VE Day, liberated Norway where he was appointed CRE of the Division.

In 1946 he was posted as an instructor at the Staff College at Haifa and when that folded took up a similar job at Camberley. He then served in Kenya for several years where in his spare time he and his wife, a notable artist, designed and built by direct labour a house near Nairobi. Back in the UK in 1950

Winchester attended the Joint Services Staff College and then took up a GSO1 post in the Ministry of Defence. In 1952 he was appointed a Brevet Lieutenant Colonel and his career began to be shaped for one likely to rise high in the Army. In 1953 he became a much respected College Commander at Sandhurst and after two years left to go as an instructor at the United States Staff College. He followed this by commanding a Territorial Army Engineer Group when he was posted to the Imperial Defence College. His next appointment was as secretary to the Army Council, a prestigious appointment which he carried out for two years with outstanding efficiency and for which he was appointed CBE. All his friends confidently expected that he would rise to the highest rank in the Army, but it was not to be. The outcome of a disagreement on a matter of principle making him aware that his career had received a set-back, he refused the post of Military Attaché in Moscow and resigned his commission, retiring to his house in Kenya. There he shortly inherited a large house on the outskirts of Nairobi from his aunt, who had started an airline which later became Middle East Airways. After Independence this house was eventually bought by a senior Kenyan minister and Jack and Lorna, who survives him, retired to Madeira.

As JHB writes "Jack was a man of sterling worth, great courage and outstanding ability. Yet he was modest, kindly and had a quiet sense of humour. All who knew him expected that he would go much further in the Army. However in the highest ranks the hazards of personalities are a big factor and in this respect he seems to have been unlucky. But his career was one of which the Corps and his family can be justly proud.".

ECWM, JHB, PNMM, FHL, AJ, IHLG

MAJOR GENERAL SIR GERALD DUKE KBE CB DSO DL

Born 12 November 1910, died 29 April 1992, aged 81

Maj Gen Sir G Duke KBE CB DSO

GERRY Duke was an outstanding staff officer, able military engineer, and all-round sportsman and sailor but, above all, a most amusing personality with a quick, crystal clear mind, nimble wit and lightness of touch which made him a man for all seasons and all ranks. His honesty of purpose, sense of fun and unstinting enthusiasm appealed to soldiers and generals alike.

He came from a Service family: his father, Lieutenant Colonel A A G Duke, was Indian Army; his grandfather, Cape Mounted Artillery; and his two uncles, Royal Navy and Royal Artillery. He was educated at Dover College, the Royal Military Academy, Woolwich, and Jesus College, Cambridge, and was commissioned into the Royal Engineers in 1931. During the Abyssinian crisis in 1935 he was sent out to Egypt to join the 2nd Field Company RE, which was part of the embryo armoured division in the Western Desert, where he began his long, and ultimately useful politico-military association with the Middle East.

The Arab Revolt in Palestine in the mid-1930s brought him his first operational experience: two years of counter-terrorist operations with 2nd Field Company RE, followed by anti-sabotage work on the Palestine railways with 8th Railway Company RE until he went to the Staff College, Haifa, in 1939. His first staff appointment was GSO2 in the ill-fated British Expeditionary Force to Greece in 1941. He

managed to escape capture by sailing a barely seaworthy caïque with a party of Sappers to Crete, where they were rescued by a destroyer and landed at Port Said.

He returned to the Western Desert soon afterwards in command of the 4th Field Company RE in 7th Armoured Division — the original Desert Rats. His dashing style and zest for life, coupled with sound tactical instincts, made him *persona grata* to the armoured regiments during the desert war. As the invasions of Sicily and Italy approached, he was brought back to Egypt to become Chief Instructor at the Combined Operations Training Centre, where he organised and ran the intensive training programmes needed by 8th Army units.

Just before the invasion of Sicily in July 1943, he rejoined 8th Army as a GSO1 on Montgomery's operational staff for the Sicilian Campaign and the invasion of Italy. When Montgomery returned to England in January 1944 to prepare for *Overlord,* he stayed behind for a short time as Brigadier General Staff until he, too, was summoned home to establish the 'Build-up Control' for Normandy as Brigadier Q (Movements) on 21st Army Group staff.

During the invasion, it was Duke's task to determine the priorities for shipping units and cargoes across the Channel, and to develop Montgomery's lines of communication. Before the war ended, he was allowed to return to regimental duty in command of the 49th (West Riding) Divisional Engineers, and won his DSO in the fighting in the Nijmegen bridgehead.

As the war drew to its close in Europe, he went out to India to become Chief Engineer of the 14th Army for the invasion of Malaya; after Singapore and Malaya had been reoccupied in the autumn of 1945, he was appointed Brigadier i/c Administration, tasked to convert 14th Army into its peacetime role of Malaya Command. By this time he had established a reputation for constructive originality, which led to his appointment as the Chief of Imperial General Staff's exercise planner and then as an instructor at the Imperial Defence College.

He was in BAOR in 1952, commanding 7th Armoured Divisional Engineers, when he received an urgent summons from the War Office to go out to Cairo as British Military Attaché. The Egyptian Revolution had just taken place, and he was considered to be the best man to help win Colonel Abdul Nasser's confidence in negotiations for the British withdrawal from Egypt. Being much the same age as Nasser and with some experience of the Cairo environment, he was able to establish a friendly first name relationship with him, and to become a key figure in the tortuous negotiations, which led eventually to the Anglo-Egyptian Agreement of 1954.

Duke's subsequent career was: Deputy Director of Staff Duties in the War Office, 1954-56; Commandant of the School of Military Engineering, 1956-59; Director of Personal Services in the War Office, 1959-62; and Engineer-in-Chief, 1963-65. He retired at his own request in August 1965 to build a new and successful career in civil engineering. He was appointed a KBE in 1966.

Early in his career he had represented the Army at hockey, and throughout his life he was passionately fond of sailing in all types of boat, enjoying most the challenge of sailing big boats off-shore in the foulest of weather. He was Commodore of the Royal Engineers Yacht Club, 1957-60 and 1964-65.

He married Mary Elizabeth Burn in 1946. They had a son and a daughter. Mary died in 1979.

WGFJ

PFWC also writes : I remember in 1951, when General Duke was commanding 21 Field Engineer Regiment in Nienburg, having taken voluntary demotion from Brigadier in order to have that experience, I saw him arriving back at his quarter from an exercise into a gathering of young wives having a coffee morning with Mrs Duke. He was grubby from two days in the field, but was wearing a broad grin.

"I have blown up a bridge!"

"Why?"

"The orders from Brigade were to blow it, so I did! They forgot to mention dummy charges, so we used real ones!"

"Whose job is it to repair it?"

"I don't know. I only obeyed orders. It's Brigade's job to sort it out!"

It happened to be the footbridge the horse gunners were in the habit of using to exercise their horses. The irrepressible sense of mischief as well as a unique way of demonstrating to those above and below him the importance of meticulous accuracy was, I think, typical of the man. It perhaps also illustrates the perennial competitiveness between RA and RE, which stems from the days of the Shop at Woolwich.

LIEUTENANT COLONEL (QM) R J GROCOTT

(Memoir April 1992 *Journal*)

AEY also writes: Bob Grocott was my Regimental Sergeant Major when I commanded 36 Engineer Regiment. For the Commanding Officer of a regiment the personality of his Regimental Sergeant Major is so vital that it is probably the most important single factor in his command. I have never ceased to thank my luck that my Regimental Sergeant Major was Bob Grocott. I could not have had a more sensible, balanced and experienced man to fill that critical post. That he rose to the rank of Lieutenant Colonel was most well deserved, and his death is a matter of the deepest sadness for all those who had the good fortune to serve with him.

Mini Memoirs

Brief Memoirs are published below on distinguished men whose deaths have been notified recently in the national press and who served in the Royal Engineers during World War Two.

Sydney Harpley RA, who died in Dublin on 9 March 1992, did his National Service in the Royal Engineers from 1945-1948, including service in Egypt. He was elected to the fellowship of the Royal Society of British Sculptors in 1963, an associate of the Royal Academy in 1974 and a Royal Academician in 1981.

Anthony Cecil (Tony) Abbott served in the Royal Engineers in the Second World War reaching the rank of Captain. He was awarded the MC in 1945. After the war he worked for a time in the field of architecture but in 1954 he joined the design department of the BBC. It was there that his extraordinary talent for design developed. His drama design credits for television included *The Idiot* (1966), *Hotel in Amsterdam* (1968), *The Tempest* (1970), *Twelfth Night* (1973), *84 Charing Cross Road* (1976), *Crime and Punishment* (1979) and *Going Home* (1982). His opera sets included *Rigoletto, La Bohème* and *Faust* in 1968 with *Otello* the following year. He also designed for the stage, including productions of *Look Back in Anger* (1978) and *The Entertainer* (1974).

Raymond Hitchcock. Raymond Hitchcock was born in Calcutta in 1922. He attended Prestfeld School at Shrewsbury and Denstone College and went up to Emmanuel College, Cambridge, to read mechanical sciences in 1939. He very soon joined the Royal Engineers and spent the War with the Corps.

He was severely wounded in Normandy in 1944 and was invalided out of the Army. He continued studies at Cambridge, gained his Mechanical Sciences degree and then joined Cable and Wireless in London, working on ionospheric propagation, aerial design and satellite communications.

But Hitchcock's first love was for oil painting and over the years he established a reputation for himself, exhibiting regularly in London and Oxford. He was also a prolific author and after his first book, *Percy*, published by W H Allan in 1969 he went on to add nine further novels, a non-fiction work, *Fighting Cancer — A Personal Story*, (Angel Press 1989) and five plays broadcast on BBC TV and radio.

Raymond Hitchcock died on 24 February 1992 leaving a wife, two daughters and a son.

Correspondence

THE WASTED YEARS

From Major L A M Fraser

Sir, — I was interested to read the above-mentioned article by Mr Ashton, the reason being that Mr Ashton served with me in 242 Field Company during the time covered in the article.

I was 2IC of the Unit and Mr Ashton a Platoon Commander. We formed part of the force defending Arras in May 1940. On 24 May we received orders to withdraw which we did on a Platoon strength basis, Headquarters taking up the rear.

It wasn't until we reformed at Rouveroy that we realised that something serious had befallen Mr Ashton's Platoon. Sometime later it was reported that he had been killed.

A few years ago I was pleasantly surprised to receive a telephone call from Mr Ashton. Understandably, exchanges of past experiences is still a foremost topic in our communications. Yours sincerely — L A M Fraser

2 BE OR NOT 2 BE

From Major General P J M Pellereau

Sir, — The article in the April *Journal* concerning the new M3 Amphibian recalled for me one of the key incidents during my several tours of duty on the Staff. Alone, but for one of my own G2s, without consulting anyone else upwards or sideways, I made a decision which time has now shown was not questioned nor reversed.

Responsible for RE Equipment Development, I had found that confusion was occurring — particularly in the minds of civil servants and even some military colleagues — between two items in the new range of bridging equipment just coming on to the scene. There was the splendid Medium Girder Bridge already known as the MGB for dry gaps and then, after due comparisons with the Gillois, its French alternative, the German amphibian was chosen for wet crossings. This M2 was actually the second version officially designated by EWK, its maker, as the M2B. Inevitably "MGB" and "M2B" were being mixed up.

So one afternoon I decided that this latter "B" should be dropped to help the uninitiated and that we should accept the risk of people getting confused between the Amphibian and the Motorway running past Chatham! No one objected — or perhaps no one noticed that we had done so — "M2" it remained and I clocked up a rare sole decision as a Staff Officer.

Now 25 years later it would seem that there should be no confusion at all with this new M3 and the Christchurch Bridge emerging together. But perhaps we should again keep our fingers crossed that nobody tries to take the Amphibian across Twyford Down by mistake. Yours faithfully — P J M Pellereau

MEMOIR: BRIGADIER SIR MARK HENNIKER Bt CBE DSO MC DL

From Lieutenant J R V Mason

Sir, — I notice that the memoir to Brigadier Sir Mark Henniker Bt CBE DSO MC DL in the *Journal* for April 1992, Vol 106 No 1, appears to contain the same typographical error that I first remarked when it was printed in *The Times*.

The Welsh Division was the 53rd and not the 43rd Division. The latter being the Wessex Division. Yours — John Mason

UNCIVIL QUALIFICATIONS

From Lieutenant Colonel G C Farrington CEng MCIBSE

Sir, — After reading the articles and correspondence on *Mice and Men* I feel obliged to maintain a balance and express a view for those engineers who are "uncivil". The Engineering Council is revising its requirements for entry as Chartered Engineers (CEng), having sought to standardise procedures and to minimise the influence of individual institutions.

Thus Electrical and Mechanical Engineers within the Corps can proceed via an institution of their choice to CEng in the four ways described by Colonel Spaight in his article, namely:

First as a graduate with an accredited engineering degree and with about four years practical experience.

Second as a chartered engineer of another British professional engineering Institution.

Third as a graduate with more than eight years experience. This will probably be the route followed by the majority of non-PET Sapper Officers.

Fourth as a "mature" student, at least 35 years of age, who does not have a relevant degree but has experience in lieu of the approved academic qualifications and training. This is also a possible route for Garrison Engineers.

For those whose degree is not specifically "E" or "M" nor accredited by an Institution, membership is still feasible. IMechE quote:

"Other Degrees

The greater a candidate's experience when applying for corporate Membership the greater the latitude that can be shown regarding the degree discipline that has been taken. For degrees other than those previously listed every application is considered on its individual merits. Typical qualifications are those in other branches of engineering (civil, electrical, etc) and in the other sciences (physics, chemistry, mathematics etc)."

IEE are quite strict and insist on a 2:2 or better.

Thus several routes to membership are possible but that is not to say easy. It requires considerable time to become chartered as a result of engineering experience gained during military service compared with civilians and the PET course where specialist experience and training have been tailored to the requirements of chartered membership. Thus four years normal experience may take eight years with a "strange" degree to gain equivalent full-time training.

Anyone who would wish to try for membership of an "uncivil" Institution can contact either Colonel W H T Spaight (Telephone Main Building 85047), or Lieutenant Colonel G C Farrington — Chatham Military 2235, for advice or sponsorship. Yours — Graham Farrington

A BRIDGE TO VICTORY

From Colonel A P Daniell

Sir, — May I refer you to the recent publication *A Bridge to Victory* by Brian Harpur (HMSO) reviewed by Sir David Willison in the April 1992 *Journal*. It would appear that Mr Harpur has copied his pages 67 to 72 directly from my book *Mediterranean Safari* without having obtained my permission or given any acknowledgment.

I am satisfied that he did in fact obtain it from an article I wrote in the September RE *Journal* in 1951. But some acknowledgement would have been at least courteous. However I have now received an unqualified apology from HMSO for this omission, for which I am grateful. HMSO's comment being that "both authors must have used the same source" — I am happy to be the source! Yours faithfully — Tony Daniell

From Colonel J H Frankau

Sir, — Clearly, one man's meat is another man's poison but I must take issue with DJW's review of Brian Harpur's *A Bridge to Victory*. This paperback over priced at £14.95 claims, using three different phrases, to be "The Untold Story of the Bailey Bridge". This is not so: Colonel J H Joiner's *The Bailey Story. A Tribute to Sir Donald Bailey* was published, in its final version in 1987. It is a more readable and accurate book and is available from Corps Enterprises for £1.50. Harpur himself admits to being aware of an earlier version of Joiner's book.

My own concern is that I found on page 66 an attributed passage with my name misspelt which I had written for the RE *Journal* in 1984. My objection is that these sentences have been inflated with adjectives and additions which make me appear to have written journalistic rubbish.

Harpur has died and cannot answer for himself but he claimed only to have written about "a man whose story has never been told", which in his own fashion he has done. Here HMSO can hide under the usual umbrella statement that "the author alone etc ...". However, HMSO are the editors and publishers and they are solely responsible for the publicity "blurbs" and subtitle which give rise to the erroneous claims for this publication. Furthermore, it is stated on the flyleaf "While every effort has been made to obtain copyright permission for the use of extracts ... it has not been possible to trace the legal Copyright holder(s) in all cases". This is not accurate, since the names and addresses of those concerned are in the RE *List* and, with the permission of the Institution of Royal Engineers, whose assistance is "Acknowledged", the *List* and the authors could have been consulted.

A final point: the RE *Journal* has over the years been erratic in reserving copyright for its contributors. Harpur quotes (p 72) from an article I wrote in the *Journal* for December 1992. He attributes this to me by name and it was not protected by specific copyright; but the passage to which I have most objected was covered in June 1984 by the symbol ©. This practice

ought to be continued: it is not the current procedure. Yours faithfully — J H Frankau

BRIDGING MATTERS

From Colonel J H Joiner

A BRIDGE TO VICTORY

Having read *A Bridge to Victory* by Brain Harpur, reviewed in the April *Journal*, I feel that I must point out that is is not in fact a previously untold story as claimed in the book. The claim is repeated at least four times, that is on the front cover — "The Untold Story of the Bailey", on the back cover — "The story of Donald Bailey and how he came to design his famous bridge has never been told", in the preface — "The subject is of a man whose story has never been told" and in the foreword by Sir Colin Cole — "no single work has concerned itself with the Bailey Bridge."

My lengthy two part article entitled *The Bailey Story* was published in the Royal Engineers *Journal* in 1986 and this was subsequently extended and published as a 24 page booklet in 1987 under the title *The Bailey Story — A Tribute to Sir Donald Bailey*. Brain Harpur received a copy of this booklet and actually wrote to me in May 1987 saying how much he had enjoyed reading it.

A Bridge to Victory obviously goes into far more detail than I did in my booklet, but my view that it is hardly the untold story is borne out by the fact that no less than 12 of the 33 photographs used in the book had already appeared in my booklet some four years earlier.

THE WADI-EL-KUF BRIDGES

I read Roland Ward's article on the Wadi-el-Kuf Bridges, in the April *Journal*, with interest, having crossed the bridges a number of times in the early 1950s. I had earlier been in touch with the Libyan Interest Section of the Saudi Arabian Embassy in London enquiring on the present state of the bridges. They informed me that the bridges are still in place but are no longer used, having been replaced by a new concrete bridge, the construction of which was in progress in May 1969 when the Baileys were inspected by Captain M P Tebbutt RE, now retired. He found at least one panel pin missing altogether, others very loose and some deformation of the main bridge. Matters were not helped by the speed at which the local traffic crossed the bridge, despite attempts by the police to slow traffic down.

I have subsequently found a reference to the new bridge in the 1976 *Guinness Book of Structures*. The bridge, completed in 1972 on an adjacent site, was designed by the Italian engineer Morandi, and is listed as being, at that time, one of the longest cable stayed concrete bridges in the world, with a centre span of 925ft (282m) and two side spans of 322ft (98m). Yours sincerely — J H Joiner

MEMOIR: COLONEL STEPHEN HOLLWAY OBE MC TD DL

From Major M W Whitchurch

Sir, — I am writing to comment on the Memoir written about Colonel Hollway in the April 1992 Journal. The Memoir states that Colonel Hollway was responsible for clearing the obstacle at Bagnara during the Italian Campaign and subsequently installing the first Bailey Bridge on Mainland Europe. This is not correct. The work was, in fact, done by 38 Field Company.

The work done at Bagnara was one of the highlights of 38's history. Yours sincerely — Matthew Whitchurch

Reviews

THE CHIEFS

BILL JACKSON AND DWIN BRAMALL

Published by Brassey's (UK) Ltd
1st Floor, 165 Great Dover Street
London, SE1 4YA — Price £30.00
ISBN 0 08 040370 0

The Chiefs, as befits a work produced by two such distinguished officers as Field Marshal Lord Bramall and General Sir William Jackson, is an unusually valuable book. Although it is given the sub-title The Story of the United Kingdom Chiefs of Staff, and although, in keeping with that title, it describes the development of the Chiefs of Staff Committee in a strictly chronological fashion, certain themes running through The Chiefs are highly relevant to the challenges currently facing the Armed Forces.As today's officer comes to terms with the end of The Cold War and attempts to produce a capability-based, as opposed to threat-oriented, Army, he would be well advised to read Chapters 5 and 6 of *The Chiefs* in order to realise the extent of the difficulties ahead. On Page 163 he would see that in 1937, a mere two years before the beginning of the Second World War, the Prime Minister of the day, Neville Chamberlain, was able to convince his Cabinet colleagues that the United Kingdom should have "an Army designed for imperial policing and small wars, not for Continental adventures". A period of extended peace, such as that which optimists believe stretches before us today, produces enormous Treasury-imposed pressures on Defence expenditure. *The Chiefs* shows graphically how such pressures, symbolised in the Inter-War Years by the Ten-Year Rule, can, albeit incrementally, undermine the operational capabilities of the Armed Forces — despite the best efforts of the Chiefs of Staff.

A second theme running through *The Chiefs* is the conflict that successive Chiefs of Staff have had to face between, on one hand, the need to maintain a balance of power in Europe, and, on the other, the demands arising from the United Kingdom's worldwide responsibilities. Although, from decade to decade, the language in which this conflict has been expressed has varied, these conflicting requirements have never been far from the deliberations of the Chiefs of Staff committee. The dangers of under-estimating either commitment, whether it be Europe, in the case of Neville Chamberlain in 1937, or 'out of area' commitments, in the case of John Nott in 1981, are considerable. It is to be hoped that, now that *The Chiefs* is available in bookshops, none of today's officers will fall into the trap of believing that the collapse of the Warsaw Pact and the revolutionary changes taking place in Eastern Europe had in any way resolved the long-running tug-of-war between Europe and the United Kingdom's worldwide responsibilities.

The authors of *The Chiefs* attribute much of the success of the Chiefs of Staff to their ability to maintain the vital linkage between power and responsibility and to balance policy and management. Two developments within the Ministry of Defence may well impact upon these traditional roles: first, the New Management Strategy will increasingly result in authority for management being delegated from London — with inevitable consequences for the Chiefs of Staff: and, secondly, the recent review of the Ministry of Defence's structure will, to some extent, continue the shift of power from the single Services to the Defence Staff, a process started by Earl Mountbatten in 1964 and continued by Michael Heseltine some 20 years later. Clearly, the final chapter of *The Chiefs* has still to be written!

It is very unusual to find, within a single book, a detailed factual history of events, sharp insights into current issues, and enormous enjoyment. *The Chiefs* is, in the words of dust wrapper blurbs, a 'jolly good read'. Every officer should buy it.

SCG

ACHTUNG! MINEN!

The Making of a
Flail Tank Troop Commander

IAN C HAMMERTON

Published by The Book Guild Ltd, 25 High Street, Lewes, Sussex — Price £12.95
ISBN 0 86332 533 5

IAN Hammerton tells us how, after being trained for four years as a Heavy Tank

Commander, Royal Tank Regiment, he joined a Cavalry Cruiser Tank Regiment in an Armoured Division, in September 1943, only to be sent off straight away to train with 'Flails' in readiness for the Invasion the following Spring. This was because, although there were 12 assault squadrons of Royal Engineers in Churchill tanks, another whole Armoured Brigade from the Royal Armoured Corps was needed to man Flail tanks and deal with mines all the way from the Normandy beaches to the heart of Germany.

Ian's Flail tank was one of the first to land and he recounts how, working with AVREs, the high sea wall was scaled at Bernières, and subsequently how his Troop flogged their way across Europe to finish near Bremervörde nearly a year later. Also described are his meetings and friendships with people of Liberated Europe, and his experiences in Occupied Germany.

The story is simply and vividly told from the point of view of a Tank Commander — indeed it is the view from inside of a tank in action, not only flailing mines but also often in direct engagements with enemy tanks and SP Guns. His maps are clear and plentiful — with one mistake for which Ian has apologised — I leave the reader to spot it!

I believe that this story is not only of great interest to Sappers (and Tankies) but also to others young and old, and even to wives and families.

REW

April 1992 *Journal* Awards

The publications and Library Committee announces the following awards for articles of special merit published in the April 1991 *Journal:*

Disaster at the Sittang Bridge — Burma 1942
by Major E R B Hudson TD ... **£75**
The New M3 Amphibian UK User Trials by 28 Amphibious Engineer Regiment
by Lieutenant Colonel T H E Foulkes ... **£50**
Sappers at the Battle of Kyaukse
by Major General I H Lyall Grant ... **£50**
The Sapper's Biggest Construction Job?
by Sapper C Meacher ... **£50**
The Fate of the 18th Division Royal Engineers
by Professor P H G Allen ... **£25**
Escape from Singapore — A Sapper's Story of an Event in February 1942
by Major T J Phelps ... **£25**
Delaying the Japanese Advance in Burma 1942
by Sir Eric Yarrow ... **£25**

NEW AWARD

The Publications Committee intends to make an additional award specifically for an article written by a junior officer not above the rank of Lieutenant at the time the article is received by the Institution. The award will be worth £25 and will be made for each issue of the *Journal* where the Committee deems the article worthy of it. It is hoped that this will encourage young officers to write for the *Journal.*

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