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Glubb Pasha

Photo 1. Lieut General Sir John Glubb KCB CMG DSO OBE MC shortly after World War Two

AN EULOGY OF A MEMORABLE MAN

Editor's Note: His Majesty, King Hussain of Jordan, has kindly given permission for his own words, used at the memorial service for Lieut General Sir John Glubb to be published in the Journal *below.*

THE memorial service which we are commemorating today in honour of the late John Bagot Glubb echoes with special resonance and depth in my heart, as well as the hearts and minds of my countrymen. Rarely has a man left such a profound imprint upon a people as has General Glubb, better known in Jordan as Glubb Pasha, in recognition of the singularly meritorious services which he rendered devotedly, and with the greatest integrity and fullest dedication, in the service of my country.

A soldier, a statesman, a public figure and author of remarkable qualities, he belonged to a unique generation of outstanding men who dedicated their entire lives to the establishment of a genuine understanding, deep friendship and mutual respect between the united Kingdom and the Hashemite Kingdom of Jordan, which have since not only survived the turbulence and vicissitudes of a dazzling changing world, but which have grown into an exemplary relationship between friendly states in every way.

Sir John Bagot Glubb became so immersed in the innermost lives and concerns of my people, the humble and the exalted alike, that I wondered often times and without any reflection, on his ultimate love and loyalty to his own mother country, where his heart and life dwelt and identified after so many years of service and association with Jordan.

His love and understanding of my country and its people was profoundly heartfelt and overwhelmingly affectionate. Unlike some other flamboyant arabists, he disdained publicity which inevitably embellishes men of his stature. The legendary image which subsequently became associated with his name was, in my considered opinion, neither of his choice nor even to his liking.

He was a down to earth soldier, with a heart, a simple style of life and impeccable integrity, who performed quietly and unassumingly, the duties entrusted to him by his second country Jordan, at a crucial moment in its history and development.

He contributed immeasurably to the enhancement of the disciplined, martial, and professional traditions of the Jordanian Arab Army in its early formative years, an accomplishment recognised since World War II by friend and foe alike. I am sure that few would have been happier than he himself to have seen this valiant army, whose small nucleus he dedicated himself to build on the most solid foundations of honour, courage and professionalism, grow and expand to its full flowering and maturity over the past quarter of a century since his retirement from its service.

When General John Bagot Glubb retired from active service in 1956, the winds of change and transformation were sweeping the entire Middle East, including Jordan, with hurricane force. In normal circumstances his retirement from service, after a long career, should have been the most natural of events, as in all countries in the world. But, regrettably, the retirement of such a distinguished General became embroiled in the whirlwind of international politics which had then enmeshed the region of the Middle East and rendered it a centre of crises.

General Glubb, to whose memory we pay homage today, was fully cognizant of the imperatives of change. He retired with full understanding and no rancour in his warm heart, but with sadness for the end of an era which he passionately loved.

He spent his long years of retirement writing books and articles singing the praises of Jordan and its valiant Army. He matched his services to his beloved Arab Legion and to Jordan with equally dedicated efforts to propagate its cause, as was only to be expected from a man of his stature, principles and intellectual integrity.

On this solemn occasion, I wish to pay the highest tribute to the man, the friend, the adviser, the legend we are honouring today, a tribute shared by all those who knew him and mourned his passing away. Our condolences go to his bereaved family and his life-long friends.

May God bless his soul, and may he rest in peace, which he so richly earned in life, and abundantly deserves in the afterlife. His memory will live in our hearts and his name will always be associated with the loftiest qualities a man could be endowed with in his lifetime.

THE PASHA

A PERSONAL RECOLLECTION BY BRIGADIER J CONSTANT, MA, C ENG, FICE, FIMECHE, MIEE, FCIT, FCIARB, FIQ

ALWAYS known by the British officers in the Arab Legion as "The Pasha", John Bagot Glubb died on 17 March 1986 in his 89th year, after many months of declining health.

The only son of a Sapper, Major General Sir Frederic Glubb, he went from Cheltenham to the Shop and in April 1915, was commissioned into the Royal Engineers during the week in which he had reached the age of 18.

Always known in his family and among his contemporaries as "Jack", he endured six months at the SME, impatiently awaiting his posting that November to the trenches in France, for three years in 7 Field Company RE; there he was wounded three times, awarded the MC and, as he told me, "grew up". He did not talk much about his First War experiences, though he later wrote details of them in one of his books, *Into battle: a soldiers' diary of the Great War*; however, he carried a visible scar for the rest of his life, in the shape of a noticeably disfigured jaw. The horrors of the war in Flanders appalled his essentially compassionate nature, but his professional dedication and determination enabled him to surmount them and to maintain the morale of his devoted troops. As a keen horseman, he was also noted for the good condition of the animal transport in his unit. (The detailed diaries which he wrote at the time have been presented to the Corps by Lady Glubb and can now be found in the RE Corps Library.)

Returning from what had become his "real world" of danger and discomfort, he found his year on Supplementary Course at Chatham to be almost irrelevant and he soon looked for another challenge.

Many of his contemporaries wanted nothing more than the dazzling social opportunities available in Britain in the early twenties; others followed family and regimental patterns to India or to the Colonies. His path led to Iraq, recently freed after centuries of the Turkish yoke, including the disasters to the Indian army there in 1916. In spite of having some sixty major units stationed there in 1920, the Iraqis suddenly rebelled violently against their new government.

The problems of suppressing this revolt led to many volunteers, including Jack Glubb, being posted to Iraq and his first assignment was to supervise and maintain the enormous bridge of boats spanning the wide Euphrates at Ramadi, west of Baghdad, in the summer floods of 1921.

The marauding tribes of Central Arabia had taken advantage of the many changes following the defeat and withdrawal of the Turks to turn religious fanaticism against their traditional competitors, not yet subservient to the rising star of Abdel Aziz ibn Saud. One great tribe, the Shammar, decided to retreat across this bridge and seek refuge to the north of the river.

The passage of this tribe, with its horses and camels, took five full days and nights to cross, anxiously watched by Glubb, who found his interest in the Arabs and their history, language, religion, *etc* kindled to such an extent that he devoted the next thirty-six years to them.

By now, most of the Army units had been withdrawn and, instead, the Royal Air Force had been awarded the guardianship of Iraq, and the desert including Transjordan; but the method of achieving control with a few aircraft and armoured-cars took nearly a decade to evolve. Glubb realised that one aspect of this responsibility

was the necessity for officers on the ground to provide reliable information to Air HQ and to guide any sorties authorised.

Somewhat of a loner, he was soon by himself in the south of the country learning the difference of character between that of the officials of the cultivated Euphrates valley in contrast to that of the shepherds and camel-people of the desert. Here, it was largely his intelligence and drive, which pointed the way, in which the latter could be guided and protected in their struggle to survive against the fanatics from the Nejd. As well as conducting his duties on horse or camel-back, and in cars and open pick-ups, he frequently flew with his RAF comrades, both on reconnaissance and in "strafing".

It is the custom amongst the Arabs to call a man "the father of . . ." rather than using his own name; but if he has no son—and Glubb was not even married at that time—an outstanding feature may be pressed into this service, instead. It was his noticeable jaw wound they chose and they called him *Abu* (father of) *Henaik* (the little jaw), a soubriquet, which has remained with him there.

In the early twenties, the desert was not spanned, as it is today, by the Haifa–Baghdad Road and the oil-pipelines from Kirkuk and Dhahran, with their many pumping-stations and luxurious air-conditioned accommodation. It consisted mostly of hard limestone, liberally covered with flints, and a belt of lava with boulders as big as houses. Except for very rare wells, often fought over, there was no water, and the dislike of the nomadic tribes for each other was only exceded by their distrust and hatred of strangers, particularly those who were not Muslim.

These were the conditions chosen by Jack Glubb for two months leave in 1924, when he bought two rather ordinary camels for about £15 each and rode with one Arab servant across 800 kilometres of this desert in the biting winter winds.

With only hard bread and dates to eat, except when the tribes overcame their suspicion and offered them desert-stew, they rode every day for over a month, until Glubb was able to present himself to King Husain, the exiled King of the Hejaz, visiting his son Prince Abdalla, the Emir of Transjordan, in winter camp by the River Jordan.

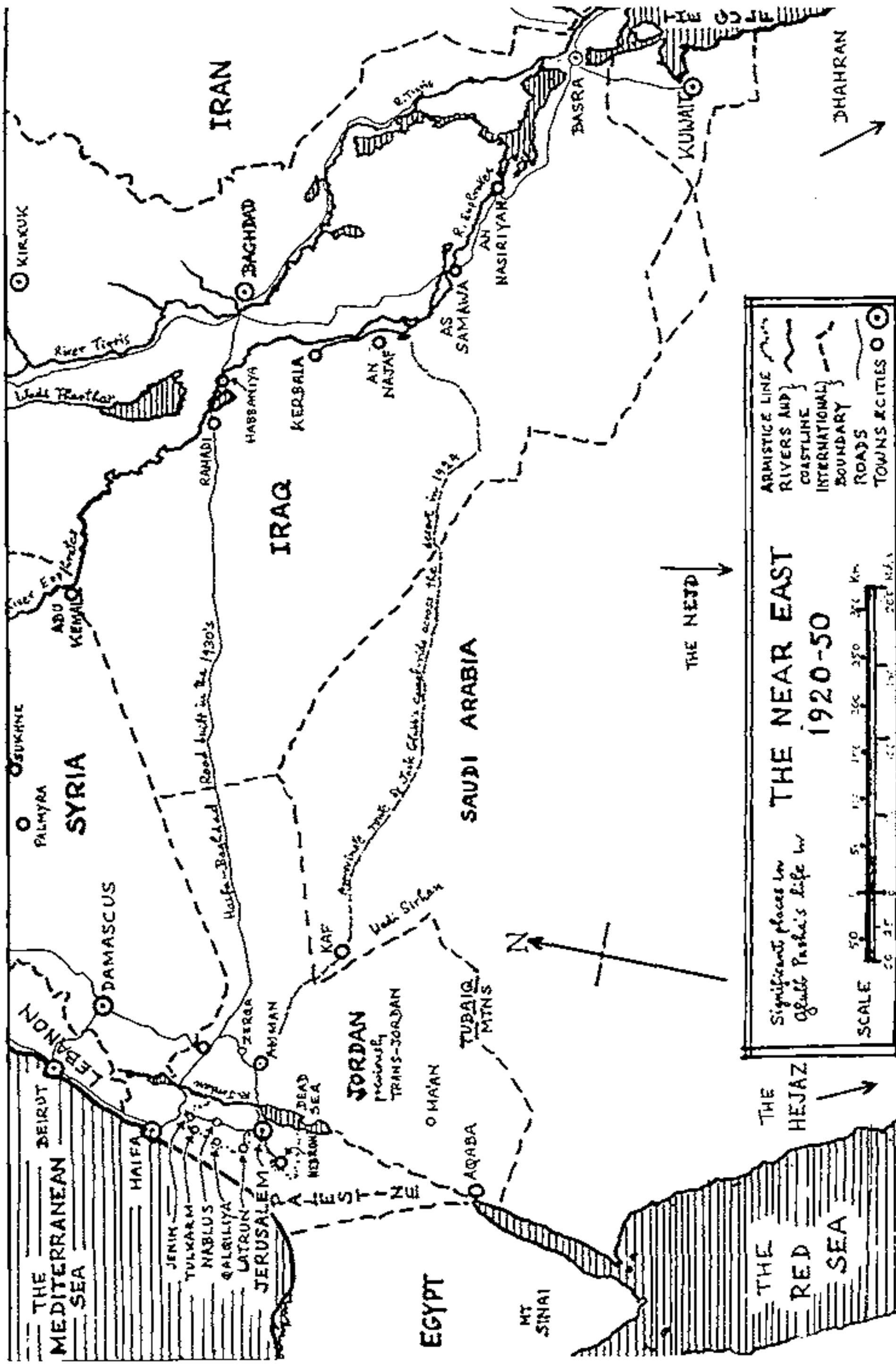
After his return to Iraq, Jack Glubb continued his duties as an intelligence officer; soon promoted Captain, his services were recognised in 1925 by the award of OBE.

After his first six years in Iraq, it had been time for his return to the British Army, but his interest in Arabia was too strong and he resigned his Commission, so that he could stay on among the primitive tribes there, perfecting his fluency in the Arabic language, always with a distinctly Bedouin intonation. He was appointed Inspector ("of what?" he asked), and eventually authorised to raise a small force of desert police with both camels, and open trucks mounting Lewis guns.

In November 1930, Glubb left Iraq on the invitation of Emir Abdalla of Transjordan. The climate of that region divides land into two main types: the desert and the "sown". The latter, mostly stony fields and villages, had since Turkish times been policed by cavalry, whilst the towns had their gendarmes. There were two other armed forces, both of soldiers trained to deal with external threats. The Transjordan Frontier Force (TJFF) was locally raised, but with British Officers and under British orders, whereas the Arab Legion, "al Jaish al arabi", was the remnant of the original Arab army raised in 1916 by the Emir's father in Mecca to drive out their Turkish rulers. Originally led entirely by Arabs, there had been some British officers seconded for liaison purposes, and one of them had been a young gunner, who remained in Transjordan as a political officer: Alec Kirkbride (later British Ambassador to Jordan and knighted).

These Arab forces started by Husain, the ruler of the Hejaz and sherif of Mecca, were commanded by his son Feisal and, in concert with Allenby's Palestine Campaign, they had cleared the Turks from Arabia and set up Feisal in Damascus as King of Syria. Soon after that war, the latter was evicted from Syria by the French and was given the thorny task of ruling Iraq instead.

The Treaty of Versailles had carved the loosly organised Arabia of the Turkish


THE NEAR EAST
1920-50
Significant places in Glubb Pasha's life
SCALE
ARMISTICE LINE
RIVERS AND COASTLINE
INTERNATIONAL BOUNDARY
ROADS
TOWNS & CITIES
THE MEDITERRANEAN SEA
BEIRUT
HAIFA
LEBANON
DAMASCUS
SYRIA
PALMYRA
SUKHNE
KIRKUK
IRAN
BAGHDAD
River Tigris
Wadi Tharthar
HABBANIYA
RAMADI
KERBALA
AN NAJAF
AS SAMAWA
AN NASIRIYAH
R. Euphrates
BASRA
KUWAIT
DHAHRAN
IRAQ
ABU KEMAL
River Euphrates
Haifa-Baghdad Road built in the 1930s
Approximate route of Jack Glubb's camel ride across the desert in 1924
SAUDI ARABIA
THE NEJD
KAF
Wadi Sirhan
ZERQA
AMMAN
JORDAN formerly TRANS-JORDAN
MA'AN
TUBAIQ MTNS
AQABA
DEAD SEA
HEBRON
JERUSALEM
LATRUN
QALQILIYA
NABLUS
TULKARM
JENIN
PALESTINE
EGYPT
MT SINAI
THE RED SEA
THE HEJAZ

empire into a number of sovereign states; but, left with a fragment in the middle, they called it Transjordan, and invited Feisal's brother Abdulla to rule it as Emir. With few resources of its own, support was given by the British Treasury and in exchange certain important positions were given to British nationals. One of these was Colonel Peake, who commanded the Arab Legion; it included Arab officers from the old Turkish army, including the equivalent of a major general, so the British Commander was given the Jordan rank of *Feriq* (lieut general) to which was added the courtesy *Pasha*.

Although the TJFF was deployed in the desert, it had not been successful in stopping the practice of raiding amongst the nomadic Bedouin tribes. Emir Abdalla's invitation to Jack Glubb was to raise a new type of desert police, on the lines already developed by him in Iraq, principally to avoid the Saudi tribes having any excuse for retaliatory raids into Transjordan territory, across the country's frontiers: themselves an unwelcome post-war innovation seen to interfere with the business, and indeed sport, of camel-raiding. These police were to be the very individuals, who would otherwise have been leading the raids; tough, arrogant, hardy, and generally believed to be un-tameable. However, Glubb's exceptional knowledge of Bedouin psychology combined with his battle-scarred, but honest face, enabled him to persuade the tribal leaders that it would be their privilege, if he invited any of their sons to join his patrol—thereafter known as *Al Badia* (the desert). Since only the best racing camels, brightly caparisoned, were good enough to be their mounts, these men looked magnificent, as they rode in their long khaki robes and accoutrements with a scarlet *shamagh* (head-cloth), and the addition in winter of a scarlet cloak.

Gradually, a small patrol was permanently based on each of the principal wells in the desert, and their supplies were distributed to them from Amman by trucks along well marked tracks.

From time to time Jack Glubb had visited England on leave, and, on one of these trips, he had met Rosemary Forbes, to whom he was married in 1938 and they set up their home in Amman.

The following spring Peake Pasha retired and Glubb was appointed by the Emir to assume command of the Arab Legion, in addition to all the police; his troops now included some Bedouin as mechanised infantry, soon to be developed into a regiment in 1940 at British request. He was still a major in the eyes of the British, but his rank in the Legion was *Feriq*, with the badges of a lieutenant general.

By now "the Pasha", Glubb had about 1600 men, mostly Bedouin, whereas the imperial TJFF recruited many farmers and townsmen.

When the Germans, in April 1941, inspired Rasheed Ali's revolt against the King of Iraq, the Royal Air Force headquarters in Habbaniya was beseiged and about a thousand British citizens took refuge in our Embassy in Baghdad. A small British column was sent along the Haifa–Baghdad road at full speed and the Arab Legion patrolled the desert ahead and on both sides of the road to prevent the Iraqi guerrillas attacking our column and cutting their tenuous lines of communication stretching some hundreds of miles to the west. As their experience grew with every skirmish, "Glubb's girls", as the British troops affectionately called them, were given increasingly arduous objectives and by the time Baghdad was relieved, the Legion was accepted as battleworthy and trusted. Lebanon and Syria were nominally Free French at this time, with few if any British troops north of Palestine; the exodus of the column towards Baghdad led Vichy sympathisers in Damascus and elsewhere to show their true colours. Immediate action was taken to suppress their revolt, and amongst other troops putting it down were the Legion, recalled hot foot from Baghdad and sent across that part of the desert to Palmyra and Sukhna. Knowing how the Bedouin hated the French for evicting Feisal in 1919, the Pasha had the greatest difficulty in avoiding unnecessary bloodshed, when the Arab Legion overcame the Vichy forces in those two battles. He was awarded the DSO, but much to Glubb's chagrin, his beloved troops were not to be in battle again for the years of the Second World War. They expanded fast to a total of 8000 or more, and Glubb's time was devoted to their

training and to supervising the many guard duties they performed all over the Levant, in order to free British troops for Europe.

It was in 1943 that I first met the Pasha. I was attached to HQ Ninth Army for a few months staff training, before going to Quetta, and it was in my GOC's discretion to allot vehicles and arms to the Arab Legion, as well as to the TJFF, Poles, the Free French, an Indian Division, and many other deserving and/or importunate demands. At that stage, with no other British officers in the Legion, "we" thought that its expansion should be carefully controlled and his visit was referred to, ungenerously, as "Glubb-trouble".

After the war was over, the Emir was encouraged to proclaim himself King of Jordan, and the Pasha was awarded the CMG in 1946; nevertheless influences in Whitehall ensured that funds from Britain declined and the Legion was reduced to 4000 by 1948, when the British withdrew from their League of Nations mandate in Palestine and the Jewish settlers there sought to take over the whole country. The King of Jordan was inundated with requests from the Palestinians to defend them against the Jewish attacks, of which the most violent was the massacre at Deir Yaseen. Bedouin troops, with their blood up, fight bravely in open country, but Glubb knew there was a great risk in committing them to street fighting in Jerusalem and the other towns. The number of non-Bedouin troops was minimal, as were the artillery and engineers; there were no tanks at all. Against his better judgement, the Pasha was ordered to defend Jerusalem and the Legion managed to hold on to the Old City, as well as Bethlehem and southward to Hebron, while holding the Judaean Hills northward to Nablus and Jenin, with outposts forward to Tulkarm, Qalqiliya and Latrum. After the cease-fire, when more British funds and arms became available, some of the Arab Legion's deficiencies were made up, whilst more regular British officers were seconded to key positions, and ex-officers were employed under contract—usually called "hired assassins" jocularly.

In 1951 the Pasha suffered two blows, which history now recognises as having spelt eventual disaster for him. In July, Nasser started the troubles in Egypt and, at the same time, in the Old City of Jerusalem, assassins murdered King Abdalla, at his prayers in Al Aksa Mosque. He had been statesmanlike enough to realise that some accommodation with the Zionists would be necessary, if enduring bloodshed was to be avoided, but no-one else on the Arab side would admit to this. With the King's death, Jordan's political stability had gone, and, before the end of that year, the Pasha then suffered the departure of his reliable friend, the British High Commissioner, now Ambassador, Sir Alec Kirkbride, who knew everyone in the Jordan political scene. Having started with Feisal in the Arab revolt of 1916–18, Kirkbride had been instrumental in providing the Pasha with a reliable link to the British Foreign Office, itself penetrated by some traitors at that time.

I had only just got to know Sir Alec by the time he left—though I remember his stories well—and my imperfect Arabic was little help in getting to know the most senior Arab officers left over from the Turkish army. Therefore, almost all my background knowledge, like that of several other British officers, was imparted by the Pasha. How he found time for it, I cannot imagine. Not only dealing with all the weighty matters of the Legion—now a full division, including my own regiment with three field squadrons and a field park as well as some base troops. In addition there were the various police forces, an air force and a few naval vessels—but also leading a happy family life, giving time to the Palace and the Defence Council, and continuing as he always had to arbitrate, when so requested, in quarrels brought to him by the Bedouin, pairs of whom I have seen walking hand-in-hand for many miles to his judgement, where in earlier days they would have fought, perhaps to the death.

When he used to visit units to keep in touch with the Arab officers and warrant officers, he would invite us all in, while he sat on a table, in front of a hundred or more, talking gently to them about the problems facing Jordan, and asking their views.

King Abdalla's successor, his eldest son Talal, was handsome and popular, a good horseman, but with little heart for politics and somewhat unstable mentally. For the

Photo 2. General Sir John Glubb during HM King Hussain's visit to the Arab Legion Engineers in June 1954.

Pasha, with both his friends Abdalla and Kirkbride gone, the King's weakness was a dreadful blow, just at the very time the British had begun to support the Arab Legion with money, modern equipment and experienced British Regular officers of all arms. King Talal lasted about a year, and the last time I saw him, when he was paying an informal visit to my Regiment on his horse, he mentioned in the friendliest way that he had never wanted to be King; indeed, he said, he would prefer to live quietly with his family in a villa at Maidenhead. It so happened that later in the day, he was reported to be suffering from schizophrenia and was to abdicate the throne. He was followed by King Hussain, then only nineteen, and himself under tremendous pressure from many quarters, particularly from Egypt.

The younger Arab officers, many from Palestine by now, were always asking why the many Israeli raids on the front-line villages went unpunished, and they began to question whether the British, through Glubb, were behaving even-handedly towards Jordan. Syria was threatening too, and the Saudis were believed to be considering making raids from the Wadi Sirhan. The Pasha still found time to attend to all of this and to the many international visitors that came our way, not all of them meaning well, as we now realise.

Every year in May, an Arab Legion parade had been held on the airfield near Amman. Originally it had included almost every man in the Legion: but, after the partition of Palestine in 1948, so many troops were required to man frontier posts, that only the mobile reserve units, and token parties from the other regiments, could be included. Always, the police units on horseback, and the Bedouin on their camels, provided a colourful contrast to the guns and the armour, as well as a line of three motor-graders abreast representing the *Hendasa* (Engineers).

Being keen on flying since his early days in Iraq, Glubb had included aircraft in "his" Legion, both for Air OP duties and for communication purposes. These, too, were included in the parade.

As a keen rider himself, Glubb usually appeared on any parade mounted on horseback, and encouraged the officers, British and Arab alike, to keep up their

prowess in this direction, as a result of which the game of polo is still popular in Jordan, to this day.

A devout member of the Church of England, Glubb was much respected by the Arabs, 80% of whom were Muslim and most of the others Orthodox. He knew that they despised unbelievers and liked us to encourage our men to keep to their faith. His courtesy to our families was exemplary, and his only son, Godfrey, or *Faris* in Arabic, as well as three adopted Arab children, were very friendly with the children of all the British officers.

He took pleasure in helping the Bedouin families, if they wished to give up the nomadic life, to settle in any unoccupied areas, where the rainfall exceeded 250mm a year. From time to time, he would ask me to give them assistance, which was also useful training, by sending a junior NCO to show them how to drive a well to provide perennial potable water, or to send a motor-grader to throw up banks of clay to protect new settlements from the occasional thunderstorm or cloudburst.

After three happy years there, I left along with other British regular officers, who had been there the same time, but, little did we realise that our successors were to have a more difficult task. Glubb was increasingly under pressure from every political angle and the young King found it difficult to bridge the generation gap. British influence in the Middle East was in decline, and some of our western "allies" were out to alienate the Arabs from us. The British effort to promote the CENTO defensive pact in the area, comparable to NATO, was rendered unpopular by massive interference from Egypt under Russian pressure, and led to the Pasha's sudden dismissal in March 1956.

Being so busy on all these matters, the Pasha did not have time to keep his close ties with some parts of the Legion, and had not been able to imbue the new wave of British officers with sufficient background. He told me afterwards that he had on several occasions suggested to the young King that a more youthful general should be appointed to take over from him, and that he himself would like to retire to Jerusalem, where there was quite a coterie of western arabists, including Lady Glubb, his mother. He bore no rancour for his dismissal as such, only deep disappointment that it was done in such a discourteous way that he had no opportunity to go round saying goodbye to his many friends.

He had made little provision for the way his future had turned out and suffered hardship, undiluted by the Knighthood awarded him, at a time when employment in this country, even as a part-time adviser might have been even more welcome. He was ignored by the British government, but managed to keep himself and his family during the last twenty years by writing nineteen books and giving many lecture tours, especially in the United States.

Of recent years he suffered from a weak heart and had a pacemaker fitted. A story, perhaps exaggerated, circulates that the pacemaker failed on one occasion, until he got it going again by beating his chest.

To the end, he remained devoted to the Arab cause and uncomplaining of his treatment in 1956 by the Hashemite monarchy. He was unfailingly friendly to those of us, who had served with him, and we met annually in London for our reunion, which was usually attended by the Jordanian Ambassador and his Defence Attache, as well as by visiting princes, generals and politicians from Jordan. The Pasha will never be forgotten by us for his bravery, his compassion and his friendship; his name *Abu Henaik* will be remembered with affection for many years by the Bedouin.

Footnote. Readers with access to old copies of the *RE Journal* may wish to refer to more detailed accounts of the Arab Legion as follows:

Vol LXVIII No 1 March 1954 "The Arab Legion" by Major George Howe RE.
Vol LXX No 2 June 1956 "The Arab Legion Engineers" by Lieut Colonel J. Constant RE.

Putting Australia's Maps on the Map

MAJOR A J M VICKERS RE

Grandson of two Surveyors General of India, Tony Vickers left it very late to start his career with the Corps. Commissioned from Victory College in 1976 aged 29, he had one tour as a Troop Commander in 2 Armoured Division Engineer Regiment (43 and 39 Squadrons) and a year at Army Apprentices College, Chepstow, before joining Military Survey in 1980. After two years with Ordnance Survey he was transported to Australia, from where he has returned to command 13 Map Production Squadron.

IT is the business of Australian and British Military Survey to supply their respective Defence Forces with all maps and other information related to areas of potential military operations. This encompasses: survey (field and aerial) where the topographic information is gathered and collated; cartography, which is the preparation of the information in graphical form; non-survey intelligence gathering and liaison with other mapping agencies; and the distribution and stock control of the finished products, printed maps or otherwise.

In the age of computers were are now able to integrate all these stages of the survey and mapping process into what is termed a Military Geographic Information Database (MGID). Topographic information about the natural and man-made terrain can be merged with information on the actual and planned disposition of troops, then manipulated and displayed in a variety of ways to assist commanders in static and even field headquarters. It has been my privilege for four years, the last two in a military environment, to take part in significant developments concerning the creation and use of such databases. This article describes one project undertaken for the Royal Australian Survey Corps from 1983 to 1985, but aims to draw lessons which could apply to many computer projects with which Royal Engineer officers may be involved.

When I arrived in Australia as UK Survey Exchange Officer in September 1983, to be employed for two years at the Army Survey Regiment in Bendigo, Victoria, there was no single comprehensive Catalogue of maps for current military use. The Catalogue or Index of maps is an important part of the survey business which users consult to ensure they order the right product, and which Military Survey need to help plan their own operations. There was some argument whether the most recent Catalogue was for 1946 or 1974 (I later found out it was the earlier date!), but most users had to make do with the *Pictorial Index to the Survey Corps Annual Report* which was merely designed to show the previous year's additions to the national map archive. For at least four years a new Catalogue had been under discussion and in 1982 the then UK Exchange Senior NCO at Bendigo, Staff Sergeant Critchlow (a cartographer), was tasked with designing one. However, the project was held up by lack of manpower.

The problem for Australia's military mappers was and is vast and very different to our task in UK Military Survey. The country is fifty times larger with a population five times smaller. It was of course almost totally unmapped at a time when Britain was already covered at the old one inch to a mile series. The most likely direction

Major A J M Vickers

from which an enemy is presumed to threaten, as Japan did in 1942, is the north. Northern Australia is all tropical and much of it, being sparsely populated, has been given low priority by civilian state and national mapping agencies. However, a number of public and private survey and mapping organisations are active in all parts of Australia, often producing maps and control data which the Survey Corps can use. Co-operation between these agencies is good but is hampered by lack of any overall database or Catalogue of mapping.

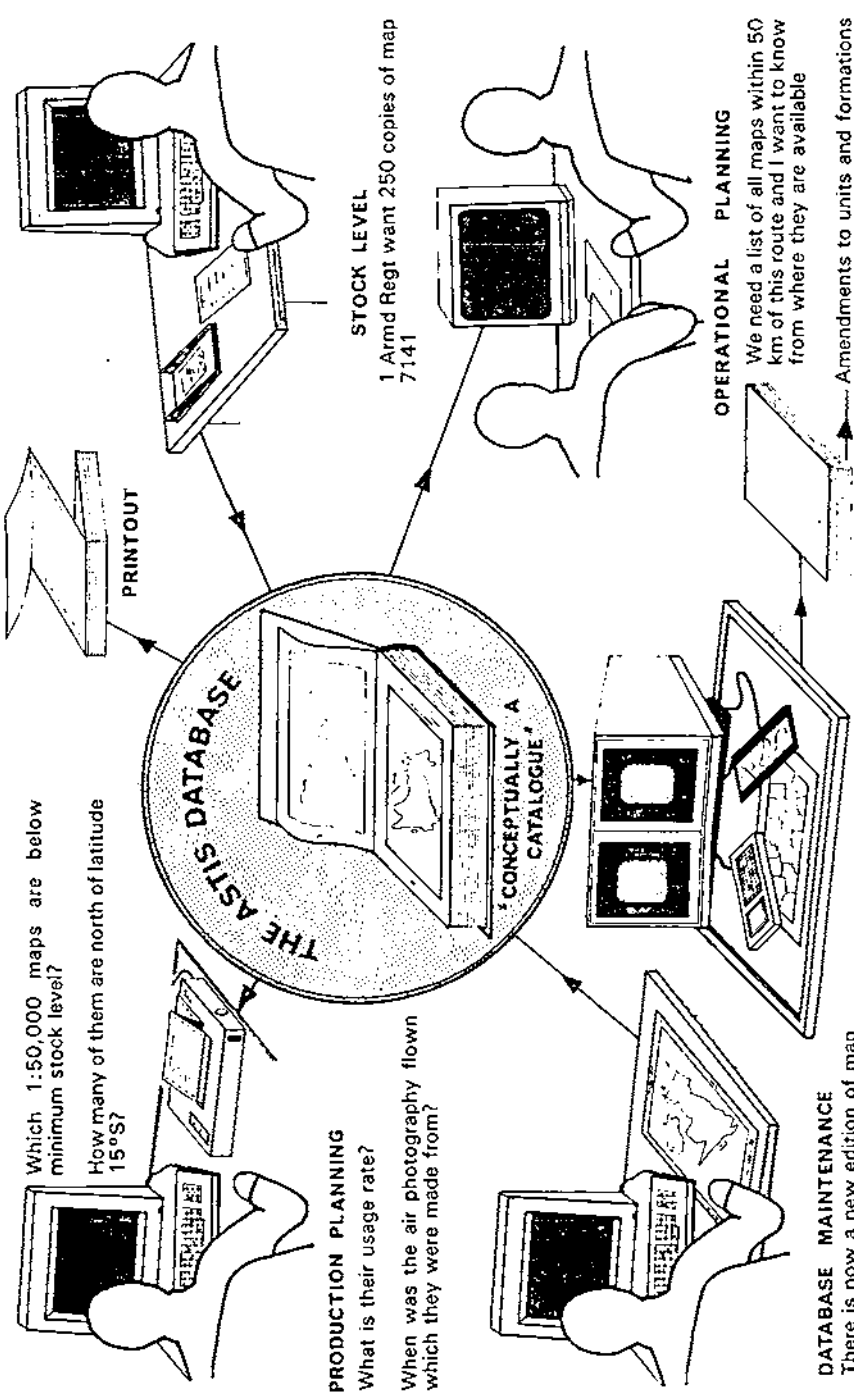
I arrived in Bendigo on the very day that the Survey Corps Development Coordination Committee approved a project to be known as ASTIS, standing for Army Survey Topographic Information System. Although given "Priority One" status, no resource had yet been assigned to ASTIS. The Regiment had a Technical Services Cell attempting to cover many other research and development tasks. This consisted of the UK and US Exchange Officers and one other Australian officer who was totally dedicated for a year ahead as Project Officer for AUTOMAP 2, the most up-to-date computerised map production system just acquired for the Survey Corps. I had come from two years at Ordnance Survey where I had worked in another research and development cell and had a vague knowledge of, and keen interest in, database design. I volunteered to take on ASTIS.

ASTIS, AUTOMAP 2 and the Map Catalogue were to become totally entwined during my stay in Bendigo, so I will explain the objectives of the first two. ASTIS is an ambitious all-embracing concept for using the computer to store, manipulate and retrieve information about maps, the topography they describe and indeed potentially any information related to the business of survey which has a spatial component. ASTIS is primarily intended for use by the Survey Corps itself, to help in planning and monitoring the Australian map production programme. However, it could eventually indirectly serve the wider military community by enabling catalogue type information to be more rapidly and intelligibly recovered. For example, if a Commander has to carry out an operation at short notice in a remote area, ASTIS—or rather a member of the Commander's staff with access to ASTIS via a computer terminal and landline—could, in a matter of minutes, given the area of interest and scales of map required, list or show diagrammatically all available map products, the location and level of stocks and the currency (survey date). For its own use, the Survey Corps aims to maintain a variety of graphic and non-graphic reports, listings and statistical summaries concerning map production by all Australian mapping agencies which would otherwise involve an inordinate amount of manual, clerical and cartographic effort.

AUTOMAP 2 is a powerful and "bespoke" cartographic production system designed by the Intergraph Corporation of Huntsville, Alabama, which can turn air photographs or existing paper maps, or a combination of both, into a multitude of products. Paper maps of many types are perhaps the least significant of these products because the same information on the database can also be used to produce computer-generated models of terrain and navigational data for weapon systems. AUTOMAP 2 does not actually print maps: to do this, lithographic printing plates have to be made in the conventional way by exposure in light-frames to plots of each colour component of the map on full-size sheets of special film. The AUTOMAP system plotters are capable of driving optical laser "pens" to create directly from data in the computer, the image of the map features on film in a matter of from 20 minutes to a few hours. This replaces days of manual drafting and scribing. The cartographic technicians are not replaced by machines: their capabilities are extended three-fold and they become graphic data manipulators.

As an incidental extra, Intergraph was supplying a database management system called Database Management and Retrieval System (DMRS), for which no specific application was at that time envisaged.

"Situating the appreciation" my intuition told me that ASTIS could probably use AUTOMAP and DMRS. But like a good (partly trained) systems analyst I promised to study all the factors and after two months I came up with a discussion paper, "An



Drawn by Corporal I Coupland, RE

Figure 1. Diagram of the concept of ASTIS.

Approach to ASTIS", wherein I concluded that, while an "in-house" design and development of ASTIS (on a computer system which was still not even half-way to full installation, using software which nobody in Australia yet understood) was not an ideal way forward. The AUTOMAP 2/DMRS development route for ASTIS was the simplest available. No new additional purchase was necessary to allow at least a prototype database to be built and tested.

Production of the Map Catalogue was just one of many intended applications for ASTIS, but at the end of January 1984 I was directed to take on the dormant Catalogue project and given one month to report back on the feasibility of using ASTIS to produce the Catalogue by July 1984. I had hoped to design a database which would be suitable for all proposed ASTIS applications and then test it over at least six months using a small sub-set of map information, before preparing the full implementation programme, which might have said AUTOMAP/DMRS was not the way to go. It is always wise to separate clearly the development and implementation phases of a computer project, yet here I was being pressured to commit myself to a significant degree of implementation before I had even begun development. Unfortunately the temptation to go for quick results overcame all concerned, not least myself, and I agreed to "give it a go", as they say in Australia.

The AUTOMAP project should have been handed over to the Regiment in May 1984. It was agreed with Intergraph that I could have access to computer terminals for training and programme development prior to handover. Meanwhile, the database graphics and attribute files were created under contract to my design, by the only commercial cartographer in Australia with an Intergraph system and some DMRS expertise. The actual map information which would eventually be bulk loaded into the files was captured by employing civilian and military cartographers to inspect over 10,000 map products and enter the values of some thirty attributes of these maps into a Hewlett Packard HP 1000 micro-computer, using a programme written by a college student working with us in his summer holidays! This data capture stage was substantially complete within three months of the Catalogue tasking being received, which seemed good at the time, but in restrospect this stage should not have been rushed. It turned out that some 5% of records were incorrect in some respect or other, typically mis-spelt map names or transposed numbers. The programme had validated the data entered, wherever possible, but could not check spelling and valid but wrong data.

MORAL Anyone building a database must distinguish between validation *and* verification. *Rules can be written and incorporated in algorithms in programmes to* validate *automatically. To* verify *you cannot avoid using skilled human resources: normally a "double key entry" system, ie entering everything twice, will pick up 99% or more valid mistakes.*

Between April and August 1984 the ASTIS project was badly affected by problems with the contract software for AUTOMAP which limited access to the computer, and an upgrade in the DMRS product software which required a new approach to my own programme design. DMRS was substantially improved but one had to read volumes of manuals in order to make use of the improvements.

MORAL When selecting fancy computer software for a department with few, if any, trained programmers, clear documentation and a user training package are crucial factors.

During this period we did manage to gain and train additional staff. A Survey Corps sergeant with VAX experience was made available for two days a week from his degree (yes, degree for a Senior NCO) course in computing at the local Polytechnic, and a corporal cartographer with no computing experience was assigned to be the first of a small cell of technicians/workstation operators for the Catalogue task. Between them these two tested my procedures and we wrote up a draft Catalogue Production User Manual.

The production of a Map Catalogue divides into three logical parts. My main concern was the accuracy of the information about maps: this became known as "the

ASTIS aspects". Because this information was portrayed largely in graphical form, the ASTIS aspects involved cartographic aspects, but the main concern of the Cartographic Squadron whose task was to produce the Catalogue, was the overall presentation including the base maps upon which ASTIS information was superimposed. These base maps were themselves in digital form on AUTOMAP, having been digitised by contract in late 1983 from the 1:2½ million scale series of Australia. Finally, there were the publishing aspects of the task: what type of binder to use; the text of the introductory chapter explaining how to use the Catalogue; the tabs, separator pages, page numbering system, *etc.* In June a Catalogue Project Officer was appointed at my instigation, because so much of the Publishing and Cartographic Aspects were distracting me from the ASTIS work. This *was* a success.

MORAL Just because you have a project involving computers, it does not need to be managed as a computing project. You should continue to operate the normal functional departments, forming project Teams including computer experts but managed by "normal people" (ie, not *people totally dedicated to computing).*

The AUTOMAP 2 system was not finally commissioned until November 1984, by which time we had realised our mistake in not verifying data input and had checked and corrected about half the records affected. We had also begun to realise the scope of the "update problem", *ie* map production was not standing still! We had several hundred new maps to add to ASTIS which had been published during 1984. As yet, we had no database maintenance procedures devised. Only now did we have, in theory, unlimited access to the system, but even with the highest priority given by the Director of Survey to the Catalogue, we were in fact limited by:

system break-downs running at 10–20% with no "silent hours" maintenance from INTERGRAPH.

annual postings and summer leave December 1984–January 1985.

the need to train programmers and operators (half those originally trained had by now been posted!).

MORAL The Army should accept a proportion of civilians in static computing posts, because of the short life and high cost of the equipment, the rapidly changing high level skills and the loss of capability resulting from frequent postings.

We began production in earnest, with fingers crossed, in February 1985 with four soldier operators. Straight away, as we linked the ASTIS map records with the Database files to produce graphic "proof page" copy off the edit plotter we found there were still errors and anomalies. One which was a particular worry was the appearance of one map in Northern Territory which should have been in South Australia! On the computer listing, which reads the same file as the graphics processor, all appeared to be in order. Yet the information (map name, number, edition, *etc.*) which we had selected for portrayal on the Catalogue page had somehow become linked to the wrong map. It turned out that this was caused by wrong procedure being followed in correcting a transposed map number. We had to make a lot of workstation procedures more secure against such errors by linking them within programmes which INTERGRAPH called User Commands. These proved simple to write and effective to use, but the Programmers' Course which INTERGRAPH ran to teach us about User Commands was not scheduled until later that month! We also decided we would have to do a 100% check of the ASTIS Catalogue plots as well as the 100% check of full ASTIS print-out information (which was then nearing completion). I was quite surprised how long-suffering the map librarians were throughout the project: all this work was on top of their normal duties.

MORAL It pays to "sell" your project hard to the major users early on, and to keep involving them throughout.

As production speed built up the innate professionalism of the Royal Australian

Survey Corps soldier technicians meant that more and more problems were resolved by the men themselves, better ways were found to do things and I was able to stand back from the production line and spend more time thinking about how the Corps was to manage the ASTIS database after my return to UK in September. The Australian "Software Major" posted to Technical Services Cell in January was a postgraduate in Database Design and made me feel quite inadequate, but his concerns were broader even than ASTIS: a computer-based map production control system was looming as the next big task after the Catalogue. He felt that with current resources (Technical Services had quadrupled in size in eighteen months) we could barely maintain the Catalogue, let alone develop new applications for ASTIS. His main concern was that any project taken on *must* be thoroughly tested before implementation—unlike ASTIS, so far. We felt that, without even more resources, which were unlikely to be made available, no significant new computer mapping project would ever get off the ground through in-house design. We agreed that Technical Services role would in future be restricted to:

a. Preparing Technical Requirements for Survey staff;
b. Managing development of resultant projects by consultants and/or contract suppliers;
c. Post-implementation training and advice;
d. Modifications to existing software.

MORAL Soldiers (and officers) should never be tempted to become computer programmers. Defence systems require computer literacy at varying levels from uniformed personnel, but their design is a matter for civilians.

Having said that, what more need I tell you about ASTIS and the Australian Army Map Catalogue? I am proud to have spent two years on the project, not least because in my last week in Australia the Catalogue was published, very much in the form and by the method that I envisaged. The task proved ideal for an Exchange Officer, motivated to achieve completion of a main phase within his tour of duty. With a handful of Royal Australian Survey Corps people now familiar with ASTIS, what it can do for the Corps and how to do it, hopefully the system will continue to develop as resources permit.

One application which my friends in the Map Library wanted is achievable now. When asked to produce a new edition of an air chart, they can enquire from ASTIS: "what maps already exist within the area of this proposed map?" and immediately receive a list and a planning diagram with all they need to know. Previously it took seven to ten days to research this information.

I am confident ASTIS will not have to wait for another Exchange Officer (the UK post is now sadly abandoned) before it can be more fully exploited. Meanwhile, there is at least one RE Survey officer convinced that his main business is not merely to make and supply maps, but to collect, store, manipulate and display military geographic information to commanders. Australia's maps may be "on the map" but, while selected terrain analysis and up-to-date battlefield information is unavailable to NATO Divisional Commanders and Staffs in graphical and report format, we in the Survey business have work to do.

Footnote The main hardware components of AUTOMAP 2 are: three inter-connected VAX mini-computers (2×780, 1×750); 24×twin-screen graphics work-stations each with a Motorola 68,000 processor, one screen having full colour and vector or raster drawing with automatic refresh, both screens having high resolution (1000×800 pixels) and capable of emulating non-graphic edit terminals (*ie* one work-station can operate as two independent terminals *and* simultaneously run processes in background mode); eight Wild B8 photogrammetric stereoplotters with monochrome monitors, voice input capability and vector superimposition; one (soon to be two) Optronics scanner/plotters; three flat-bed digital plotters; one verification low resolution 4-colour-pen drum plotter; and four single colour electrostatic printer-plotters which can "photo-copy" a graphic screen.

Sapper Platoon

DERRICK R VERNON Esq FCIT

The author joined the Royal Warwickshire Regiment on his 17th birthday in 1940 and after a period with the Royal Armoured Corps was commissioned into the Corps in 1943. As the story tells, he went to France shortly after D Day remaining with 24 Field Company until the end of the war in Europe, during which he was wounded on the Rhine crossing and was awarded a Commander-in-Chief's certificate for "outstanding good service and great devotion to duty". He subsequently spent two years in India. His experiences there were the subject of an article published in the Journal *in June 1986. Since the war he held several senior appointments in the Road Passenger Transport Industry and retired recently from Greater Manchester Transport where he was also Director of the Manchester Transport Band.*

Foreword

This story is probably typical of many Sapper units who fought in various theatres of war between 1939 and 1945. It has been abridged for publication in the *RE Journal* but the complete text, giving a fuller flavour of the ups and downs of field company life in the war, has been lodged in the RE Corps Library.

24 Field Company Royal Engineers now 24 Field Squadron proudly bearing the Maltese Cross as its emblem, is one of the oldest regular engineer units in the British Army. Formed in 1855 as a Fortress Company, it has served continuously in peace and war, at home and throughout the world.

The Company was in Malta for many years, and during the trying ordeal of the island had been well tested. After a short spell in North Africa, the Company returned home on 10 December 1943 and changed its designation to 24 Field Company.

After a hectic period of training and mobilisation, and with new transport and equipment, the Company left for Normandy on 7 July 1944 as part of a 21 Army Group Engineer Formation not really knowing what its exact role would be. I joined the Company as a Second Lieutenant early in 1944, my first responsibility being Transport Officer which I held until I took over the command of 2 Platoon in August, but my story begins on the evening of 5 July 1944.

To France

There was no "lights out" or "reveille" for 24 Field Company, Royal Engineers, on the night 5th/6th July 1944. Only a few hours previously, one of the men in 1 Platoon had married and celebrations were going on to a late hour, in other platoons there was not much inclination to sleep. In the mess we were busy saying goodbyes to all our good friends in West Horsley village, and listening again to the tale of one of them, a retired *Times* correspondent, who had once placed an RSM on a charge. How many times he repeated "they got drunk in the Sergeants' Mess that night", I cannot remember. After two hours sleep we breakfasted in the half light of a dull summer morning.

The Company, two hundred and forty strong in fifty vehicles, formed up outside "The Wellington" at 0500. I was the last to leave Company Headquarters, a large

Derrick R Vernon BsQ FCIT

modern house on the North Downs situated amidst delightful rural surroundings which had made life very pleasant and far removed from the realities of War. We moved off at 0515 and I was happy to see that everything as far as transport was concerned, went according to plan. The last few days before departure had been spent in covering all vital parts of the vehicles with waterproofing compounds and it was remarkable they performed as well as they did. Just prior to leaving we had been joined by the Colonel's Headquarters, and a sister company, the 74th. A third company, 55, was to join the long snaky convoy en route to Tilbury a little later.

We soon passed our favourite haunts and after two hours we were met by an efficient squad of Metropolitan Police, who conducted us over Blackfriars Bridge and through a tortuous maze of streets in the East End to the docks. I shall never forget the terrific farewell accorded to us by those Londoners, who had suffered so much but still had plenty more to give. Their send-off was most heartening and an excellent fillip to morale. The convoy was proceeding at a crawling pace, and what little there was in the shops in the way of food and cigarettes was unselfishly tossed into the trucks. We eventually arrived at a cleared bomb site which was to be our home for one night prior to embarking. At this camp, final administration was completed, waterproofing of vehicles finished and Sterling exchanged for Francs. The same night we disposed of a large quantity of English beer which was to be the last for some time.

On the following day some hundred and fifty trucks, in very miserable weather conditions, were loaded on a Liberty ship which, to say the least, was not designed for the carriage of seven hundred and fifty passengers as well! Shortly after embarking, rumours of a last and final visit to a "local" spread like wildfire, but needless to say, this did not materialise, and we spent an apprehensive evening watching a fascinating stream of "V1" flying bombs hurtling over the sky. During the night the ship weighed anchor and morning found us in an already large convoy assembling off Gravesend and bound for France.

After a stormy passage through the Channel, considerable alarm being caused at one time by striking the superstructure of a wreck, we arrived off Arromanches on the 12 July. The sea was very rough and unloading was postponed for a day after abortive attempts at placing vehicles in landing craft, rising or falling ten feet with every wave. Eventually, all our vehicles successfully "waded" ashore, and I was fortunate as the engine of my truck, having stalled on immersion, restarted at the first press of the starter. I was soon waved on to a beach exit and following the truck in front for about two miles along roads that were forested with signs, I found myself in a dispersal area, with the company nearby, busily preparing a meal and generally reorganising. We spent two days here, removing all waterproofing from the vehicles and rechecking stores, and on 16 July we moved to our first, and mostly continuous and not very glamorous, task of maintaining road communications.

Normandy

I had not realised what a terrific enterprise the Mulberry was until the day I viewed the whole panorama from the high ground above Arromanches. As far as the eye could see there were ships—hundreds of them. In the foreshore, a non-stop stream of amphibious supply vehicles bustled to and fro, removing all manner of stores to the dumps, whilst the jetties discharged a continuous stream of vehicles and the heavier mechanical equipment. The pulse of the British share of the invasion effort was indeed beating fast.

The village of Manvieux was the first stop, we bivouaced in a cider apple orchard; for the army and all its appendages a prominent feature of the Normandy countryside. Repairing roads in this area was a thankless task. Unmarked mines and booby traps were a constant threat, any unidentified object was treated with considerable caution.

Occasional enemy aircraft flew over at night to mine the Mulberry and the usual firework display was put up to meet them.

We had not been at Manvieux more than a few days when the Company was

ordered to move to a new location, an order which, during the next few months, we began to anticipate after spending more than three or four days in one place. Our first move took us to the village of Crepon some three miles east of Arromanches. Crepon was a small village with a church and cafe, but owing to its important position on the army route system, it had been decided to improve the narrow crossroads by constructing a circular by-pass. This had already been started when we arrived and was progressing well until heavy rain turned the thick covering of dust into an impassable quagmire. We immediately began to make a semi-permanent job of the road but it was not so straightforward. We could not obtain hard stone easily and due to traffic congestion, supply was irregular. However, in spite of these difficulties and the mixed weather, a stone crusher was coerced to work for three days non-stop and we had an ample supply of mechanical equipment. The weather remained very indifferent but quite often heavy rain ruined a good day's work or made further work impossible.

For the next two months 24 Field Company was engaged on a series of unglamorous but essential road maintenance and bridging tasks, making its way through the litter of war in Northern France to the village of Chambray near Pacy-sur-Eure, which it reached in 1 September. During this time the author took command of 2 Platoon.

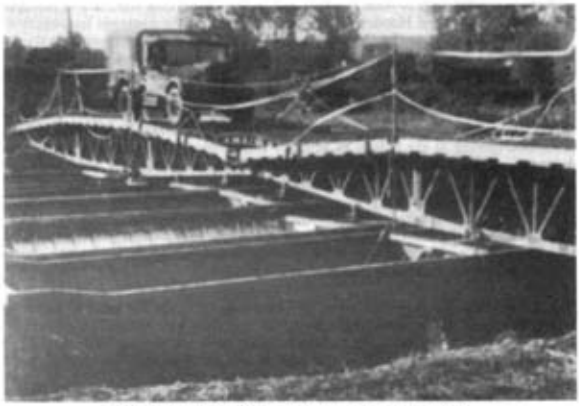


Photo 1. German K Bridge at Pacy-sur-Eure, August 1944.

THE following day I accompanied the Colonel and our Company Commander in the reconnaissance of a demolished bridge (then spanned by a Bailey equipment bridge) in the main street of Pacy-sur-Eure, where it was proposed to construct an improvised bridge of timber and steel to take Class 40 traffic in both directions. Whilst the plan of the new bridge was being agreed, the Platoon commenced the construction of a pontoon bridge further upstream, and the necessary layout of the bridge approaches. Considerable organisation was required for the diversion of traffic and its consequent direction to the bridge over approaches which were virtually nothing more than tracks, marked by white tape, over about a mile of fields. The equipment for the bridge was brought from the enemy stores at Cocquerel and the bridging train stranded in Vernon

Sapper Platoon (1)

station, and the construction of it took a day. The bridge was calculated to take loads up to 40 tons but after being in commission for a few days, its class load was increased to 70 tons by the simple expedient of floating two more pontoons underneath the girders. The "K" bridge, as it was called was, I believe, the first of its type to be built by Royal Engineers in France. Considerable disorganisation on the bridge and approaches was caused by a hotch potch of French civilian transport chugging away on one or two cylinders. The bridge itself was smothered with a variety of spare parts from these vehicles, and most days a good laugh could be had. One one occasion a heavy lorry failed to climb the ramp, rolled backwards and sank into the earth. All traffic was held up for three hours, but after removing the vats of cider and then practically jacking the bodywork from the chassis in order to lift the lorry out of the hole where it had sunk, the way was once again clear. That was the only serious hold-up in the fortnight that the diversion was open.

The next stage was to remove the Bailey bridge in the main street, clear the rubble away and commence building the semi-permanent bridge which I understand remained in good order for many years after the War. The bridge piers and seats were made good and after much stalwart work with the pick and shovel the site was cleared. The steel girders for the bridge were brought on an old contraption driven by charcoal from the other side of the Seine and launched into position. In the meantime, one of the attached platoons had been solely employed in cutting and shaping the twelve-inch timbers what were to form the deck and in due course they were laid in position. The bridge was named Horsley Bridge in recognition of the generous hospitality of the people of Horsley to the Company when in England, and was opened on the 27 September, to the great delight of the townsfolk who had been forced to use a ferry or go for a long walk over the pontoon bridge. Whilst we had been working on this task, Number 1 Platoon had constructed a similar bridge of reinforced concrete girders and timber baulks over the railway east of the town. This bridge was named "Buggins Bridge" the nickname of our much respected Colonel R R Gillespie MC. 3 Platoon (posing as the School of Military Engineering!) constructed a 200ft long 1 ton suspension bridge at Chambray which subsequently collapsed soon after our departure, having been over-loaded. They also built a 200ft long bridge of "K" equipment further upstream.

The Company left Chambray on 28 September to join the convoy of vehicles moving north up "the Corridor" towards Nijmegen, performing various tasks on the way. It eventually came to Deurne, a small village in Holland.

THE canal bridge just beyond Deurne had been destroyed, the far bank of the canal was in enemy hands. A joint Anglo American operation was planned to assault the canal and rebuild the bridge over which would pass the British 11th Armoured Division to liberate Venray from the west in co-operation with the British Third Infantry Division attacking from the north.

Under the command of the 7 American Armoured Division, 24 Field Company Royal Engineers commanded by Major T H C Raikes MC was ordered to assist the initial assault over the canal and to build a bridge as soon as a bridgehead about 800 yards deep had been secured.

Deurne was under sporadic shell fire, we waited just out of range whilst Lieutenant Bob Harris carried out a stealthy night reconnaissance. Bob and his driver were lucky, on approaching the destroyed bridge their armoured car was blown up on a mine, they both escaped unharmed. Bob's reconnaissance indicated the water was too deep for heavily assaulting infantry to cross without risks of drownings. The ground was too soft to use tanks with scissor bridges and the new bridge would need to be 60ft long requiring two main girders each side to carry a 40 ton load. Consideration of Bob's report by 24 Company officers resulted in a decision to build six wooden foot bridges 32ft long, just long enough to be thrown across and span the water. Each bridge would be carried or dragged into position by six sappers. Once in position, the

Photo 2. Bridges at Deurne built by 2 and 3 Platoons following the assault supported by 1 Platoon in October 1944.

attacking infantry would be able to race over dry-shod and storm the far bank. Major Raikes decided that 1 Platoon, led by Lieutenant Stanley North (Old Freezer to his men!) would make the assault crossing. The necessary timber to construct the foot bridges was found in a nearby dump and after one or two trial models, six stout foot bridges were made in a day. 2 and 3 Platoons led by Lieutenants Derrick Vernon and Gerry Shepherd would build a new bridge once the bridgehead was secure. The assault was planned for mid-day on Sunday 15 October but for reasons unknown to us was postponed until mid-day on Tuesday 17 October.

1 Platoon moved their foot bridges into hidden positions under cover of darkness the previous night, 2 and 3 Platoons waited in their transport in the village; there was continued spasmodic shelling but no casualties. We waited patiently for the promised artillery barrage to support the attack—something went wrong with the fire plan and there was a disappointing silence. 1 Platoon were on their way crawling and heaving the half-ton bridges along the deep ditches, the American Infantrymen were with them, they all got very wet and muddy but were relatively safe. There was heavy machine gun fire; there were reports of snipers. More infantry men moved up in White half-tracks, some ambulance jeeps returned with wounded men, there was the continued dull thump of shells and mortars exploding into the peaty ground and it was raining heavily. There was a long silence from 1 Platoon, we waited, we had strict orders not to move until the bridgehead was secure. This would take time, there was no natural cover beyond the canal bank, men would be very exposed and would have to move carefully.

The heavy bridging company lorries arrived behind us, darkness fell at 1800 hours the rain continued unabated and the lowering skies promised a bad night ahead. Just after 1900 hours, 1 Platoon returned, bedraggled with mud and very wet. Unbelievably they had only suffered one casualty, they had achieved their objective, they had put over 250 infantrymen dry-shod. Emerging from the ditches they had achieved considerable surprise, but they had been pinned to the ground by heavy shelling and a barrage of 6-barrel mortars—"the moaning minnies" as they were cynically called. Gerry and I were as assured as we could be that the bridgehead was secure but for

some reason or another we both shared considerable unease. Stanley's fearless leadership of 1 Platoon earned him the immediate decoration of the Military Cross and two of his stalwart NCOs Lance Sergeant Bob Walter and Corporal Jock McCarthy were each awarded the Military Medal.

The bridge at Deurne was intended to be completed by first light at 0600 hours the following morning, we had already lost a valuable hour or more of darkness, there were eleven hours to complete the action if we were not to be exposed as sitting ducks at dawn. We led the bridging column in our radio equipped armoured cars, moving quietly up the pitch black road littered with fallen trees and damaged vehicles, keeping well away from the verges which we thought were mined and guided only by the stark outline of some bordering trees to within a few yards of the canal. Our heavy tools and equipment were unloaded silently and there commenced an immediate and systematic search for mines and booby traps around the demolished bridge site and the nearby grass verges. The wood "schumine" could not be found except by careful prodding of the ground with bayonets; it was very dark and very wet. We slung stout hanks of rope from the front to the back of our trousers—if one was unlucky enough to lose a foot or both feet or a leg, at least we would be eligible for other pursuits! Fortunately, the demolition of the bridge had left the abutments intact but large pieces of reinforced concrete had to be removed from the road surface before bridging could begin. There being no adequate turning area the six wheeled bridging lorries were slowly reversed a mile to the canal, they dare not touch the verges as one mined lorry would have wrecked the whole operation because of the narrowness of the road. They could only be unloaded one at a time, the equipment had to be stacked on this same narrow road, some of it further away than convenient to preserve movement. The low reverse gears made an unbelievable noise in the silence of the night; the clanging of steel on steel as the lorries were unloaded could not fail to be heard, yet we were talking in whispered tones. Well above the level of the surrounding peat, we were, and felt, very exposed. Mortars and shells shricked at intervals into the soft ground around us, so long as they landed there and not on the tarmac road we were fairly safe. The darkness was intense, we had much difficulty in finding all the parts needed, and we dare not use any lights.

In building the Bailey most of the parts are wanted all the time, time was not on our side, we were only protected by the darkness of the night. Holes had to be felt for, small parts found, the site was wet and increasingly slippery, muttered oaths and curses as fingers were trapped rent the air, some parts were difficult to fit, and it was hard to keep the construction straight as the levelling had been hurried. There was the constant apprehension of mines underfoot and of mortars and shells landing amongst us, the occasional star shell illuminated the sky; progress was slow. In the most frustrating moments I heard Brownie's soft voice exhorting his comrades to keep trying. The night continued to be shattered by salvos of mortars—six at a time, shells we did not hear exploding in the peat, and scattered small arms fire seemingly from nowhere.

Burning buildings to the north and artificial moonlight covering the 3 Division's attack, served only to intensify the blackness around us. We were not contacted by the American Infantry shielding the bridgehead, several times I crouched and crept along and very afraid, several hundred yards along the deserted road ahead into no mans land, attempting to find out just where they might be—a task fraught with the risk of being shot anyhow, but they were not to be found. We depleted our working strength to protect the bunched bridge builders. As the night progressed we were encouraged by visits from our Colonel Gillespie (Buggins), Company Commander Cecil Raikes and second in command, Nigel Holloway. Bob Harris was never far away and made sure we were supplied with hot tea. It was a very wise group and company policy, never to interfere with tasks already delegated, was going well. This policy of confidence worked like a charm, the Platoon Officers had been given their orders and that was enough.

Gerry and I were left alone to cajole and hopefully inspire our valiant sappers to

work against the clock knowing full well that if the bridge was not finished by first light, and dawn breaks quickly in October, we would certainly suffer heavy casualties and there could be no question of retreating before the job was done, but the behaviour of every man was impeccable and in the highest traditions of the Corps of Royal Engineers.

Time passed, the voices of our trusty Sergeants Ron Brewer and Bob Cushen became more impatient and demanding—we had no wish to be caught in the open at day break, but for all the strenuous effort, we had problems with the jacks, the ramps were not finished at first light and the wear decking had not been fixed.

The mortaring increased and the range was closing quickly; Lance Sergeant Baker took a small party to windward to cover us with smoke which was so effective we were all soon choking! There were several bursts of machine gun fire nearby; our time was running out. Very soon ominous black puffs in the sky approaching steadily nearer overhead, warned us we were about to be strafed with air bursting shells but the bridge was completed well enough to take the first tanks of the 11 Armoured Division. Our task was done, we were completely exposed in the broadening daylight, it was pointless to risk so many lives by nailing down the wear deck—we decided to retire.

By a quirk of fate, my scout car would not start, it was prone to blockage of the petrol filter, I did not propose to leave it behind so I raised the engine cover and unscrewed the filter coated with sediment. My driver Jim Kinnell pressed the starter, a stream of clean petrol washed the filter clean, I have never replaced a filter more quickly!

A mile down the road we ordered a hurried roll-call, one of my section Lance Corporals was missing, Jackson a quiet man from a Durham mining village. "Jacko" was last seen by the smoke pots, I decided to search for him and scrambled back to the bridge under the protection of the deep drainage ditch. The smoke had long since given out, I searched the desolate expanse of peat and heather, I shouted his name but there was no reply. The mortars were firing again, I was convinced they were firing at me! Reluctantly I concluded Jacko was missing and if I stayed much longer, I would be too. As I withdrew a troop of three Sherman tanks which had come close up to the bridge attracted again a ferocious barrage of shelling and "moaning minnies". I sought cover and laid underneath a tank whilst the air shrieked with sound and the ground shook. I shook too, and prayed the tank, whose crew were unaware of my presence, would not decide to move.

There was a lull and I rejoined my men, dismayed to be told that Jacko was not to be found. Very soon afterwards the tanks and supporting infantrymen of the leading Brigade crossed the bridge, "Jacko's Bridge" as it was later named, followed closely by a section of number 1 Platoon under the indomitable Bob Walter to fix the wear decking. They too, were pinned down by a vicious barrage and sought shelter under the girders. The steel work was later found to be cut through in many places (the bridge was later rebuilt) and the attacking infantry suffered many casualties. As the attack pressed forward, the firing ceased. Bob Walter found Jacko lying in the heather near the smoke pots, he had been hit many times and would have died instantly, only forty yards away the unseen Spandau machine gun we had heard during the final stages of construction was found abandoned. I shall never know why the machine gunner did not turn his gun on the crowded bridging party but perhaps we were hidden very effectively in the smoke. Amongst the fallen British Infantry struck down as they crossed the foot bridges and the main bridge, on the canal bank near the smoke pots that had protected us all in the dangerous half hour after dawn, we buried Jacko where he fell; the Officer's Field Service Pocket Book had many uses and thoughtfully includes a form of service for such occasions.

Venray was captured and the line closed to the Maas; 24 Field Company which had lost one man dead and five wounded, were extremely brave and exceedingly fortunate and, not least, were true then as always to the Sappers motto "Quo Fas et Gloria Ducunt" (Whither Right and Glory lead).

The bridge at Deurne was small in comparison with many other Royal Engineer

bridging feats, but it was a fearless and distinguished action for which all concerned were complimented by General Sir Richard O'Connor, KT, GCB, DSO, MC, Commander of the British 8th Corps.

The author's platoon was now divided in half, and under the command of 4 Armoured Brigade again performed many tasks of removing mines and booby traps, and rebuilding bridges, through Goirle, Tilburg, Breda to the Maas. On 11 November the Company came under the command of 1 Canadian Army and moved to Veghel. The chief task was to maintain and repair the "Club" route, an unenviable job in the icy conditions of that winter. On 8 March they began rehearsals with 15 Scottish Infantry Division, whom they were to transport across the Rhine.

The Rhine

Our sister unit 629 Field Squadron, some 200 men strong, would man the first assault boats carrying the leading infantry of 15 Scottish Division; once over, their task was to clear the far banks of all opposition whilst 24 Company and our other sister unit, 55 Company, would construct and operate Class 9 rafts, large enough to take most of the wheeled transport and the 25 pounder field guns; 145 Field Park Company which had given tremendous support to all our operations since Normandy days would provide the heavy earth moving equipment to make roadways, ramps and jetties for the flood of military vehicles of every description ready to cross the river as soon as the exits on the east bank were secured.

I had been on leave for a few days, so thought I might miss the party (our euphemistic word for all types of action!) and be referred to evermore as a "Dodger". But no, via Folkestone and Boulogne I was back in the Hochwald at Company Headquarters billeted in one of the few farms still standing after the early battles of 1945. In the Mess a candlelit card party was in progress, together with the usual hospitality. Gin, I recall, was 32½p a bottle and Scotch 35p! There were the usual questions about leave and life at home.

The following morning commenced with a Company conference and a detailed check of the rafting equipment well hidden in a nearby wood. My platoon were cutting stakes which we would use to revet landing piers. The weather was brilliant; a drying east wind turned the fine soil to choking dust which limited careless movement. After dusk we moved to Wardt a tiny farming village north of Xanten and situated about a mile from the river. Behind the four metre high flood bank, Wardt would be our "rest centre".

There was much livestock running about, and in the darkness my driver had the great good fortune to run over a pig which was quickly slaughtered. I think a number of chickens and ducks were also bagged!

We returned in the dark to load the pontoon equipment on heavy sledges which were then camouflaged to look like a thick hedge. I took my Sergeant "Ginger" Pratt to the river bank and silently surveyed the wide expanse of the Rhine's swirling black water. The Company billet was in the middle of the divisional 5.5 inch gun area, a choking blanket of smoke covered all movement; nerves tautened in anticipation of whatever lay ahead.

At Company conference on 23 March final plans were made. The Company plan was straightforward; 1 Platoon were to move with their equipment to the cover of the flood bank just after dark (the bank had been breached in several places by a bulldozer the previous night, the breaches covered by thick smoke throughout daylight hours), and at 0200 hours on 24 March move to the river's edge and construct the first raft. The tractors would return for 3 Platoon and their equipment, and finally return again for 2 Platoon at about 0600 hours. We reckoned to have three rafts in operation by 0800 hours.

During breakfast a number of shells landed too close for comfort, one exploding just outside the headquarter's lorry, unfortunately wounding two men standing nearby. We hastily dug slit trenches in the event of further attack, and passed the remainder

of the long hot spring day with nothing to do, but wait. About 1700 hours the artillery commenced a tremendous barrage, according to some veterans it far exceeded El Alamein.

Some time after 0300 hours, I took a small party to the water's edge to inspect the building site 2 Platoon would use. It was very dark, I could just see the outline of the far bank, identified by intermittent fire which buzzed too close to be comfortable. As I said, it was a party, everyone that mattered was there, the group Colonel Gillespie, our Major Cecil Raikes, Captain Nigel Holloway, my brother Lieutenants Gerry Sheppard and Bob Harris, all quite unperturbed watching Stanley North construct and launch the first raft.

An armoured bulldozer was making jetties, three armoured cars were already well dug in for radio and traffic control and to protect us with their firepower. Having almost completed his task, the bulldozer driver was shot in the chest. On our left, 629 Squardron had completed their task, the infantry were on the far bank, but in the darkness it was not fully cleared of enemy lying low in their foxholes. On our right 55 Company was also building rafts. Batteries of light artillery had been brought close behind this scene of super activity, their tracer shot piercing the darkness with a continuous stream of fire.

I returned to my platoon, sheltered in the farmhouse cellar, and about 0600 hours as planned the tractors returned for our equipment. At the very moment of hitching the sledges to the tractors, we were caught in the open by a sharp attack of shelling. The farm was obviously a certain target for enemy guns and within a few seconds several men were killed and wounded. One of the sappers, a young man of only 19, had the great misfortune to be killed by a splinter which, by cruel fate, entered the narrow visor of my armoured car; I was dazed by a splinter furrowing my steel helmet, others had similar narrow escapes. This was a bad start, but as the shelling ceased we heard from radio control that 1 and 3 Platoons, already on the water's edge as daylight broke, were under heavy mortar and small arms fire; operations had temporarily ceased and they were furiously digging in to protect themselves from unnecessary losses. The infantry had unfortunately missed the Spandau nests opposite. These were eventually knocked out by direct hits from the armoured cars, but not before the first two rafts built had been sunk by machine gun fire. The far bank was cleared about 1000 hours when, to the background of the thunder of the guns, we watched entranced, as the British 6 Airborne Division flew overhead to seize the German gun area. For about thirty minutes the sky was black with aircraft and coloured with parachutists, who, spearheading the attack, suffered heavy casualties in the days that followed.

Just as soon as the opposition ceased, we arrived at the water and on a brilliant spring day quickly constructed our raft and with the other two repaired in record time, the Company was ready to operate just after midday. The rafts consisted of two pontoons each of three sections and linked by a bridge long enough to carry a 25-pounder field gun, tractor and limber; ramps that could be lowered or raised gave access to the shore. The rafts were propelled by four Petters outboard engines, one at the end of each pontoon; good watermanship was required to drive the raft across the wide fast flowing river. Each platoon operated non-stop for sixteen hours (refreshments were provided on board!), and two rafts were maintained constantly in service. Signal lamps were placed for continued operation through the night, and we fitted up a public address system to broadcast the news and "music while you work". I had the privilege to take over Major General C M (Tiny) Barber the GOC of 15 Scottish Division, "Tiny", because he was about six feet six inches tall!

There was considerable rivalry between the platoons for the best time in making the round trip which required crafty handling of the boats when approaching the far bank where the current was about two knots faster. The average time was about twelve minutes. A shell, possibly one of our own, burst in front of a raft in midstream. We did not relish the prospect of being sunk, for even with life jackets, the temperature of the water meant instant death. Unfortunately, for 1 Platoon this proved only too true; whilst transporting an armoured ambulance during darkness on 25 March, their

Photo 3. Anniversary Bridge over the River Weser at Nienburg, June 1945.

raft, believed to have been holed by a rock, sank in midstream with the loss of eight of our men and the ambulance crew.

The morning of 24 March was one of din and action, the supporting barrage of the guns was intense, RAF rocket firing Typhoons flew constant sorties overhead to eliminate strong points. Suddenly all was quiet, as the Airborne Division swamped the opposition. Ever anxious to be quickly on the scene of historic events—as he was in Normandy—and the crossing of the Rhine was an historic event, Mr Winston Churchill, accompanied by Field Marshals Sir Alan Brooke and Sir Bernard Montgomery and General Sir Miles Dempsey, arrived on the Rhine not a hundred yards from our rafts and watched the construction of a Class 9 folding boat bridge intended to replace the rafting operation. An orderly laid afternoon tea on a white tablecloth for these distinguished visitors; our men muttered about camouflage and helped themselves to a few cakes left behind!

We hoped the folding boat bridge would soon relieve the accumulated traffic. However, no doubt because of bunching by nervous drivers (and without practice, driving over a long pontoon bridge in pitch darkness is hard on the nerves), the bridge became unsafe and next morning showed a third had sunk. We therefore continued the rafting operation until late on 27 March when both Class 9 and Class 40 bridges were in full operation. We had taken across many indispensable first line vehicles, I think the most useful job done was to ferry a complete regiment of 25 pounder field guns which were quickly in action. On the return journeys we brought back a great number of prisoners, many of whom were only frightened boys no doubt glad to find the horror of war was over. During the last night of operation, my raft struck a rock a few yards from the shore and started to sink, fortunately the situation was seen in time and we were able to return to dry land.

When ordered to cease operation, we were very tired. In three days, the Company made about seven hundred round trips across a very dangerous river in flimsy craft, we suffered nine men killed in action and twenty wounded. In retrospect I think we were lucky, but we knew that partly as a result of our effort and that of all other British and American engineers, organised resistance east of the Rhine had ceased to exist and final victory could not be too far away.

The successful action brought a message on 27 March from Lieutenant General Sir

Ronald Charles, Chief Royal Engineer, "Please accept and convey all ranks RE my warmest congratulations on magnificent part played in crossing of RHINE!". Major General Inglis, the Chief Engineer of 21 Army Group replied "Thanks for message much appreciated by all ranks. All in good spirits and conscious of moral support derived from tradition of the Corps and of magnificent backing by all in UK responsible for design and provision of equipment".

From Headquarters British Second Army, Lieut General Sir Miles Dempsey wrote on 29 March to our group Colonel Gillespie, "Dear Gillespie, The Battle of the Rhine has been won, and our leading troops are now, five days after crossing, breaking out from the bridgehead. I want you to realise how much of this success is due to the work which you and those under your command have carried out. The crossing and bridging of the Rhine could not be described as an easy operation. It was, however, essential to success that the build up on the other side of armour, artillery, vehicles and stores should proceed quickly.

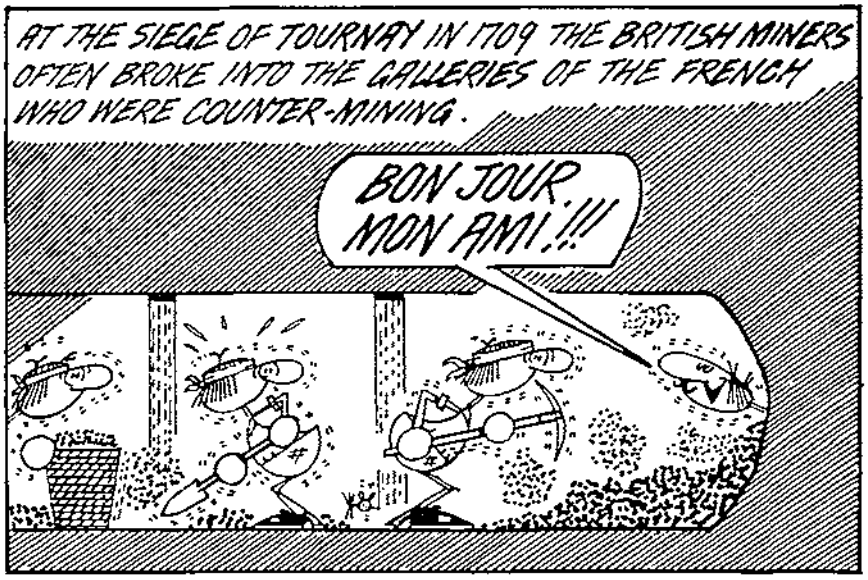
Thanks to the skill and energy with which you carried out the task allotted to you, this was achieved and I would be glad if you will tell all ranks how much I appreciate and admire their splendid work. Yours sincerely, M C Dempsey."

By the evening of 28 March 21st Army Group bridgehead was twenty-five miles wide and twenty-five miles deep, 50,000 tons of bombs were dropped in support, Wesel and Rees were all but destroyed, there were almost 6000 allied casualties, of which the Airborne troops suffered nearly half.

As a young officer, however, one did not see the grand strategy, only the men one knew and lost, one saw the frail equipment and its problems, the wide treacherous river and the far bank.

In early April the Company crossed the Rhine and made its way through Germany to the Weser with route maintenance and bridging the highest priority. Their tasks included building a Bailey pontoon bridge at Nienburg. During this time the war in Europe ended and the author was posted to South East Asia.

KNOW YOUR HISTORY



In Favour of Painted Warriors

MAJOR M R CAMPBELL RE

The author was commissioned into the Royal Engineers in 1971. He took a degree in Civil Engineering at RMCS Shrivenham. After service with UK and BAOR Engineer Regiments and HQ Commando Forces he attended Staff College. He now commands 59 Independent Commando Squadron.

NEW paintings arrive at the REHQ Mess rather like an occasional present from a distant relative. Sometimes the purple spots on the new tie complement the canary yellow of an old pair of favoured socks; but more usually there is slight embarrassment in wondering what to do with the product of "Auntie's" eccentric taste. The same feeling percolates through from the Corps paintings. There is much commendation for the technical competence, muttered appreciation for the clarity of vision of the artist, occasional asides about the fidelity of the colours but leaving one with a general air of disquiet, wondering where the new painting fits into the general theme of paintings.

The new Falklands painting has raised such doubts in my mind. I cannot help feeling that the Falklands War for the Royal Engineers was nothing more than yet another overseas MACC Task including all the possible equipments in the painting and reducing the human contribution to ant-like proportions in the bottom left-hand corner. Is this really what modern war is about? Is this the impression we wish to leave with future generations? Perhaps it is time to reconsider what we wish the subject matter of our paintings to be. Hopefully this article may be the starting point for discussion. Rarely, it seems are people willing to discuss the subject matter of paintings and little is asked of Corps members before paintings are commissioned. Naturally this article is my personal and subjective viewpoint.

Firstly, I believe that the war paintings should recognise the theme that man is the first and last resource of war; that he is frail and has to overcome his fears, individually and as a team, to enable him to do his job under conditions of extreme duress. Sappers, in particular, frequently have to carry out their tasks without being able to retaliate thereby increasing the sense of isolation. Cuneo's *Alamein* and *Rapido* paintings reflect this theme admirably. His *Hook* painting captures part of the mood but is more muted. The new Falklands war painting sadly has none of it. Although I would not wish to return to the style of the Victorian romantic military paintings there is no doubt about the feeling of most of the battle scenes of the 19th Century. Perhaps it is easier to capture the mood when depicting infantry and cavalry in action but we have done it successfully in the past.

All our paintings whether depicting peace or war should also try to achieve a balance between the man, his work and the environment in which he is working. If possible the artist should set out to portray the physical and environmental barriers that men have to overcome. For our work is primarily about men and a painting is an appropriate medium to register their emotional, psychological and human aspects. It is, of course, important and interesting to register for posterity the artefacts and

Major M R Campbell
In Favour Of Painted Warriors

Photo 1. The new Falklands painting by Mr Tim Havers.

engines of war of the current period which we use. But would not many of these subjects be much better represented by commissioning a series of photographs, and what better place to portray them than the new museum? Every Commanding Officer and Officer Commanding who was involved in their use or construction could then justifiably treat that part of the museum as his personal icon! This would free the Corps paintings, costly to produce, to concentrate on the human face of our work in war and peace.

If we can agree on these general themes for subject matter perhaps we can also give some direction to the artist or the style of his work. Or at least select an artist who can produce the style we would all like. Maybe we could go down the road of abstract surrealism in the style of Picasso's *Guernica* portraying very forcefully the horrors of the Spanish civil war. Although this style has a positive emotional appeal, it may be limited in its universality as it can be difficult to live with!—or Goya's stark vivid portraits of the same period which again have an attraction. I suspect that we would not wish to afford artists of this calibre though. An alternative approach would be to link the human aspects of individual and collective action. This approach is favoured by many American military painters but they are inclined to glorify the male machismo for its own sake.

Understandably it is difficult to produce a balance. A painting which seems to strike the right sort of balance is that of a Royal Signals Sergeant laying line across the Caen Canal bridge in Normandy which hangs in the Chattenden Officers Mess as a print donated by a previous Royal Signals attached officer. The artist in that instance was Peter Archer but there are many others capable of this approach.

The other main style used in recent years is that of the Ken Howard school bringing a draughtsman's qualities to watercolour paintings and using a montage approach to reflect various aspects of engineer work. This usually serves to emphasise the task and the environment at the expense of the human aspect leaving the paintings rather cold and clinical. They do have their place though, and many Commanding Officers' and Officer Commandings' offices have been much improved by these paintings. If allowed

Photo 2. Harrier Pad by Ken Howard RA.

more freedom, Ken Howard's oil paintings have an excellent touch and his book of watercolour sketches of Exercise *Spearpoint 80* do have a dynamic, human feel. So perhaps if the artist has a better understanding of what we require then he may be able to do more.

These thoughts are I hope not to be taken as swingeing criticism but rather more as thoughts on a subject which is rarely discussed and maybe help to form our future ideas on what our future paintings ought to look like. Personally I favour painted warriors in our pictures.

The Corps and the Rock Temple at Abu Simbel

CORRECTION

THE Unit that undertook the work was 24 (Fortress) Company not 25 (Fortress) Company as printed in the June issue.—Editor.

In Favour Of Painted Warriors (2)

Attachment to L E Jones Demolition Ltd

LIEUTENANT C R P LANGSTON RE

The author joined the Army in August 1980 with Rowallan Company, RMAS. He was commissioned in August 1981 and after an attachment to the QGE in Hong Kong joined 77 YO course in February 1982. From there he commanded a troop in 22 Engineer Regiment, Tidworth, spending six months in the Falklands. He has just completed his final year of a Mechanical Engineering degree at RMCS Shrivenham.

Introduction

At RMCS Shrivenham the Engineer Directing Staff frown upon Sapper students who waste too much of their twelve weeks summer vacation. This year I decided firstly to go on a four week trans-Iceland trek and then to spend six weeks in the temporary employ of a Sheffield-based demolition company. I wrote to Mr Fred Ogden, contracts director of L E Jones Demolition (and incidentally President of the Institute of Explosive Engineers) to set up the industrial attachment. He sent me to one of their sites, a power station in Croydon, South London.

The task involved total demolition of all CEGB buildings and properties including six 300ft concrete cooling towers. It was the latter portion of the job that L E Jones had tendered for and won.

As with any task of this nature, it was not only the physical destruction and removal of the tower that presented a problem but, in addition, so doing within the confines dictated by neighbouring buildings, roads, gas mains and similar. My intention was to learn something of "civvy" methods employed in the demolition industry.

Contract/Aim

The contract was a thick verbose document (even more than this article) produced by the CEGB and designed primarily to cover them from the liability angle against all manner of mishap or problem. In essence, however, ignoring the reams of Safety at Work Act reproduced therein, the six towers had to be felled as follows:

The first two, both on the morning of Sunday 18 August in separate explosions.

The third on the morning of Sunday 25 August.

A decision on the method of demolition of the last three would only be made after Sunday 25 August. If not completely successful then the contract provided for the "taking apart" piece by piece of the last three, those being closer to factory premises.

Execution—Phase I

Phase I was in fact totally unconnected to the physical destruction of the concrete and steel towers. Before even a single charge could be placed, a great deal of liaison had to take place. This was to keep local residents and businessmen informed of timings, not only of the demolitions but of road closures and cordons necessary for security.

I was fortunate to attend two sets of meetings, both those attended by outside

Lieut C R P Langston
Attachment To LE Jones Demolition Ltd

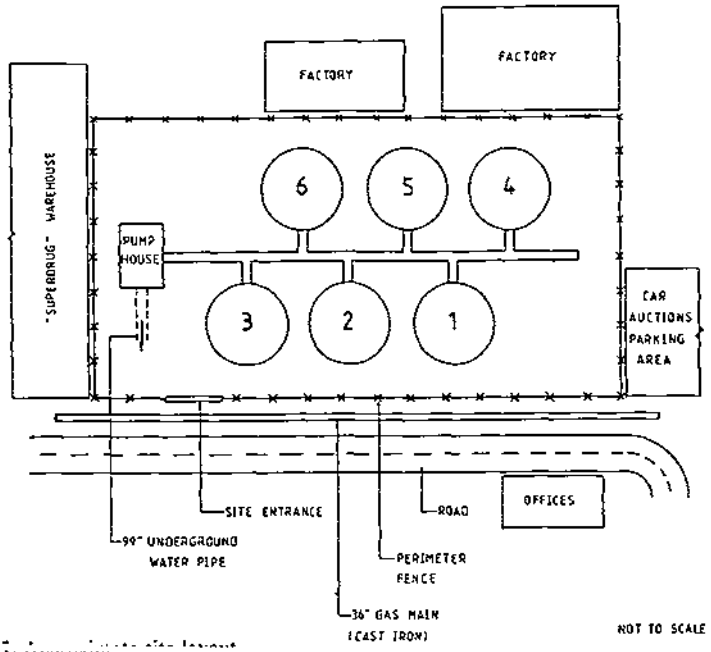


Figure 1. Approximate site layout.

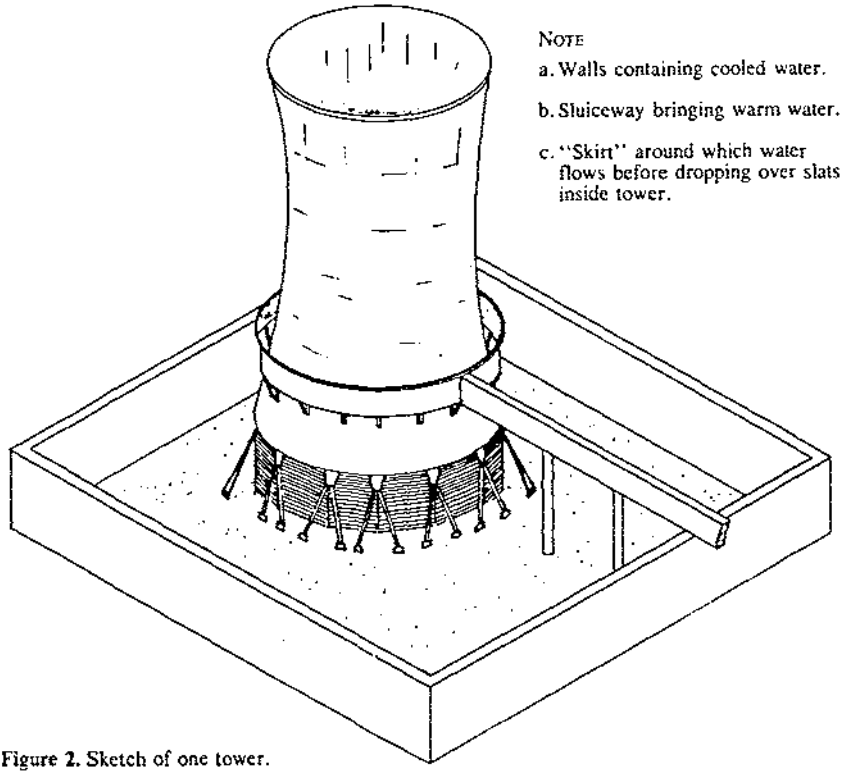


Figure 2. Sketch of one tower.

Photo 1. One of the two kicking lines.

interested parties and those of the "organisers". At those meetings for the community, all manner of anxieties were cleared up by a board of experts and special passes issued for factory access on the days of blasting. The organisers' meetings were attended by CEGB representatives, L E Jones, the police, public relations, fire, ambulance, gasboard officials and seismic experts from "Rock Environmental".

This stage was especially novel for me since it represented that aspect of demolition work so necessary in peacetime but virtually disregarded in time of conflict.

Execution—Phase II

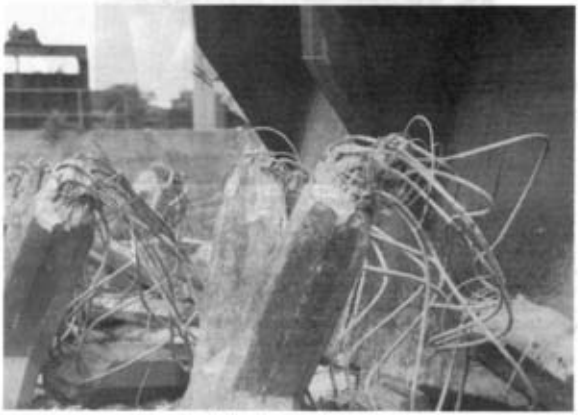
General

The six towers stood in a staggered 3×2 grid (see *Figure 1*). Each was approximately 120ft in diameter at the base and 300ft high with the familiar "waisted" cylindrical shape (see *Figure 2*)—total weight about 3000 tons of concrete and steel reinforcement per tower. In addition a network of sluiceways and large concrete channels existed to distribute and re-direct the warm water requiring cooling. The outline charging pattern was to drill at two levels around two-thirds of the tower circumference. The lower level being designed to destroy the very strong base legs and the upper to cause collapse of the main tower shell. The third sector left undrilled was used as a form of kicking fulcrum to direct the tower in a chosen line of fall.

Attachment To L E Jones Demolition LTD (1)

Legs

Forty of the sixty legs were drilled with boreholes at 45° to the leg surface. The configuration was a line of five holes running up the leg spaced at 18in intervals. The bottom hole was approximately 6ft from the concrete floor base. A 4oz charge of 19mm diameter was dropped into each borehole (22mm dia) and tamped with clay sticks. The explosive was 80% strength in powder form. The five charges per leg were linked with detcord and attached to a "Magnadet" detonator. (This is a new commercial detonator. Effectively it consists of a small magnetic coil responding only to a certain frequency which causes it to induce the detonating current. The Magnadets are neat since they require no clipping of contacts [simply thread ring main through coils], they are waterproof and are free from danger of accidental detonation by freak radio/electrical signal.)



Photos 2 and 3. Legs before and after demolition.

Main Shell

At about 40ft above ground level ran a form of concrete "skirt", originally designed to allow warm water to circulate around the full circumference before passing through holes in the shell onto cooling slats inside. Inside the lip of this skirt was the second series of boreholes. Here the skirt would act as a shield against flying concrete scabs. The pattern chosen after test blasts was an 18in square of four holes with one in the middle akin to a five in dominoes. Again this was to extend for two-thirds of the tower

Attachment To L E Jones Demolition LTD (2 & 3)

circumference, one-third either side of fall centreline. The boreholes were achieved using a drill bit of 11½in length at 45° to the shell surface. Here the concrete was 13in thick and thus the 4in long charge was located at half depth.

Drilling

Boreholes were drilled using hand held pneumatic rock drills. Drilling the leg holes was particularly precarious being done on an unsteady aluminium ladder, sometimes reaching above head height for upper holes. In the case of shell holes, great quantities of compressed air hosing had to be employed to reach from the compressor on the ground to the skirt on the far side of the tower. A two man team alternated between drilling and rest. With both shell and legs, many unsuccessful holes were started before the tell-tale feel of steel reinforcement indicated a fresh hole was

Photos 4 and 5. Shell before and after demolition.

needed. It was usual for each man to drill five holes taking 20–30 mins depending on luck with reinforcement before handing over to his partner. Noise, dust, concrete chips and wrist fatigue made this job less than comfortable for a full twelve hours each day.

Personnel

In order to complete the drilling in time, two two-man teams were employed. On this site were a pair from Sheffield and a pair of London based Irishmen. In addition a cabin boy acted as telephone answering service, contact for visitors (*eg* scaffolders) and cook for breakfast and teas. Overseeing was Dominic Ogden (son of Fred) acting

Attachment To L E Jones Demolition LTD (4 & 5)

as both foreman and explosives engineer. In all a small team for such a seemingly large task, assisted by the author wherever possible in all roles.

Only on the days of blasting and in the presence of pressmen were the higher echelons interested in visiting the site.

Co-ordinating Instructions

Timings

Each tower took approximately one week of drilling to prepare, using both drilling teams. Charging up and screening took several days (long distance scaffold protection screens were erected by outside contractors) and the final circuitry was completed in several hours on the morning of each blast. Effectively a fortnight was required for each tower. On blast day the following abridged schedule was made available to the multitude of visitors and "hangers on" that appeared from every quarter as well as "locals" requiring one.

0630	— Road closure by police	
	— Flagmen in position	
	— Factory personnel already evacuated where applicable	
0740	— Warning shot	Tower No 2
0745	— Three 5 second blows on airhorn followed by detonation	Tower No 2
0746	— After collapse, all clear given by one 5 second blast on airhorn	Tower No 2
	Inspection of second firing circuit. Rectification if required. Anticipated timings as follows.	
0755	— Warning shot	Tower No 3
0800	— Three 5 second blows on airhorn followed by detonation	Tower No 3
0801	— One 30 second blast on siren to signify end to blasting ops	Tower No 3

NB The abort signal will also be one 30 second blast on siren.

Equipment and Stores (and Security thereof)

Explosives were delivered by Mr Fred Ogden on an "as required" basis but there were obviously times when boreholes contained prepared charges overnight. Extraction of the charges would have been difficult due to clay tamping but on these occasions an outside security firm was employed to patrol the site border fence. Detonators were similarly guarded and were afforded the additional protection of being in the on-site accommodation for the few days prior to blasting.

The threat of theft by neighbouring gypsies and scrap merchants necessitated all tools and plant being secured in compounds at the end of each working day. Much of this equipment belonged to L E Jones but a healthy float was available for local purchase or hire.

Service Support

Accommodation was either on site in a caravan or in hotels according to the nearness of blasting day. Apart from a mid-morning cooked breakfast all food (and copious quantities of Pils lager) were taken in Croydon restaurants and cafes.

Command and Signal

On days prior to blasting a telephone was in use for "upwards" and "outwards" communication from the site office. A "Pye" radio link was provided for site safety between the towers and the office. On each blasting day a command post was located high up on the roof of a suitably located CEGB building. This provided a centre of communications for both the police outer cordon and the company inner one. L E Jones laid on a "line of sight" cordon consisting of eight men with radios and with flags as back up. This inner ring was located just beyond the safety distance which was three tower heights, and all sentries had been previously rehearsed in reporting procedure.

Blast Days and Summary

The author was lucky enough to be involved in three of the six towers. Both demolition days were totally successful and only a minor alteration in detonator timing was made betweeen the two blasts. When watching the towers fall from a distance there was surprisingly little charge noise and the shell-collapse seemed to be in slow time (the four photo sequence was wound on by hand). Ground tremor (for which there was an independent monitoring company) was not felt by observers and only the great dust cloud seemed to tally with the magnitude of the structures.

The attachment experience was valuable not only from the technical point of view but also from the point of view of studying civilian site methods and styles. On-site management and equipment acquisition differed greatly from their military equivalents. The ever present topic of finance and profit was a new feature too.

Should any reader have the opportunity of a similar industrial attachment then he would be well advised to accept. It is, however, easy to become jealous of the large wages earned by labourers in this field. Demolition work is hard, often dangerous but correspondingly well rewarded.

A great deal of planning and work, co-ordination and liaison goes into the *safe* and *controlled* demolition of a large structure such as a cooling tower. In demolition work only is it a most gratifying sight to witness the fruits of one's labour come crashing to the ground in the space of several seconds.

Epilogue

Since the author's attachment to L E Jones in July and August 1985, the company has been in the public eye concerning the failed or partial demolition of a tower block in Hackney, London. The author in fact accompanied the explosives engineer on his initial recce of this task but fervently denies any involvement in the eventual method chosen!

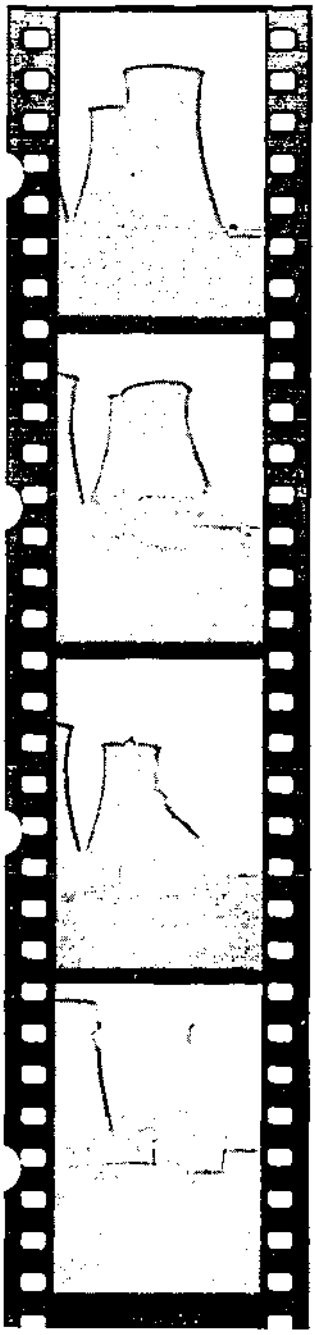


Photo 6. Photographic sequence of collapse.

The Search For Water

CAPTAIN A M MILLS BSc RE

The author graduated in civil engineering from Leeds University in 1981. After attending RMAS and a YO course he was posted as a troop commander to the Queen's Gurkha Engineers. He is at present a squadron second-in-command in 35 Engineer Regiment.

A convenient supply of safe water is an essential for healthy, productive life in any community. Water which is not conveniently located results in waste of time and energy: and water which is contaminated can cause disease. Today 1.5 billion people in developing countries do not have access to safe water. This decade has been designated International Drinking Water Supply and Sanitation Decade, with the aim of securing a safe and dependable water supply for all. The wealthier nations accept that they have a moral responsibility to help the Third World towards a better life for its people. It is a challenge to governments, and to charitable organisations. The Corps, too has been playing a part; well-drilling teams have been busy in this field in the past, though unfortunately present commitments have precluded work in the Third World recently. Operation *RALEIGH* plans to study water-related problems in the Far East. It is not only our more specialist organisations which are at work. This article describes two recces which I, as a Troop Commander in the Queen's Gurkha Engineers, was lucky enough to undertake for water supply projects in Kenya and Nepal.

KENYA: TURKANA DISTRICT

IN 1984 a Gurkha Troop was attached to 9 Parachute Squadron for an Exercise *LARCHPOLE* tour in Kenya. The chance arose to carry out an initial recce for improvements to the water supply to an orphanage at the village of Lokichar. Lokichar lies some sixty miles to the west of Lake Turkana (Lake Rudolph to the more conservative) and has a population of five thousand.

After an adventurous three day cross-country journey by landrover, which exhausted our supply of three spare tyres, we arrived in the arid Turkana region. We saw no surface water; but crossed some dried-up river beds. Our first question on arrival was "When did it last rain?" The reply was "two years ago". Clearly things were not going to be easy. The village is served by three wells. The first is the property of the East African Reformed Church, who do not share their water with the village. From the second, capped with concrete, water is drawn by diesel pump, which frequently breaks down. Replacement parts for such obsolete equipment can take months to obtain. The third, crudely dug into the bed of the dry River Lokichar, had, at the time of our visit, no more than a trickle of water at the bottom. This was the only water supply available to most of the villagers; it involved the user in a hazardous 25ft descent down the side of the well (*Photo 1*).

It was clear that the requirement of water for the orphanage could only be considered in conjunction with the needs of the village as a whole. We approached the Regional Minister of Water to find out if any schemes were being considered for the

Captain A M Mills RE BSc

Photo 1. The well at Lokichar.

area but Lokichar had not been a beneficiary of regional planning. We then spoke to the Turkana Water Project team, a charity working in the area; they were on the point of embarking on a geological survey of Lokichar. It became clear that the several charities operating in the area were doing all that was possible, they had abundant volunteer labour and much expertise. As all that was required now was money, we concluded that there was nothing more the Corps could do to help and departed wiser for the experience.

NEPAL: SYANGJA DISTRICT

It is customary for officers serving with the Queen's Gurkha Engineers to go on Nepal trek once during a tour. Trekking officers usually carry out recces for possible engineer tasks in support of the Gurkha Welfare Trust, the majority being for village water supply schemes.

Nepal is luckier than many developing countries because, at least in the hills there is no shortage of pure water. The problem is how to get the water from an almost inaccessible source, across daunting terrain, to the home. In the foothills of the Himalayas, houses are built on the top of the hills. Here the ground is level, the soil is better and the threat from landslides less. The disadvantage is that water must be carried from the river far below.

The Search for water (1)

Photo 2. Captain (QGO) Kharkabahadur Ghale MBE ex 1/2 Gurkha Rifles.

One of the villages I was tasked to recce was Sallyan in the Syangja district. By Nepalese standards it is not difficult to reach, being half a day's trek from Helu on the Tansen–Pokhara road. Our party was given a magnificent welcome by Capt (QGO) Kharkabakadur Ghale MBE ex 1/2 Gurkha Rifles, who had originated the application for assistance to the Gurkha Welfare Trust. After appreciating several pages of faded photographs recording his visit to the Coronation, we were able to proceed with the recce. At present the three hundred and fifty villagers obtain their water from a well lying some five minutes walk from the village. In spring, however, the well runs dry for as much as four months, forcing the women to undertake an arduous thirty minute climb to the river and back.

We identified a source some two kilometers from the village and planned a scheme to pipe water from the source to seven stand pipes in the village. We surveyed the routes and calculations proved the scheme to be feasible. The villagers undertook to provide unskilled labour and local materials, while, subject to approval, the Gurkha Welfare Trust would provide technical assistance (a retired Gurkha Engineer) and stores. This is an arrangement which has been proved to work well, keeping all financial transactions in the hands of the trust and putting to good use the otherwise largely untapped skills of British Army pensioners throughout the country.

Per Omnia Asperima
The 2nd Miners Engineer Alpine Battalion

LIEUTENANT A D PERREY RE

After leaving Sandhurst and completing 77 YO course at Chatham, the author was posted to 51 Field Squadron (Const) RE and spent six months in the Falkland Islands (immediately after the conflict) at Goose Green, constructing a 500 man battalion sized camp. He then spent six months in Belize with his squadron. He was posted to 3 Training Regiment RE in November 1984 and in July 1986 became Second-in-Command 57 Training Squadron RE.

It was the magnificent view of the snow covered Alps, Mont Blanc and Geneva from 30,000 feet that convinced me I was on my way. After characteristically oversleeping and missing duty-transport, negotiating British Rail's rush hour loaded down like a Nepalese hill-porter, and chatting to Pat Jennings of the Irish FA at Heathrow, my exchange visit was happening! It had all begun many, many months before whilst wistfully thumbing through AGAIs—yes, a two week exchange scheme to foreign climes, the perfect escape plan from the rigours of training regiments. Sadly, my hopes to visit Jordan had not materialised, with UKLF opting to send me to the 4th Alpine Corps—the famous "Alpini" of the Italian Army. A telephone call to my host officer in the Alps indicated an assumption of two things: that I speak Italian and German, and that I ski. Of course, I did neither!

The 4th Alpine Corps Engineers are based in the north of Italy, some thirty miles south of the Austrian border. The unit consists of two battalions, each equating to a British engineer regiment in order of battle: the 2nd Battalion is a Miners or Demolition Unit and the 4th Battalion is a Pioneer or General Field Unit. In both cases they are about 1000 strong, 97% of which are a completely diverse mix of twelve month conscripts. It was not unusual to see highly educated doctors of philosophy working on menial tasks alongside illiterate peasants from Italy's southern regions. To confuse matters, many of the soldiers speak primarily German because the area was Austrian until about forty years ago. Some also speak a local dialect called "Ladin", a strange mixture indigenous to the Alpine area. This complete mix of peoples means training is difficult.

Training always takes place at a very basic level with facilities more constrained than in a British unit. After one month's military induction in Rome, the conscripts get three months "in-unit" engineer training near the 4th Alpine Corps Headquarters in Bolzano. Engineer training is primarily Double-Storey/Single-Span MGB, Bailey, and some low-level demolition training. Training areas are all small and restricted, and in most cases live demolition confidence-type training can only take place in winter because of the fear of upsetting tourists in summer!

It was the 2nd Battalion who were my hosts during my stay. Armed with my English speaking corporal "guide", a driver, a Fiat equivalent of a landrover, and a typical Italian-organised visits programme, I endeavoured to look at the Alpine

Lieut A D Perrey

Photo 1. Mountain Aerial Cable equipment used by "Alpini" soldiers in training.

Photo 2. Alpine Engineer Section training in clearing fields of fire.

Per Oma Asperima The 2nd Miners Engineer Alpine Battalion 1 (1 & 2)

Engineers. The first week I spent visiting local training, and the second visit the prestigious CASTA competition—the annual Alpine Corps Ski Championships, held near the Italian resort of Cortina. The latter provided an opportunity to experiment in langlauf and to take in the numerous sights that an expensive, international resort attracts!

Throughout my stay I was always staggered by the extremes of standards achieved and always surprised by events. Invariably barracks were well guarded, surrounded by high walls, and security levels were high—my MOD 90 being checked on numerous occasions. Similarly when out of barracks and visible, the discipline, bearing and dress of Italian soldiers were immaculate. In barracks, any British SSM would have had a breakdown on the side of the square! Fitness and physical training attitudes were strange. Although expected to do vigorous work at high altitudes, physical training was virtually unheard of—no gyms existed and the concept of a road-run was unthinkable. However, I must add the "Alpini" Infantry seemed exteremely fit as did the specialist Parachute, Ski and Mountain Climbing Training Alpine Engineers. In fact, I felt the Army mirrored the Italian society. Meal times epitomised this, with long, heavy, lavish fare, complete with wine and cognac at every meal! It seemed as if everyone adopted an attitude of enjoying life and living for today.

The Alpine Engineers face many problems, most of which they are quick to mention. Their largely conscript system gives birth to very few experienced NCOs which restricts technical abilities and professionalism. A rapid turnover of soldiers poses special training problems, especially as many conscripts are far from being enthusuastic fighting men! However, I was always impressed by the dedication of the few regular officers and NCOs and by the good-humoured, cheerful nature of the soldiers. For them Army Life represents twelve months in an odd part of Italy, living in extremely spartan conditions, with little recreation and on £2.00 a day—with even essentials like a bar of soap costing 50p! Above all I sensed a friendliness and intense unit pride, both for historical reasons and for the future possible task of deterring aggressors through the Alps: as the 2nd Battalion motto reads, *"Per Omnia Asperima!"*—"Serve for Every Experience!".

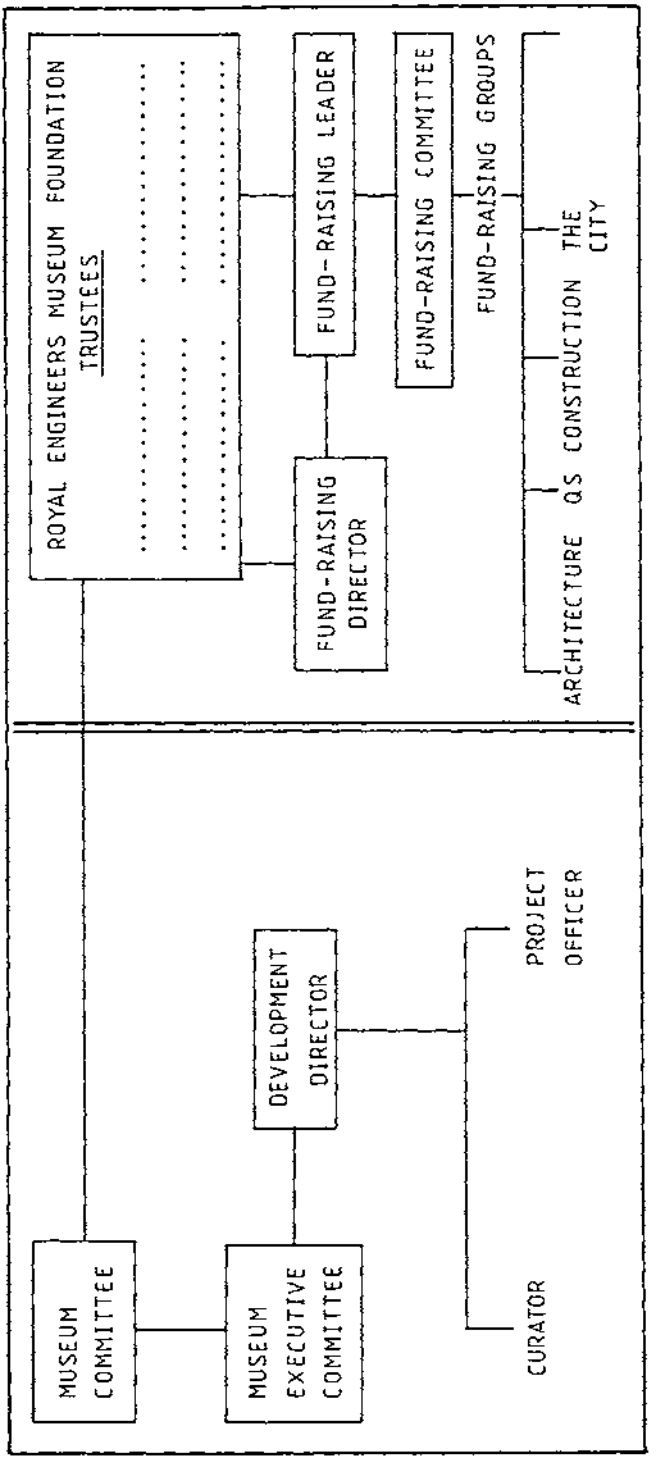


Figure 1. The Foundation.

The Royal Engineers Museum Foundation

THE plans for raising the £¾ million required to complete Stages 2 to 4 of the Museum project were touched upon in the June 1986 *Journal*. Here we explain how things are being organised for the future financial support of the Museum.

THE FOUNDATION

A charitable trust has been set up called the Royal Engineers Museum Foundation which is independent of the Institution and those of its committees responsible for developing the Museum. The Foundation will consist of the Trustees themselves and a number of fund-raising groups; their role will be to seek donations on behalf of the Museum and to provide a mechanism for receiving and handling donations in the way likely to be most acceptable to donors. The Foundation then provides the Museum with the necessary funds as plans develop.

The Museum developers will thus not only benefit from the funds, raised by the efforts of committed members of the Foundation; they will also enjoy the advice and experience of men who have been highly successful in their own fields and have contacts in the world of business and the professions which could be of immense importance to the future of the enterprise. The Foundation will create an enduring constituency of goodwill and support for the Museum.

STRUCTURE

The Foundation's daily business will be conducted by a full-time executive who will co-ordinate its activities in giving permanent attention to the attraction of funds. The Foundation will be self-financing in respect of the salary and expenses of the executive and therefore fund-raising will cease to be a cost to the Museum once the initial efforts have been launched. The relationship of the Foundation to the Museum itself is shown at *Figure 1*.

PERSONALITIES

The Foundation has made an exciting and highly encouraging start. Three Trustees, themselves all donors, have already been appointed.

Colonel P E Williams TD, ADC, Chairman of Triple Crown Securities and TA Colonel North, HQ London District, is Chairman of the Trustees and of the main fund-raising committee.

Captain J H Fitzmaurice, a partner of Buckmaster and Moore, stockbrokers to the Corps and the Institution.

Mr John Rowe, Senior partner of John Rowe Associates, Quantity Surveyors.

In addition three ex-officio trustees from the Corps have accepted appointment; the Chief Royal Engineer, the President of the Institution and the Engineer-in-Chief.

Fund-raising groups are now forming in functional as well as geographical areas of activity. Groups are forming up under Captain John Fitzmaurice, leading a City-based team, Mr John Rowe (Quantity Surveyors), Mr Bill Francis (Construction Industry), Mr Peter Martin (Consulting Engineers), Mr William Nimmo (Architects), Mr Victor Revell (Chartered Surveyors) and Colonel Douglas Spratt (Scotland). As word gets round much interest is being shown from people who would like to make their own contribution and feel they have something to offer this intriguing project. Briefings are taking place every month now and are likely to continue to the end of the year. They normally take place at Chatham but can be arranged in other parts of the country. Anyone interested who feels they may be able to offer something to the enterprise should get in contact with the Regimental Colonel (Colonel W T Dennison OBE) on Chatham Military (Medway (0634) 44555 ext 227) or the Secretary (Colonel (retd) G W A Napier) ((0634) 42669).

Royal Engineers Rugby Football Club
An Update

CAPTAIN T W WYE RE ENG TECH MHTTA

The author enlisted in 1960. He was trained as a Plant Operator and served in BAOR, Aden, PRA Wing, Hong Kong and Canada. In 1975 he was trained as a Military Plant Foreman and completed tours in Cyprus, Nepal, the Training Regiments and again the PRA Wing. Commissioned in 1984 he is currently serving as Resources Troop Commander in 60 Field Support Squadron.

AN article in *December 1972 Journal* entitled "Royal Engineers Rugby—Some Random Reflections" by Colonel E E Peel B Sc FICE covered more than adequately the formative years of Sapper rugby up to 1970. It has without doubt been used by the contributors of memoirs and unit historians alike. 1985 was the sixtieth anniversary of the formation of the RERFC. It is therefore a good time to update and record for future generations the more recent business of the Club.

The past fifteen years have seen many changes and advances in RE rugby. The Sapper Club has gone from strength to strength, the Corps Sevens Competition has been introduced and is now a popular permanent fixture in most units' fixture lists. The Mini Fern Tournament, introduced to replace trials, is a successful competition, far more popular with players than even the best run trials; and the Campbell Cup, only introduced in 1980, provides the Corps with a suitable grand finale.

The RE rugby season has the Mini Fern Tournament as its curtain raiser. It was started in 1981, coincidently at the height of the moratoria, and is now firmly established to provide the machinery that allows selectors to watch in excess of 200 players under competitive conditions. This is a spectacular improvement according to the club's minutes which are littered with criticisms of trials where more than sixty players were invited to attend but of these perhaps only thirty turned up. In 1983 the Club purchased a trophy which the committee unanimously decided should be named after one of the latter day servants of Corps rugby, Jim Wood. It is presented annually to the winners of the Mini Fern Tournament. This fifteen-a-side, fifteen minutes each way, knock out competition is now a permanent feature of the RERFC year.

The Fern Cup Competition introduced in 1964 continues to be an important event for most RE rugby playing units. It is now organised as a knock out competition during the months January to March. During this period continuous problems arise due to Army matches and inter-unit competitions but attempts at playing it at different stages of the season have proved unsuccessful. The competition is obviously loaded in favour of the larger establishments, many discussions have taken place with a view to separating the major and minor units, but this has always been considered impracticable and in any event the minnows prefer it as it is. Perhaps it is worth recording that minor units have won the cup on ten occasions and have been runners-up on five.

The great gathering for Sapper rugby units is without doubt the seven-a-side tournament. Surprisingly this was played for the first time only as late as 1977. It

Captain T W WYE RE

Photo 1. The new Jones-Drake Trophy which was awarded for the first time in November 1985 to the Winners of the annual fixture between the Royal Artillery and the Royal Engineers. On this occasion the Royal Engineers won by twenty points to three.

now regularly attracts more than twenty teams—a great improvement on the prototype when nine teams entered (one team being formed from "spare" players that won through to the finals). In recent years BAOR Sapper rugby has been represented, indeed thay have won the competition on the last two occasions.

Another domestic competition that enables UK and BAOR teams to compete against one another is the Campbell Cup. This was originally known as the Foster-Fern Final as it brought together the winners of the Foster Cup from BAOR and the winners of the domestic UK competition. In 1981 the then President, Maj Gen C P Campbell CBE, agreed to let the trophy be known as the Campbell Cup. It has been played for every year (missing only once) at Chatham and to date the BAOR teams have a 4–1 advantage.

It would not be possible or correct to write an article on Sapper rugby without including a mention of the "Big One". The Gunner game was first played in 1889 and is the oldest surviving fixture in Service rugby. There have been several rude interruptions to this fixture but to date some 62 matches have been played with the

Photo 2. RE versus RA Game 1985. Lance Corporal Hopson, supported by Corporal Mathias, collecting the ball, with onlookers Lieutenant Bush and Lance Corporal Wilson in the background.

following results for the RERFC. Played 62 Won 28 Drawn 4 Lost 30. Consolation for the Sappers can be taken from the fact that we have scored 620 points to the RA 537, and it is six years since we lost a game. As the Mini Fern is the curtain raiser and the Campbell Cup the finale the Gunner match is *nulli secundus*. In recent years the Sapper support at both Woolwich and Chatham has been excellent, possibly out-numbering but definitely out-supporting the old enemy during the last two visits to Gunner Country. It is without doubt the most important game for the players and the degree of delight or disappointment to be seen on their faces when the team is announced says it all.

Touring has been a regular feature of Sapper rugby. The build up for the Gunner match has included a three-day two-match tour in Guernsey for the past three years. This was not always the case; in 1980 a tour to Jersey was arranged as a post-Gunner event and numbers were made up by including two Gunners in the party. Other venues have included Berlin, Belgium, France, BAOR, Scotland and various England excur-

RE Rugby Football Club (2)

sions. The value of touring cannot be over estimated. Tours are tremendously popular with older players and provide a means of introducing new talent to the Corps scene. The Club now tours twice during the season and would normally involve some sixty players who enjoy themselves, make many friends and have proved themselves good ambassadors for the Corps.

The Corps enjoys some prestigious civilian fixtures. The Cambridge LX Club has appeared on the list since 1947 and they were joined by the Oxford Greyhounds in 1978. The annual Presidents XV game was replaced in 1980 by the very popular and successful Public School Wanderers, who often include international players and always have representative players from the top London Clubs. The RERFC have played Ripon, Jersey and Guernsey RFCs regularly.

A new addition to the Service fixtures is the game against the Royal Naval Engineering College from Manadon in Plymouth. It is an officer-only game that was played for the first time in 1981 and by 1982 was referred to in all correspondence as "the annual game between RNEC and RE officers". The Vaughan Cup is the prize and to date the Corps has won it twice. The matches played at Manadon are followed by *Ram Sammies*, a quaint Naval term that has endeared the RN to many Sappers. The post match festivities at Chatham have been well documented in various incident books and will probably be expanded upon only when individuals write their biographies or have their memoirs printed in these pages.

When reading the International Honours Annex of the 1972 article one can only be envious, the Corps has not had an international since R H D Bryce in 1970. Corps players gained sixty-six Army caps during the years 1907–1970 and their successors have won twelve in the years since then. In the Army Cup Competitions the Corps has improved on the previous record of seven times runners up between the years 1906–1970. Sapper units have won the major units competition once and been runners up once, while in the minor units tournament (started 1972), we have been winners four times and runners up four times, indeed on two occasions Sappers provided both teams in the final.

Readers of the update would have noted that the RERFC has progressed rapidly over the past fifteen years and even the strongest anti-rugby lobby (should there be one) could not accuse it of standing still. This is of course due to the hard work, dedication and loyalty shown by many members of the Corps, particularly Major General Campbell CBE, President for ten years until 1983; Colonel J N S Drake, Chairman since 1978; Captain L E Wood, coach and honorary secretary for many years and responsible for much of the research in this article; Lieutenant R Bedford, team captain extraordinary with three consecutive wins over the Gunners to his credit; and Staff Sergeant W B Higgins, physio, assistant coach and now coach.

Annex A

ARMY HONOURS

ARMY CAPS GAINED BY CORPS PLAYERS 1970–85

K Bassom	1978/79	N J Gray	1973/74	G Nield	1982/83
R Bedford	1982/83	A Hitchcock	1982/83	C Sexton	1976/77
M Blomquist	1983/84	L Horton	1981/82	C Spowart	1981/82
W E Bott	1975/76	R Matthews	1977/78	D Stevens	1977/78

ARMY CUP (MAJOR UNITS) RESULTS

1982	21 Engineer Regiment	Runners-up
1983	21 Engineer Regiment	Winners

ARMY CUP (MINOR UNITS) RESULTS

1981	9 Parachute Squadron	Winners
	14 Topographic Squadron	Runners-up
1982	9 Parachute Squadron	Winners
	14 Topographic Squadron	Runners-up
1983	14 Topographic Squadron	Runners-up
1984	14 Topographic Squadron	Winners
1985	24 Field Squadron	Winners

Now, Then and Before Then
The Royal Engineers Headquarters Mess

LIEUT COLONEL J A COOMBS FI Plant E MBIM

THE RE Journal *has published two earlier articles* The RE Headquarter Mess *by Lieut Colonel B R Ward RE in 1908 and 1909 and* The RE Headquarters Mess *by Colonel J M Lambert in March 1957. This article reflects the more domestic side of life pre and post World War II.*

I FIRST entered the Headquarters Mess in December 1948; before that I had spent some five years overseas. In 1948, the Mess interior was very much as now, except that there was no Bar (or Keller Bar), there being waiter service from a Dispense, where the present Bar entrance is. There was also the Small Ante Room where the present Corps Silver Display and Ladies Room is.

The Mess was full of living in officers, who apart from permanent staff and instructors, were in general officers who had been commissioned during the War, and who were attending a post war Supplementary Course. I joined No 15 Course (38 strong), and No 16 Course started at about the same time. No 12 Course were also in the Mess for part of 1949, at the end of their Course. Mess life then was much more formal than now. One did not speak at breakfast, but read one's paper, supported on a paper rack. In the evening, there were two dinners (because of the numbers involved). The first was at 1830 hrs, when a suit was worn, except on Wednesdays and at the weekends, when we wore neat sports clothes. The second dinner at 2000 hrs was formal. We wore dinner jackets except on Thursdays, when Blue Patrols were worn for the weekly regimental dinner night, and at the weekends. At the formal dinners a president (and vice president on Thursdays) were detailed from the living in majors and captains. The president took the senior living in officer in to dinner, who was seated on the president's right. In 1949, the senior living in officer was the Deputy Commandant of the SME (as it was then), who had been Commandant of the RBS and M Gp IE when I had first joined, and of whom I had then gone in fear and trembling; I was surprised and delighted to find that in 1949 he was quite human!

The Mess Secretary was Lieut Colonel (Jim) Chatterton, late DWR. I never heard any officer of lower rank than Lieut Colonel call him "Jim"; we of lesser rank stood to attention, and called him "Sir". The Mess Steward was Mr Wallace, and we treated him, too, with respect. Rumour had it that a newly joined second lieutenant had once called him "Sir", but this may not have been so! Anyone who wanted a drink, rang an electric bell, a waiter then came from the Dispense, took the order, and brought the drink on a silver salver. If anyone ordered a drink for a friend, both drinks were entered against the separate officers' names in their bar books. Very rarely did a Mess waiter have to ask an officer's name. Mess manners were much more formal then than now. If a general officer or the Commandant came into one of the Ante-Rooms, everyone stood up until asked to sit down. If a visiting officer's host was not in the Mess to meet him, he was offered a drink, which was charged to Mess Guests.

I had a bedroom in what was then House 4, opposite to the swing doors to the main mess entrance, and I shared a sitting room with another officer. Our batman was called Diamond, an ex-Marine, a great character, and no respecter of persons. However, he "acquired" coal for our coal fires, always told us when to have a bath while the water was hot, and generally looked after us wonderfully well. When I returned to the Mess some fifteen years later as PMC, I was given the same room and batman for the ten days or so before I moved into the CO's tied quarter at 4 Gibraltar Avenue. Diamond greeted me with "'Allo, Sir. 'Ow nice to 'ave you old ones back". When serving, Diamond had been batman to Lieut Tailyour, RM. When Lieut

Photo 1. Mr King, Mr Fish and Mr Thyra in the pre 1966 blue mess staff Guest night uniform.

General Sir Norman Tailyour, then Commandant General of the Royal Marines, came to a Corps Guest Night in the Mess in 1968, Diamond was detailed to be his batman, and to meet his car outside the Mess. He opened the car door and said "Cor bloody 'ell, Mr Tailyour, 'oo made you a bleedin' General?". They went off to the Mess Guest rooms talking nineteen to the dozen!

In 1949, there were two theatres in Chatham High Street, the Theatre Royal which played straight theatre and light opera, and the Chatham Empire which put on mostly variety. The orchestra stalls cost two shillings and sixpence, and a box seating four was I think a pound. We often used to go to the Theatre Royal or to the Empire after dinner, and have supper at Veglios Italian restaurant afterwards; I think that it was here in the High Street that oysters were five shillings a dozen! Rumour had it that there were forty-eight pubs in Brompton in 1948, including four in a row in Wood Street, opposite what is now the Wood Street block; one of these was called "The Royal Engineer"; this was not an officer's pub, as I quickly discovered when I once poked just my nose inside! Before writing this I tried to check this fact reference to Kelly's Directories (not published between 1939 and 1953). 1938 and 1954 only showed thirteen pubs, including only the Royal Engineer in Wood Street! 1985's pub count is six, which for Old Brompton village is a fair number, particularly as the Royal Marines and the Royal Navy are no longer there.

In 1966, when I was PMC, the Mess Staff still wore blue uniforms on guest nights; these were extremely hot in the summer. I obtained permission from the Corps Committee for them to wear a cooler uniform (which they still wear) in the summer, and for them to revert to blue in the winter. The blue uniforms were stored in the old Silver Room, but when winter came, they were found to be moth eaten, and the cost of their replacement was far too expensive!

I have in my possession a copy of "Rules of the RE Mess, Chatham, 1923". In particular those relating to balls and dances suggest that we are still very traditional. However some extracts from the Mess Rules extant after the first World War may be of interest to those serving "now", and those serving "then", who joined the Corps just after World War II.

"Half-yearly reports on servants will be called for from their Masters in June and December each year, on the form kept in Mess office. The clerical administrative

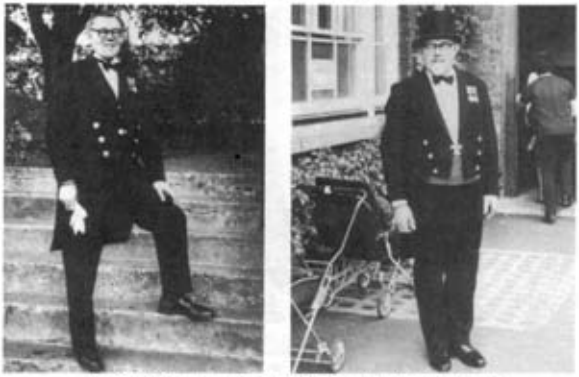


Photo 2. Mr George Le Dain in 1949 (left), thirty years later (right).

work in connection with the fund is carried out by the Mess Secretary's staff and the fund bears a proportion of the cost of service as assessed from time to time by the Mess Committee.

"2. Every candidate for a servant's place must produce characters from the persons he has been serving under for the three previous years and also characters for his wife.

"A servant will not be engaged permanently without having appeared (accompanied by his wife) before the Committee: he will be taken on trial for a month, at the expiration of which the officers whom he has attended will be requested to report whether they consider him suitable for the appointment.

"A SME servant must be a married man, and his wife must be capable of washing clothes, mending them, etc.

"When engaged he must be between the ages of 25 and 35 years, unless he be a pensioner, when his age must not exceed 45 years: he must not have more than two children residing with him. If his family becomes too large for the quarters alloted to him, some of them will be ordered out of barracks. No child will be allowed to remain in barracks after attaining the age of 16 years.

"Servants as a rule will not be engaged unless they are 5ft 8in or over in height.

"He is to be informed that he will not be kept on after he has reached the age of 55 years, though he will be liable to be sent away at any time if found too old or incapable of performing his duties. . . .

"3(c) The establishment of permanent servants in Brompton Barracks is fixed at 20 for 76 quarters; the numbers may be adjusted at the rate of one servant per four quarters over or above this number. Each servant will have to wait on four Masters. The pay to include the services of himself and his wife.

"(d) Washing not to exceed 30 pieces per week per Master, any excess to be paid by the Master at a rate of 1s 6d per dozen pieces. The pay also includes an amount to provide for the supply of all soap, etc., necessary for cleaning his own and his masters' quarters, passages, etc., also blacking, boot polish, pipeclay, wood, matches, etc., for kindling fires."

The Quartermasters of the Training Battalion and Depot Battalion were responsible to the OC of their respective batallions for the discipline of "The servants, their wives

Now, then and before then (2)

and families" in the quarters and should servants "commit any breach of discipline in barracks contrary to regulations" they were liable to dismissal. Each servant was given a quarter and provided he and his wife and family conducted themselves satisfactorily, he would not be removed from it. Colonel J M Lambert in his article in the 1957 issue of the *Journal* writes, "In pre-war days the batmen, who were all old soldiers, lived with their families in the basement of the single officers quarters." The Mess as it is now, used to be four officers quarters Nos 18, 19 and 20 houses.

Each servant wore a livery and it was laid down in the Mess Rules what he was to be provided with.

"5. He will be provided with the following articles when required, but not oftener than the times specified opposite each, viz:—

1 Livery coat	4 years	
1 Livery waistcoat	4 „	
1 Pair of breeches	6 „	
1 morning coat	4 „	or 3 years*
1 „ waistcoat	4 „	or 1½ years*
1 pair of trousers	1 „	or ¾ year*
1 working jacket	2 „	
1 „ waistcoat	1	
1 pair of trousers	1 „	
1 hat with cockade		
Pair white gloves	(2 pair on joining and one	
Black stockings	pair annually)	
Buckles for shoes	1 pair on joining	

* When livery suits are not issued.

"If partly-worn clothing be issued to him, the committee will decide how long each article is to be made to last.

"He will be required to keep the above articles in repair, and to have the breeches re-lined at his own expense, and also to provide himself with pumps of the regulated pattern.

"If the clothing is prematurely worn out the servant may be called upon to pay the value of the unexpired period of wear.

"Clothing will be inspected periodically by the secretary, servants' fund."

Each servant was also supplied with items such as "2 blacklead brushes, 1 chamois leather, 1 iron kettle (2 quartes)" and so on, each of which had a laid down life expectancy and for which he was expected to pay should there be any deficiencies.

An officer who engaged a private servant could be supplied with a set of "utensils" on payment of five shillings a month.

"7. (a) All officers serving at the SME and RE Depot are required to provide themselves with a servant, or if not, are given part share of an SME servant (except officers quartered in the Great Lines, where other arrangements exist). Officers employing private servants will provide them with livery and conform to all orders issued by the Mess Secretary as regards waiting and serving or assisting at Mess."

This was not so for "living out" members. Each officer employing an SME servant paid a subscription of £3 per month to do so, (but if he wished to claim remission of subscription he had to vacate his quarter and cease to employ an SME servant during the period for which the remission was claimed).

"8. The SME servants will be required to wait every night at dinner, at Mess, and on ball nights and other special occasions; also to attend at the Mess when required to wash-up, etc; to take their turn of attendance at breakfast, luncheon, and after dinner, and further to wait at cricket matches, etc.

"They may be required to go on detachment with officers to Gravesend or elsewhere.

"Provided the exigencies of the service permit they may be given 14 days' leave with pay each year.

"9. Each servant to be responsible for a share of all glass, etc., broken at the Mess, the breaker of which is not known; the amount will be recovered from the servant by the steward after approval by the Mess committee. They are liable to fines established by the Mess rules.

"10. The servants are to be informed that the Commandant allows their children to attend the regimental school on the payment fixed by regulation. The servants to be allowed divine service every Sunday morning.

"11. Servants and their families are not to loiter in the doorways and passages or in front of the officers' quarters; they will on no account allow their children to play on the barrack square or on the roads and pavements in front of the officers' quarters.

"12. SME servants are expressly forbidden to enter the rooms of officers other than their own masters, except with the permission of the officer concerned or in the case of fire."

What comments can one make in 1986? Very few—except to remember that in 1945, only forty years ago, when Adjutant Training Wing, at HQ Royal Bombay Sappers and Miners, IE, I had a bearer and his son as cook, a share of a sweeper (who emptied the "top hat" of the thunder box), the *mali* (gardener), the *bhisti* (water carrier, for the tin bath), and for all these, I paid Hariba, my bearer Rs 100 per month; he paid all from this sum, and took the rest for himself. One rupee was then worth 7½ pence!

Most of the rules reflect how little things have changed and as our home, how little has the spirit of the RE HQ Officers Mess changed since 1923. It's standards are as high as ever, and it is home to all officers "Now"—"Then" or "Before Then", surely.

An extract from Record of My Life *by Colonel A J Hepper DSO, who was a YO in 1860 and retired as Assistant Commandant SME in 1890, throws additional light on Colonel Coombs article.*

"I FOUND Chatham much improved since I had been there as a subaltern, the tone and tastes of the young officers were especially so.

"In my time the present ante-room was the mess room and the ante-room was a small part of the present vestibule; there were no billiard or card rooms and consequently immediately dinner was over we all rushed to our rooms. A great many got into 'Mufti' and frequented the billiard rooms and Music Halls in the town of Chatham, others got up card parties and 'sing songs' in their rooms—afternoon tea was unknown and would have been thought effeminate.

"Now the Mess provides all that is necessary for social entertainment, billiard tables, card rooms, racket court and a commodious ante room with piano and it is quite the exception for anyone to seek amusement in the town; those who do not care to play billiards or cards have music in the ante-room or read.

"It was quite refreshing to me to see many young fellows having afternoon tea in the ante-room; in my time it would have been brandy and soda, or sherry and bitter (if you could afford it—I couldn't, which was, perhaps, fortunate for me). Flo 'came out' at an RE Ball at Chatham. General & Mrs Dawson Scott (the Commandant) were unable to be present owing to family bereavement, and Sophie and I had to act as hosts and receive the guests, which perhaps added to the importance of the occasion for Flo."

Memoirs

GENERAL SIR OUVRY ROBERTS GCB KBE DSO MA

Born 3 April 1898, died 16 March 1986, aged 87

GENERAL SIR OUVRY ROBERTS was one of the most distinguished field commanders of the Second World War, serving throughout in the Far East, mostly in the testing conditions of Burma; achieving further distinction in the post-war Army and pursuing a second active and successful career in civilian life after retirement from the Army.

Ouvry Lindfield Roberts was born in Ceylon where his father was a planter and educated at Cheltenham College, the Shop and King's College Cambridge. Although commissioned into the Corps in 1917 his first experience of active service was in 1919 in the Third Afghan War as a Section Commander in 55 Field Company, Bengal Sappers and Miners. The Company was involved in heavy fighting in Waziristan as the only Sapper element in a two-brigade column attempting to achieve domination in the Tochi Valley in operations in appalling weather conditions over the winter of 1919 and 1920.

Soon after this formative experience, Ouvry Roberts returned to England to attend Cambridge University and the Supplementary Course at Chatham. EICJ, who shared rooms with him at Cambridge remembers: "He was an excellent companion, and made the most of the sporting activities at which he excelled. He got a blue at hockey, and played a number of times for Wales. He was an excellent wicket-keeper and only failed to get a blue for cricket because the existing University wicket-keeper stayed up for a fourth year. Ouvry stayed up and took the Tripos which the Sappers were allowed to do in two years and got a second class."

He was apppointed Assistant Instructor Fieldworks and Bridging at the SME in September 1927 and remained there until October 1931. He went to the Staff College in 1933 and returned to the Bengal Sappers and Miners early in 1935 to command 2 Field Company in Peshawar. By June they were in Quetta engaged in the multitude of tasks demanded of the Sappers in relief of one of the most appalling earthquake disasters in history.

Only a few more years of carefree peacetime soldiering remained to him, spent at Roorkee as Second-in-Command Bengal Sappers and Miners and CO of the Training Battalion. He was now able to indulge further his off-duty sporting interests such as polo and scatter-gun shooting in the *jheels* by the River Ganges. Then as SHMB records "... Ouvry was translated to Army headquarters in Delhi, to become GSO1 Operations and Intelligence and promoted Brevet Lieut Colonel. The year was 1938

General Sir Ouvry Roberts GCB KBE DSO MA

and the war clouds were gathering over Europe. In 1940 he became GSO1 (Colonel) of 10 Indian Division under the redoubtable Bill Slim. The Division was due to sail for Malaya and perhaps (his) story might have been very different had it not been that a certain Raschid Ali at that moment raised a rebellion in Iraq. Ouvry was despatched by air to organise the ground forces defence of RAF Habbaniya.... Resourceful as ever, Ouvry found two ornamental cannon outside the RAF officers' Mess. These turned out to be 4.5in howitzers. A signal to AHQ Delhi produced gun fitters, gun detachments, ammunition and all the paraphernalia necessary to fight the guns. Then Ouvry decided to attack the rebels on the surrounding heights albeit with inferior forces but, with two guns in support and great determination, the attack succeeded. The outcome—a DSO for Ouvry and the command of a brigade, still under Bill Slim". *The Times* report of this operation reflects vividly the way in which Ouvry Roberts force of character and determined capacity for improvisation saved the Habbaniya garrison against heavy odds.

Little more than two years later, in the thick of the fighting in Imphal in command of 23 Indian Division, and surrounded by enemy, the Habbaniya experience may have seemed a secondary affair. In between, Ouvry Roberts had commanded two infantry brigades (20th Independent and 16th) and had become BGS of 4 Corps.

Translated to divisional command at the lowest ebb of the Burma campaign, his forceful and personal style of leadership came to the fore as his division, in their role as the 4 Corps mobile striking force, dealt in turn with enemy attacks to the south and north of Imphal in Slim's great attrition battle. Later, 23 Indian Division led the breakout to Tamu in the East before being withdrawn to India after nearly a year in Burma.

In March 1945 Ouvry Roberts was appointed to the command of 34 Indian Army Corps charged with mounting Operation *ZIPPER*, the intended invasion of Malaya and reconquest of Singapore. After the longest sea crossing of any such amphibious force in the war the landings, near Port Sweetenham, were unopposed having been preceded by the Japanese surrender, and the force undertook the reoccupation of Malaya and the East Indian Islands.

After the war, Ouvry Roberts returned to England to contribute his talents to a series of appointments in the Army high command; Deputy and Vice Adjutant General, GOC in C Southern Command and finally as Quartermaster General.

After such a life, quiet and well-earned retirement might have been on many a man's agenda. Ouvry Roberts, however, now moved to Canada in response to an offer to lead a team for Grosvenor Estates on a major long-term development scheme near Vancouver and in 1955 he became President of the newly formed Grosvenor Laing Company. MKR recalls: "Ouvry's distinguished background coupled with his personal charm and ability to get on with men from all walks of life were great assets in establishing the identity of the new company in the local community.

"A man of his energy and presence was soon sought after in local affairs: in 1958 British Columbia formed a committee to promote an arts festival to celebrate the centenary of the province. The event was a success and Ouvry joined the board in 1959 becoming President of the Festival in 1960/61. The Festival attracted many international artists in the world of music, ballet and the stage to Vancouver.

"After his retirement from Grosvenor Laing in 1960 he took on yet another challenge joining the University of British Columbia as Administrative Officer and remained with them until 1968.

"Prior to his departure for Canada Ouvry's wife Eileen had sadly died of cancer. Tragic circumstances in his wife's family led to Ouvry becoming the legal guardian of his late wife's nephew and neice who, at the time, were very young children. Shortly after his appointment to Grosvenor Laing Ouvry returned to England and married Joya Scorer and they returned to Canada with the two children and provided them with a happy and secure home until adulthood. Ouvry's own two sons by his first marriage were already leading their own lives: Michael having a highly successful career in the Corps and John established in business in Canada. It was a great tragedy

that Michael, who had already achieved the rank of Colonel, was killed in a car accident in 1975 in England on his way back from seeing his father.

"Not long after their marriage Ouvry and Joya started a family of their own. Their three children, Hugh, Pelham, and Ouvrielle, were all born in Canada.

"When Ouvry and Joya returned to England in 1970 their children came with them while their adopted children remained settled in Canada. In England Ouvry and Joya made their home at Iffley at Oxford and Ouvry became head of the Fabric Committee which raised the funds to rebuild the tower of St Mary the Virgin at Iffley. He devoted his time to the family tasks of a man fifty years his junior: gardening with great enthusiasm, decorating, and eventually starting work on his memoirs which he had taken up to the year 1955 when he died.

"Although clearly endowed with the power to command, Ouvry maintained a directness of manner and friendliness with people of all ages and all backgrounds to the end of his life. His military and war careers were distinguished but they were laurels upon which he declined to rest. He never looked back and started each chapter of his life afresh without a moment of hesitation.

"Although in a tribute of this sort more obvious achievements are usually highlighted, Ouvry's devotion to the young people in his care over the last thirty years of his life must, in human terms, be considered as memorable as any feat of arms."

EICJ, MKR, SHMB, MBA, THFF

BRIGADIER R E HOLLOWAY CBE

(Born 16 January 1902, died 4 January 1986, aged 83)

Brigadier R E Holloway CBE

Rex Holloway was born in Calcutta, the elder son of Major General B Holloway, CIE. Educated at Tonbridge and the RMA, where he got a Cadet Scholarship and a Rugger blue, he was commissioned into the Royal Engineers on 22 December 1921. After his YO course he spent the next five years in the Training Battalion and the RE Mounted Depot. In February 1929 he was posted to King George V's Own Bengal Sappers and Miners, joining 5 Field Company in Rawalpindi. He was greatly liked and respected by the men and proved imperturbable in action in the Kajuri Plain Operation in 1930 and 1931 for which he received a well-earned MBE. After the Staff College in 1935 and 1936 he returned to India and spent two years in staff appointments. In February 1940 he was posted to Eritrea as GSO2 and then took over command of 4 Field Company. He became GSO1 (Liaison) between India and the Middle East and returned to staff jobs in India in December 1941. He was married in 1938 and had two sons but the marriage broke up and his sons were sent to Canada to be brought up by his brother.

From July 1944 to March 1946 he was CRE 23 Indian Division and took part in the arduous and fiercely fought operations on the Imphal front. He became Com-

mandant of the Bengal Sappers and Miners in July 1946 but was on leave in Canada during the Partition troubles. When he returned to Roorkee at the end of 1947 he found the Bengal Sappers and Miners badly shaken. Nearly all the British officers had been repatriated and all the Mohammedan Sappers had left for Pakistan, taking half the equipment and stores. The Sikh Sappers had nearly all lost relatives and friends in the riots in the Punjab. Nevertheless as soon as he arrived, helped by his effortless command of Urdu, Holloway managed to restore morale and was able to send off several field companies to the operations in Kashmir. When Colonel Dhillon, the first Indian commandant, arrived in January 1948 he took over a going concern. Holloway was one of the last of the British officers to leave Roorkee in February 1948 when he accepted the option of serving on with the Indian Army after Independence. He was posted to the new SME at Kirkee and took over as Commandant in June 1948.

This appointment was the most challenging and important of his career. During the war the SME (India) had been set up in the Thomason College of Engineering which was to become Roorkee University. The site for the new SME consisted of some five thousand acres of black cotton soil traversed by the River Mula Mutha with a few wartime huts. The first courses had been planned to start in January 1948 and the need for trained officers and NCOs was so desperate that the timetable was left unchanged and the SME started life in tents with only four British officers. Holloway's role was to maintain liaison with Army Headquarters in New Delhi, where Major General Williams was E-in-C, with the Works Services in Poona to get the huge SME complex built as quickly as possible, with the three corps of Sappers and Miners to get their best instructors and with the University of Poona to get the right staff to raise the standard of instruction to degree level. Within a few years handsome and well-equipped buildings had been erected for the Schools of Field Engineering, E & M and Civil Engineering, the Administrative Headquarters, a splendid Mess and better married quarters for both officers and other ranks than had ever been seen in India. The SME soon became a show-piece and was visited by Pandit Nehru and other VIPs.

A stream of young men volunteered for training as engineer officers. Although most of them came from non-military backgrounds the standard was high and they were very keen. For three years Holloway was the only British officer on the campus, living in a hut and eating in the Mess. Some of these young officers, now retired major generals, have written to say how much they appreciated his friendly advice on military life, particularly on the dangers of slow race horses and fast girls in Poona. At guest nights he was the life and soul of the party. He took a keen interest in the SME Yacht Club which used the Mula Mutha for training and racing. The Holloway Trophy is still competed for annually. He retired with a CBE on 31 January 1954 to be with his sons in Canada. He found it almost impossible to obtain suitable employment there but found happiness in his second marriage.

He is remembered for his unflappable temperament and quiet determination to get things done as well as for his wry sense of humour. He had a strong affinity with India, being looked up to by all ranks and all races. He could no doubt have returned to England in 1947 where his experience and ability would have ensured a brilliant career. The Indian Engineers owe him an incalculable debt for giving that up and devoting five years of his life to turning a sea of mud into a flourishing College of Military Engineering. This is recognised by the present Commandant who has written to say that it was Holloway's vision, foresight, involvement and professionalism that were instrumental in the development of the CME into the premier training institute of the Corps of Engineers.

LMM, HKK, EFEA, WGAL, JCS, TSS, RCG

BRIGADIER E L H SMITH CBE MC BA

Born 6 August 1914, died 1 March 1986, aged 71

ETIENNE LIONEL HERIZ SMITH, son of a Colonel in the RAMC, was educated at Cheltenham College and the RMA, Woolwich, being commissioned into the Corps in August 1934 with 32 YO Batch (Kirkwoods). After Cambridge (Sidney Sussex College) and the SME course, he was posted, in September 1937, to 12 Field Company RE, in Palestine, in what was to be a six and a half year tour overseas. In 1939 he was Mentioned in Despatches for his work with the Company. After being an instructor in the Middle East Training School in 1940, he attended the Haifa Staff College in 1941. In May 1942, he took over as the senior SORE2 to the Chief Engineer, 8th Army and in September became the GSO2 (RE) which appointment he held through the battle of El Alamein to the end of the North African campaign. He then became OC 626 Field Company RE which he lead through the landings in Italy and the advance North. Soon the Company was put under command of an armoured brigade entailing a hurried reorganisation to meet this more mobile role. In November, a brigade attack was seriously held up by an extensive minefield, but he lead his Company in clearing a way through despite heavy enemy fire, thus ensuring that the attack was complete and decisive. For this he was awarded the MC and later was again Mentioned in Despatches.

He returned to the UK in March 1944 and became an instructor at the Staff College, Camberley for a year. After a tour in the War Office as AAG (PW3) and as OC 252 Field Company RE in BAOR, for a short period, he was appointed Brigade Major of 26 Army Group RE (TA). After two years he went out to Malaya for a three year tour as GSO2 (SD) in GHQ FARELF during which he was awarded the MBE. After a tour as an instructor at the RN Staff College, Greenwich, he spent a year in BAOR, before becoming CO of 1 Training Regiment RE at Malvern in December 1953. He returned to BAOR in January 1957, as GSO1 (SD) in GHQ. In November 1958, he was promoted Colonel Commanding 2 Port Task Force (TA). After two appointments as Colonel GS in Military Training at the War Office he became Brigadier, Chief Engineer Southern Command. He retired in August 1966, having been awarded the CBE earlier in that year.

He married, in 1944 Susan, widow of Flight Lieutenant Ian Walker. They had two much-loved children, Prunella and Douglas who gave them seven grandchildren. They were a devoted couple and Susan gave him enormous support, especially when, after his retirement, he became Custodian of Berkeley Castle. They were a tremendous success there, as JB records: "I was very fortunate to obtain the services of Brigadier Etienne Smith as Custodian. He was responsible for the day-to-day running of the Castle and its opening to visitors. Although without previous experience of such a job, he entered wholeheartedly into the post, together with his wife. In no time at all, they had increased the number of visitors from 60,000 to 100,000 a year. He and Susan were delightful persons to work with and they became very good friends of myself and my wife. They got on well with everyone and the Castle Staff were devoted to them.

Brigadier E L H Smith CBE MC BA

It was a sad day when they retired in 1981, but living nearby were able to keep in contact with their many friends in Berkeley. They are now very much missed."

Susan died at the end of 1982, and in July 1984, Etienne married Eleanor, widow of Christopher Tanner, Chaplain RNVR. She was a life-long friend of Susan and Etienne and a godmother of Douglas. The marriage delighted their families and friends and was a great help to him as his health declined.

Etienne Smith was a big man in every way—his unhurried manner belied the quickness of his brain, wide knowledge, shrewd judgement and administrative ability. He combined these with a loyal and understanding nature and a dry sense of humour which won him the trust and friendship of those who knew him. RFNA particularly remembers the help and consideration Etienne gave him when he was working alongside him, in his first staff appointment. HPC writes: "I remember him as a very helpful and supportive Chief Engineer who taught me a great deal and I count myself lucky to have served under him." He played a good game both of golf and of bridge, but in later life his main interests centred around his fly-fishing and the Wildfowl Trust at Slimbridge of which he was a staunch supporter. He was a great family man in the widest sense of the term and was especially devoted to his seven grandchildren. He much enjoyed the periodic gatherings of all his relations and close friends, often organised for him by his children.

We offer our deepest sympathy to his widow Eleanor, his two children and seven grandchildren.

RFNA, JB, HPC, TNG, HJHG, JKS, RWCS, PJFW

BRIGADIER V E H SANCEAU OBE

Born 4 April 1899, died 19 December 1984, aged 85

VIVIAN EDGAR HALIFAX SANCEAU, known during his service as Sanko but to his friends outside as Jim, came of French stock on his father's side. He entered the Shop in March 1917, was commissioned in January 1918 and arrived in France on 12 November 1918, the day after Armistice day. Following two years at Magdalene College Cambridge he joined the Survey Branch of the Corps in 1925.

During his early military survey service he worked with the Sierra Leone Protectorate Survey for five years and on the re-triangulation of Mauritius for one year. A life-long bachelor, it was during this period he met Mr B A Francis (a member of the Colonial Service) and his wife. He made his home with them in the Isle of Wight from 1936 until his death. He worked at the Ordnance Survey Southampton from 1935 to 1939.

At the outbreak of war he became AD Survey, 2 Corps with the BEF and spent four days on the beaches at Dunkirk before being evacuated by trawler. August 1942 saw him in the Middle East as AD Survey Tenth Army (PAIFORCE) until in October 1942, just before the Battle of Alamein, he moved to become DD Survey Headquarters Eighth Army from then until April 1944. The substantial contribution made by Survey at the Battle of Alamein, and subsequently on the long and rapid advance to Tunis, received generous acknowledgement from Monty himself. Much of the credit for this is due to the energy and forethought which Sanko brought to bear on the many problems which arose.

Appointment as DD Survey Headquarters Allied Armies in Italy followed. He served under Generals Alexander and Mark Clark before reverting to Headquarters Eighth Army after the German capitulation. For his services at this time he was awarded the OBE in 1943 and the US Army Bronze Star.

His last two appointments were as DD Survey at the War Office for four years until March 1949, and as Director Survey GHQ MELF, until February 1952. Following his retirement in April 1952 he spent seven years at MEXE, Christchurch, as Staff Officer to the Director, retiring permanently to the Isle of Wight in 1960.

In the Island Jim Sanceau threw himself into local affairs, representing his village on the County Council, serving on the Properties Management Committee of the local National Trust and also on the governing bodies of local state schools. A sincere churchman he was active for many years in the support and administration of his parish church.

Jim Sanceau was an efficient soldier and an upright, correct, and rather reserved person. He was not easy to get to know well, but in his later years, under the benign influence of his adoptive family, he mellowed and blossomed. Towards the end he showed that he had all the highest qualities of compassion, loyalty and steadfastness in difficult circumstances and it is with respect and affection that he will be remembered by the many who knew him in the local community.

OMR BStGI OGR

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GIFTS AND BEQUESTS TO THE CORPS OF ROYAL ENGINEERS

INTENDING benefactors of the Corps may like to know the various Funds which welcome gifts and bequests and the advantages which may be obtained, both by the Funds and by the donors and their estates, under current legislation. Certain Funds, managed by Trustees on behalf of the Corps, are recognized by the Inland Revenue as being devoted to charitable purposes only. Broadly speaking these are Funds which are applied exclusively to the relief of sickness or poverty, or the advancement of education. The Funds at present recognized as being "charitable" for this purpose are:

(a) Royal Engineer Officers, Charitable Fund.

(b) Institution of Royal Engineers (including RE Kitchener Scholarships Fund and the New Museum Appeal).

(c) Royal Engineer Association (incorporating the former RE Benevolent Fund).

(d) Samaritan Fund—RE Officers' Widows Society.

In the case of the last named, this purely Charitable Fund is for the relief of widows and orphans of RE officers. Subscriptions and gifts to it have no connexion with members' subscriptions to the RE Officers' Widows Society and grants made from it are over and above any benefit paid by that Society.

Annual subscriptions to any of these Funds which are made by a deed of covenant, whereby the subscriber binds himself to pay the amount of the subscription annually for a period not less than four years out of income which has suffered tax in his hands at the standard rate, are treated as net payments and the Fund concerned can recover tax paid from the Inland Revenue.

Suitable forms of deeds of covenant can be supplied by the Secretaries or Treasurers of the Funds concerned.

Correspondence

Evelyn D Battye
Fensacre House
Ascot, Berks SL5
7DH

Lord Kitchener's Coach

Sir,—The above article with foreword by Colonel A H W Sandes fires me to write about another relic of Lord Kitchener's. This is his piano. It is a travelling, brass-bound, 7ft 6in long grand with a beautiful tone. The brass plates unscrew, the solid Victorian legs unwind, and the whole instrument takes to pieces for crating.

It came into my husband's family through a cousin (now deceased) who was given it by a friend of his, then Colonel Norwood, one time ADC to Lord Kitchener who had left it to him in his Will. Manufactured especially for the tropics, it was built by *Steiert & Co*, distributors to Simla and Lahore. The model is a Beckstein "by Appointment to Her Majesty the Queen", which inscription is followed by a string of titled heads.

Obviously it was with Lord Kitchener in India, but one wonders on what other campaigns of his it "followed the drum". Was the Field Marshal a talented pianist, and did he perhaps like to play hymns? The only light we can throw on this is that he advised Lord Curzon to choose "Onward Christian Soldiers" for the 1903 Durbar in Delhi to celebrate the Coronation of King Edward VII. The Viceroy did not accept the Commander-in-Chief's recommendation, finding the line "Crowns and Thrones may perish" undiplomatic if not downright dangerous!

I should be most interested to hear if any of your readers can tell us more about this unique relic.—Yours faithfully, Evelyn D Battye.

(*A £10 book token is offered for the most apt tune for Lord K to have played on his piano.—Editor.*)

Angus Dalgleish MA MICE FIHT C Eng
Shouson Hill
Ruxbury Road
Chertsey KT16 9NH

New Towns

Sir,—Professor Jensen (letter *RE Journal* June 1986) is fighting yesterday's battles. His complaints about "loss of good agricultural land" read strangely in an age of huge food surpluses which have had a disastrous effect both on the finances of the European Community and on farm incomes in Third World Countries. Loss of farms, whether to New Towns, other building or to motorways, the latter only a minor factor, should be considered as a benefit in that it helps to reduce the surpluses.

I was glad to read Professor Johnson Marshall's comments on New Towns. They provide excellent facilities for those with young families; this must give us hope for the future.

As to the high unemployment and resulting frustrations in the old inner city areas, it is not hard to find a reason for this. Today industrial and commercial developments follow good roads. Local Authorities around the M25 ring are only too well aware of the intense pressures for development which are the result of its construction.

In contrast myopic local politicians in the old cities have stubbornly resisted the building of good roads in their areas, with inevitable consequences. The Greater London Council was particularly at fault in this and its demise will be a great benefit if it enables Central Government to press ahead with road development in its area.

Schemes such as the M11 extension and the East London river crossing have already brought hope in the huge areas of urban dereliction of the old Docklands.

Road building in urban areas is indeed difficult, but the late Brigadier Tom Lloyd, former Deputy Engineer-in-Chief at the War Office, knew the answer. It is to make better use of the vast areas of grossly underused railway land in cities by building roads on them. Please let no-one suggest that this land is "too narrow" for roads. It is very wide.—Yours faithfully, A. Dalgleish.

THE JOURNAL

These are just a few of the letters received about proposed changes to the Journal *format. A fuller coverage to comments will be given in the December Issue.—Editor.*

Lieut Colonel J R Hill
Bellmans Green
Four Elms
Edenbridge, Kent

Sir,—Any review of the publications of The Institution of Royal Engineers must take account of the purpose and nature of that Institution. There has been much soul-searching on this subject recently, and I do not propose to repeat it, but only to mention some considerations which are of significance to my suggestions on the publications themselves. I shall do so by a series of statements, ranging from the self-evident to (I hope) the provocative:

a. The purpose of the Institution is to further the science(?) of military engineering.
b. The science of military engineering is practised only by Officers(!)
c. The vast range of artisan, combat engineer and specialist skills cannot be regarded as science, and are outside the scope (beneath the notice?) of a professional Institution, except that they can be mentioned in passing in articles on projects and their management.
d. The *Journal* of the Institution exists to publish and place on record Members' papers on significant developments in the field of military engineering. It is relevant (hateful but necessary word!), authoritative, and, within the limitations of security, comprehensive in its record of such developments.
e. The monthly *Supplement* to the *RE Journal* is a useful and interesting publication, but bears no real relationship to the *Journal* itself.
f. Sapper covers sport and Regimental activities for both officers and other ranks, although aimed principally at junior ranks. It also covers the postings and promotion of senior ranks, much as the *Supplement* does for officers, and the activities of the TA and REA.
g. All publications of any serious military or engineering significance are published as training manuals, and are wholly outside the scope of the Institution which aspires to be central to the development of the science and practice of military engineering.

I do not propose to draw these statements together or to challenge those which seem to be wrong, beyond saying that the *Journal* is neither authoritative nor comprehensive on the subject to which it (arguably) should be primarily devoted—military engineering. I leave assessment of these statements to the intelligence of any reader who has stayed with me this long, and pass directly to my suggestions.

The principal publication of the Institution should be a monthly magazine, on the lines of an upgraded *Sapper*, with the information now published in the *Supplement* included, possibly as an officers'/Members' insert.

It should also include articles covering all aspects of military engineering such as those currently published in the *Journal*, but with much less reminiscence and history.

It could usefully contain potted biographies of one RSM, CO, and starred officer (not necessarily in that order of importance) each month. Most important of all, it must contain at least one substantive article of real military or engineering value to the Royal Engineers. Finally, where information cannot be included on the grounds of security, or technical complexity, detailed references should be given for the benefit of those interested, and qualified to obtain it. Only with these features could the *Journal* here suggested claim to be relevant, authoritative, and comprehensive; it will still need many others to be readable, fun, and worth buying.

This does not really answer the perceived need for a learned journal, but I would suggest that we should look beyond the limitations of an eighteenth century technology requiring the printing, binding, and distribution of the written word. Surely, the solution now is to record and store on disc the articles worth storing, including, of course, the memoirs and reminiscences for which I can see little place in the *Journal* I propose, and to circulate a listing annually, or perhaps biannually, so that members can buy(?) print-outs. I should not expect a roaring trade! A small number of suitably bound copies could be produced for the libraries of fellow Institutions each quarter, or, preferably, each year.

To summarise:—

Sapper to incorporate articles of general military interest and the sort of articles of contemporary engineering interest that now appear in the *Journal*, and the *Supplement*, and to appear monthly.

The *Journal* and *Supplement* to disappear.

The best of the military engineering content of *Sapper* to be collated annually as the *Journal* of a respected scientific Institution, together with memoirs of distinguished deceased members and selected ramblings on historical themes, and published on a very restricted circulation, perhaps as "The Yearbook of the Institution etc".

The Corps *List* to continue as it is, with abbreviations explained.—Yours sincerely, J R Hill.

Lieut Colonel P J F Wingate
Berkenhof
89 Lower Cookham Road
Maidenhead, Berks SL6 8JY

Sir,—A quick word on restyling the *Journal*. Please do not go for the popular "large format". The *Journal* would then become a thin, flimsy magazine, indistinguishable from dozens of others and would occupy an awful lot of area in storage. The present style is dignified and allows the number and date to be printed on the spine.—Yours faithfully, P J F Wingate.

Brigadier C E F Turner CBE DSO
The Colleens
Lower Cousley Wood
Wadhurst, Sussex TN5 6HE

Sir,—Another excellent *Journal* came today. You ask for comments on that subject: "Correspondence" always very good. For a number of years I stopped subscribing but re-joined as I was anxious to see Memoirs and Obituaries—I turn to them first.

As a non-technical Sapper I avoided "too difficult" articles, though the policy of having a photo and brief "Who's Who" on the writer leads me always to read that much.

I agree that "I was there" articles can be tedious, and have been guilty of contributing more than one on these lines—but I feel there is a space for them.

Brevity is the key all through.—Yours sincerely, C E F Turner.

Emeritus Professor Sir Alan
Harris CBE BSc(Eng) Hon DSc
FEng FICE FIStructE MConsE
128 Ashley Gardens
Thirleby Road
London SW1P 1HL

Sir,—Having, so to speak, a foot in both camps—civil and military engineering—I am tempted to take up the editorial query in the last *RE Journal*.

First, an assumption. I assume that the *RE Journal*, whatever form it should take, exists to further the interests of the Institution of Royal Engineers, not of the Corps as a whole; does there not co-exist a rag called "The Sapper"?

Which said, it is worth noting the huge success of the New Civil Engineer. It is popular amongst members, has high standing in the engineering profession as a whole—and makes a profit. (It had a tricky period when job adverts were dropping, but has picked up again and, I understand, is now doing nicely thank you.) Perhaps its secret is that once picked up, it is not put down—even though once put down, it is not picked up again. The point of the NCE is that it provides an organ for news (often at parish level), opinion, discussion and occasional contention, a provision totally absent from the Proceedings which continue their stately, stuffy way in loading professional CVs and justifying the award of Institution gongs. There is sometimes something to be learnt, but not often: with the NCE, one is in touch with what goes on.

What then of the *RE Journal*? I think that the format, like that of the Civils Journal, dictates the nature of the contribution—there is no room for the punchy twenty liner. There are, of course, always such as "Honker" Henniker who send in lively short articles or letters—but "Honker" would bust any format.

In short, I think the *RE Journal* needs liberating from the tyranny of the five thousand word article headed with photo and brief CV. Let it be contentious (one sees the potential for free discussion in the correspondence columns) above all let it be lively. There will always be problems of security, of course, but it is easy to shut out what is improper. More difficult to open up!—Yours faithfully, A Harris.

Lieut Col (Retd) H T Heard
Whitemead
Vicarage Lane, Yateley
Camberley, Surrey GU17 7SR

Sir,—You ask in the June *Journal* "What do you think?". Here are a few of my thoughts:

Shape, size, colour. Leave alone.

Content.	Keep short and to the subject heading of the Article. Where appropriate, introduce humour. An Article should be well written. For instance "Their very own" is a fine example.
Layout.	The righthand page should be given preference.
General.	Page 119. The heading "Know Your History" should have been in bolder print. Photos. Many could have been omitted. Try to avoid errors in grammar and spelling.

Yours sincerely, H T Heard.

Major R J Wade B Sc(Eng) RE
9 Catherine Close
Shriveham
Swindon SN6 8ER

Sir,—As a keen *Journal* reader, I am concerned about the sort of changes you may be contemplating.

Everyone has his own preferences—mine are firmly for the *Journal* to continue as it is in format, size, and content. The present size fits nicely on to a bookshelf, and matches all its predecessors (at least back to 1934 to my knowledge). The contents are a pleasant balance of "I was there", technology, history, and occasional humour (POM Chitty is my favourite author).

The proof that I like things as they are—I open new *Journals* eagerly, give them precedence over TV and Times, and re-read them cyclically.—Yours sincerely, R J Wade.

A H Beckett Esq
Sir Bruce White, Wolfe Barry & Partners
Douglas House
Douglas Street
Westminster SW1P 4PB

Sir,—Having read the Editorial to Vol 100 June 1986 No 2 as well as Major T H Johnson's article on the *Dykes of Walcheren*, I feel prompted to reply to the invitation "What do you think?"

Major Johnson's paper is clearly a masterpiece in its accuracy of reporting with a delightful economy and rhythm in wording. The reported meeting was obviously the outcome of rigorous research and organisation, but bringing together "I was there" records and subsequent developments in Engineering techniques, he succeeded in providing the feedback we all look for in RE experience.

I certainly learnt a lot and hope the *Journal* may find space for more articles of this type.—Yours faithfully, A H Beckett.

* * * * *

Journal Articles

THE Editor is always pleased to consider articles and correspondence submitted for publication in the RE Journal.

The latest date for submission is two and a half months before publication (eg, by 15 September for the December Journal).

Submissions should be typed double-spaced, ideally no more than 12 to 15 pages of typescript.

Illustrations can be reproduced from coloured or monochrome photographs, slides or negatives, drawings, maps or sketches. They should be accompanied by a suitable caption.

Only *unclassified* material can be published. Security clearance should be obtained before submission.

* * * * *

Book Review

OPERATION FRESHMAN
THE RJUKAN HEAVY WATER RAID 1942

RICHARD WIGGAN

(Published by William Kimber: Price £11.95)

OPERATION FRESHMAN was the code name for an airborne raid, planned to take place in 1942 in German-occupied Norway. The target was a factory sited in Southern Norway near the small township of Rjukan. The raid was to be carried out by a detachment of two RE Officers and thirty Other Ranks drawn from 9 Field Company RE (Airborne) and 261 Field Park Company RE, both units being of 1 Airborne Divisional Engineers based on Salisbury Plain. The men were all volunteers and of very high calibre—fit, resourceful and aventurous.

The plan was to carry the Sappers and their equipment in two Horsa gliders, each towed by a Halifax four-engined bomber. The Halifax bombers were crewed by RAF personnel from 38 Group RAF; the aircraft were specially attached to 38 Group for the Operation. The Horsas were piloted by pilots from the Glider Pilot Regiment (two pilots for each glider).

The aim of the raid was to stop the production of a fluid known as Heavy Water, which was produced by a Norwegian hydro-electrical plant, situated near the West Coast of Norway on about the same latitude as the Orkneys, off Scotland.

Heavy Water was the technical name for a fluid that looked like water but whose atomic structure had been altered by electrolysis, the electricity having been generated in a hydro-electric power station, high up on the mountainside near the Heavy Water plant. The Heavy Water, produced in Rjukan was to be shipped to Germany by ferry-boat and used for advanced research into the mysteries of nuclear fission by German scientists.

The outline plan in this operation was to carry the raiding party in Horsa gliders and release them over a landing zone within marching distance of the Heavy Water factory. Having reached the factory they were to destroy the appropriate equipment and release over the hillside the stocks of Heavy Water, before it could be shipped to Germany. They were then to find their way to Sweden—a neutral country—using the same cunning, and trusting in the same local help as many airmen had already done after being shot down in air-raids over Europe since 1939.

A number of patriotic Norwegians had made their way to England previously, and gave great help in this raid, as the book under review tells us. It tells how urgent was the call to make this raid, and how little time there was to prepare for it. In brief, the explanation is that the Germans were known to have made great progress in perfecting two pieces of equipment, called "secret weapons"—the V1 flying bomb and the V2 ballistic rocket—and secondly an atomic warhead for either of them. They needed great quantities of Heavy Water to finish their research; and supposing they had been able to achieve this by (say) 1943 the war might have ended very differently.

It thus came about that on the night of 18 November 1942, two gliders carrying the raiding party, each towed by a Halifax bomber set off from Skitton Airfield (a satellite airfield of Wick) one after the other. Nothing definite was heard from either by the anxious watchers in the Control Room in Skitton till late at night one of the Halifax aircraft (piloted by Squadron Leader Wilkinson, RAF, with Wing Commander Cooper in the second pilot's seat) returned to Base.

The report they made was a depressing one.

They had started well in a clear sky and made a satisfactory landfall, after a long flight across the North Sea, to Norway. With the glider still safely in tow they turned for the landing zone. Here their fortunes changed. Their maps proved unreliable; the "Rebecca" (a homing device, operated by patriotic Norwegian agents, planted in

Norway by SOE from London) did not function properly. And, worst of all, the weather suddenly clouded over, and map-reading ceased to be possible. The Halifax towing the Horsa behind it was beginning to run short of fuel and Wing Commander Cooper was forced to return to Base. In front of him, however, was a belt of thick clouds, over which it was impossible for the Halifax, still towing its Horsa, to climb. Flying through the clouds, ice formed on the tow-rope and the tow-rope broke, releasing the glider.

Such was the report made by telephone from Skitten to Combined Operations in Whitehall. The second Halifax did not return; and intercepts made from the few audible signals transmitted by the Halifax gave a garbled indication of what exactly had happened.

Nothing more was heard till two days later, when a broadcast from Germany was heard. It stated that a raid by two gliders, containing "sabotage troops", had landed in Norway, and that one bomber had also been forced to land. The broadcast ended with the words: "The sabotage troops ... were put to battle and wiped out to the last man."

Thus ended a distressing report, and no more was heard from Norway about it until after Germany surrendered. Then, shortly after VE day on 5th May 1945, 1 Airborne Division was flown over to Norway and extensive searches were made and many local Norwegians were met and told their adventures, all of which was accurately reported in a paper submitted by QMS D F Cooper, RE. This was subsequently printed in the *Journal* Volume LX, March 1945. It tells how the survivors from the two gliders that crash-landed fell into the hands of the Gestapo and were summarily executed. Later on, however, much more was learnt from the reports of war crimes trials carried out by the victorious Allies; and from evidence submitted by patriotic Norwegians who finished the work intended by Operation Freshman.

A full account of these doings would prolong this book review to excessive length. It may, however, be summarised in a few sentences. Local Norwegians made noble attempts to help save the survivors from the two gliders, fetching help and bringing doctors. They also made successful plans to sabotage the Heavy Water plant, and to prevent all further despatch of the supplies of Heavy Water to Germany. They gave decent graves to the British soldiers whose bodies could be found. All of them now lie honoured in seemly graves. And, as Henry V declaimed on the battlefield in Agincourt: "Old men forget"; and today only a few men who still remember these events survive. A marching column of them have answered *ad sum* to another call, leaving their memories unrecorded. No book is perfect; but your reviewer, who with halting memory remembers these days, inclines to the view that this book is the fruit of vast research and careful reporting. It is apparently very accurate, though there may be a few mistakes. It will in time, no doubt, become a standard work on the subject.

Let all who see it, read it; and then let them say the silent tribute of the Royal British Legion:

They shall grow not old as we that are left grow old,
Age shall not weary them nor the years condemn,
At the going down of the sun, and in the morning,
We will remember them.

MCAH

(The Heavy Water cell was recovered after the War and is now in the RE Museum at Chatham—Editor.)

A NEW EXCALIBUR
THE DEVELOPMENT OF THE TANK 1909–1939
A J SMITHERS

(Published by Leo Cooper in association with Secker & Warburg at £15)

THIS fascinating book, contrary to its title, is about the men involved in the development of the tank—inventors, engineers, soldiers and politicians.

It is a detailed account of the trials and tribulations of these men, their relationships and their quarrels, for quarrel they did, as the author candidly describes.

The book is based upon published material with, perhaps, one important exception. In 1919 the Royal Commission on Awards to Inventors assembled at Lincoln's Inn to consider claims relating to the development and introduction of the tank as a weapon of war. A copy of the proceedings together with transcripts of all the evidence given to the Royal Commission are included in the Wilson papers, held in the Tank Museum at the Royal Armoured Corps Centre, Bovington. The author had access to these and more through my friend David Fletcher, the librarian there.

Whilst the other names in the story are well known—d'Eyncourt, Swinton, Stern, Tritton and, of course, Winston Churchill, that of Wilson is not.

Walter Gordon Wilson was a mechanical engineer who specialised in power transmission systems, particularly gearboxes. As a major in the Machine Gun Corps, he was largely responsible for the design of all the early British tanks. As the author says: "but for him there would have been no tank. Not, at any rate in 1916."

After the War, Wilson founded his own company, Self Changing Gears Ltd, which to this day is active in the field of armoured fighting vehicles. If nothing else, this book makes Wilson's contribution clear.

The book contains few technical details since it is a study of the men involved. It encompasses many facets of the story: how the Royal Navy funded the initial work for the land weapon system in which the Army had no interest; the difficulties in finding the manpower to field the new weapon, once military prejudice had been overcome; the evolution of a doctrine for its employment and the early attempts at standardisation. The author even mentions uniforms, describing battledress as "the top half of a golfer and the bottom of a skier along with the most ridiculous headdress imaginable".

The bulk of the book is naturally concerned with the period to the end of the First World War and the tank actions are described in some detail.

The period between the world wars is covered sufficiently to understand how Britain slid from the front of the field to the back in twenty years.

At the outbreak of the Second World War, the British Expeditionary Force had two battalions of Matilda tanks. France had 2600 assorted tanks and the Wehrmacht 3200. Even Japan was estimated to have over 2000. But Russia had some 20,000 including up-to-date models based on British designs rejected by the British Government. There is surely a story here to be told.

The text is illustrated with some excellent photographs and the Sapper interest in the early days is well covered. Occasionally, an incident described will sound familiar to those of us engaged in the development and testing of AFVs today.

In spite of his extensive research, the author has found no clear explanation for the adoption of the term "tank". It was apparently coined by Swinton and seems just to have crept into the minutes of the Landships Committee.

For the record, the Royal Commission on Awards to Inventors gave Wilson and Tritton £15,000 between them, d'Eyncourt and Swinton £1000 each. Crompton's claim was rejected. Churchill and Stern made no claim. Mr de Mole, an Australian engineer who submitted a design for a tank to the War Office in 1912 (it was filed and forgotten but there is a model, found in a Brighton junk shop, in the Tank Museum) was recognised for his "very brilliant invention" but got no money.

JEN

MINE WARFARE ON LAND
LIEUTENANT COLONEL C E E SLOAN RE

(Brassey's Defence Publishers—Price £15.00)

LIEUT COLONEL SLOAN has produced a compendium of minewarfare on land that is without equal in the reviewer's experience. It contains a brief historical review of mines and their uses, gives a thoroughly comprehensive discussion of the present state of the art and concludes with a thought provoking look into the future.

The book is clearly presented and well illustrated, although the excellent line drawings would be enhanced by the use of colour. It is well written but is not a book to be skimmed through, it should be digested carefully. It is aimed at an international, rather than a solely British readership, but this does not detract from its value.

It is a pity that Lieut Colonel Sloan did not see fit to include material from the Korean War in which British and Allied Engineers laid considerable numbers of conventional minefields and learned how to adapt quickly to different mines and laying drills.

Lieut Colonel Sloan rightly places great emphasis on C³I and its vital importance in engendering all arms confidence in dealing with mine warfare on land.

Some years ago in BAOR, at the end of Exercise *ROB ROY* the CRE 4 Armoured Division (now General Sir George Cooper GCB MC) very convincingly argued how cost effective mines were in relation to the targets they were designed to attack. The point was valid then and this excellent book makes it very clear how valid it is today and how valid it is likely to be in the years to come.

Lieut Colonel Sloan's work is essential reading for every Sapper officer, indeed for anyone who is a Sapper. We all know that Sappers lay mines, many of us know how to lay mines and some have actually laid mines. How many of us have given much thought as to why we lay mines at all and have considered how effective mines really are in battle? This book provides the answers.

JNC

THE ENGINEER STUDIES CENTER AND ARMY ANALYSIS— A HISTORY OF THE US ARMY ENGINEER STUDIES CENTER 1943–1982

(Published by the US Govt Printing Office)

THIS 300 page book traces the history of the small Engineer Studies Centre through a turbulent forty years of American military history. It is written by Dr William C Baldwin of the Historical Division of the Office of the Chief Engineer.

The Studies Centre was commanded by a Colonel for most of this period and had a staff of about fifty civilian and military. Its task was that of studies, as opposed to trials or research, and covered topics as diverse as—Strategic Nuclear Weapons, Drug Abuse, Herbicides, Facilities Engineering and Dredgers. A picture is portrayed of a small, effective and almost independent team that was tasked at times directly by the Army Chief of Staff. As a result it was frequently in the enviable position of being able to tell the Chief of Engineers that it was too busy to take on his work.

It is hardly designed to be an entertaining book but one that usefully records the work of clear thinking engineers against the backdrop of some important stages of US strategic thought. Not a book that you would buy, more one to dip into in the Corps Library.

GBLC

* * * * *

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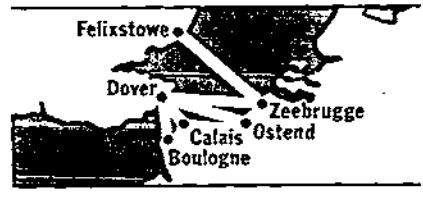

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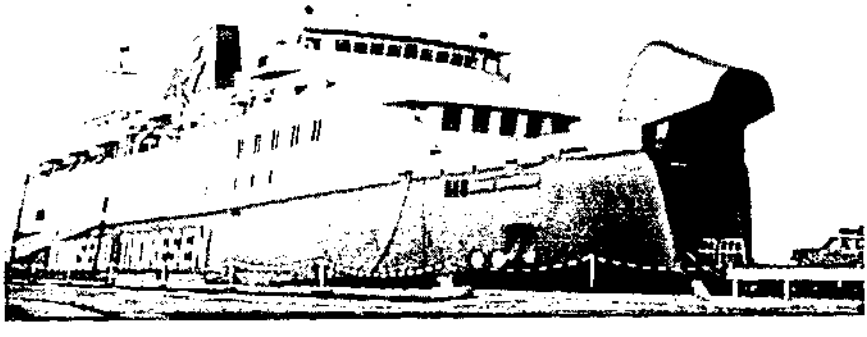


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