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DECEMBER 1979

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# Editorial

#### "AFTER THE LORD MAYOR'S PARADE...."

MOST Editors tend to become manic depressives, alternating between periods of elation and depression with rare intermediate (and short) periods of relative sanity. Their sense of humour becomes warped and they thrive on off-beat "one-liners": "Why not go to church next Sunday and avoid the Christmas rush?" "Harwich for the continent, Paris for the incontinent."

"Incest is more common than thought."

This issue completes the first volume of the new-look Journal (Vol. 93). It would seem that most Members consider the new approach to be a success and the Editor is extremely grateful to all the contributors. Provocative and forward-looking articles led to a very satisfactory exchange of views in the Correspondence section. The "professional" military engineering articles were of a high standard and aroused considerable interest. The Royal Artillery Journal published extracts from one of the articles!

So much for the 1979 period of elation!

Can we keep it up? For how long?

"After the Lord Mayor's Parade comes the man with bucket and spade!"

# The Temporary Bridges at Tours

### COLONEL JACQUES TABARD

A Member of the Institution on holiday in the Loire Valley crossed over the river on a side-by-side triple-single temporary Bailey, and suggested that there might be an article in it. Major A A Fitzherbert RE, BLO Angers, was approached and has provided us with an edited translation of an article which appeared in the French Journal Vauban. Major Fitzherbert has tried to keep to the staccato style of the original. We are grateful to Colonel Jacques Tabard (the author) and the Editor of Vauban for their permission to republish the article and to Major Fitzherbert for his efforts on our behalf.

ON 9 April 1978 at 0927 hours, a subsidence occurred on both sides of the second pier out from the left hand bank of the Wilson bridge at Tours, breaking the structure itself and severing the services which the bridge carried. (Photo 1). At 1415 hours, in front of a bemused crowd, the second and third spans, followed at 1420 hours by piers No 2, 3, 4 and 5 and the fourth, fifth and sixth spans collapsed, with a huge splash, into the Loire already very swollen at that moment. On 3 May, the first (LH bank) span fell in its turn. The breach was now some 145 metres long.

Nature had achieved a better result than the French Sappers in 1940 (one span on the left bank) and the German Sappers in 1944 (three spans in the middle)!

Built by Mathieu de Bayeux between 1765 and 1778 for a cost of 3,578,057 livres the "stone bridge" (nobody called it Wilson) crossed the Loire on the north/south axis of the town to the route "Paris to Bordeaux". (Route Nationale 10.) The bridge was 480 metres long, with four lanes of traffic, resting on fifteen hewn stone piers, themselves resting on oak piles driven to refusal and cut off below the lowest known water level. Scouring was probably the cause of the disaster. The collapse was obviously a catastrophe for the town of Tours, deprived of water, gas and telephone. Although three other bridges were available for traffic (the motorway bridge A10 which fortunately is accessible from the centre of the town, the Mirabeau bridge upstream of the Wilson bridge and the Napoleon bridge downstream), it became quickly apparent that the diversions were creating very difficult traffic conditions.



Photo 1. The Wilson Bridge just after 0927hrs on 9 April 1978. (The bridge is named after the USA President and not the Member of Parliament for Tours, M Daniel Wilson!)

Mr Jean Royer, Mayor and a Member of Parliament, wasted no time and right from the beginning was in contact with Mr Le Theule, Minister for Transport. Decisions were taken rapidly once it had been agreed that the first temporary bridge was to be built in the shortest time possible and was to be opened to traffic on 1 July 1978. A second bridge would follow immediately afterwards.

Early decisions were required on:

(a) an agreed alignment giving easy access to the existing roads;

(b) the type of intermediate supports to be built in an already swollen Loire;
(c) the number of traffic lanes required—at least one lane up and one lane down

would be required to maintain the flow of traffic.



Photo 2. The first pier of the temporary bridge is completed and the launching of the Bailey Bridges has started.

# The Temporary Bridges at Tours (1 & 2)



Photo 3. Each pier consists of three hollow steel piles filled with concrete and capped with a reinforced concrete bridge seat.

The County Equipment Office quickly got to work in liaison with the CNPS (National Emergency Bridging Organization), an efficient and very well run organization as will be seen.

The first week's work resulted in:

(a) the choice of the alignment—parallel to the Wilson Bridge and 50 metres upstream, providing a tie-in to the Route Nationale 10;

(b) the choice of intermediate supports—sixteen piers lined up in line with the destroyed piers and each consisting of three pile driven steel tubes of 1 metre diameter (the tubes were between 16–18 metres long driven to a depth of between 8–10 metres), filled with concrete and topped with a reinforced concrete bridge seat, 15 metres × 2.5 metres × 1.5 metres.

(c) the choice of roadway--two parallel (but not connected together), Bailey bridges of triple-single configuration, type M2 (road widths 3.81 metres), launched as continuous beams and in one length of 460 metres, one in the direction northsouth, and the other south-north, in short from opposite banks.

The maximum span would be 100 feet ( $9 \times 100$  feet,  $6 \times 90$  feet and  $1 \times 60$  feet, the landing bay on the right bank, a total of 1,500 feet or 460.25 metres) thus allowing passage of Class 40 loads. The continuous beams were to be "broken" on a pier every third span and each bridge was to be fitted with a pedestrian footpath.

The Bailey equipment (920 metres of triple single and two launch noses and the launching equipment—eight rocking rollers on each pier) were provided from the resources of the CNPS without having to call on military equipment. The County Equipment Office put the piers out to contract. Because of the very short time available (six weeks) and the equipment necessary (floating pile driving, static pile driving, transport of piles, continuous concrete pouring from a raft, etc) two firms were retained, Citra-France and Salviam-Brun, who divided the work between them.

By 15 June (five weeks after the disaster) the pliing work was practically finished. During this period, the Bailey bridges were brought up and the launching sites prepared. The actual construction of the Bailey bridges could begin.

The bridges were launched simultaneously each from its own home bank. Each

# The Temporary Bridges at Tours (3)





Photo 5. The temporary bridges are virtually ready for traffic.

# The Temporary Bridges at Tours (4 & 5)



Photo 6. Bridges in use.

team (north and south), was composed of six technicians of the CNPS, six labourers locally recruited and two Poclain T45 excavators with their operators. These excavators lifted, transported and placed in the bridge the panels and transoms, then the decking pieces and finally pushed the bridge during the launching. The labourers had carried only the lighter pieces of equipment and positioned panel pins and bracing bolts. This is the so-called military method of "launching Bailey by mechanical means", a well trained working party of fourteen was sufficient for each bridge. Each of the bridges was launched solely by the Poclain for the first 300 metres,

Each of the bridges was launched solely by the Poclain for the first 300 metres, and from there, a winch cable was bought in to assist. It is a very impressive sight to see 300 metres of triple single bridge being launched with such simplicity and ease. On 25 June the bridges touched down on the far banks. The remaining days of the month were taken up with jacking down, breaking the spans into five sections, the construction of a wearing surface (planks in echelon covered with a coating of bitumen), the completing of the access roads and the positioning of road signs and traffic lights. The installation of street lighting was to follow in a few weaks time.

The opening ceremony took place, on time on 1 July although the bridges were not opened to full traffic until 7 July.

It was planned to construct two further Bailey bridges (to re-establish the four traffic lanes of the old bridge) by the end of 1978, Each was to be 330 metres long and would require twelve piers in the Loire. However it was all a question of budgets, the first two bridges cost 12 million francs, and there was also the problem of equipment – the CNPS could not supply a further kilometre of bridging before the middle of 1979. However the Minister of Defence, alerted by Mr Royer, agreed to loan the necessary Bailey equipment from military stocks. The construction will be carried out using the equipment whose drills and efficiency have gained the admiration of even the most experienced and blase of Sappers.

#### After note:

Since this article was first published the situation seems to have changed. When Major Fitzherbert visited the site in June 1979 there was no visible signs of a second set of bridges. The twin bridges of the article have now been restricted to "Authorized Traffic" only. There is a 15 ton maximum load limit now at 40m spacing and 20kph speed limit. Major Fitzherbert reports that he only saw the bridges being used by pedestrians, bicyclists, taxis and single-decker passenger buses.

# The Temporary Bridges at Tours (6)

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### Machines or Men?

P A GREEN BSc, DIC, FGS, C Eng, FICE



Philip Arthur Green is a partner of Scott Wilson Kirkpatrick & Partners with special interest in geotechnical engintering and appropriate technology. He graduated from Imperial College, London in 1957 and after post-graduate studies in engineering geology became an irrigation engineer in Africa. On returning to UK in 1961 he joined his present firm as a geotechnical engineer. He has worked on a wide range of overseas projects, both in Africa and Asia. Since 1973 he has been director of a World Bank study to examine the role of labour-based technology in civil construction.

ONE of my Partners (himself an ex-sapper) suggested that military engineers might like to know about labour-based methods, as used in present-day civil construction. Never having seen, let alone read, the Royal Engineers Journal, I naturally did some research to see the kind of article it contained; the "research" comprised reading the March 1979 edition (Vol. 93 No. 1). I was very surprised to find that it had two articles directly relevant to this one, and in general terms they reflect the current discussions in civil construction on the question of machines versus men. On the one hand Lieut Colonel Addison pats up a powerful argument for the equipmentintensive approach, while on the other Major Vialou Clark extols (I detect with enthusiasm) the virtues of building roads in Nepal using labour-intensive methods. Of course both approaches, and others in between (so called *intermediate technology*), have their proper place; however, in this article I intend to concentrate on the labour-based end of the technology spectrum because I assume most readers will be familiar with equipment-intensive work.

What then is labour-based work all about, and does it have any relevance to British sappers? Perhaps you are better placed to answer the second question while I attempt, albeit briefly, to answer the first.

Let me emphasize immediately that using men instead of machines will only be successful if the economic, political and social conditions are right, and if the organization and management is adequate. I agree wholeheartedly with Lieut Colonel Addison that this substitution is completely inappropriate if the men are sappers costing £50 per day. Clearly the cost of labour is one vital element and research' has shown that world-wide there are probably forty – sixty countries where the unskilled labour wage is sufficiently low to suggest, a priori, that men can be employed economically for the majority of civil engineering tasks. Excluding China, these include the India sub-continent; parts of SE Asia, for example Indonesia; some countries in Africa; and a few, generally small, countries in Central and South America and the Caribbean. These countries are characterised by chronic unemployment, or underemployment; few natural resources, other than an abundance of men; and a low per capita income.

From a technical viewpoint one of the first questions that is asked when discussing labour-based methods is whether these can produce an acceptable quality. I would suppose that this question is more important for civil works because it influences the cost of long-term maintenance and embraces consumer acceptability; for example, the ride quality of a road is likely to be more important to civilians. Nevertheless, if

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Machines or Men? P A Green this question is important to the military engineer it can be stated categorically that for most types of construction project found in developing countries the use of manual labour gives a result that is equal in quality to that of machines, and sometimes better. The evidence for this comes both from present-day works, mainly in China and India, and from historic records; for example, the Upper Ganges Canal built by the Indian Army (with British sappers providing the senior and middle management) is still functioning satisfactorily after 130 years.

However, although labour-based methods can usually give a satisfactory job it may be necessary to modify specifications, and it must be recognized that there are a few tasks which cannot be done well by men, except at very high cost. These would include heavy compaction, bulk haulage over long distance and the production of hot bituminous materials. In addition, there may be time constraints which dictate that machines must be used, although it is noteworthy that the 110km long railway from Lancaster to Carlisle was built in two years by labour-based methods while it took three years to build the M6 Motorway that runs parallel to it. The quantity of earthworks was similar for both projects.

The unskilled labour wage is only the first indicator that men can be used instead of machines. Perhaps foremost amongst the other considerations is a sympathetic political environment—one in which the need for the efficient use of domestic resources is clearly recognized and job creation forms part of government policy. Then it has to be accepted that the adoption of labour-based methods cannot be done on a project-by-project basis. The work programme, both in time and scope, has to be large enough to warrant setting up an organization which is geared to using men rather than machines.

Of course, the need for effective organization and management of a project exists irrespective of the technology employed. However, it is often not appreciated by civil engineers that the organizational and managerial requirements of labour-based construction are equal to, but quite different from, those of equipment-intensive work. It is certainly not adequate merely to buy the tools and to give them to the labourers in the hope that a satisfactory project will magically materialize. I arn sure most military engineers will be aware of the unique problems associated with the organization, supervision and motivation of labour, which call for different supervisory skills and a different project organization.

Accepting that quality using labour is acceptable, that the organization and management will be adequate, and the political and social environment is favourable (or, at least, not hostile), when are labour-based methods financially feasible? Clearly this mainly depends on the relative costs of labour as compared with the cost of owning and operating machines. A number of cost comparisons have now been made and these point to the following conclusions:

(a) At a (1976) unskilled labour man-day wage of US\$1 or less, almost all civil construction tasks can be done more cheaply by labour-based methods.

(b) In the range for the unskilled labour man-day wage of US\$1-3, alternative technologies will be comparable in cost terms and the cheapest will depend on local circumstances (eg labour outputs).

(c) Above an unskilled labour man-day wage of US\$3, equipment-intensive methods become increasingly more competitive until, at US\$4 per day or more, most civil construction tasks are done more cheaply by machine.

Therefore, if one now combines technical feasibility with financial viability one can *suggest* those types of projects which may be best suited to labour-based methods at different ranges of unskilled labour man-day wages; this is shown in Table 1.

This is all very well in theory<sup>2</sup>, but what does it mean in practice and are such programmes actually being implemented? The answer is a very clear yes, not only are extensive programmes in being, but the numbers are increasing as population pressures build-up in many of the developing countries.

In the field of road construction, India and Indonesia have traditionally used labour-based methods. In particular, in India there is a very large para-military organization-the Border Roads-which since 1960 has built many thousands of miles in the mountainous country on India's northern and eastern borders. In the 70's further labour-based road programmes have started in Asia, Africa and Central America. For example, in Kenya there is an ambitious Rural Access Road Programme which is well launched on building 12-14,000km of rural roads. In Lesotho there is a Labour-Intensive Construction Unit (LCU) constructing fully gravelled mountain roads at the rate of 40-50km per year. Similar programmes are contemplated, underway or completed in other countries including Benin (formerly Dahomey), Mexico and Honduras.

It is not only roads that are being built by labour-based methods. In India enormous irrigation schemes3 have been and are being constructed and in Lesotho the LCU is building fish ponds, soil conservation works and upgrading and maintaining mountain airstrips.

All in all then, there can now be no doubt that in the proper place, for the right type of project and provided adequate attention is given to organization and management, labour-based methods in civil construction are here for the foreseeable future—and more so following the drastic increases in oil costs.

Individually, you may be able to adjudge what this means to military engineers. Clearly it is likely to have limited relevance outside those countries having an abundant, cheap labour supply. But what about operations in those countries? Additionally, the logistics of setting up and running a labour-based programme appear to resemble a military operation and it demands considerable skill at the engineer level and in middle management. Much of this type of work is technically basic, but often the engineer has to improvise and modify his design as work proceeds. In other words, it requires an organized but flexible man-are these not qualities needed in military engineering? Lieut Colonel Addison on page 32 of his article lists ten items which are basic skills of all military engineering, these are:

- -- Reconnaissance
- Planning
- Work to line and level
- From simple drawings
- In concrete, steel, timber, earth and water
- Using machines
- Efficiently
- Economically
- Safely
- Fast

With the exception of using machines and perhaps speed4, all of these skills must be fully utilized in labour-based civil construction.

The author is very aware that he has left many things out and has only dealt cursorily with other important issues. The reader who wishes to know more should refer to the bibliography given below:

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#### Footnotes:

'See, for example Annex 1 of the World Bank "Guide to Competitive Bidding on Construction Projects in Labor-Abundant Economies" (June 1978).

<sup>2</sup>In reality it is not pure theory because work study and the analysis of a limited number of projects have been used in the preparation of Table I. However, in generalising it has been necessary to interpolate extensively.

<sup>3</sup>Sec, for example, *The Consulting Engineer* July 1977 which contains an article describing the Sarda Sahayak Irrigation Scheme,

<sup>4</sup>Even speed can be a feature of labour-based work; in 1974 the author saw a 4km long 10m high flood bund being built in India to protect a major bridge. It was constructed in less than two months using 40,000 labourers.

Type of Program/Project	Comments	Man-c	lay Lab	ourCos	t(US\$)
Type of Hograny Hojeer	Dispersion, etc)	0-1	1-2	2-3	3-4
Surfaced roads (1)	Minor roads	•			
Gravel roads (2)	Dispersed projects	ł •	٠	•	
	Average projects	*	*		
	Large, concentrated projects	•			
Dirt roads	Very dispersed projects	•	٠	٠	
	Fairly dispersed projects	•	٠	•	
	Other projects	•	*		
Road widening, upgrading dirt roads by gravelling	Large concentrated projects				
	Other projects	•	•		
Periodic road maintenance programs	Dirt and gravel roads, very dispersed	•	٠	•(3)	*(3)
	Other dirt and gravel roads		+	+(3)	
	Other unsurfaced roads	1.		()	
	Surfaced roads	+			
Small unlined canals and ditches	Small, dispersed projects	*	•	*	
	Average projects	1 •	•		
	Large, concentrated projects	•			
Large unlined canals and ditches					
Brick lining for canals and ditches		•	•(4)		
Routine maintenance of canals and ditches	Minor canals, very dispersed	•	٠	•	*
	Other minor canals	*	•	٠	
	Major canals	•	•		
Pipelines (5)	,	*(6)	*(7)		

TABLE 1: Suitability of Programmes/Projects for Construction by Labour-Based Methods at Different Daily Unskilled Labour Wages

MACHINES O	R MEN?	ł
------------	--------	---

Small dispersed projects	* * *(9)
Other small projects Large, concentrated projects without important time constraints	• •
Comstrainto	*
	•
Small (incl weirs) Large (incl gated barrages)	* *(11)
	• •
	• •(13) •(13)
Traditional construction Non-traditional construction	
Timber or masonry Concrete	•
	Small dispersed projects         Other small projects         Large, concentrated projects         without important time         constraints         Small (incl weirs)         Large (incl gated barrages)         Traditional construction         Non-traditional construction         Timber or masonry         Concrete

#### NOTES ON TABLE I

Explanatory Comment

Table 1 indicates the general suitability of programs/projects for construction by labour-based methods at different daily unskilled labour wages. An asterisk indicates possible suitability.

General Notes

(a) Parts of large concentrated projects may still be suitable at labour costs higher than those shown.

(b) 1976 prices.

Specific Notes

- (1) "Minor roads" are defined as those due to carry such light traffic that any delay caused by using labour-based methods would not seriously reduce user benefits. 500 veh/day is suggested as an upper limit for minor roads in this context.
- (2) Provided haul lengths do not generally exceed 5km (assuming tractor/trailer haulage).
- (3) Periodic maintenance would include regravelling and rescaling.
- (4) Bricks should be used only if they can be produced locally, usually by labourbased methods.
- (5) This applies to trench excavation, pipe laying and trench backfilling.
- (6) Manual methods of excavation are economic except in massive rock.
- (7) Manual methods of excavation are economic except in stiff/hard/dense soils and in rock.
- (8) Provided haul lengths do not generally exceed 1km.
- (9) The soil should not be harder than firm/loose.
- (10) Mixing should be done mechanically.
- (11) Aggregates smaller than 25mm are best produced by crusher but they can often be replaced by natural gravels won by labour.
- (12) This would include contour ridging, watercourse construction, check dams in gullies, tree planting, etc.
- (13) Applies only to small, remote airfields where the only means of access is by air.

\* \* \* \*

## Nepal and The Brigade of Gurkhas

LIEUT COLONEL J H EDWARDS RE, BSc



Lieut Colonel Edwards spent one tour as a troop Commander in BAOR, but all the remainder of his Regimental Service has been with The Queen's Gurkha Engineers, which he commanded from 1973 to 1973. In between times he has attended the Staff College, done a number of staff jobs and been Chief Instructor of the Tactics Wing at Chatham. This article was written when he was Defence Attaché in Katmandu, before he returned to BAOR, after a gap of 25 years, to be CRE 2 Armd Div

A OREAT many officers and soldiers of the Royal Engineers have been associated with Nepal and the Brigade of Gurkhas in different ways over the years. The links with The Queens Gurkha Engineers are obvious, but there are also many who have served on the Brigade's Lines of Communication, or been members of mountaineering or adventurous training expeditions in Nepal, some who have come to know individual Gurkha soldiers well on courses, and those who have simply served alongside Gurkha units in the same formation. People in each of these categories have to a greater or lesser extent an incomplete knowledge of the country and of the Brigade of Gurkhas, and I thought that it might be of interest to try to complete these one-sided pictures by filling in the background, and perhaps making some of the shadow features stand out more clearly. My credentials for attempting this task are set out in the biographical note above, but I am by no means an expert. After my first tour with the Brigade, I thought I knew verything aboat Gurkhas, but over the succeeding years, as I have learned more, I have realized how little I know.

Map 1 shows how Nepal is sandwiched between the towering peaks of the Great Himalaya to the north, and the strip of plain known as the Terai in the south. The fact that the ground rises from the Terai at less than 1000 feet above sea level, to the Himalayan summits of 25,000 feet and more, in little over 100 miles, gives some indication of the ruggedness of the country. The Terai forms part of the northern edge of the Gangetic plain, and is wirtually flat. Until about thirty years ago it was almost entirely covered with tropical rain forest and swamp, and abounded in wild game. It was malarial, and only the aborigine Tharus, who had developed a partial immunity to the disease, were able to live there. During the past three decades the majority of the Terai has been cleared of jungle and drained, to provide the best agricultural land in Nepal, which has been settled by Nepalese hillmen moving south and by immigrant Indians, both categories from burgeoning peasant populations desperately seeking land. Some of the jungle has been retained in the form of National Parks where wild animals are protected, and the two most important, the tiger and the one-horned rhinoceros, survive.

From the Tibetan plateau, itself at an altitude of over 10,000 feet, the Himalayan giants rise to their peaks in Nepal. Their names read like a roll of honour; Dhaulagiri, Annapurna, Himalchulí, Gaurishanker, Kanchenjunga and finally Sagarmartha, or Everest as we know it. They are all over 23,000 feet, and from some vantage points in Central Nepal, all are visible at once when conditions are favourable. Sometimes

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Napal and the Brigade of Gurkhas Lieut Colonel J H Edwards RE



when the air is clear it is difficult to believe that they are real, looking as they do more like a painted backdrop to the lower hills. In the valleys that run between them live people of Tibetan extraction, the best known of whom are the Sherpas. As with the Tharus in the south, they have adapted to the peculiar conditions of their environment, which would be uninhabitable to anyone else.

Between these two extremes lie what I have called the Middle Hills. They comprise the Siwalik Range and Churia Hills which rise straight out of the Terai without any foothills, and behind these the Mahabharat Range forming the foothills of the Himalayas. This is the heartland of Nepal, consisting of a jumbled mass of steep hills and twisting watercourses, at an altitude of between 3,000 and 10,000 feet. In some places the narrow river gorges have widened to produce fertile valleys, the most important of which are Kathmandu on the Bagmati River at 4,500 feet, and Pokhara on the Seti at 3,000 feet. In these Middle Hills live the tribes who have forged the history of Nepal, and from which have come the soldiers to whom Nepal owes so much of its reputation.

The hillmen live a hard life as peasant farmers, cultivating the steep hills in an unbelievable series of terraced fields, sometimes only a few feet wide. The generations of hardy people who have cut these terraces, have also constructed intricate irrigation channels to carry water, sometimes over several miles, to the fields. The Himalayas are geologically young and unstable. As the forests on the lower slopes have been cut down, first to provide agricultural land, and now for firewood, fearful landslides have resulted and still occur, causing destruction and hardship. The people are nearly self-sufficient, but there are certain essentials such as cloth and salt, or luxuries such as kerosene and sugar, which have to be bought. One of the few sources of cash in the hills are the pensions and savings of the Gurkha soldiers. Although there are now a few hundred miles of road in Nepal (shown on Map 2), they are all in the Terai or connecting the main centres. In the hills, the only transport is still a basket on a man's back. Foreign economists working for UN and other aid organizations, often try to assess the wealth of the hillmen by comparing the economy of Nepal to that of an industrialized country; they are seldom satisfied with their results. How can you measure the wealth of a peasant? He owns his own land, has a house (that he has built himself) and some livestock, and after a good harvest he has enough to eat; but his income is nil, and disaster is always just around the corner in the form of insufficient rain so that the crops fail, hail or too much rain bringing landslides, ravening insects, or simply disease and death with no doctors or hospitals to prevent it, and no welfare state to soften the blow. It is this demanding environment that forms the hardy, stoical, self-disciplined but cheerful characteristics in the Gurkhas who join the British Army.

No account of Nepal would be complete without a special word about Kathmandu. One of the first things that strikes most visitors to the Valley is the major part that religion plays in the lives of the people who live there. Nearly every street in the three cities of Kathmandu, Bhadgaon and Patan contains at least one temple, and hardly a week goes by without a festival. It is difficult to understand the significance of many of the festivals which often combine elements of both Hindu and Buddhist mythology; indeed many of the temples and shrines contain allegorical figures from both religions. The two religions, Buddhism concentrated in the north near the Tibetan border, and Hinduism in the south near the Indian, are inextricably confused in Kathmandu, and worship takes place in a robust and unselfconscious way as perhaps Christian worship did in Europe in the Middle Ages. In the narrow streets it is easy to imagine oneself in a medieval city with the small dark wooden houses and overhanging upper floors, many beautifully carved by Newar craftsmen, and little changed over the last 300 years. The smell resulting from an urban population of 250,000, and a total lack of sanitation, adds to the illusion. Some light industry has been introduced, but many of the ancient crafts are still practiced in tiny shops as they have been for hundreds of years. The land is fertile, and outside the cities peasant agriculture flourishes. The Valley is a fascinating place, but is not representative of Nepal as a whole; to the hillmen Nepal simply means the Kathmandu Valley, and is a foreign country.

It is difficult to distinguish between myth and fact in the early history of Nepal. Before the hills were neatly terraced, the mighty rivers bridged, or tracks defined over the passes, the Middle Hills must have been very inhospitable, and few if any people lived there. The Kathmandu Valley was originally a lake until, if you believe the mythology, a God from China named Manjusri clove the mountains to the south with his sword, to form the holy Bagmati River which drained the water away. What is certain is that a race called the Newars, probably originally from Tibet, inhabited the Valley from early times, and that immigrants from India diluted their pure mongolian blood, and introduced Hinduism, albeit with strong Buddhist overtones.



The Newars, who still form the majority of the Valley population, were a cultured and energetic people whose artistic talents, particularly architecture, influenced both the Chinese and Indian civilizations. In about the 10th century a Newar family called Malla became the rulers of the Valley. The Mallas were warriors and administrators, and built a prosperous and powerful kingdom in the Valley while encouraging the creative Newar talents. Meanwhile great population migrations were taking place in Asia. The Dravidian aborigines of India had been driven south to make way for Aryan invaders, some of whom, known as Khas, found their way into the Middle Hills of Nepal, where they met Mongolian tribesmen, Magars and Gurungs in the West, and Limbus and Rais (known collectively as Kiranti) in the East, immigrants from the North.

By the time of the Moghul invasions of India around the 13th century, there was a prosperous Malla kingdom in the Kathmandu Valley, and settlements of Mongolians and Khas in the Middle Hills. Attempts by the Moghul conquerors to impose their Moslem faith on the proud Rajputs of northern India, resulted in many of the latter fleeing to the foothills of the Himalayas, where they carved out kingdoms for themselves, and absorbed the Khas and Mongolian communities already there. These newcomers from India were Brahmins (Bahuns), Thakurs and Kshatriyas (Chhettris), high caste priests, rulers and warriors, who brought with them their rigid caste system. The Khas were already Hindus, although they neglected many of the strict laws, and the Hindu religion was adopted, with the Mongolians being granted an appropriate status in the caste system, but to a greater or lesser extent retaining much of their Buddhist tradition. As time went by these kingdoms became more firmly established, and inevitably conflict developed between them. Minor wars took place, uneasy alliances were made, and more than one pair of envious eyes was cast upon the fertile valley of Kathmandu.

In particular in the 1750s in a kingdom based on Gorkha, fifty miles away in the hills west of Kathmandu, lived a Thakuri prince called Prithvi Narayan Shah who had recently succeeded to the throne, and who was determined to overthrow the Mallas, and establish an empire with its capital in Kathmandu.

Apart from being a great military leader, Prithvi Narayan Shah must have been a man of vision and determination; by 1769 he had conquered the Valley, and he and his immediate heirs embarked on a remarkably successful period of empire building. By force of arms, treaty, intrigue and dynastic marriage, the Shahs extended their Kingdom, so that by the end of the 18th century the Gorkha Empire extended almost to the borders of Kashmir in the West, right through the foothills of the Himalayas, to include Sikkim in the east, and a generous slice of the Gangetic Plain in the south (Map 3).

But now Nepalese territorial ambitions started to conflict with the interests of another acquisitive power, the British East India Company. After two bloody but inconclusive campaigns in 1814 and 1815 the Nepalese were forced to agree to the Treaty of Segauli, which confined them to the borders of Nepal as we know it today. The British had learned to respect the fighting qualities of the Gurkhas, as they called them, and part of the treaty allowed them to recruit Nepalese for service with the East India Company. In 1815 the first three Gurkha Regiments were formed, and Gurkhas have served the British Crown ever since.

High caste Hindus within the armies of the East India Company suffered from the disadvantage that their caste rules interfered with their military efficiency. Refusal to eat food cooked or handled by a person of lower caste, the necessity to wash from head to foot before eating, reluctance to perform menial tasks such as digging, were examples of the difficulties of campaigning with such troops, however brave and well-disciplined they were. One of the things that the British had noticed about the Gurkhas was that although they were Hindus, they did not seem to adhere so rigidly to these rules, and this was particularly true of the Magars and Gurungs, whose claim to be Hindus was questionable anyway. Indeed many of them, particularly Gurungs, remained Buddhists and are still Buddhists today. So it is that with the exception of



one Regiment, the 9th, all Gurkha Regiments have been recruited almost exclusively from the Magars and Gurungs of West Nepal, and later from the Limbus and Rais of East Nepal.

After the Treaty of Segauli the power of the Shahs was eroded by intrigue and internal disorder, until in 1846 a Chhettri nobleman called Jangbahadur Rana came to power, and was established as hereditary Prime Minister, and later granted the title of Maharajah. For 100 years the Shah kings were virtual prisoners of the Rana Maharajahs, but remained constitutional monarchs and titular leaders of Nepal's peoples, largely because of the mystic belief that the reigning monarch is a reincarnation of the God Vishnu. Jangbahadur had led a turbulent and violent life, and had established a reputation for great physical courage to match his name which means "brave in battle". He was a quick-tempered and impatient man, ruthless enough to eliminate his rivals, but a wise and capable administrator with the strength of character to carry through the reforms that he could see were necessary. Prithvi Narayan Shah unified Nepal, but to Jangbahadur Rana must go the credit for launching it on the road to nationhood. From the moment he assumed office, he set about modernizing the country, and in 1850 he visited Britain as the guest of Oueen Victoria. He returned to Nepal understanding that it was systematic application and hard work, rather than magic or supernatural power, which were the secrets of British success, and from then on he modelled Nepalese institutions on British lines. He also appreciated the insidious nature of British diplomacy, and determined to keep Europeans out of Nepal, to avoid its status being reduced to that of the Princely States of India. Nepal has always retained its independence, and until 1951 the only foreigners living in Kathmandu were a British Resident and his small staff, Visitors were not encouraged, and this policy was not difficult to put into effect, with a 20,000 foot barrier to the north, a malarial jungle to the south, and a total absence of roads in the Kingdom.

Throughout the 100 years of Rana power, one of the mainstays of their policy was friendship, as equals, with Britain. Not only did they continue to allow Gurkha soldiers to be recruited into the Indian Army, but in times of crisis they supported British interests as allies with their own forces. During the Indian Mutiny in 1857, Jangbahadur personally led a force of 12,000 men against the mutineers, and in both world wars Nepal declared war on Britain's enemies, and Nepalese battalions fought alongside British forces. While Britain ruled India, her friendship was a guarantee of stability and independence in Nepal, but when in 1947 the British left India, elements opposed to the Rana regime had a firm base from which to agitate for its overthrow. In 1950 the King fled to India, and the Nepal Congress Party, already based in India, and now with the King as its legitimate constitutional head, was able to force the abolition of the hereditary Rana premiership.

King Tribhuvan Bir Bikram Shah was thus restored fully to the throne that he and his predecessors had only occupied nominally for 104 years. Over the next ten years, King Tribhuvan and later his son Mahendra, tried to introduce democratic reforms into the country, but there was little experience of administration, the Nepal Congress Party was riven with internal disputes, and a succession of weak governments resulted. In 1959 general elections were held, but there was now fear of foreign influence within the Congress Party, and the Nepal Communist Party was gathering strength. In 1960 King Mahendra outlawed all political parties, adapted the constitution, and instituted a unique form of non-party political democracy, based on elected village councils, or panchayats, working up through district and zonal panchayats to the national or Rastriya Panchayat with the King himself at the top of the constitutional tree. Under the present King, Birendra, this system continues.

Over the 132 years between the time that Gurkhas were first recruited and Indian independence, ten Gurkha Regiments had been raised within the Indian Army. In 1947 a tripartite agreement was reached between the British, Indian and Nepalese Governments, by which six of them should remain in the Indian Army, and four, the 2nd, 6th, 7th and 10th, each of two battalions, should be transferred to the British



Photo Ia A hill village (left) Photo Ib The only means of transport to it (right)

Army. These eight battalions moved to Malaya, and shortly afterwards the idea of a composite Gurkha Division was conceived. The first step was to convert the 7th Gurkhas to artillery, but this was quickly overtaken by events when the Malayan Emergency started, there was a shortage of infantry, and the 7th reverted and have remained infantry ever since.

In 1948 Gurkhas first started training as military engineers. Some were transferred from infantry battalions and some were re-enlisted having been discharged prematurely in 1947. Initially they were simply attached to the Royal Engineers, but in 1955 The Gurkha Engineers was formed as part of the Brigade of Gurkhas, and in 1976 the Regiment was granted a royal title as The Queens Gurkha Engineers. The parents of the new Regiment were the Royal Engineers and the Brigade of Gurkhas, but the birth of a new Regiment in the unsettled circumstances of the new concept of Gurkha troops in the British Army, combined with the Malayan Emergency, was not easy. Fortunately apart from its distinguished parents, the Regiment also had famous godparents in the form of the Indian Sappers and Miners, and will forever owe a debt to the officers of those Corps who joined it, bringing with them their traditions and high standards. Through all the difficulties with which the Regiment has had to contend over the years, the example set in different fields by its parents, together with the inherited traditions of its godparents, have been an inspiration to its officers and men. It is not always understood within the Royal Engineers that The Queens Gurkha Engineers does not form part of the Corps; the soldiers are recruited into the Brigade of Gurkhas, and the British officers are seconded from the Corps. There has never been any suggestion that The Queens Gurkha Engineers should have a permanent cadre of officers as does the infantry in the Brigade, but for purposes of continuity a roster of officers is maintained, and as far as possible appointments in the rank of Captain and above are filled by officers who have already served with the Regiment. In some cases officers spend virtually the whole of their regimental service with The Queens Gurkha Engineers, but a great strength of the Regiment is the reservoir of Royal Engineer officers on which it can draw.

After the formation of Gurkha engineers came Signals (now Queens Gurkha

# Nepal and the bridge of Gurkhas (1a & 1b)

Signals) and Service Corps (now Gurkha Transport Regiment). Defence cuts over the years have reduced the size of the Brigade, and it now consists of five infantry battalions (two of 2 GR and one each of 6, 7 and 10 GR). The Queens Gurkha Engineers consisting of two field squadrons and a support squadron, and units of Queens Gurkha Signals and the Gurkha Transport Regiment. A figure that is often quoted is that Gurkhas provide ten per cent of Britain's front line infantry Perhaps it is worth noting that the two Gurkha field squadrons represent seven per cent of her front line combat engineers.

Recruiting for the Brigade is carried out by an organization called British Gurkhas Nepal, with its HQ and main Depot in the Eastern Terai at Dharan, a subsidiary Depot in the West at Pokhara (Paklihawa Camp is now closed), and a Transit Camp in Kathmandu. Recruiting takes place once a year, when ex-Servicemen appointed for each area (galla wallahs), bring a pre-determined number of potential recruits (their gallas) to central points in the hills, where ex-Gurkha Officers carry out the first selection. About twice the number finally required are then brought to the Depots, where a stringent selection process is applied to pick out the lucky few who will go to Hong Kong to be trained as soldiers. There is enormous competition to be selected, and galla wallahs and recruiting officers are put under great pressure to favour this boy or that; it is estimated that there are some 300 aspirants for every place. 2 GR and 6 GR recruit in the West among the Magars and Gurungs; 7 GR and 10 GR in the East among the Limbus and Rais; and Engineers, Signallers and Transporters come from both sides. Nepalese tribes are sometimes known as jats, but this word really refers to their caste in a religious sense, and the word clan, with its analogous association with the social order in the Scottish Highlands is more appropriate. Most Nepali clans have a sub-clan structure.

The majority of people in the Middle Hills are Chhettris, Thakurs and Bahuns, of Indian origin, from whom the Brigade of Gurkhas does not normally recruit. In the Far West of Nepal, comprising about one quarter of the country, and in which the



Photo 2a King Prittivi Narayan Shah with one finger raised to indicate the unity of the natio (left) Photo 2b Maharajah Jangbahadur Rana (right)

# Nepal and the bridge of Gurkhas (2a)



Photo 3a Riflemen from the author's father's Battalion 1/3 GR c1930 (left) Photo 3b Sappers from QGE 1975 (right)

Brigade does not recruit at all, the whole Middle Hill population is Chhettri-Thakur-Bahun. A few of the Thakuri are enlisted but normally under their sub-clan names, for instance Sahi or Chand. Of the four main clans which are recruited, the Gurungs, Limbus and Rais are enlisted under these names, although Ghales, the aristocrats of the Gurung clan, are known by their sub-clan name. Magars on the other hand are almost always enlisted under their sub-clan names, the most important of which are Thapa, Burathoki, Ale, Gharti and Pun. Apart from the main clans, a few Tamangs and Sunwars from central north Nepal are recruited, and throughout the Middle Hills there are occupational castes such as Kamis (metalworkers), Damais (tailors) and Sarkis (leatherworkers), of whom a handful are recruited to ply their trades, the Kamis as armourers. The archtypal Gurkha soldier, equivalent to the Duke of Wellington's Private Thomas Atkins, is Rifleman Ginger-beer Ale, but he does not represent the majority of the population of Nepal. The section of the population from which the Brigade of Gurkhas recruits only forms 6% of the total population of Nepal (12 million), and 20% of the population of the Middle Hills, and the area in which they live only about one-third of the total area of Nepal; every Gurkha is a Nepali, but the reverse is by no means true.

BRIGNEPAL, as it is known, has other functions, in addition to its recruiting responsibilities. Some 5,000 men, about 25% with families, pass through on leave and discharge each year, and have to be moved, accommodated, documented and generally administered. The British Government pays pensions to nearly 20,000 ex-Servicemen or their dependants in Nepal, and the majority of these pensions are paid in cash. Soldiers going on discharge are given a resettlement course in agriculture or building, and a farm and handyman training centre are run at Dharan. Finally large sums in welfare funds are spent in the form of cash grants and welfare pensions to those in trouble, and on community projects in the Hills, mostly in connection with water supply and schools.

Nepal has progressed since its early turbulent history, followed by the autocratic rule of the Ranas, but it is still one of the poorest of the developing countries. Aid, both bilateral and through international agencies, is pouring in, but the country's very under-development limits the amount it can absorb. 98% of the population are peasant farmers, but lack of communication prevents the hillmen from marketing their produce when they have a surplus. Tourism and mountaineering provide a

# Nepal and the bridge of Gurkhas (3a & 3b)

welcome source of income, but again lack of roads and an inadequate internal air transport system place a limit on the numbers with which the country can cope. The pay and pensions earned by Gurkha soldiers in the Indian and British Armies still represent a vital element in the economy of the country with the advantage that the money finds its way into the villages in the Hills, where it is most needed. Let us hope that misguided political considerations do not deprive Britain of the loyal and dedicated service of this supremely professional portion of her Armed Forces, and Nepal of the foreign currency it so badly needs.

I have tried to describe Nepal and its history, and to show how the present day Brigade of Gurkhas, and in particular one of its components. The Queens Gurkha Engineers, has come into being. An argument with which the Regiment was frequently faced in its early days was that Gurkhas make some of the best infantry in the world, so why waste them by making them into sappers. It was a difficult argument to refute, but it is not heard these days. Could it be that it is now recognised that they also make some of the best sappers in the world?

#### Postscript by the Author

Since I wrote this article the political scene in Nepal has changed dramatically. I deliberately refrained from commenting on the Panchayat system in the article because at that time any criticism of it would have caused offence, but one of the principal results of the events of April and May 1978 has been the legalization of political activity (though not political parties), and the right to freedom of speech.

The root of the trouble is dissatisfaction with the Panchayat system which had become immutable, and undemocratic in the sense that candidates for election to village councils were mominated by a central body, and were seldom opposed. To the hill people Government is in many ways irrelevant, demanding little from them and doing little for them, but the people of Kathmandu and the Terai towns are politically aware and subject to a variety of outside influences. The trouble started, as is so often the case, with student unrest, and the catalyst that led to the first riots was the



Photo 4a Subedar Major 7 GR 1907 (left) Photo 4b Gurkha Major QGE 1977 (right)

# Nepal and the bridge of Gurkhas (4a & 4b)

execution of Mr Bhutto in Pakistan. The situation deteriorated fast, and the first deaths occurred in late April. On 23 May there was a serious riot in central Kathmandu, when.damage was done to property, and the following morning the King personally broadcast to say that a referendum would be held to decide between a modified Panchayat system and a return to party politics.

The problems involved in holding a referendum in Nepal are daunting, and there is a danger that whichever side loses will be able to claim with some justice that it was not properly run. In any case the choice is far from clear: the modifications to the Panchayat system have not yet been announced and may not be well defined, and the concept of party politics is not a familiar one. I would certainly not attempt to predict the outcome, but I hope that Nepal's remarkable resilience will help her to weather the storm, and to evolve a system of Government suitable to her peculiar needs.

### In The Wake of Drake

#### LIEUT COLONEL J N BLASHFORD-SNELL MBE, RE



The Author was born in 1936 and educated at Victoria College, Jersey, and RMA Sandhurst. His military service has taken him all over the world. In 1963 he became an instructor at RMAS with a special responsibility for Adventure Training. During his time at the Academy he launched over 60 expeditions to different corners of the globe. His overwhelming interest is exploration-he contaminates all who meet him with this enthusiasm. Since 1958 he has led or been a member of over 20 major expeditions including the Great Abbai Expedition, Dahlak Quest, British Trans-Americas and Zaire River Expedition. Today he is leader of Operation-Drake, the largest and most ambitious expedition ever undertaken. In his spare time he writes books, broadcasts, jogs with his labrador Maxamillian and shoots. He

adores Scotch Whisky, wine, sea food and Peter Sellers films.

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OPERATIONDRAKE, the two-year, round-the-world expedition, is now (31 July 1979) in the Pacific. HRH Prince Charles sailed the base ship—the 150 ton brigantine Eye of the Wind—out of Plymouth Sound last October. Since then over 200 "Young Explorers", servicemen, scientists and directing staff from many countries have certainly had the adventure of a lifetime. The presence of so many sappers on Operation Drake is thanks to a most generous grant from the Corps Charitable Trust.

They have crossed the Atlantic, investigated an active volcano crater lake, searched for lost cities, found ancient shipwrecks and a gold mine. They have seen (and in many cases have been molested by) rare animals, birds, insects and reptiles. They have worked on scientific projects in the rainforest and made friends with the local Indians and with Panama's Guardia Nacional.

In the Wake of Drake Lieut Colonel J N Blashford-Snell MBE RE IN THE WAKE OF DRAKE



Photo 1. The giant inflatable diving platform used by RE and RAF divers in Caledonia Bay.

As in all expeditions, there have been problems too. On the first phase it was seasickness. It affected almost everyone and was particularly stoically endured by two young Gurkhas (including one QGE) whose previous maritime experience was a trip on the Kowloon Ferry.

Our study of Mount Soufriere's crater lake on Christmas Eve produced ominous indications of activity which we reported to the University of the West Indies. The massive eruption on Good Friday shows that our teams are indeed not playing at being explorers.

In Panama the achievements have exceeded our wildest hopes. Archaeologist Mark Horton's discovery of the site of New Edinburgh and the archaeological finds by his team's excavations have added considerably to previous knowledge of this near-forgotten episode in Scottish history.

The location by RE and RAF divers, working with British magnetometer expert Anthony Lonsdale, of the almost complete hull of the merchant ship Olive Branch was immensely exciting. This ship, which lay 30ft under water, buried in deep mud since the day she burned and sank in 1699, is in a remarkable state of preservation. The excavation caused many difficulties. But it was just the sort of task for which Captain Jim Winter and his friends at Central Engineer Park had designed the inflatable diving platform David Gestetner. The divers worked under water in nil visibility and at one moment Corporal Brian Ranner RAF was nearly buried alive when tons of mud suddenly descended on him. Inquisitive sharks provided another hazard. A plastic bucket full of artefacts vanished when one diver handed it to what he assumed was his partner! After WO1 Mark Moody had netted six sharks, including a 10ft Hammerhead, excavations continued without further interruption. That work was directed by marine archaeologist Meredith Sassoon. She was also teaching the staff of Panama's Patrimonio Historico about conservation of the artefacts discovered. Complete excavation of the Olive Branch will take at least a year, using special equipment-so maybe some of us will be back after Operation Drake ends in October 1980.

In the Darien jungle Mark Horton, assisted by sappers and a team of Young

# In the Wake of Drake (1)

#### THE ROYAL ENGINEERS JOURNAL

Explorers cleared acres of dense vegetation to reveal the extensive ruins of the ill-fated Scottish colony Fort St Andrew. Earthen fortifications, ramparts with four bastions and three entrance ways were uncovered. A "fighting platform" was identified with regularly positioned cannon emplacements and on the upper level, the location of a now lost wooden pallisade. Another discovery was a powder store. Careful records were made of all finds. These included iron pikes, cannon ball, cannister shot, lead shot, flint lock and gun flints as well as domestic artefacts such as hinges, latch fittings, knives, scissors, weights, keys, glass vessels and a large number of clay pipes similar in style and markings to those discovered in the hull of the Olive Branch. They also found what may well prove to be Balboa's famous city—Acla.

Another project was the construction of a 480ft long aerial walkway in the rain-forest. Designed and built by Operation Drake's RE section with load-lok nylon straps and dexion, it enabled our scientists to study flora and fauna in the high forest canopy. The walkway will be re-erected by the expedition in Papua New Guinea and Indonesia for further, comparative studies. Our nurse, Claire Bertschinger was marooned at 100ft above the ground when her safety rope jammed. She was attacked by an army of ants while a snake leered menacingly on the branch above. Sergeant Mike Christy RE suffered a 15ft fall before he was able to rescue her. However the walkway proved to be extremely well built and was tested by our Commander, General Sir John Mogg.

We've seen plenty of snakes (a small boa coiled itself around a soldier's bare foot)



Photo 2. A young explorer "surveys" the site of Fort St Andrews in Panama.

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Photo 3. Sergeant Mick Christy RE, suspended 110 feet above the ground in the Panamania jungle while building an aerial walkway for the scientists as part of Operation Drake.

and hungry sandflies were with us continually. Andrew Mitchell, our scientific co-ordinator, found a crocodile in the bathing place at base camp and Nicholas Lindsay from the Jersey Zoo made a unique study of some marmosets which are threatened with extinction. A young Canadian girl thought she was being stalked by a sea monster in the moonlight—it was a six-foot turtle coming ashore to lay eggs!

Deep in the Darien Gap while on a seventy-mile trek, one patrol ran into real trouble. They were in an arid region when the TV cameraman fell sick. Clearing a helicopter landing zone so he could be airlifted out, two Young Explorers went down with heat exhaustion. The searching aircraft directed by Jim Winter could not identify the party's smoke signal because Indians were burning great areas of the forest. Fortunately the party had the new "James Bondian" Clansman radios—superb, 12lb weight instruments. The rescue was successful, but only at the eleventh hour.

Not everyone on the expedition is young and fit. Paul Hanson, a forty-seven year old spastic from the West Surrey Cheshire Home came to the Panamanian jungle in his wheelchair. An amateur radio operator, he worked tirelessly, uncomplaining of the beastly sandflies, using the transmitter and tapping morse with the key against his chest. And there was Anna Richards, a beautiful twenty-two year old Canadian victim of bone cancer. With one artificial leg, she managed a nine-mile jungle walk although at the end her leg stump was bleeding. It's the spirit of people like this which we all admire.

One problem which we face constantly is the expedition's cost. Sometimes I feel more like a fund raiser than an explorer. We thought we'd solved the problem when Royal Marine Reservist Mike Wright, a Young Explorer appropriately sponsored by Barclays Bank, found an old gold mine near the Colombian border. I had learned about this during the Darien Gap expedition in 1972 and even had an ancient Spanish map which described it as "the richest gold mine in Latin America". We found gold alright, but it belongs to the Panamanian Government!

# In the Wake of Drake (3)

Operation Drake left Panama just as the rains came in April. The withdrawal was organized with military precision by Major Alan Westcob DWR. Some ninety-six loads of scientific specimens and stores were back-packed out of the jungle onto our brigantine for shipment to Panama City. They were repacked there and, amazingly, they have all arrived safely in Britain.

Our next port of call was Drake's Bay on the Pacific coast of Costa Rica. We commemorated Sir Francis Drake's visit there 400 years ago by unveiling a plaque on a lonely headland. The locals were delighted with the affair, conveniently forgetting that their ancestors regarded Drake as a Corsair. After scientific work and wildlife studies in the remote Oso peninsula, the ship sailed to the "treasure island" Isla Cocos, 400 miles to the west. No attempt was made to search for the various hoards of pirate loot reputed to be buried on this mysterious island. Instead, marine biological studies were carried out, with plenty of circling sharks to add spice!

On 24 May the Eye of the Wind reached the Galapagos where Operation Drake's scientists have been working for some time. Here Young Explorers sought, found and captured a rare female land iguana, possibly the last of its type. As a result the Darwin Research Institute and three frustrated male land iguanas are delighted and this species may have been saved from extinction.

The ship is now sailing on to Tonga and Fiji where our task will be hurricane relief work. In August we shall be in Papua New Guinea for the next major land phase, with volcanoes to survey, jungle trails to map, World War II wrecks to chart and many scientific projects to carry out. The aerial walkways will be re-crected by a new Sapper section and "traditional" medicines (including contraceptive plants) will be investigated by scientists from the University of Papua New Guinea. Major Roger Chapman and Captain Jim Masters-veterans who led the white water teams on the Blue Nile and Zaire expeditions-will undertake the first full exploration of the mile-deep Strickland Gorge which cuts a groove through the Western Highlands. Using Avon inflatables, they aim to travel down a river that is more difficult than any I have previously seen. It is still largely unmapped. With them will be Staff Sergeant David Weaver RE, a man of incredible physical strength who is known as "Hands" at the Junior Leaders' Regiment, and an apprentice from Chepstow. Jungle trails and routes for roads are to be surveyed by Lieut Colonel Robin Jordan and Corporal Manbahadur Guring QGE and engineers from the Papua New Guinea Defence Forces.

The Young Explorers, aged 17-24, we have had with us so far have been excellent. I believe our rigorous selection process has been pretty successful. Inevitably it has not been a "bed of roses". Some of the young feel they want more responsibility. So in Papua New Guinea they will be doing some of the logistics. A few, suffering perhaps from "welfare status" felt the need for more facilities. We made no concessions to them.

Many of the youngsters who have completed their three months adventure with us are now home in Australia, Britain, Canada, Iceland, Nepal, Hong Kong, Malaya, New Zealand and the United States. Already they are giving lectures to young audiences with the aim of inspiring others to follow their example and place "service before self". In Britain this is being organized to a large extent by the Round Table. Capital Radio, one of the major sponsors, estimates that 250,000 London school children are following the expedition and many of them are taking part in an educational programme based on information sent back from the Eye of the Wind.

Some of our ex Young Explorers, are being especially enterprising. They are now organizing their own expeditions and others are even helping my small staff to administer future phases of Operation Drake. With seventeen months of explorations still to come, the venture has certainly ignited a flame. Whatever is said about the young today I firmly believe there are still plenty around with the same spirit of adventure and healthy contempt for difficulties and dangers that Raleigh, Hawkins and Drake had 400 years ago. Thankfully many of them have a collar dog with *Ubique* on it.

### **Roorkee Revisited 1978**

BRIGADIER SIR MARK HENNIKER BT, CBE, DSO, MC, DL



- Mark Henniker went to the Shop in 1924 and was commissioned into the Royal Engineers. He saw Active Service in many places, and retired in 1958. He started an oil company after he retired and ran it for 14 years. Looking back, he is mainful saware of the debt he owes to his fellow men both
- in the Army and in Industry. He finds no fault with the British soldier, nor with the working men of this Country.

In November 1978 the Bengal Group of the Indian Corps of Engineers celebrated the 175th Anniversary of their original Raising Day in 1803; and this paper is a summary of extracts from letters sent Home by those who attended the celebrations. A longer and perhaps more comprehensive account has been preserved in the RE Library in Chatham.

As far back as 1976 General Sir Ouvry Roberts, the President of the King George V's Own Bengal Sappers and Miners Association, received an invitation from the (then) Commandant in Roorkee: "We do hope," he wrote, "that some of the ex-Bengal Sappers and their Lady wives will be able to join us..." It was a tempting offer—and a most hospitable one—but finance presented a formidable difficulty. However a party of seven was mustered and became known as our "Delegation".

The leader of our Delegation was a retired Regular Officer, Colonel M C Perceval-Price, supported by three World War II Sapper Officers; Lieut Colonel W A Hare MC and his wife, Major H Balston and his daughter, and Major T le M Spring-Smythe and his wife. We were very well represented by them. Besides bringing our greetings from Home they brought tape-recorded messages from our President, from Lieut General Sir Clarence Bird and Lady Bird. (Lady Bird is particularly remembered for the work she did when General Bird—a Lieut Colonel at the time—was Commandant and together they made great improvements for the health and welfare of the Other Ranks' families.) Perceval-Price also had in his baggage a magnificent Historical Record of the doings of the Bengal Sappers serving in the Third Afghan War. This had been compiled by Brigadier E F E Armstrong for the Museum.) He also had a large silver salver as a present to the Mess in Roorkee from the Association.

Of his arrival in New Delhi Perceval-Price writes: "I quickly made contact with the Liaison Officer whom the Engineer-in-Chief thoughtfully sent to meet my flight. The E-in-C had dag up an old Customs Regulation saying that mementoes were not liable to Customs Duty so no smuggling was required of me. I was staying in Delhi at a Guest House run by a retired Bombay Sapper, Lieut Colonel Khanna, who also has a 9-acre farm near the City. He and his wife, who are keen cricketers, were most helpful in every way. I was hospitably entertained by the E-in-C and soon found that most of my Indian friends from days gone by are now retired Generals in addition to being either business tycoons, retired Ambassadors or ex-Commanders of UN Peace-Keeping Forces—much above my station! One of them runs a large stud farm near Delhi and is a regular customer at the Newmarket Bloodstock Sales."

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Photo 1. The Salver. The two badges are "The Prince of Wales Feathers", the badge worn in the days of *The Raj*, and the badge of the Indian Corps of Engineers.

Although out of chronological order, perhaps the following extracts from a later letter from Perceval-Price may be included here. "I soon noticed that agriculture in the UP has been much improved. A lot of artificial fertilizers are now used, much wheat of new varieties is grown, and wheat is even being exported from India. The UP is considered rather backward and few villages have electricity, but many of them are connected to all-weather roads. There is much more money evident in the countryside than in the '30s, and the people seem to spend it on better clothing and food rather than on houses or sanitation. These are much as in former times. *Ghee* is no longer used much as the population has long ago outstripped the supply of milk. More tea is drunk, and more kerosene is used for heating and lighting, but one still sees (and smells) cow dung cakes being burnt as well. Cricket is frequently to be seen being played in even the remotest villages."

He also visited Dehra Dun and the Bhakra Dam, which must be one of the largest solid concrete dams in the world. In Dehra Dun he was told that only six tigers remain in the nearby jungles. Blackbuck and panthers are seldom if ever seen and his informant knew nothing about the *Jheels*—swamps where wild duck collected during the winter—near Roorkee that we knew in our day.

. . .

After this diversion we must leave Perceval-Price, who had set off for Roorkee

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# **Roorkee Revisited 1978**

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Photo 2. The reverse side of The Salver.

with a Sikh Major and his wife also visiting Roorkee. We must join some of the other members of our Delegation.

Major Balston writes: "We set out for Roorkee at mid-day. The first thing we encountered in Delhi was a riot, and the Police were in action with tear gas. Our taxi driver took evasive action and we got to our destination in the cool of the evening. We crossed the bridge over the railway in Roorkee, turned up Dhillon Marg, noticed a road called God's Own Marg and another called Bill Williams Marg and turned into the Mess drive. (Marg: a word of Hindi origin meaning road, not commonly used in Urdu.) We were greeted with the kindest of welcomes by the Chief Instructor of Workshops, Captain Gupta. From then onwards we were cared for in the most efficient but relaxed way, everything for our comfort having been thought out in great detail. Our first call, still hot and dusty from the road, was on the Commandant (Colonel Wadhawan) and his wife in their bungalow. A fellow guest, General Nanda, who arrived simultaneously, remarked: "When I was a student I was taught by your father-in-law, Colonel Crawford." This seemed a welcome home!"

We must now take leave of Balston and see how Perceval-Price, who had arrived the day before, had fared re-visiting his old haunts. He writes: "The Mess is vastly expanded. The old Ante Room and Billiard Room are both used as Ante Rooms. The old Library, now nicely panelled—as are all the main rooms—is used as a bar. The old Mess Secretary's Office with its verandah is used as a Ladies Room. (No

# Roorkee Revisited 1978 (2)

officers allowed in unless accompanied by a lady.) Behind this there is a new Library and a new Billiard Room, round which hang portraits of former British and Indian Commandants. The present generation, incidentally, had never heard of billiard fives! There is a new Dining Room parallel with the old one and separated from it by arches. In addition there is a small additional dining room which is, I think, the small room we used when 'dining dirty'. About twenty-four heads still adorn the walls: buffalo, goorul, ibex, and several tiger skins. The Burmese Bell and the Burmese Door and the Chinese Door still survive. The oldest Mess Servant claimed to remember me when he was a boy, and several others claim to be descendants of the old Mess Staff of the '30s. I was told that my old Bearer had died, but an old man presented himself to tell me that he had been 'Mocha' Sutherland's Bearer. (Colonel G D Mc K Sutherland himself died on 31 July 1964.)

"In the Cantonment I was first shown the Boys' Hostel with a Primary School alongside. These schools at all Bengal Engineer Stations are run with an identical syllabus, so that a boy whose father changes station can enter the new school without losing ground. I also saw the Knox Memorial School which is separate, but I could not quite follow the difference. At the Roorkee Health Centre there was a photograph of General Bird and Lady Bird prominently displayed in the hall. There were posters on the wall—some for family planning—and clean clothing on the nurse's table inscribed with the words 'Roorkee Helf (sic) Centre'. There was no sign of activity, but that may have been due to it being Sunday. It was very clean and tidy. After that I was taken to the *Shlvala* and the *Gurdwara*, now expanded to touch one another. We visited the Mosque, into which my Sikh companion also entered. They still enlist a few Muslims from the East Punjab, but more civilians worship there than troops.

"By now my inside was beginning to feel a bit shaky, but I carried on to re-visit the HQ Offices and was duly photographed sitting in my old Adjutant's chair. We went on to visit Sukh Ram and Sons, now labelled 'University and Military Tailors' (in that order). I went in and saw the picture of the old man with a white beard who used to measure one. His grandson now runs the business and was delighted to find someone who remembers his grandfather.

"Suffering from my malaise, I slept all the afternoon, but emerged to watch the finals of the Basket Ball Championship in the evening. I was without warning invited to present the prizes and found to my surprise that the language came back very easily. After this I was taken by a Christian Sapper Officer to the site of Bill Williams's grave. The Cemetery is well tended, and Bill's grave particularly so. I bought a wreath on behalf of the Association and laid it on the grave.

"While near the canal, I photographed the *dhobles* under Ganeshpur Bridge. It might have portrayed a scene 100 years ago! Likewise, on returning to the Mess I seemed to see the same sweepers, using the same brooms, still sweeping the same dust; the same tree-rats climbing the same trees; the same *chipkullies* (lizards) on the same walls. I even saw the same 'seven sister birds' never having settled their old arguments. (Indians call these birds 'seven brother birds', a reflection perhaps on the more argumentative habits of boys than girls in India.) I heard the familiar cry of the brain-fever bird and saw the same figures apparently sitting on the same *charpois* outside the servants' quarters. It all made me feel very much at home."

On the Monday morning, the main celebrations began with a golf match at 7am, followed by a breakfast at the Three Feathers Club overlooking the old Fieldworks Ground, now the Golf Course. After breakfast—a formidable feast—there was a special social function for the ladies and perhaps we may be permitted a feminine touch.

Daphne Balston writes: "The welcome was one the like of which I have never experienced before. Each visitor was made to feel she was the most important person in the room.... The women tended to keep slightly apart from the men and I was always drawn into one of these groups and made to feel very much at home.... Of the many ladies I got to know I don't think I ever saw one of them in the same saree twice—which meant a dozen or more beautiful sarees in a few days. The saree really



Photo 3. Presentation of The Salver to the Engineer-in-Chief.

is a most practical garment. It not only suits all types of figure, but it can be worn—with or without a knitted jumper—both on the back of a motor bike or at a cold evening party. And some evenings were quite chilly!"

Meanwhile Perceval-Price continued his explorations. He writes: "I was taken to St Gabriel's School in the old No 1 Bungalow. It is run by the Roman Catholics and has over 1,000 boys and thirty-two staff. The central room of the Bungalow is now a Chapel and Rest Room. I was told it had been Bill Williams' Room.

"There was a great get-together with the pensioners at what was formerly the British NCOs' Mess (now the JCOs' Mess). Here I was kept busy taking down the names of British Officers to whom pensioners wanted to be remembered, and answering enquiries about British Officers whom they had known. (Many of those asked after are now dead, such as Veitch, but many are still living.)"

At this function Balston showed some photographs of his wedding in Roorkee in 1943. He had had a guard of honour from amongst his Subedars and Jemedars, and their successors were intrigued to see the old Khaki drill clothing of those days. (Today's photos seem to show a smart green kit with a blue beret, except for the Sikhs.)

At mid-day there was a Barakhana in a huge hanger for all ranks with their families, followed by country dancing, Perceval-Price writes: "Something in the order of 800 people must have been fed. When the top table was seated an NCO advanced, saluted and blew his whistle as a signal for the men and their wives to begin, sitting in rows with the dishes already before them. The wives were all nicely dressed in sarces. When all had fed there was more whistle-blowing and three dancing teams performed on a raised platform rigged in the middle of the hanger. First there was an Indian dance, then a more lively Kamaoni one and finally a *Bhangra* from the Punjab, involving quite a lot of stamping and waving, not unlike a Khattak dance. All very good."

That evening the "Great Roorkee Opera Party" put on "Badi Buaji" at the Central Theatre. It was an excellent production by a mixed cast from the garrison.

# Roorkee Revisited 1978 (3)

#### THE ROYAL ENGINEERS JOURNAL

Let Balston renew the Muse: "After the last curtain and bouquets had been presented we were whisked away to the grounds of the Officers Mess for the preliminaries of what was announced as a Moghul Dinner. Here there were dancing and "whisky galore". An hour or so later the Commandant strode to the microphone and made a short official speech of welcome to the British Officers 'who have travelled many thousands of miles to attend the celebrations'. He went on to announce that Perceval-Price had brought with him some tapes bearing messages of friendship from General Sir Ouvry Roberts, General Sir Clarence Bird and from Lady Bird. These messages sounded clearly across the lawn of the Mess; and I am sure all those present listened with great attention and satisfaction. (Unhappily space does not permit the messages to be reported here.) There was loud applause after the recordings and the Commandant proceeded to give each British Officer a present. This present consisted of a fine miniature of the War Memorial, mounted on a wooden base with each inscribed with the recipient's name; a set of glasses and an ash tray with the Three Feathers inscribed; a Three Feathers key-ring, and even a bottle of whisky with the Three Feathers label on it.

"The next day, 7 November, was to be the climax of the celebrations and began with a well executed Ceremonial Parade on what used to be called the Maidan, overlooking the War Memorial. The movements followed the traditional order, with the Companies marching past in marvellous straight lines to the tune of Wings, followed by an Advance in Review Order."

Let Perceval-Price again take up the tale: "The breakfast that followed the Parade was again a mixed affair in the Mess, after which I went to see the opening of the new Children's Playground for Other Ranks. The E-in-C's wife did the official opening and children surged over swings and slides, refusing to retire hurt when they fell, but continuing with undiminished zest. An Art and Needlework Exhibition followed in the Nursery School just behind the newly opened Playground. Here I saw the only two horses I saw in India—two rocking horses!

"Lunch was then served for about 100 in the Commandant's Bungalow. This is now the 'Mikehouse' of my day—though no longer so named. Everyone seemed to know that I had designed it, and I was shown all round and saw that a few additions had been made. At this gathering I presented 'Effie' Armstrong's album of the Afghan War events and received the gifts that had been intended for me the evening before when I had been unwell. I was still feeling a bit below par and spent that afternoon also in bed; but in the evening I watched the Beating of Retreat, a



Photo 4, Commandants All, L to R: Brig R S Sundaram, Brig M Valladares VSM, Brig Naresh Prasad VSM, Col V Wadhawan, Lt Gen J S Dillon, Maj Gen B P Wadhera AVSM, Maj Gen K C Soni, Brig S S Rana

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gymnastic display and a Torchlight Tattoo and Firework Display. All were excellently presented.

"The final Mess Dinner had to be delayed because certain distinguished guests had been delayed on the road from Delhi. However we eventually sat down eightyfour for dinner. Lots had been drawn amongst the junior officers for seats. The meal was conducted on traditional lines and at the end of it my turn came to present the silver salver I had brought from England. I had guarded it with the greatest care to ensure that the glittering polish given to it by the silversmith in Reading was in no way tarnished. It looked splendid, I made a short speech for the occasion, quoting the inscriptions on the face and the reverse of the salver."

The inscription on the reverse, which we hope in days to come will strike the right note on appropriate occasions, reads as follows:

"General Sir Ouvry Roberts GCB. KBE. DSO. and one hundred British Officers and Officers' Widows contributed to this Presentation. The passing of time has not diminished their great affection for the soldiers with whom they served in the Bengal Sappers and Miners; and they rejoice that so many of the old virtues, traditions and customs that they themselves honoured are still honoured by the sons and grandsons of the men they knew so well in bygone days."

General Dhillon replied, and has subsequently written to the present writer both to say how pleased they are with the Presentation and how felicitously it was presented by Perceval-Price. "Thus the evening was spent, the celebrations ended, and with a feeling of contentment the assembly dispersed. There was a full moon outside and the crickets chirruped under the trees of the Mess Garden."

\* \* \* \*

Here the Muse brings down the curtain, but two random thoughts may perhaps be added as a postscript. First, just as Balston was about to depart next morning an old man appeared clutching a *chitti*. It was signed in 1932 by "C A Bird, Lieut-Colonel RE, Commandant," appointing the man as *Bishti* in the Commandant's bungalow. (Balston has been able to send the old man the photograph he took of him.)

Secondly, when our Delegation had returned, General Bird sent a note to Peterborough of the *Daily Telegraph* which was published on 9 December. He recorded how the most charming letters of appreciation had been received from Roorkee; and he ended with the words: "A happy interlude in a troubled world." There must be very few men of ninety-three capable of such a successful feat of journalism as getting published on the centre page. But then he was a Bengal Sapper.

# Escape from Singapore—Part IV and Appendices

#### MAJOR FRANCIS L ANGELL RE

Parts I to III told of the journey from Singapore, to Sumatra, to Java and of the preparations for the journey to Colombo on the Wu Chang, a China river boat. The story concludes:

#### CHAPTER SIX

At 4.00pm on 27 February we set out for Colombo. The idea was that all the little ships in the harbour would sail together to a given point and await a Naval escort. We would then proceed until it was time for the *Wu Chang* to break away and start her lonely journey to Colombo. I think we were first away and as it got dusk I remembered seeing some fourteen little ships in line steaming away from Tjilatjap.

That night we had a very heavy rain storm and everything was blotted out. This was possibly just as well in case the Japs were watching the harbour, in fact it was

what we had hoped for on leaving Singapore. But in the morning there wasn't another ship in sight. Now the skipper had maintained that we would be much safer by ourselves as we were a very small target. We all wondered whether he had deliberately "got lost" or whether it was the school atlas. I heard subsequently that the escort did not turn up as it had other important work to attend to. The ships bound for Australia had a very bad time. The Japanese raided Christmas Island and their planes spotted the ships. When the Japs had finished the Christmas Island job they set about the little vessels sinking several and causing many casualties.

The Wu Chang chugged along at about six knots, I believe her all-out speed was about eight knots. She rolled at a most alarming angle and sitting on the deck you would be looking into the ocean one minute and at the Heavens the next. Why she didn't turn turtle I cannot think but it was quite obvious that one storm and she would join the dozens of other little ships recently sent to the bottom. I suddenly remembered that I was a very bad sailor and I ought to have been sick long ago! Then I realized that even in the *Tanjong Pinang* where we had that appalling stench I hadn't even felt sick! What was more, no one had been sea-sick since leaving Singapore. The doctors assured me that you can't really do two things at once and that if you had the "wind up" you really haven't time to feel sick. And I suppose I can say without fear of contradiction that we were all "windy" to a greater or lesser extent and had been since 14 February.

OC Troops, Lieut Colonel Phillips, was magnificent on this voyage and we all have a lot to thank him for. He seemed to have everything under control; this proved a Godsend in the trouble which followed. All the officers and men were allotted their specific tasks. The poor old Sappers of course became the sanitary squad, a most unpleasant task when you think that there were five hundred, not to mention one woman who required special privileges, on board. What little sanitary accommodation there was seldom worked owing to the shortage of water. And I discovered that there are a hundred odd jobs which, it would seem, only Sappers could tackle. There were all the bamboo mats which had to be roped and looped for use as rafts should trouble overtake us and this took quite a time. Duties such as submarine spotting were of course shared by all.

This little boat boasted three lifeboats which were scarcely sufficient for five hundred of us so OC Troops allotted seats to each platoon according to it's strength. My platoon now numbered sixty-one officers and men so I was given seats for two officers and seven other ranks! Handing out these seats was an impossible job so I suggested drawing lots for them to which all agreed. I didn't get one but quite honestly I wasn't very worried on this score because I thought if we got a direct bomb hit or were torpedoed those one hundred tons of bombs down below would blow us all to Kingdom-come anyway. I must say that the senior officers, Brigadiers, Colonels and so on refused seats right from the start which I thought a very good thing and which I am sure the men appreciated.

At 10.00 am each day we had boat stations. When the siren blew all men had to fall-in at their quarters by platoons and the platoon commander had to parade with them wearing, if he had them, his tin hat and revolver. Those with seats in boats naturally fell-in by their boat. Then round came OC Troops accompanied by the skipper and they spoke to the men. There was no nonsense of clean boots or polished buttons, some had no boots anyway, but the men were asked how they were getting on, and had they any suggestions for improving comfort or rations. I thought it was a grand idea and it was certainly more personal than Regimental. The OC could size up a man and towards the end of the journey when officers and men were, shall I say, getting rather down, he knew the chaps and knew how to handle them; but don't for one moment think that he stood any nonsense, he did not.

The next thing he did was to split the officers up into syndicates, Sappers, Signals, RAMC and so on. Each day there was a compulsory syndicate at 4.00pm in the little lounge. Each party had to say what it had learnt from the Malayan campaign. You could say what you liked within reason and the views expressed were definitely
candid as can be imagined. When you have a bunch of officers who have been through a most unpleasant retreat and final surrender, and who really don't expect to live to tell the tale, they say quite a lot of things, which, under different circumstances, would remain unsaid. Each session ended up by general discussion and questions and I must say I found it most interesting and instructive. The last session was taken by the Staff Officers of the Malaya Command who were present and they summed up the points raised by the syndicates and then gave their own views, I have since heard it said that one officer who expressed certain opinions at those meetings had landed himself in trouble because of them. I sincerely hope this is not true because every officer was invited to say what he liked, and you must agree that the conditions were rather unique. Having ultimately got away with our voyage everything said at those meetings should have died at Colombo and never have been allowed to be repeated except by high ranking officers in the form of instructive criticism.

Then at 11.00 am each morning we had a voluntary talk given by any officer on the interesting experiences he had met with during the campaign. As several officers had been behind the Jap lines for some time some very interesting stories were heard. As can be seen, everything was done to keep our minds occupied. Before leaving Tjilatjap one of the officers had obtained playing cards, "Housy-Housy Sets" and other games to help the men pass the time which proved invaluable.

And so the time went by. We had bully beef on biscuit or fish on biscuit with a mug of tea, for breakfast, lunch and supper and during the morning a drop of water which had to be most carefully rationed. Before breakfast you could stand on the deck if you so wished and be hosed down with salt water which was the principal wash of the day. With cold sea water and sore faces, shaving was a problem, but we scraped away. It was very hot as can be imagined, the sun burnt you, the ship rolled along at her six knots, the sea remained calm and Heaven-be-praised, no Jap planes came to see us. Not that they were likely to because we were hundreds of miles out in the open sea, but one automatically scanned the skies. The sick parade each morning was between fifty and sixty strong and I was terribly pleased that we had obtained the medical supples from the Dutch. Officers and men went down with malaria and some came out in horrible running sores. What caused the sores I cannot say unless it was the food, but it didn't affect me. The poor chaps who had both fever and sores really were in a bad way and there was little you could do to help them. And it was so damned hot!

On the morning of 4 March we had our boat stations as usual and, that finished, we lay around awaiting our syndicates. Suddenly someone shouted "What the devil's that?" There was a white streak shooting across our bows. The siren went and everyone took up boat stations. I jammed on my tin hat, put on my revolver and ran down below to join my men. They were all in their allotted places. Now on a river boat the sides of the boat below the cabin deck are open and as we stood there two more of those infernal white streaks appeared heading straight for us, broadside on. It was ghastly. We could do absolutely nothing about it. On they came and it seemed almost as though the boat slowed down with the express purpose of giving the torpedoes a fair chance. It was the same feeling as when a shell whines down beside you and you feel chained to the spot. You can think an awful lot in a few seconds and believe me I did, but the only thought which may interest you was whether, when those infernal machines hit the boat and set the bombs off, should I know anything about it as I sailed through the air in small pieces. I hoped not. On they came, nearer and nearer until I shut my eyes, clenched my fists and hoped it wouldn't hurt too much. God, it seemed years. I could stand it no longer and I opened my eyes. There were those white streaks, right up to the boat only a foot or two below me, but they were no longer neat thin wakes, they were wide and becoming dispersed. I began to think I was mental and the whole thing was a nightmare. But it had been real enough. Our poor wretched little river boat only drew eight feet of water and the torpedoes had gone underneath. There could only have been a matter of inches between us and

Kingdom-come. I'm sorry I cannot agree that a miss is as good as a mile—that was a damned sight too close a thing to be pleasant. The lads on the other side of the boat had seen two torpedo wakes come from underneath them and wondered what the devil they were. In my ignorance I thought that torpedoes travelled on the surface and that the wake is many yards behind. That little episode couldn't have lasted for more than a minute but it seemed ycars.

The submarine then made a bad mistake and came up right alongside. It wasn't a question of looking out to sea at her, there she was alongside us. It was most uncanny. The conning tower appeared and then the deck was awash and inside were those nasty little "Yellow-Bellies". We were helpless. She must have realized that something was radically wrong and submerged in a hell of a hurry: word was passed round to stand by with anything that would float as she would in all probability come up again and shell us. Everything was made ready and again, chugging along at six knots, we waited. Sure enough she surfaced a little way back and I anxiously waited the whine of the shell. The suspense was the worst thing, waiting, waiting, it seemed an eternity. But nothing happened. We chugged on and the submarine became a speck in the ocean. I think that submarine Commander must have thought there was something "phoney" about our boat. He had put two torpedoes right at her. She ought to have been blown to bits but there she was placidly continuing on her way.

Well, I know how I felt during that incident and I felt damned sorry for our only woman passenger. We could get together and say precisely what we thought about the Japs, their bloody submarines in particular, in no uncertain terms and get it off our chests; but she wasn't so lucky, she just sat on, by the bridge, and I expect offered up a little thanks. Of course like most trying incidents it had it's humourous side. The drill was that officers without troops remained on the cabin deck during boat stations. When the two torpedo wakes were seen bearing down on us one officer, who had in some miraculous manner obtained a bottle of Johnny Walker, broke off the neck of the bottle, drank half the contents neat in a few gulps and handed the remaining half to a brother officer who polished it off. He said he thought he might just as well die with something warm inside him as not. The remarkable thing was that both of them remained stone-cold sober. For what it's worth they were both Sappers. How different it had all been to the Shu Kwang. No fuss, no excitement, everything according to plan. I think OC Troops had something on which to congratulate himself. I was most interested to see that Gilmour mentions that above incident in his Singapore to Freedom. I am of course referring to the two torpedoes and not to the drinks!

We went up onto the roof over the cabins and rigged up a spar to represent a gun which was then manned. We hoped that this might deceive the next Japanese sub into thinking we were armed and at least keep it at a respectable distance before it did it's tricks. I've no idea whether it's true or not but we all thought that submarines hunted in pairs and we kept a very special lookout for the second submarine. Spotting these beastly things at night is a rotten job and I continually thought I could see a periscope moving through the water, but it must have been pure imagination as nothing untoward occurred. Everyone settled down to normal routine but I doubt whether anyone slept well that night. On the next morning, 5 March, we had a minor scare. Something was seen to break water not far from the *Wu Chang*. We all thought it was the sister sub of the previous day's incident—but it was a whale. That I can assure you was a relief.

The days and nights passed with a succession of duties, voluntary lectures and syndicate meetings. The sick parade was getting bigger and the medical supplies smaller. The little *Wu Chang* chugged and rolled her way through the ocean and there was no sign of any storm. Everything was going according to schedule and it looked as though, given a spot of luck, we would make Colombo. The radio operator picked up news items from which we learned that the morning after we had left Tjilatjap the place was heavily bombed prior to the Japanese entering—so the little ships had got out in time. On the afternoon of 8 March, we sighted Ceylon. It is a complete mystery to me how the Skipper made the correct landfall and how he got the Wu Chang along without mishap. I think I'm right in saying that our speed was a little slower than a submarine when submerged and it must have been a terrible temptation to have put her along a little faster and this would probably have resulted in a breakdown. We were very lucky in having that particular Naval Officer as Skipper and that particular Army Officer as OC Troops, they were both grand throughout.

We found our way through the minefields and reached the Mole at Colombo at 4.00 pm only to find that the harbour was closed for the night! A launch came out to find out who we were and then instructed us to anchor near the Mole. The men asked for a padre to be sent out for a short service but no padre was forthcoming, which I thought rather a pity. I wish I could give just a brief idea of the wonderful feeling of relief we experienced. We had left Singapore on 14 February, We had been chased and badly bombed by Japanese planes and again bombed and sunk. Miraculously picked up by the Tanjong Pinang and taken to the Indragirrie. Crossed Sumatra and away from Padang before the Japs got in. Passed within a few miles of a Naval battle at the Sunda Strait without incident and landed in Java. Out of Tjilatjap the night before the heavy raid and the occupation by the enemy and the little Wu Chang had not turned turtle. And thanks to the fact that she was a river boat we had harmlessly passed over two torpedoes. Like most of the others I spent the night on the deck, just lying there and thinking it all over and thanking God that we had made it. Of course I wondered what had happened to my family; had they got away with it, or had they been less fortunate. I don't think I slept very much. With the worries of the journey removed I just wanted to lie there and think. And what a lot to think about. I'm one of those who cannot agree that it was just luck that had seen us through—Yes, I thanked God from the bottom of my heart.

At 8.00 am the next morning we steamed into the harbour passing numerous troopships crammed with men. We were like nothing more than a small toy sailing between those troopers. The port doctor came on board with various officials and because of the number of sick and the insanitary condition of the boat, promised to get us off quickly. We disembarked at 3.45 pm and officers with troops marched their men off to a collecting point from which they were taken to camp. On my way back to the *Wu Chang* I spotted an evacuee office on the jetty and thought it possible, though highly improbable, that I might get news of my wife and kiddies. To my astonishment and delight not only had they heard of them but there was a little note written by my wife saying that all was well and they were continuing their journey Westwards. It seemed that she had thought I might get away and reach Colombo and that it was worth while writing. That little note did me a power of good.

The officers were told to report to the Galleface Hotel and on arrival found that we were quartered on the ballroom floor. That evening I found quite a number of civilian friends from Singapore who had been sent out earlier. It was a very happy reunion.

The first job next morning was to try and get some money and to buy a new uniform. As I was a Major the Paymaster graciously consented to advance me 130 rupees which was about as much good as a sick headache! But I was lucky. The other chaps, Licutenants and Captains, were given just about enough to buy themselves some cigarettes. We tried to explain the position but it was useless. Those of them who had taken the trouble to listen to the radio had a vague idea that there was a bit of a war going on somewhere, but they didn't seem terribly interested.

The wounded who had been put into hospital in Sumatra had been taken through to Padang and put into a ship heading straight for Colombo and I was very glad to meet them all again. On reporting to headquarters I found that all my men were posted to Trincomalee, that one or two Sapper officers were required and that the rest of us were to go up to Bombay. I was very sorry about this as I had worked with my men for about two years and had hoped that we might carry on together. Whoever got them acquired a grand bunch of men. Saturday, 14 March, saw me on the Trooper HMS *Dunera* heading for Bombay. There is no need to tell of subsequent events except to say that it seemed that anyone from Singapore "Smelt like a drain" and was not very popular. Why this was I cannot say, but other officers had remarked about the same thing. We couldn't help it that Singapore had fallen and we had done our best. It took a long time before Delhi gave me my official posting and in the interim I was sent from Bombay to Bangalore and after a few week's down to Trichinoply and eventually to Karachi. Then on into Persia via Quetta.

Looking back over the war period I am amazed at the extraordinary good fortune I have had. I received my discharge from the Singapore Volunteer Corps with the outbreak of the war in Europe in 1939 and obtained my commission as an ECC in the Royal Engineers. But for that I should have been serving with the Volunteer forces at the fall and should either have been killed or a prisoner of war. Both my partners, Volunteer officers, are in the bag, one in Thailand and the other in Japan. And when one thinks of the number of Sapper officers who were left behind it makes me wonder why my name was included in the list of men booked for the "Get Away". My wife and I decided to refuse the offer of evacuation for her with military families in December 1941. My practice was in Singapore, my home was there, and everything I had worked so hard to obtain. I could not imagine Singapore falling; it did not seem possible. But in mid-January my DCE, Colonel Peak, came into my office and said "Where's your wife?" Not taking him very seriously I said that I thought she would probably be at home, to which he replied, "Don't be a bloody fool Angell, get her and the children out of here." And with that departed, Knowing him, I realized that he meant what he said and straight away rang Headquarters and asked that my family be included in the list for evacuation. As I have said before, they got out on 31 January 1942, fifteen days before the surrender. I still think that if my Colonel hadn't seen me I would have left it until too late. As for my own journey, well, to my mind it sounds too fantastic to be true. But I assure you that I haven't been romancing.

And so, like hundreds of others who lost everything in that shambles, I am keen to get back and make a fresh start; and I thank God for my health and strength.

The End

APPENDIX A

List of RE Personnel who were, on the night of February 13/14, 1942, instructed to report to move to Batavia.

Lieut Colonel W H Treays		CRE Singapore Fortress
Major Wooldridge		DCRE Changi, Singapore
Major D N Moore		DCRE Coast Defences, Singapore
Major F L Angell	(108085)	DCRE Alexandra, Singapore
Major H De Blois	```	DCRE Perak
Captain Harrison		IREM
Lieut Treffry	(123748)	GE
Lieut Easterbrook		
QMS Lush	(398716)	Clerk of Works
QMS Poulden	(1862957)?	Clerk of Works
QMS Martin	(1862957)?	Clerk
QMS Day	(1863336)	Mechanist
QMS Longstaff	, ,	Draughtsman
S/Sgt Bailey	(1868813)	Clerk of Works
S/Sgt Buckett	· · ·	Clerk of Works
S/Sgt Davies		Clerk of Works
S/Sgt Smith	(2122180)	Clerk of Works
S/Set Bass	(1868810)	Clerk of Works
S/Sgt Marsh	(1869934)	Mechanist

S/Sgt Williamson	(1879677)	Mechanist
S/Sgt Homer	(1867551)	Draughtsman
S/Sgt Phelps	```	Clerk
S/Sgt Ginn		
Sgt Goodridge	(1869251)	Draughtsman
Sgt Dix	(1868424)	Draughtsman
Sgt Parkyn	(2040162)	Draughtsman
Sgt Gurnsey	(1873661)	Clerk

APPENDIX B

List of RE Casualties during the first bombing of the Shu Kwang.

Killed:	Major D N Moore		
Wounded:	Captain Harrison	S/Sgt Bass	
	Lieut Easterbrook	S/Sgt Homer	
	QMS Day	S/Sgt Phelps	
	QMS Longstaff	Sgt Goodridge	
	Sgt Parkyn		

APPENDIX C

The following RE Personnel escaped from Singapore and joined up with me at Padang, Sumatra.

QMS White	(1867506)	Mechanist
S/Sgt Evans	(1862846)	Clerk of Works

APPENDIX D

List of Engineer Personnel (Java) who became part of my Platoon at Poerwokerto, Java,

Major W A Kirk SRE Major D M Mc Diarmid SRE Major P Mc Nee SRE Lieut F Moston RE Lieut R A Addison SRE Lieut R W Hewson SRE Lieut P J Norris SRE QMS Carpenter RE

QMS E H Lane RE QMS L C Wren RE S/Sgt R M Johnson RE S/Sgt C Willoughby RE Sgt G Blake RE Sgt P G Lillie RE Sgt J C Parsons RE Sgt R Teasdill RE

Cpl W H Myers RE

Note: The SRE Officers above are believed to have been Engineers of PWD Malaya.

APPENDIX E

List of Signals Personnel who became part of my Platoon at Poerwokerto, Java.

Captain H E Cornish FMSVF Sgt H C W Camp (2323423) L/Sgt G Webb (2324409) Cpl W Moffat (2324362)

VF Cpl N Northall (4189931) 3) Cpl A D Sinclair (2323247) L/Cpl F Darlow L/Cpl F H Williams (1868778) Sig R D Ladkin (2361008)

APPENDIX F

List of RE Personnel who became part of my Platoon between Poerwokerto and Tjilatjap, Java.

Lieut Sibley Cpl R Tall (2092861) Cpl R Lightbody (2065394) L/Cpl R J Tuck (2077953) Spr S Futcha (1906816) Spr J Piercy (1906820) Spr I J Laws (2094286)

Spr J Marsland (1905315) Spr J Lock (1922994) Spr W Pring (2067932) Spr J Fielding (2092925) Driver D Munro (2003413) Driver W Bailey (2091741) Driver J Comerford (2077471)

## Water Water Everywhere Nor Any Drop to Drink!

MAJOR M G R MONTGOMERY RE, B Sc



The Author was commissioned from Sandhurst in 1964. After three years at Shrivenham he served as a Tp Comd in 3 Div Engrs. His next two years were in 35 Engr Regt as a Sqn 21C and included a tour in Northern Ireland in the infantry role. He then spent two years as Adlt 42 Svy Engr Regt before attending the Long E & M Course. He is at present with 38 Engr Regt commanding 15 Fd Sp Sqn.

FRESH water, or the lack of it, has featured prominently in the history of Gibraltar. Today it is still a problem, though with the introduction of salt water distillers on The Rock the average inhabitant is less aware of it and more pre-occupied with other matters such as going about his daily business or the Spanish border question. Gibraltar has always been a garrison and the supply of fresh water was one of the many utilities run by the military. More recently, the supply and distribution system was split, and the public Works Department became responsible for the town supply and the military, initially as RE Works Services and then as MPBW and PSA, the Services supply. Today there is close co-operation between PWD and PSA, the Services supply. Today there is close co-operation between PWD and PSA, the Dividings in the City of Gibraltar are on the town supply. Often when PWD levels run low PSA help out with a transfusion of a few thousand tons from their stocks.

The Corps has done much work in Gibraltar over the years and there is still much to be done. 15 Field Support Squadron were in Gibraltar in March and April this year (1979) and carried out electrical and mechanical work installing pumps, pipework and water treatment equipment for PSA as part of their continuing improvement to the Services supply.

The main source of water for the Services supply is salt water distillation. PSA have four distillers; two on the east side of The Rock at their main water depot and two on the west side, one at Rosia Bay and the other behind the Royal Naval Hospital just opposite 1 Fortress STRE's "172 Club." Together the distillers produce around 1200 tons of fresh water daily, which is approximately 90% of demand. Water from the distillers is supplemented with rain water from catchments dotted over The Rock, the biggest of which is the southern half of the main catchment on the east side covering 26 acres; (PWD have the northern half.) The catchments, put in by the Royal Navy around 1900 were the main source of fresh water until the 1930s, when the distillers were put in. Today they are less important, providing only 8–10% of

Water from the distillers and catchments is supplemented from natural water sources inside The Rock, the main one being Ragged Staff Pool where fresh water percolates through fissures in the rock and collects as a lens on the surface of tidal

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Water Water Everywhere Nor any drop to drink Major M G R Montgomery RE



brackish water. Once every month this lens is pumped off yielding some 1500 tons. In times of severe shortage, water has been imported by tanker, usually from UK. This is not so common now, as tankers for this purpose must be brand new and must not have been used for oil or other such cargoes; with the current oil shortage and resultant glut of tankers, few new ones are available.

All raw water is fed into tanks at PSA's East Side Depot, where it is chlorinated. Prior to the Squadron's work, water was distributed by gravity along separate mains running together in the Admiralty East-West tunnel through The Rock to HM Dockyard and the RAF at North Front. Halfway along the Dockyard main, water was drawn off into Maunzells Winze, a chamber off the East-West tunnel, and pumped up to high level tanks at Green Lane, 150m above sea level, from where it was, and still is, distributed to other areas of The Rock. The old distribution system is shown at Figure 2. (Winze: A shaft or an inclined passage sunk from one level to another, but not rising to the surface.)

With only 10m head at the tanks at East Side, pressure head at the end of the



distribution mains in the Dockyard and at North Front was poor. As the mains to the Dockyard and North Front ran together along part of the East-West tunnel and parted only a few feet from Maunzells Winze, the obvious solution was to re-arrange the pipework to feed them from the high level tanks at Green lane. The estimated increased demand on the tanks was 1300 tons daily and with a capacity of 9500 tons this presented no problem. However, the pumps in Maunzells Winze had a maximum output of only 600 tons per day and were too small to meet this demand.

PSA had already brought the delivery and distribution pipes for Green Lane down to Maunzells Winze. The Squadron's task was to continue this pipework inside



Photo 1. Maunzells Winze looking south, towards valve room and pumphouse beyond. In foreground are pipes for delivery to Green Lane tanks (right) and distribution from Green Lane to Dockyard and North Front (left).

# Water Water Everywhere nor any drop to drink (1)



the Winze and make the connections for the re-arranged distribution to the Dockyard and North Front and install larger pumps with suction and delivery pipework to replace the existing pumps in the Winze. The distribution main and suction and delivery pipes for the pumps were all 8in and 6in PVC, joined together using either solvent welding techniques, or bolted flange joints where longitudinal movement of the pipe was restricted and solvent welding impractical. Two 150-50psi reducing valves were included in the distribution main to bring the pressure down to within the limits of the older pipes to the Dockyard and North Front. The two pumps were electric single-stage centrifugal pumps rated at 75kW (100hp); capable of delivering  $1\frac{1}{2}$  tons per minute each, they are run up to eight hours a day and easily meet the increased demand. The re-arranged distribution system is shown at Figure 3.

At PSA's East Side Depot the only treatment carried out was chlorination, by the sackful by hand; there was nothing for palatability or acidity correction. To update and improve the treatment, modern automatic chlorination and water treatment equipment was required. The Squadron installed two sets of chlorine control and injection units and four 0.75kW dosing pumps, two for calcium chloride for acidity correction and two for sodium carbonate and sodium bicarbonate mixed for palatability. This equipment is duplicated as chlorination and dosing are essential to water treatment, and one set of plant must always be on standby should the duty plant break down.

The project aim was to get as many as possible of the Squadron to Gibraltar, complete the project tasks, and carry out other suitable work found whilst there. Of the forty-two men who went to Gibraltar the majority were workshops tradesmen from Resources Troop and as the project progressed it soon became clear that extra work could be taken on. PSA had the ideal task; they needed an alternative distribution main to the Upper Rock.

The Upper Rock is a MOD Training Area, used mainly by the resident battalion and visiting units; along the peak the Royal Navy and RAF have much of their radar and telecommunications equipment. The Upper Rock is supplied with water from a tank at Rock Battery at the northernmost end of The Rock, with water pumped from the tanks at Green Lane. Water is distributed by gravity from Rock Battery to Middle Station, halfway along the peak, where it has to be pumped up to Spy Glass Battery, the summit, at the southernmost tip of The Rock, some 7m higher than Rock Battery.

By installing pumps in existing unused pumphouses at Hole-in-the-Wall (80m above sea level) and Mediterranean Road (260m above sea level) and linking them together to the tanks at Green Lane using an existing main in the Fosse Way tunnel, PSA would be able to pump up to Spy Glass Battery and supply the whole of the Upper Rock by gravity, leaving the existing main as a back up. The Squadron installed two 55kW pumps and two 22kW pumps at Hole-in-the-Wall and Mediterranean Road respectively, with electrics and pipework, and laid 300m of 6in screw-threaded galvanized mild steel pipe in the Dudley Ward tunnel linking the pumps at Hole-in-the-Wall to the main in Fosse Way: PSA will complete the system by connecting Hole-in-the-Wall and Mediterranean Road pumphouses at some future date. The present distribution system and alternative systems are shown in Figure 4.

Work was supervised by a Clerk of Works (Mechanical) under whom tradesmen worked; when not required by the CW(M) they worked in a pool under a combat engineer SNCO on various non-technical tasks for PSA. These included laying a culvert across Engineer Road to divert rainwater between catchments, re-roofing a hut halfway up the East Side catchment used by catchment maintenance men as a rest room and store, and the stripping out of scaffolding and boarding in Ragged Staff Pool used as a walkway for taking water samples across the pool. One other task was the construction of an 80ft long reinforced concrete hardstanding for the PWD at their Highways Depot at Catalan Bay for two rock crushers bought some years earlier from MOD.

Project tasks and all other work were successfully completed in the two months,

saving PSA £26;900 and PWD £4,080. There was much technical work enabling the tradesmen to work in a different environment to their normal Workshops life and also as members of a construction team, so expanding their knowledge and skill. Such work by the Corps is of tremendous benefit, both in the savings made to PSA and the training value for the sappers. What is more, on this occasion it enabled the Squadron, who were last in Gibraltar in 1919–1925 and before that 1885×1914, to make a welcome return to The Rock.

## **Royal Engineer Divers in Kenya**

#### LIEUTENANT C J WARD RE



Having spent seven months at Sandhurst, Colin Ward was commissioned into the Corps in August 1976 and following the YO course, he spent two and a half years in BAOR with 73 Indep Fd San RE. Since September of this year he has been a Troop Commander at the Junior Leaders Regiment. He has served in BAOR, N Ireland and Kenya.

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ON 3 January 1979 six members of the RE Diving Team, 73 Independent Field Squadron RE, landed in Nairobi, Kenya; Exercise Limpid Midnight had begun.

The idea of spending four months diving in the Indian Ocean, was initially conceived by Staff Sergeant Tony Liddicoat in May 1978. He had previously spent three months in Mombasa diving with the Joint Services Sub Aqua Expedition in 1977 and was keen to take his own team of professional RE divers to participate in the third season of the Mombasa Wreck Excavation. Initial approval by Major S Lane-Jones, our Squadron Commander, meant that planning for the Expedition could go ahead. In December 1978, the team spent a training week in Kiel, diving and finalizing all arrangements. Final clearance for the Expedition was not received until mid-December. We left for England on 28 December, to join 50 Field Squadron (Const) RE, who were flying out to Kenya for a four month tour. They had agreed to transport us and our freight to Kenya. Without quite managing to escape the snow, we left England!

Having collected our freight, we drove down to Mombasa. The Expedition house, located near the Old Port, is situated some 100 metres from the wreck site. With the exception of Robin Piercy, the Archaeological Director, we were the first members of the team to arrive. Work started immediately with the preparation of the lighter for diving operations.

The wreck lies approximately 50 metres offshore, below Fort Jesus, formerly a Portugese stronghold, now a museum. The ship rests on a steep 30 degrees slope in 15 to 18 metres of water. The excavation was conducted from an old ammunition lighter, which was anchored over the site and remained in sits for the entire period of excavation. The Excavation itself is conducted under the auspices of the National Museums of Kenya and directed by the Institute of Natical Archaeology (INA).

The Santo Antonio de Tanna believed to be the name of the wreck, was a 42-gun Portugese frigate. She left Goa, India in November 1696 as flagship of the relief force sent to the aid of Fort Jesus, which was besieged by Omani Arabs. Arriving in

## Royal Engineers Divers in Kenya Lieutenant C J Ward RE

Mombasa in December, she left for Mozambique on 25 January 1697; on 22 August she returned to Mombasa with supplies and reinforcements. She sailed into the harbour and anchored near the Fort and immediately came under fire from three enemy batteries. After a series of mishaps and having lost her rudder, she was secured below the Fort by two hawsers. Unloading of provisions, meat, rice, wine etc, then began. However, after so much unloading, the ship's draft was considerably reduced and she went onto the reef below the Fort with the spring tide. On the ebb, she was left aground. She ended up with the prow floating and projecting over the reef and, finally, on the following ebb tide she heeled over and sank.

The Army Team working on the Excavation consisted of five divers and one Admin officer. As well as being leader of the Army Expedition, Staff Sergeant Liddicoat was responsible for all aspects of diving operations on the barge; I acted as Treasurer and also ran the messing for the Excavation during the latter half of the season; WO2 Terry Newbery RE was the Admin Officer and was involved in local purchase. He was frequently required to travel the 400 miles to Nairobi to collect vital diving spares which were not available in Mombasa. Lance Corporal Cook, as Equipment Officer, ensured that all diving equipment was serviceable and in good repair; the other two Army members, Sapper Comerford and Craftsman Watt were involved in drawing and logging the small finds plan. All members of the Army Team had attended at least one diving course at Royal Engineers Diving Establishment (REDE). Staff Sergeant Liddicoat is an Army Diving Supervisor (ADS) and Lance Corporal Cook an Army Advanced Diver (AAD).

The Mombasa Wreck Excavation 1979, was a truly international effort, with members coming from Great Britain, United States, Australia, Kenya, Sweden and S Africa. The Director of the Excavation Mr Robin Piercy, is a staff member of the Institute of Nautical Archaeology and he controls all aspects of the Excavation.

Diving was scheduled for six days a week with Sunday a rest day; work started at 0730 and continued until about 1730. Normally, everyone dived twice a day with a six hour interval between dives, in keeping with the Rules of Repetitive Dives. A surface demand system enabled four divers to be in the water at any one time. This system was supported by a low pressure Rotair commercial compressor. The air passed into a storage tank, through two filters and finally to the diver. For emergencies, the diver also carried a "bale-out" cylinder on his back should the surface demand system fail. An electrical high pressure compressor was used for filling self-contained cylinders, which were used mainly by the archaeologists for photographic purposes and project assessment. Safety precautions were given high priority; all diving was carried out in accordance with Joint Services Rules and Regulations with an extra 2 metre safety factor, added to the diving tables. An oxygen emergency resuscitator (Oxyviva) was on board at all times. The Kenyan Navy recently took delivery of a new recompression chamber from England and this was made available to the project. The Katherine Bibby hospital, some 300 metres from the lighter, provided medical facilities and first aid treatment. This proved most efficient when one of the divers was stung by a stonefish.

Divers worked in 2 metre square grids, carefully sifting through the sand and mud to recover the artefacts. The speed of the excavation was increased by the use of airlifts, which sucked up the sand and silt and deposited it away from the site. At the end of each dive, every person filled out a log sheet giving exact details of the work executed in their grid. These log sheets provided the archaeologist with not only the location of each artefact, but also indicated the detailed structure of the ship, ultimately giving a complete overall picture of the excavated area.

Numerous artefacts were found on the wreck this season, the most interesting being Chinese porcelain plates and bowls from the K'ang-hsi period, decorated knife handles, three fineware flasks possibly from Baroda, India and a large four-handled storage jar with stamp that may have originated in Cambodia.

Apart from excavating, there were many other tasks; the first was to break up a concretion of cannonballs (4 metres by 1 metre) to enable it to be raised to the



Photo I. Underwater View through the wreck from bow to stern. The hull has just been cleaned ready for photography, and the stereo photogrammetric tower can be seen in the background.

Royal Engineer Divers in Kenya (1)



Photo 2. Lance Corporal Cook repairing an airlift.

Royal Engineer Divers in Kenya (2)

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Photo 3. The author taking measurements during the trilateration survey.

surface with buoyancy lifts. Two-ounce sticks of Nobels 808 plastic explosives were used to carefully crack it up. The charges were electrically detonated from the lighter. Jeremy Green, Curator of Western Australia Museum has perfected this technique which does not cause any damage to the artefacts. Secondly, a complete survey of the ship was carried out in the area exeavated during the season. In his report, Jeremy Green descibes the survey procedures carried out on the ship as follows:

"The overall shape of the structure was recorded by measuring profiles at 1 metre intervals across the hall of the ship at right angles to the keelson. A stereophotogrammetric survey was carried out over the whole of the inside of the ship so that detailed information of the internal structure could be recorded. Control points were surveyed so that the photogrammetric survey could be related to the profiles and incorporated in the overall plans. The survey of the control points was carried out by trilateration. The centre of the keelson was selected as the baseline. The control consisted of tags driven into the keelson and port and starboard extremites to the site at 2 metre intervals. A 2 metre rod was clamped against, and at right angles to, the lower edge of the keelson opposite each of the keelson controls. Measurements were made to the three nearest controls on both the port and starboard sides of the site, from the base of the rod and at the keelson mark, twelve measurements were made to port 2, 4 and 6 marks and starboard 2, 4 and 6 marks from both points. The offsets of the control marks on the keelson the rod were measured and the angle of

## Royal Engineer Divers in Kenya (3)

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the rod was measured using a carpenter's level. With this information, it was possible to calculate the three-dimensional co-ordinates of all the control points."

By the beginning of April most archaeologists and student archaeologists had left, and it was left to the Army team to finish the season's excavation and then backfill the wreck site. This is done to preserve the hull of the ship, which cannot be raised at present due to the lack of wood preservation technology to deal with timbers having extremes in density in the same piece.

The Mombasa Wreck Excavation 1979 came to an end on 5 May. A total of 985 diving hours were logged and each member of the Army team had logged at least 100 hours. A fourth and final season of excavation on the wreck will commence in January 1980.

This expedition turned out to be extremely successful both in terms of training, not only in the field of underwater expertise but also in the various techniques of marine archaeology, photography, drawing and general survey work. We would like to thank the National Museums of Kenya for providing us with this opportunity and we hope that the close links that have now been forged with the Institute of Nautical Archaeology can be used for further RE diving expeditions in the future.

# Correspondence

Lieutenant H W Ashton 383 Heath Road South Northfield Birmingham B31 2BA

#### TITTMONING POW CAMP

Sir,—This is a drawing I did at Tittmoning, a prisoner-of-war camp in Bavaria, in 1941. It shows the oldest part of the place, a centuries old schloss and on the other side of it is a terrace, about fifty yards long by about seven wide, high above the surrounding land. It was enclosed by barbed wire, of course, and there was a sentry with a machine gun in a box above.



Here, walking around with others, I witnessed the daring escape of Lieut J R E Hamilton-Baillic RE. He cut through the wire in daylight aided by another brave man sitting in a deck chair partly concealing what was happening. He hid in a hut at the top of the rock face until nightfall. This hut was for the benefit of German sentrics on their rounds in bad weather and whilst Hamilton-Baillie was there a sentry with an Alsatian stopped briefly outside. The dog sniffed at the door but the sentry detected nothing.

Hamilton-Baillie told me afterwards about his walk to the Swiss frontier, a distance of about 190 miles. On several occasions German civilians spoke to him, but, fair haired, in shorts and carrying a rucksack, he looked just like any Bavarian Jugend on a walking holiday. When he was recaptured he believed he was actually on Swiss soil but there was an error on the map which had been made for him just at that point. It must have been a deep disappointment to fail so near to what would have been a classic escape but he was quite cheerful as he related it all to me. The last time I saw him he was in an escape tunnel scheme at Warburg in Westphalia.

There was an interesting spin off. Somebody suggested, before the day of the escape, that Hamilton-Baillie should deposit his pliers, stolen, no doubt, from the Germans, at an appointed place outside the camp where we sometimes had a parole walk. The Senior British Officer ruled firmly against this. It was a point of honour that no advantage whatever should be taken on a parole walk to further escaping activities.

I have no doubt that those pliers were thrown away where they would never be found by us on the next parole walk.—Yours sincerely, H W Ashton

> Colonel R T Weld, MA, C Eng, MICE 21 Highlanes Road Barton-on-Sea, Hants

#### MERRY GO ROUND

Sir—I believe that there does exist a difficulty in keeping R&D Establishments up to date with military thought. The most difficult part of a design is the General Staff Requirement (GSR) which must be most carefully composed and very clear on what is "essential" and what is "desirable". Further it must be constantly reviewed as design proceeds and the cost, in money or complication, of any feature becomes clearer. This is normal good practice.

When MVEE (MEXE) started in 1946, although at this time most of the civilian staff had recent battle experience, the problem was recognised. Serving officers were included in the establishment on a scale to give one in each design group plus posts at higher levels. The Superintendents were intended to be alternate military and civilian appointments. It was accepted that the serving officer would be a less competent designer than the civilian professional and the military officers' primary job was to keep the "boffins" on the rails.

Since then two changes have reduced this role:---

(1) Military staff has been gradually reduced by civilianization.

(2) Military staff posted to MVEE have tended themselves to be military boffins who have not seen a field unit for years.

I believe that adequate military staff is essential in R&D. The officers so posted should be well qualified technically so that they can communicate and actively help the civilian staff BUT they should be regimental officers with recent field experience. Further, it should be possible to arrange that MVEE military staff do, in mid-term of their MVEE tour, an attachment to a field unit to keep them up to date.

How many officers posted to R&D regard their primary role as liaison with the Army rather than an opportunity to exercise their technical skills in design work? —Yours sincerely, R T Weld Colonel H W B Mackintosh MI Plant E, AMBIM Strathnairn Crawley Ridge Camberley Surrey GU15 2BE

THE SIMS PAPER

Sir,—Having experienced a variety of posts in both R and D and Project Management in the Weapons world over the last ten years, I must challenge the recommendation made in Major Sims provocative paper that it is in the Corps' interest to "divert our best officers out of the Weapons Stream". (June *RE Journal* p 76.)

Weapons training is aimed at those who will be concerned with the development and procurement of equipment, and poor quality officers will only saddle the Corps with poor quality equipment (and God knows we have enough trouble as it is!) for the following reasons:

(a) The Procurement Executive (PE) world is inhabited largely by civilians, a diminishing number of whom have military experience. The expertise provided by the military members of the staff is out of all proportion to their numbers, and if of poor quality can do significant damage.

(b) The PE world is dominated by financial pressures. Many of the Civil Servants concerned with finance, particularly the more senior ones, are extremely able, and make mincemeat of second-rate arguments put up by second-rate officers. As a direct result the Army can fail to get the equipment it dearly needs.

(c) The PE world like many others includes staff of long standing who are motivated by no greater incentive than the perpetuation of their jobs. The presence of high quality enthusiastic Service officers, who in their next tour may actually have to use the kit being procured, has a profoundly beneficial effect on the quality and speed of procurement.

Where I believe the present system is at fault—and this may be the underlying thought behind Major Sims' point—is that officers are "labelled" too soon. A single tour as a GS02(W) can be most useful to a young major in opening his eyes to aspects of equipment which will be invaluable later, when he becomes responsible for the management and deployment of increasingly sophisticated machinery. In return, a good officer can breathe a breath of fresh air into the corridors of St Christopher which is always beneficial to the system! But he must not be condemned as a result to a life on the Weapons staff for which he may not be suited, and should have the opportunity at a later date for a straight staff tour as well.—Yours faithfully, H W B Mackintosh

> Brigadier P F Aylwin-Foster MA, CEng, FICE, FIHE Moorhill, Highlands Road Heath End Farnham, Surrey.

#### SAPPERS FIT FOR WAR

Sir—As you were kind enough (or was it unwise enough?) to allow me three pages in the Correspondence section of your last issue, I shall be neither surprised nor offended if this letter is consigned to your wpb. However, encouraged by a gratifying number of complimentary comments and letters about my last effort (discounting the remark of a close friend who said "I thought Staff College was supposed to teach you brevity!"), and stimulated by you Sir, Mr Editor, in your unceasing and so obviously successful cajoling to take up our pens and write, I am proffering this definitely shorter draft as a post-script to my letter in the September issue. Amongst the replies I received was a charming note from my old friend Tony Rickets, saying how much he'd enjoyed having another chuckle over the airstrip cratering episode, which reminded me in turn that it was he who had been umpiring Jeremy Rougier's squadron on that occasion, while on a break from his own squadron in Brunei. Truthfully I had forgotten; and what a trick I missed in my short list of *dramatis personae* by failing to mention that while Commandant RSME saved the day, t'was Chief Engineer UKLF saw fair play. Oooh! But in truth what happy days they really were.

Reverting to Mike Addison's "PQE Myths" and my own plea that we should all be professional Sappers as opposed to "either . . . or", I was also delighted to learn from another source that in the UK, at least, things have moved another step in the right direction. My informant tells me that our construction business is no longer isolated in one regiment. Evidently each regiment now has its own construction squadron, commanded by a PQE officer, and apart from a couple of months each year on specialist training these squadrons and the straight field squadrons do the same work and the same training, with no differentiation. Thus, I am told, the whole regiment is involved both in construction and combat engineering, and the PQE squadron commanders are able to prove themselves every bit as suitable for future command as their non-PQE fellows. There is thus a steady movement towards the welcome situation where there should be a healthy interchange all the way up the ladder. To my way of thinking that is excellent news, and it must surely go a long way to filling "the rift between PQEs and field engineers" about which Mike Addison argued so logically and forcefully. Which brings me to the main purpose of this postscript-to draw attention yet again to Mike's excellent article.

I was frankly astonished that such a powerful and fundamental paper, which in his own words took "a crack at every element of the Corps", has raised so little apparent reaction-a total of two letters, both of them complimentary and both from fairly elderly gents. (My apologies to Brian Rawlings!) By comparison, that entertaining little contretemps about whose squadron should take pride of place, and why, has already produced five letters and I feel sure there are more on the way. (Sour grapes of course. My own lads were known as Schmutzig Dreissig, but at least they were always ready to take the best place anywhere!) But in all seriousness, is it not strange and a little sad that such a hard-hitting article about almost every aspect of our profession should attract so little evident response? Here we have a high grade Lieut Colonel, who has worn blue beret, red beret, green beret, taught at Staff College, been an operational CRE, and is currently on a hard won Defence Fellowship, slaughtering every sacred cow in sight with magnificent panache (and with tongue in cheek?—I think not), and the general reaction appears to be . . . a stunned silence? If ever there was a classic case of lighting the blue touch paper and standing back, it was Mike Addison in the March Journal. But where is the bang? A few days ago I was discussing this with a Sapper major about to get early promotion, and he agreed quite strongly with Mike's views and with my own disappointment at the lack of response. "But you see", he said, "you've got to be pretty careful about what you say in the Journal"; and I suppose that is part of the problem. One can imagine the dreaded addition to those notorious one-line confidential reports-"Drinks"; "Clears the teapot by blowing down the spout"; "Writes serious letters to the Journal". One has to agree: it could be absolutely damning. But surely there are still some serving officers about, whose reputations are either so safe or so far beyond redemption that it really wouldn't make any difference? On the other hand, of course, it is possible that everyone agrees wholeheartedly with all Mike's radical views and feels it unnecessary to say so. But if that is the case, what is the Corps doing or going to do about it? It would be nice to know.

Once again I say "Well done Mike Addison". But I do hope somebody is going to try and sort him out!—Yours sincerely, P F Aylwin-Foster

Editor's Note: The Editorial, "Fear", in December 1978 Journal, might reassure some candidates for the title of "Most likely to be damned"!

Brigadier Sir Mark Henniker Bt, CBE, DSO, MC, DL Pistyll Began Road St Mellons, Nr Cardiff CF3 9XL

### SAPPERS FIT FOR WAR

Sir—How is the Corps to keep itself fit for War? Euclid is said to have told Ptolemy I that "there is no royal road to geometry", and there seems to be no royal road to soldiering or to engineering either. The chances of a man being a Duke of Marlborough or a James Watt must be remote; and for a man to combine the virtues of both must be verging on the miraculous. During my service I served many good Sappers, but two seemed to have outstanding gifts. Both are now dead. Both were "mad" in the Sapper manner. One ended up as E-in-C, but the other got nowhere because he was too often right; but both men had one trait in common. When some calamity befell they both seemed to stand apart as men on a different plane. Both seemed to have no doubt about what should be done. They visibly possessed the divine spark, and everyone was thankful when that man was at the helm. He ceased to be "mad"; he was the chap who could put it all right.

Experience tells me that we cannot all rise to those heights; but it seems likely that lots of men can be trained to a fair standard if four principles are observed. Namely:

First, every Sapper should be encouraged and trained to take responsibility from an early age. It is terribly easy to recommend the answer "No". It is much better to try and see what can be done to make the answer "Yes" a sound proposition. One wonders who told Hannibal that the Alps were passable to elephants. It seems unlikely that they had been there before, but the man who said "Yes" was very likely an engineer who knew about blocks, tackles and levers—and, of course, animals.

Next, Sappers should be given wide experience of engineering. They are on a different footing from engineers in civilian practice, who thrive on specialisation. The Sappers' position is more like that of engineers in the Industrial Revolution. They were constantly faced by the unknown, as are Sappers in wartime. Fortune beckons once only; then she slips away. The great engineers of the 18th and early 19th centuries saw the glint in her eye; and men like Brunel tackled anything that came to hand: tunnels, railways, engines, ships, bridges, everything. Brunel was never daunted; he believed that engineering was "all of one piece". So it must be with Sappers. It is nice to believe that there is always an expert who can be fetched in emergency. Unhappily there are always many other people to tell you that the expert cannot be spared till next week. A resolute Sapper on the spot, who will jump on the truck now, is the only man likely to get there in time to grasp the fleeting chance.

Thirdly, Sappers must constantly handle the tools and the plant of their trade. Personal, manual adroitness gives a man confidence in his own judgement; and when the rank and file have seen a Chief Engineer drive a bulldozer in a snowstorm they become inclined to believe what he says. So do the Generals, and that is important too. And who, by the way, in order to get an instant response from his men when there was a chance to capture a bridge intact, took one of his soldier's muskets and shouted: "Was I not a Grenadier before I was a Marshal?" But he would have looked an ass if he had lost the knack of loading it. I am certain that officers who get so immersed in administration that they have no time to get their hands oily have been allowed to get into bad habits.

Finally, every Sapper must be taught to speak and write on technical subjects without using incomprehensible jargon. This is difficult to do and needs constant thought; but without this ability a Sapper is liable to lose important opportunities. A General, if he is a good one, is always in the market for any idea that will give to his plan some sinister twist that bewilders the enemy. Conversely, a Sapper—again, if he is a good one—will occasionally have a bright idea that depends on a technical strategem; but he will never sell it if he has to use even quite common technical words

like (say) parallax or reticulation. (I learnt this last one from a Sapper General, and I fondly believe that he and I are the only living Sappers who can give the meaning without a dictionary). Conversely, I once saw an Infantry CO's face positively light up when I told him how a few Sappers could burrow a passage for his men to their objective by knocking down the partition walls inside a row of terraced houses. It was like ringing open the till for the benefit of a bank robber! The effect was electrical; but had I mentioned a "pneumatic compressor and 200 feet of  $1\frac{1}{2}$ " hose" he would have said: "NBG. Too gadgety". Moreover, he would have been right, because the compressor would not start and the excavation was done very easily with hand tools.

The difficulty in achieving all these things does not seem to lie in their intrinsic complexity; but in turning the right handles to bring them about. Perhaps there is no royal road to training Sappers either. I offer this contribution with the utmost reserve.—Yours faithfully, M C A Henniker

PS. I have just advertised for sale in the Echo "six wooden roof trusses, 9ft span" and had a telephone reply from one prospective buyer who was surprised to learn that a roof truss was not a surgical appliance.

"Evil communications corrupt good manners". (I Cor: xv: 33)

Colonel R Jukes-Hughes MBE, C Eng, FICE, MIHE Headquarters Royal Engineers Second Armoured Division British Forces Post Office 22

## SAPPERS FIT FOR WAR

Sir,—I have waited in vain for a flood of correspondence in the *Journal* following Licut Colonel Mike Addison's article "Sappers Fit for War", surely the most imaginative and thought-provoking article that we have seen in the *Journal* for some years. Why such a poor response? This was a golden opportunity for our young Majors and Captains to state their views on a number of subjects—which was clearly what the author had intended. Certainly the author overstated his case more than once, and his article contained some rather impractical ideas (Unit Housing Cooperatives, Mike?). Those of us who know him would have expected nothing different! But this should not be allowed to detract from the fact that the article uncovered home truths in almost every paragraph. We *are* grossly wasteful in our use of manpower and equipment; we *do* inflict quite unnecessary and damaging turbulence on ourselves by posting our officers and men far too frequently (and have done for many years); we *have* built up for ourselves a barrier between combat engineers and professionally qualified engineers, and between combat and construction engineering; and the author is absolutely right to point out such things to us.

Perhaps the only major point on which I take issue with him is his thesis that Sappers should always operate under engineer command, regardless of tactical boundaries. I am sure that it is a mistake to suggest that the engineer chain of command in the forward areas can be independent of the tactical chain of command, and that tactical boundaries are meaningless to engineers. Engineer commanders, and commanders of the other supporting arms, need to be co-located with tactical commanders at every level. Only in this way can they keep abreast of a continually changing tactical situation and contribute to tactical decisions, and only if they are located at formation headquarters can they make use of the sophisticated command control and information systems (including WAVELL) which are set up between these headquarters. This does not mean that the grouping of engineers (and other supporting arms) in each formation should always be fixed; on the contrary, they will be regrouped by the appropriate tactical commander, acting on the advice of his engineer commander, according to the situation at the time. From then on their task is to further the tactical commander's aim within his tactical area of operations. One cannot have engineers doing their own thing around the battlefield regardless of tactical boundaries—and I doubt if one ever could.

However, enough from me. How about our young Majors and Captains weighing in with their ideas before the article gathers dust?—Yours sincerely, R Jukes-Hughes

> Colonel J B Wilks Regimental HQ RE Brompton Barracks Chatham

### GENTLEMEN-THE CORPS

Sir,—Colonel Newth in his article in the June Journal comments on officer training and in particular on degree training.

There is a trend in the recruitment of officers over the past two years that has probably gone unnoticed by many officers—this is the make-up of the intake into the Corps. As the following figures show we are attracting a large number of officers who already have degrees. In the last ten YO batches (59YO-68 YO) we have had:

Regular Commission	
Welbeck College	35
Young Entry	45
Post Degree	41
Special Regular Commission	25
Short Service Commission	
Young Entry	35
Post Degree	36
TOTAL	217

So seventy-seven officers joined the Corps already with a degree and hopefully all the Welbexians and a number of the Regular Young Entry will get in-service degrees. In addition we have in the Universities on cadetships and bursaries forty-one officer candidates who will graduate in 1980 and 1981. These officers are spread around among many universities thus bringing a considerable spread of experience and training to the Corps. We are already at a stage when over one third of our officer intake joins with a degree. With those doing in-service degrees, cadetships and bursaries the number of degree trained officers will increase to half and eventually two-thirds. This is surely a very healthy trend.

If you have already undergone a long period of training in the University and at Sandhurst, who wants to spend a long time on a YO Course at Chatham? Is seven months too long? Surely the aim of a young officer is to get to be a troop commander as quickly as possible!—Yours faithfully, John Wilks

Lieut Colonel P L Dell MBE, MA, C Eng, MICE, MIE (Aust), FRSA, MBIM Westerings, Bollin Way, Prestbury, Cheshire SK10 4BX

### THE QUALITIES OF A SAPPER OFFICER

Sir—"The Qualities of a Sapper Officer" analysed in Lieut Colonel Mike Stancombe's recent article are familiar, yet it is particularly timely to restate them, as he has done, measured against the current demands. In the year when Sir Monty Finniston's report is due to be published, there will be much debate on the qualities required in an engineer, linked to the education and training which best develops these qualities.

Mike Stancombe emphasises that the cornerstone quality is engineering experience, or knowledge. This will remain central for any engineer, but the additional qualities of imagination and innovation are particularly pertinent in a period when resources are limited. In the extreme military situation of a nuclear war, in which the services must be competent, the engineer will be wholly dependent on the imaginative and innovative way in which he immediately uses his available resources. In the current economic situation any engineer has at best strictly controlled, often in real terms reducing, resources to resolve the technical problems with which he is confronted. These scenarios both demand that the engineering problem is met with an ingenious solution. Indeed ingenuity is inherent in our title, but it is a quality which needs to be kept in the forefront of our thinking as we strive to confound the prediction that our society will become further impoverished.—Yours faithfully, P L Dell

Major C Spottiswoode, B Sc, C Eng, MICE, AMBIM 2 The Lawn St Leonards on Sea Sussex

### ON TARGET!

Sir—After retirement it is difficult to put one's "brilliant" ideas to cynical fellow officers to shoot down, or to check current official lines of research, so perhaps your Journal is a suitable alternative? Your recent articles have stimulated one idea, which you may quietly tell me is "old hat", or perhaps will revolutionize Sapper life.

Current technology in missiles and electronics must surely have advanced to a state where a projectile can be targeted to pinpoint accuracy on to a suitably planted "receiver"? I envisage, for instance, each bridge in a withdrawal operation being planted with a cigarette-packet size black box (or maybe more than one) and, at the suitable moment, missiles fired to home exactly on to their individually programmed box. Similarly in an advance these boxes could be secreted on enemy held bridges.

The main disadvantage I can foresee is in handing over such a large section of our Sapper tasks to Gunners or RAF!--Yours sincerely, C Spottiswoode

Major K J Drewienkiewicz RE, MA HQ 3 Armoured Division BFPO 106

#### DISTINGUISHING MARKS

Sir—While applauding Major Russell-Jones' wish to be identified from the other Arms and Services, I wonder whether "RE" shoulder insignia, à la Royal Regiment are the right answer. Such a solution might lead to our being mistaken for them, in which case the cure would be worse than the original malady!

The form of dress in which we are most anonymous is pullover order. However, the vagaries of the English (and German) Summer mean that most officers spend 11 months of the year in this dress!

Another answer might be to revert to the blue-backed cloth rank insignia for pullover order in barracks. One advantage of this is economy, so that should fashions change again we will not have to apply for supplementary uniform allowance.—Yours faithfully, K J Drewienkiewicz

Lieut Col (QS) C A Luckin (Rtd) Lyngarth Mount Pleasant Stoford Salisbury Wilts SP2 0PP

### THE REAL THING!

Sir—Having read with great amusement the article "An Unusual Fire Drill" by Major General Sir Gerald Duke in the September issue of the Journal, I hope the following may also be of interest if only to prove that history does repeat itself.

At the coming of war in 1914 I was in Potchefstroom SA, one of about a dozen strong sergeant-commanded detachment from the 55th Field Company RE stationed at Roberts Heights, Pretoria. It was in the "Potcho" area that an uprising organized by the one time famous Boer Generals, Botha and De Wett was centred. British troops were not directly involved, the SA defence force dealt with the trouble most effectively but the British Garrison, the main units of which were the First Royal Dragoons, the 10th Royal Hussars and a Brigade of RFA were plagued by the outbreak of numerous fires in the many unoccupied buildings and by attempted raids on military stores.

As the only fire fighting equipment readily available to us were buckets of sand we usually stayed aloof but we had in reserve an early 1900 type of wheeled chemical fire extinguisher much as described by General Duke, the main difference being that a shortage of mules and intelligent NCO's had been anticipated in that shafts were removable and fore and aft drag ropes could be substituted.

Once more the fire alarm sounded, this time just as the canteens were closing on pay day and it could be that this, and that the scene of the fire was the GOC's unoccupied compound only some 300 yards distant, led our detachment commander to decree that now was the time for action. A lost door key and differences of opinions on a variety of subjects somewhat delayed our start but eventually we got going rather like a sidewinder snake and reached the compound gates breathless but intact.

The residency was not involved but the stables and servants quarters were burning merrily. The shortest route was across the lawn in front of the main building so that we took, only to meet disaster opposite the front door as a wheel collapsed causing an extremely abrupt halt.

As the nearest burning hut was within reach the hose was run out, the instructions pasted on the machine carefully followed, the required three-minute time lag observed, and all was ready for action as we thought, when again fate took over and we became unstuck because the outlet valve refused to do just that. Nothing we tried succeeded and after about six minutes the machine blew its safety valve and directed a most impressive jet on to the Residency just above the main door. This display lasted about ten minutes and can best be visualized by imagining a gigantic 'Brussell's Manikin'' suffering from an extremely mal-oderous and colourful internal complaint.

By now the Royals and the Hussars had arrived with their manual operated pumps and were engaged in an inter regimental hose battle so we slipped silently away to brood on possible retribution, but, like General Duke some twenty five years later we were saved by the war. The following day saw us en route for Pretoria at the start of the long journey home and to active service.

Incidentally, on the way we dropped the rebellious Boer ringleaders on the islands of St Helena and Ascension.—Yours sincerely, C A Luckin Major General S W Joslin CB, CBE, MA, C Eng, FI Mech E Southern Cottage Maresfield Park Uckfield East Sussex TN22 2HD

REME

Sir—Major Wade in his letter in the September Journal about the Sims Paper "Sapper Influence in the Army" says he feels certain that the formation of the Royal Electrical and Mechanical Engineers was "RE-inspired" and that "a fair proportion was RE-manned."

I am afraid that he is wrong. I have always understood that a proposal to form a separate corps of mechanical and electrical engineers in the 1920's was opposed by the Sappers. Certainly in the event when the new Corps was eventually created in 1942, it was formed predominantly from the Engineering Branch of the Royal Army Ordnance Corps. Ninety five per cent of its officers were Ordnance Mechanical Engineers of the RAOC(E), four per cent were RASC and one per cent RE; I can recall the names of only five E and M trained Sapper officers who transferred to REME in April 1943 and played a part in its early life.

No. The Corps of Electrical and Mechanical Engineers is not one which owes its paternity to the Corps of Royal Engineers.—Yours faithfully, S W Joslin

Colonel J E Weller MC, MA, C Eng, MICE, MBIM Whitley Cottage Bradninch Exeter EX5 41A

OP MACC, UNST, SHETLAND

Sir—In 1967-68 when 38 Engineer Regiment constructed an airstrip on the island of Unst, the most northerly of the Shetlands, the work was done under Op MACC with the primary and laudable object of providing a means whereby the inhabitants in times of need for urgent medical treatment could be got to hospital in hours instead of days.

Eleven years later I was invited by the Convenor of the Shetland Islands Council to attend the official opening of "Unst Airport" by the Secretary of State for Energy.

Those who were involved in the building of the airstrip will be interested to know that our runway, with exception of the black top which was put on by the County Council, is as we built it. It has not been extended. The promotion to the status of an airport has involved the construction of a parking apron on the north side of the runway with buildings to house the necessary adjuncts to an airport, ie Customs, fire engines etc. The cost of these has been £1.5 million.

North Sea Oil has meant that our airstrip has become a vital link. It is the nearest point to the oilfields to the north-east of the Shetlands at which fixed wing aircraft can land and, in consequence, is extremely busy as the place where the oil company personnel transfer from fixed wing aircraft to helicopters for the flight to the oil rigs.—Yours faithfully, J E Weller.

## Memoirs

#### BRIGADIER F M H HANSON CMG, DSO\*, OBE, MM

Born 9 July 1895, died 15 July 1979, aged 84

FREDERICK MELROSE HOROWHENUA HANSON was born on 9 July 1895 in Levin, New Zealand. He was educated at Wellington College, NZ, where in 1914 besides being a leading scholar he was Head Prefect, Captain of the 1st XV, Champion boxer and a rowing blue, and at the Victoria University of Wellington after World War I.

He was a New Zealand Army Staff Cadet at the Royal Military College, Duntroon from 1915-1917 where he was most distinguished academically. He resigned in order to go overseas on active service. He was posted to the 1st Bn, the Wellington Regiment in France. With his background of Royal Military College training he was promoted to NCO rank. He was



awarded the MM for knocking out an enemy machine gun post being one of two survivors of the six men involved. He was a member of the victorious New Zealand Army Rugby Team which toured the United Kingdom in 1919, winning the King George V Cup. He held the rank of CQMS when demobilized.

On return to civilian life, he set out to be a civil engineer. Initially he was employed by a civilian firm and was engaged mainly on transmission line surveys. He later joined the NZ public Works Department as an engineer assistant and surveyor working on transmission line survey and construction along nearly 300 miles of very rugged country. In 1927 he was appointed an Assistant Engineer being stationed in Wellington and proceeded to make his name as a highways engineer specializing in sealing and revolutionizing the then current practices of metal depths and subgrade properties. In 1936 he was appointed Resident Engineer for the Main Highways Board and remained there until enlisting in the 2 NZEF in 1939.

In 1939 he was appointed Officer Commanding 7 Fd Coy RNZE. The Coy was part of 5 NZ Inf Bde Gp and left NZ as the Second Echelon, 2 NZEF. While crossing the Indian Ocean they were diverted to the United Kingdom, arriving at Gourock on the Clyde 16 June 1940. 7 Fd Coy was stationed at Rushmoor, Aldershot and Maidstone during the crucial days of the Battle of Britain, forming part of the counter attack force. The inevitable sapper tasks which developed all too quickly, training and brigade manoeuvres kept Major Hanson and his Coy very busy. On top of this the Coy had to be fitted out with all equipment to bring it up to G 1098 scales, no equipment having been brought from NZ. They left their last base, Crondall, for Egypt on 3 Jan 1941, arriving 3 Mar 41.

On 3 April Major Hanson with his 7 Fd Coy disembarked at Piraeus, Greece, and became actively engaged in roading and demolitions during the short Grecian campaign. He was evacuated to Crete with 145 men of his Coy, where he was appointed acting CRE, 2 NZ Div, the CRE having been evacuated direct to Egypt. His maxim in the early training of his Fd Coy, that a sapper must first learn to be a soldier proved of value in Crete where most of his sappers fought as inflantry. He was wounded in Crete but remained in the field and after the withdrawal Major Hanson succeeded Lieut Colonel G H Clifton DSO as CRE 2 NZ Div and took part in all the

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Brigadier F M H Hanson

North African campaigns until the end in Tunisia on 14 May 1943. He was awarded the OBE in 1942 and the DSO for mine clearing operations at the Wadi Akarit in April 1943.

On 17 September 1943 Lieut Colonel Hanson was appointed Chief Engineer 2 NZEF Middle East with the rank of Colonel while still remaining CRE 2 NZ Div. He arrived in Italy early in October 1943, and, except for furlough to New Zealand from April to November 1944, he served until the end of the Italian campaign, receiving a Bar to his DSO in July 1945. From 9 February to 11 April 1944 he was Chief Engineer, NZ Corps, at Cassino, and from 6 January to 2 February 1945 he was Chief Engineer of 5 British Corps. For both periods he was promoted to temporary Brigadier. He was wounded three times during World War II.

Taking his cue from General Freyberg, Brigadier Hanson developed the habit of thinking of sapper problems, particularly minefield clearance and bridging, long before they were reached. Thus before the relief of Tobruk his sappers had developed a drill for gapping minefields. The drill taught at the 8th Army School of Minefield Clearance first by the then Major Moore RE, and followed by the then Major A R Currie RNZE, is a direct, though better descendant of the original RNZE drill. As soon as 2 NZ Div joined the 5th US Army and Lieut Colonel Hanson could lay his hands on Bailey bridging he started developing non-standard methods of building Bailey bridging, such as building in a safe area and sledging by towing with dozers to the launching site, by building 70ft lengths on trailers and joining them at the bridging site, and building on a suitably water-proofed tank with the tank finally becoming a pier in the wet gap. All this was to gain time to get armour and anti-tank guns forward to deal with counter-attacks. It was at Faenza that Brigadier Hanson conceived the idea of the Low Level Bailey Bridge to bridge the Senio and similar rivers during the final stages of the Italian campaign along the Adriatic coast. These rivers had high stop banks and steep sides. Briefly, the components were manhandled over the stop bank as soon as conditions, such as the infantry securing the far stop bank, allowed. The girders were built on the flood plain and launched by supporting them on a folding boat raft. On reaching the far side the girders were lifted by manpower and the bridge completed. While this was going on the home stop bank was being dozed or blown out. The first vehicle to cross was an armoured dozer to prepare the far bank exit. A full description is in the book Engineers in the Italian Campaign, 1943-45. Brigadier Hanson attended the Engineer-in-Chiefs Conference at the War Office on 13-22 December 1945.

On his return to NZ and demobilization, Brigadier Hanson rejoined the PWD, now renamed the Ministry of Works, and was appointed Chief Highways Engineer, Main Highways Board. He was mainly responsible for an intensive programme of low cost sealing of NZ roads and for setting up the National Roads Board in 1954, becoming its first Chairman. In 1955 he was appointed Commissioner of Works which position he occupied till his retirement in 1962. He was awarded a CMG in 1961.

He maintained an interest in military affairs to the end. In 1948 he was posted as a Brigadier (unattached) to HQ NZ Div. From April 1952 to April 1955 he was an Associate Member (Territorial Force Member) of the NZ Army Board, and was Chairman of a Defence Survey Committee in 1962–63. In 1957 he was invited by the Tasmanian Government to advise on the organization, staff and technical efficiency of their Public Works Department.

He kept up a life-long interest in rugby and duck shooting. He was a rugby representative for the NZ University and a provincial representative for both the Wellington and Manawatu Rugby Unions. He was a keen duck shooter and never missed being out in the Manawatu during the season. His sappers recall his bringing down a mallard type duck with a .303 rifle during a rainy spell near Sidi Azeiz in November 1941. He regularly took his daily walk around Thorndon, Wellington, with his black Labrador gundog. He was a member of the New Zealand Institute of Surveyors, a Fellow of the Institution of Civil Engineers and also of the New Zealand

#### MEMOIRS

Institution of Engineers of which be was President in 1955–56. For his technical papers he was awarded the NZIE Fulton Gold Medal and also a Bar to that Medal. In 1924 he mårried Constance, daughter of E Grindley, who has survived him and

to whom we extend our deepest sympathy.

One famous anecdote should be retold. When the 2 NZ Div had to get through the lebel into the Tripoli plain a route was found by the CRE. When Montgomery set out the timetable for 2 NZ Div. Colonel Hanson said it couldn't be done. In a shocked silence Montgomery immediately ended the briefing asking General Freyberg to stay behind. "Bernard", said Montgomery to Freyberg. "I object to the comment made by your officer." "Well, Bernard", said Freyberg to Montgomery, "I agree with Hanson." Many months later, when accosted by name in Italy by General Sir Oliver Leese, Col Hanson asked "How did you know my name, sir?" Leese laughed. "You're the best known soldier in the Middle East", he said. "You're the only man who contradicted Montgomery and didn't get the sack."

This accedote reveals an attribute he became famous for. If he believed that what he had to say was true and correct then neither rank nor position would stop him. He was renowned for his forthrightness. Such a forceful personality who served his country well in war and peace will long be remembered by all who knew him and served under him.

ARC, GAL, JG, HEW

#### COLONEL B H LEESON CBE, TD

#### Died 6 July 1979, aged 89

HAMER (Lee) LEESON was a former Commanding Officer and Honorary Colonel of the Tyne Electrical Engineers RE (TA) and a Past-President of the Institution of Electrical Engineers. He was commissioned from the ranks of the 63rd (Royal Naval) Divisional Signal Company RE on 4 January 1917, appointed to the Tyne Electrical Engineers, and posted to No 3 (EL) Company (later re-designated 594 Fortress Company) at that time deployed on Coast Defence searchlights and signals at Blyth, Tynemouth and Sunderland. In February 1917, as a Second Lieutenant, he was assigned to draw-up for, and to supervise the installation of, the electrical



generating and distribution systems for the twin 12in gun turrets removed from HMS Illustrious for erection as coast defence batteries at Hartley ("Roberts") and Marsden ("Kitchener") to the North and South respectively of the River Tyne. These works were not completed by the time the War ended in 1918.

When the Territorial Army was re-formed in 1921, Leeson was one of those selected to fill the establishment of officers in the reconstituted Tyne Electrical Engineers (still at that date a separate and distinct Section of the Corps) and continued conscientiously to serve with them in his spare time until 1940, while employed in his profession by A Reyrolle & Company on the development of High-Tension Switchgear. Being committed to addressing an International Conference in Paris on this subject in 1933, he was granted one day's leave from Annual Training in camp at Manston, where he was acting as Unit Messing Officer. On boarding his aircraft at Northolt, he discovered that, in place of his carefully prepared Address, he had taken with him his "Messing" file. An officer, sent hot-foot in pursuit, retrieved the latter just in time!

## Colonel B H Leeson CBE TD

"Lee" was promoted Captain on 16 May 1934, and, having by then exceeded seventeen years uninterrupted service on Temporary and Territorial Commissions, claimed to have been for some years the Senior Subaltern in the Corps (Regular and TA)! Prior to the outbreak of WWII in 1939, he mobilized the Tyne Electrical Engineers and commanded their 37th AA Battalion in the Air Defence of Great Britain (ADGB) until 1940, when he was recalled by the Ministry-of Supply to his "Reserved Occupation" in industry.

He was Honorary Colonel of "The Tynes" from 1940 to 1949 and presided over the reconstruction of the Unit in its post-War form, comprising a Gunner Regiment, a Sapper Regiment and a REME Workshops. In the latter part of his active career he was Secretary of the British Electrical and Allied Manufacturers Association (BEAMA), and was President of the Institution of Electrical Engineers in 1952. LEP

#### LIEUT COLONEL G LACEY CIE, B Sc, FICE, FCGI, FRSA

#### Born 26 July 1887, died 26 April 1979, aged 91

GERALD LACEY and his wife Geraldine who survives him spent many of their sixty-one years of married life in Roorkee where they were popular members of the garrison community, comprising mainly the RE officers and families of the KGV's Own Bengal Sappers and Miners and the professorial staff of the Thomason College of Engineering, now the Roorkee University.

Gerald was born the third of six sons of Thomas Stephen Lacey MICE. He showed early promise by winning the Bramwell Medal at the City and Guilds Central Technical College (now the Imperial College of Science and Technology) and he went on to gain first-class



honours in the BSc (Engr) degree at the London University. From the very first, he was drawn towards engineering connected with water conservation and irrigation; and after a period of early training on R Thames conservancy work, he was appointed to the Indian Service of Engineers in the United Provinces division of the PWD Canals Department.

During World War 1 he was called up from the Indian Army Reserve of Officers, and from 1917 to 1919 he served in 57 Fd Coy of the 1st KGO Sappers and Miners with whom he saw service in the Third Afghan War. He used to recall how, in addition to the almost routine, if hazardous, task of blowing up hostile village watchtowers (sometimes complete with enemy snipers still ensconced in the top!) he was able to put his professional expertise to good use by organizing safe water supplies for the troops in cholera-ridden areas of operations.

Between the wars, he became (1928) Irrigation Research Officer in the Central Board of Irrigation and Power in India, and simultaneously Professor of Civil Engineering at the Thomason College. Two years later, he was awarded the Kennedy Gold Medal of the Punjab Engineering Congress. In 1941 he was promoted to Chief Engineer Eastern Canals in the PWD Irrigation Branch. Officially he "retired" in 1942, once again to put on the King's uniform, albeit this time at the advanced age of fifty-five and with the mature rank of Lieut Colonel in the Corps of Indian Engineers. He was at once posted to Southern Army where he was appointed Acting Colonel and a Deputy Chief Engineer. Later he returned to Roorkee to take charge of the new Technical Wing. His final appointment was in Southern Army once more, where

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## Lieut Colonel G Lacey

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he was CRE Kalyan near the vital port of Bombay. He was demobilized in 1944 with the rank of Honorary Lieut-Colonel and returned to the Thomason College once more as Professor of Civil Engineering. Happily, he was to become Principal of the College for his last year before retirement in December 1946.

For most men, this might well have been "enough". But on his return to the UK he at once became consultant in hydraulics to Sir James Macdonald and Partners. He was also employed as part-time Adviser in Irrigation and Land Drainage to the Colonial Office, and between 1948–1958 he took part in missions to East Africa, British Honduras, the Aden peninsøla (twice) and British Guiana. Working also at UN levels, he took part in 1950 in forming the British section of the International Commission on Irrigation and Drainage, of which he was appointed Vice-Chairman: and as Co-Director of the UN "FAO" (Food and Agriculture Organization) Training Centre, he attended the 1956 Study Tour on Irrigation, held in the USSR.

For sixty years he was on the roll of the Institution of Civil Engineers and was elected a Member of Council in 1940; and in a series of six Papers in "Proceedings of the Institution" he submitted one (1958) which dealt with flow in alluvial channels; and which resulted in the Institution awarding him its highest distinction, the Telford Gold Medal. His Obituary notice published in *The Statesmar* (of India) on 1 June 1979, describes him as "one of the foremost irrigation engineers of his era . . . (who) . . . during his service of thirty-one years in India was responsible for great advances in the design of irrigation channels and headworks. In particular the design of the Sarda canal system was outstanding. The adaptation of Mr Lacey's theory on the design of stable channels and maintenance of headworks in India and other parts of the world."

But at heart Gerald remained a Bengal Sapper and Miner. During the quartercentury up to 1976 he missed only three of the Annual Reunions of the KGV's Own Bengal S and M Officers Association. To his wife and two sons we offer our condolence on the passing of this remarkable engineer; our brother officer in two World Wars.

TB

#### MAJOR ALEXANDER RICHARD BEATTIE BA, MICE, M Rhod E

#### Born 29 October 1914, died 20 May 1979, aged 64

DICK BEATTHE was educated at Rugby and "The Shop". He was commissioned in August 1934 and after completing his YO courses was posted to India where in October 1937 he joined KGV's Own Bengal Sappers and Miners. He had his first taste of active service in the 1937 Waziristan Operations serving with 3 Fd Coy. After a year in Roorkee, his unit returned to Waziristan to take part, throughout 1939, in the "New Waaa" Project. This new cantonment lay deep in tribal territory, and the project was carried out by Sapper and Miner companies, largely with Infantry working parties in support.

Late in 1940, 3 Coy was moved to Malaya as part of 11 Ind Div. In mid-1941 Dick succeeded Major T Wright as OC of

of 11 Ind Div. In mid-1941 d Major T Wright as OC of

the unit. Dick's notes on emergency tasks prior to the Japanese invasion in

## Major Alexander Richard Beattie



December 1941 read: "Construction of RC defences, pillboxes, roads, bridges, sea defences and booms, recce of engineer resources, demolitions, etcetera...." Plans were changing constantly as uncertainty persisted in the future allocation of troops and reinforcements. "Therefore" says Corps History "defences grew up haphazard; 'Lines' which were begun were abandoned as more troops became available and the defence plan amended". The situation when the Japanese invaded is described by Dick's CRE in a recent letter: "11 Div was set to advance into Thailand to secure the beaches when counter-orders came and they were withdrawn to the hastily prepared Jitra Line, North of Alor Star, in Kedah. Dick's company was in support on the left and he showed great courage and determination when he brought his unit back after Japanese tanks had broken through on the main road. Three weeks later, on 7 January 1942, came the Slim River disaster. Although the road had been ruined, Japanese tanks broke through. 3 Fd Coy was cut off and I saw no more of Dick or his company during the campaign."

Dick, who was Mentioned in Despatches, was taken prisoner and spent nearly four years in Japanese prison camps. He suffered badly through malnutrition. contracted beri-beri, and lost the sight of one eye. A brother-officer and fellow-POW writes: "After the war Dick was unable to drive a car and had to hold papers close up to his remaining eye to read. He was unable to join the rest of us on our special refresher course in Ripon . . . however, he was always cheerful and showed no sense of grievance. . . ." Another brother-officer writes: "These misfortunes would have soured many people but not Dick. His was a tough resilient character and at heart he was a very good person. His marriage in 1946 was happy and did much to sustain him." Dick spent three years in the UK and then in mid-1948 he was posted to Kenya, where he spent eighteen months as SO to the Chief Engineer, Mackinnon Road, followed by two years as DCRE at Nanyuki. In addition to his responsibility as Engineer Adviser to the Brigade Commander for the upkeep and maintenance of all military "Works", he planned and supervised the new works for the 100-bed military hospital, and for the new military cantonment. This was to prove a valuable prelude to his future life, because in 1952 he was invalided out of the Army with a disability pension. He did a further course at the SME covering soil mechanics and road construction: and then he and his wife Helen decided to emigrate to Southern Rhodesia. For some eight years Dick worked with engineering firms on important projects; in the City of Bulawayo on additional water catchment and storage from the R Ncema; elsewhere on a 90-million gallon mass concrete dam on the R Gwebi; the planning of industrial areas for new municipalities. In 1960 he entered Government service and spent the next fifteen years on PWD projects connected mainly with African townships. Helen writes "It was this period that gave him the greatest satisfaction because he felt that he was working directly for the betterment of living conditions for the Africans, whether in the Townships, or in Reserves or Tribal Trust Lands: work which took him over virtually half the country which is not small!"

Dick's churchmanship was of a thoroughly practical nature: honorary treasurer of a fund-raising scheme to build a new church, and a new training centre for Anglican clergy, mostly African. Additionally he sang in the Salisbury Bach Choir; he grew prize-winning dahlias! He kept in touch with us at Home, RE and the Bengal Sappers Association. Suddenly in 1967 he was struck down with a very severe illness from which, miraculously, he recovered. But he was left with his health further impaired and his energies very much slowed down. However he returned to continue the work he loved, up to the time of his retirement in 1975. He and Helen recently moved house to Bulawayo to be nearer their married daughter and her husband. On Sunday, 20 May, Dick collapsed and died almost instantly of a heart attack. He had had a full life; but Helen feels that he will be remembered as one whose profound faith and courage helped him to "soldier on" cheerfully and regardless of his disabilities, with never a murmur of complaint or self-pity. To her and to their daughter we offer our deep sympathy at this sad and difficult time.

TB, FJDS, TW, NHSB, JCW

#### COLONEL D PORTWAY CBE, TD, MA, FICE, JP, DL

#### HONORARY MEMBER OF INSTITUTION

#### Died 19 March 1979, aged 91

DONALD PORTWAY died peacefully after a short illness. Known with respect and affection by generations of Cambridge men, including many a Sapper Officer, he had become a legend before even half his life was lived.

In the early Thirties every undergraduate knew Donald Portway as an old swimming Blue, the only boxer ever to win his weight against Oxford four years running and a Proctor not to be trifled with. Nor was it difficult to understand that be had been a fine player of most team games with a love of sporting activities of every kind. But less apparent within that modest and friendly middle-weight frame was the versatility of the youthful scholar (with a bad stammer), turned first scientist and then engineer and soldier, the administrat



then engineer and soldier, the administrator with financial acumen: the author, the practical psychologist and the man of ideals.

From a classical scholarship at Felsted School he moved on, by dint of very hard work, to the Senior Science Entrance Scholarship to Downing College, first class honours in the Engineering Tripos, an Honorary Fellowship of Downing and, among many other distinctions, the Mastership of St Catharine's College from 1946 to 1957. Superannuated then at the age of seventy, but still feeling, as he said, "much too fit and much too active to vegetate", he accepted the appointment of Professor of Mechanical Engineering and Dean of the Faculty at the University of Khartoum where he remained for three years.

For the whole of his adult life he was an ardent Royal Engineer and might well have become a regular officer if the Corps had not been closed to university graduates when he came down in 1910. In 1908 he served in the rank of Sapper in the newly-created Cambridge University Officers Training Corps, one of his officers being that other great champion of the Corps, Second Lieutenant CE (later Professor Sir Charles) Inglis, destined to be his much-admired friend and benefactor. On 25 June 1910 he was commissioned as a Second Lieutenant RE Supplementary Reserve, having undertaken one year's full-time service, little knowing that he was to remain on the Army List, in one capacity or another for forty-seven years. After eight happy months at the SME, Chatham, he was attached to the 5th Divisional Telegraph Company RE, at Limerick, where, characteristically, he found a loophole in the regulations enabling him, though not a regular, to pass the promotion examination to Captain.

Employed from 1911 as a civilian instructor at the Royal Naval College, Dartmouth, he managed at the outbreak of war to beat the pistol and reach his mobilization station two days ahead of his orders, disembarking on 15 August 1914 at Le Harve in command of "P" Cable Section RE, equipped with two six-horsed cablelaying wagons. He won his spurs as an Old Contemptible in the Retreat from Mons and the First Battle of Ypres and served in the heavy fighting of the following year in a variety of units and formations. One highlight was, in his own words, "exactly the posting I wanted, as OC an Infantry Brigade Signal Section, the most forward unit in RE Signals". Another was a "narrow escape" from being evacuated home, with severe iaundice. A "shattering blow" fell in December 1915 when he was sent back

## Colonel D Portway CBE TD.

to the UK, to provide front-line experience for newly-formed units. Most of the next year was spent on home defence as OC 68th (Welsh) Divisional Signals Company; but in 1917 he happily returned to France and saw more fighting, this time with 56th Divisional Signals. In his final appointment, as Signals Officer to the 59th Divisional Artillery, he was able to maintain good wireless communication with forward OP's and so help to make the best use of the ample supply of shells which was by then available.

At the end of the First War Donald Portway managed a quick return to his teaching post at Dartmouth but was, within the year, invited by Professor Inglis to take charge of the rather unruly young Naval Officers in the Mechanical Sciences Class at Cambridge, among whom, incidentally, was Sub-Lieutenant Louis Mountbatten; and this he accepted on the sensible condition that the appointment included a college fellowship, which he received from St Catharine's. The fortunes of the College were at a low ebb, but in co-operation with several very able colleagues, Portway set about the lengthy task of modernizing both the fabric and the administration. (There were no students' baths: fellows had formerly objected that undergraduates were only up for eight weeks at a time.) Investment policy was progressively improved, within the prevailing legal restrictions, to increase income and create capital reserves, the statutes were revised and the Mastership was, by Act of Parliament in 1927, separated from the Norwich Canonry and opened to the laity. The number of sets of students' rooms rose from fifty in 1919 to 227 when Portway's mastership ended; since when the College has marched on from strength to strength. In 1921, though still a very junior don, he become a Proctor and continued as such for fourteen years, five on foot and nine as the first Motor Proctor, responsible for regulating the swelling number of students' cars. He was proud to recall that as a Proctor he never had any serious unpleasantness with undergraduates and enjoyed those innumerable interviews when it was his duty to fine them, to the benefit of the University chest. But he was far from neglecting the Corps. At Professor Inglis' request he resuscitated the Sapper unit of the University OTC and commanded it very vigorously for ten years, after which he commanded the R Signals unit for three, before reverting to the Sappers; thus completing twenty years as a unit commander between the wars and earning a brevet lieutenant-colonelcy.

On the outbreak of war in 1939 he quickly disengaged himself from University duties, contrived to pass a medical board and was posted to 142 Officer Cadet Training Unit at Aldershot; but by badgering the authorities got himself appointed to command 209 Field Company (TA) in the 44th (Home Counties) Division. Lieut Colonel BT Godfrey-Faussett was his CRE and most of his men were from Brighton. At fifty-two it was a quarter of a century since he had held an equivalent command in wartime. The unit was mainly employed on defence works on the French frontier, but in May 1940 the BEF entered Belgium and 209 Field Company was soon engaged in the destruction of the Scheldt bridges and an orgy of demolition in addition to the usual sapper tasks and some infantry rearguard duty. Before the end came, however, Portway had suffered concussion and knee injuries while riding pillion on a motorcycle at night, and was evacuated through Dunkirk; with the consolation, in due course, of a Mention in Lord Gort's Dispatches.

He was next obliged to work within the gloomy portals of the War Office developing a very useful scheme of short courses at eight universities for training young officers on technical lines. He was asked, in addition, to give a series of lectures to undergraduates at Cambridge, which he published in paperback, entitled *Talks to Future Officers*. The book ran to three editions and contained much military wisdom, derived from hard experience. It also revealed Portway's philosophy: his patriotism, his urge to lead the young and determination to close with the enemy. He then raised and commanded 143 OCTU at Bothwell Bridge, a major's command, and after a year or so, was appointed to command, briefly, 141 OCTU at Aldershot as a Lieut Colonel, till undergoing surgery for the gastric ulcers which had plagued him for much of his life. Then, having somehow or other got himself graded Medical Category "B" (fit for garrison duties abroad), he was switched to Personnel Selection, where he developed a deep interest in the psychology of leadership. After service with No 11 Selection Board at Golders Green, he took a board out to Lonavla in the Bombay Presidency for the last eighteen months of the war: by which time he had been promoted Colonel.

The Second War over, Donald Portway made history by becoming the first Engineer to be elected Master of a Cambridge college. At the same time he undertook the duties of Bursar, and it was during his Mastership of St Catharine's that plans were laid for re-development on a large scale, timed to coincide with Quincentenary celebrations. By living on to be in College on 23 November 1973, at the age of eighty-six, he fulfilled the last of his ambitions. During his Mastership, and while still a member of the Engineering Department, he made lecture tours in the long vacations to Service units in the Middle East, the Far East and Germany: where he found that, given the choice of subject, the men preferred "Boxing" to "Atomic Energy". For six months he served as a member of a UNESCO mission to Korea during the war there, and took twelve months' leave the following year for further UNESCO work, on technical education, in Nepal.

In the post-war years this indefatigable man served as County Cadet Commandant, Sector Commander of the Home Guard, member of the RE Advisory Board, co-Honorary Colonel (with Field Marshal the Duke of Gloucester) of the University OTC, Justice of the Peace for the City of Cambridge, President of a Branch of the British Legion, member of the East Anglian Regional Hospital Board, and more besides. He became a Deputy Lieutenant of the County, an Honorary Member of the Institution of RE and proudly wore his Old Contemptibles badge. He published two autobiographical works: *Militant Don* in 1964 and *Memoirs of an Academic Old Contemptible* in 1971. To his TD with three bars was added the CBE in 1957.

In Donald Portway's hardy single-mindedness there was more than a hint of the Ironside, hardly surprising in view of his East Anglian ancestry, but without the intolerance of the Puritan. The virtuous influence of his Quaker governess probably served him throughout his life, and it is likely that some of the great Latin writers whom he must have read at Felsted inspired him, as they had inspired so many other Englishmen, with the sterner Roman virtues of endurance, discipline and devotion to the State. But this would hardly have been enough to explain such constant and untiring fervour. There must have been something more which so drove a man who was consciously fallible and not cock-sure; and that "something" must surely have been the memory of the "Lost Generation", and especially of his numerous Cam-bridge contemporaries and very young naval pupils, who had all given their lives so cheerfully, so proudly and so tragically in the First World War: not least his youngest brother, killed in France at the age of barely nineteen. It seems that he who had survived felt bound to honour their example and lead the following generations to match their spirit, if they could. He was fundamentally, though not conspicuously, religious, feeling as he did, that a man's religion should be his whole life and not one separate compartment of it. But there was no self-satisfaction in him and his acute sense of the ridiculous, which made him such a genial companion, reflected his aversion to pomposity. The people who were happy to know him ranged from kings, royal princes and archbishops to farmers, "bullers" and college porters. But he was happiest of all in his tutorial work.

In 1919 he married Miss Sophia Maud Ablomovicz-Bezant whose hospitality many Cambridge Sappers have enjoyed. Our sympathy in their loss is extended to her and their daughter, Daphne, who has many friends in the Corps from her eight years' service as a Major in RE Survey.

The very moving Memorial Address was delivered by Dr Stanley Aston OBE, TD, DL of St Catharine's in the Great University Church of St Mary's to a packed congregation drawn from every walk of life—Town, Gown, RE, OTC and Territorial Army—who had come to praise a famous man. But this writer best remembers Donald Portway as a very kindly and forgiving tutor. THFF

# **Book Reviews**

## BRITISH SAND AND GRAVEL RESOURCES MINERAL ASSESSMENT REPORTS, INSTITUTE OF GEOLOGICAL SCIENCES, LONDON

LIEUT COLONEL P I MANNING has recently presented a near-complete set of British Sand and Gravel Resources reports to the Corps Library. Prepared since 1968 by the Industrial Minerals Assessment Unit of the Institute of Geological Sciences, these reports document the volume and main physical characteristics of sand and gravel in many key areas.

The recently issued Report No 37 (Clayton, A R, 1979, The Sand and Gravel Resources of the Country around Bawtry, South Yorkshire: description of 1:25,000 Resource Sheet SK69. *Miner Assess Rep Inst Geol Sci*, No 37, 87pp, 1 map) is representative of the series. The basis of this particular assessment comprises 1:10,560 scale geological "drift" maps prepared by the Institute; collation of preexisting borchole information from the Institute's data store; and eighty-one boreholes specially drilled on an open grid with centres roughly 1km apart. A coloured map at 1:25,000 is used to illustrate the geology of the arca; the position of boreholes; and outlines of eight resource blocks containing between 2.2 and 14km<sup>2</sup> of sand and gravel of 3 to 5m mean thickness. The accompanying report describes the geology of deposits in each block; the thickness of mineral and its overburden; and mineral grading. The report is brief (15pp), but amplified by appendices recording borehole data (65pp) and details of field and laboratory procedure.

Production of these assessment reports has been stimulated by the spectacular growth in output of quarried material in Britain, particularly in the sand and gravel industry, from 2.3 million tonnes in 1922 to 117.7 million tonnes in 1976. Growth continues, reflecting increasing mechanization, but with increasing conflict between gravel extraction and other forms of land-use. Although resource assessments for mineral development and land-use planning purposes are being undertaken in a few other countries, it is believed that the British sand and gravel survey is the only one of its kind. Its engineering importance lies both in the wealth of data summarized in the maps and reports, and in the model it provides for other comprehensive resource surveys.

EPFR

### FAITH AND FORTITUDE

### THE LIFE AND WORK OF GENERAL SIR WILLIAM DOBBIE SYBIL DOBBIE

With a Foreword by Major-General A H J Dove, CB, CBE, Colonel Commandant RE

(Published by Major P E Johnston. 12 Mansion Row, Gillingham, Kent. ME7 5SE. Price £8.50 Post free)

FAITH AND FORTITUDE is the biography of a famous Sapper, General Sir William Dobbie, written by his daughter under her maiden name, edited by his grandson after her death, and published by his son-in-law. Filial piety, an agreeable prose style, and faultless production make it a fascinating book that your reviewer can praise without reservation. The interest springs from the portrait of a high-minded character, a well-told story of the times he lived in, and the historical spotlight that illuminates the tale at every stage.

William Dobbie was born in Madras in 1879, the son of a British official in the Indian Civil Service. He won a classical scholarship to Charterhouse School, whence he passed into the Shop and was commissioned into the Royal Engineers in 1899. His first taste of active service—and enemy fire—came in the Boer War to which he went in 1901, taking his own horse and his soldier groom, who volunteered to go with him,
from Chatham. He learned some of the arts of Sapper work in the veldt, and how to look after his men in a firm paternal manner that earned their respect and affection.

Strict Christian principles were acquired at an early age. Even at fourteen he had been, in his own words, "called to God's service"; and throughout his life his Faith never wavered. He never touched alcohol, never smoked, nor danced, nor played cards for money, nor betted; and he prayed to God regularly several times a day. He read his Bible and distributed tracts and gospels to the troops at Soldiers' Meetings, and preached in Gospel Halls. He felt more at home Breaking Bread in an Ebenezer Chapel than attending Church Parade. In spite of his rigid adherence to his principles, however, he was far from being a kill-joy. He had a cheerful smile and a somewhat pawky sense of humour; he was a robust games player and a good horseman; he played the piano and he always entertained hospitably, offering whatever drink good manners required. His wife was a vivacious and attractive person and became an accomplished hostess. All his service he drew from his Faith a reserve of courage and moral strength that made him a soldier in the Cromwellian mould.

His marriage, after his return from South Africa, was a strange affair. His mother-in-law, a formidable widow with nonconformist proclivities, held the reception at her home in Blackheath the day before the event. The Bride was in white satin and the guests were invited to prayers afterwards "for those who wish to attend". The marriage service next day was held in the Gospel Hall in Bracknell. It was conducted by a General Officer—with the Registrar inconspicuously assisting to make it legal. The Bride, this time in a blue frock, was given away by her uncle, Sir Benjamin Browne, a devout Anglican who was mystified by the whole affair. The Bridegroom wore full dress and cut the cake at a tea party, held at the house of Sir George and Lady Pigot nearby, having unfortunately omitted to wipe the vaseline from the blade. Such was the start of fifty-eight years of unbroken devotion.

After a foreign tour in Bermuda and service in Southern Ireland, Dobbie started to work for the Staff College and attended one of the last courses before the outbreak of War in 1914. He served throughout hostilities on the Western Front; and when the Armistice came in 1918 he happened to be the Staff Officer at GHQ to whom fell the duty of signing the Cease Fire. (In later life he was wont to remark that his most important contribution to the struggle was "to put a stop to it").

His promotion between the wars was steady; and in 1928 he was promoted Brigadier to command the Infantry Brigade in Cairo. Then came a turning point in his carcer. An emergency broke out in Palestine. The Jews and the Arabs were at each others' throats. The Palestine garrison was provided by the RAF; but Law and Order had collapsed, atrocities and riots were rife everywhere, and the situation was out of control. It was during the leave season and the High Commissioner and most of the Senior Officers were at Home. There were few troops within range; Dobbie's brigade was the nearest and was ordered to the scene. Dobbie put himself in the first train in order to take charge of the situation promptly.

Duty in Aid of the Civil Power is always a difficult task. There are no rules to suggest how much force will turn out to be the right amount, and when the troops are thin on the ground and the distances wide the complications are increased. All hinges upon the judgement of the Commander, how he deploys the troops he has and how he tells them to act. Here the full responsibilities rested on Dobbie, and he was found fully equal to the occasion. He had prayed for guidance and received it from the Lord. He issued Bibles to the troops—and live ammunition—and put down the troubles, earning the gratitude of the people, in "four days". (p 179) Within three weeks he had handed a pacified Palestine over to an Air-Vice-Marshal, who had the wisdom and the charity to commend Dobbie's handling of a dangerous situation to HM Government. He became a man of mark overnight.

On his return Home he was promoted Major-General with the combined appointments of Inspector of Royal Engineers (there was no E-in-C those days) and Commandant SME. Here your reviewer had the privilage of serving under him as a Posted Officer in the Training Battalion, and saw for himself—what he had never suspected before—that a really great man is quite unmistakable. He was a success at the SME. He and his wife were a popular couple, and Flagstaff House was often filled with young people whose conduct might occasionally be described as boisterous.

From Chatham the General was sent to Singapore as General Officer Commanding Malaya, with the responsibility for strengthening the defences of the Peninsular. This, at that stage, was probably beyond the compass of any human being; but the new Commander did his best. He was not called upon to conduct the campaign when the Japanese attacked in 1941, but we may be sure that he would have given a stout-hearted account of himself had the occasion arisen. Instead, he was sent home at the end of his tour for retirement. World War II broke out within a few weeks of his return to London and he found himself in the frustrating position of being unemployed when his country was at war.

Perhaps in answer to prayer the call soon came. He was appointed Governor and Commander-in-Chief of Malta. There could hardly have been a better choice for the job. The main attributes required were Faith and Fortitude. The Island was under siege and the enemy close at hand. Malta received a terrific pounding from the air; but the Governor never lost heart; and because of his example neither the garrison nor the people lost heart either. This was Dobbie's great achievement. Malta survived and King George VI awarded the Island the George Cross just before the end of Dobbie's time there. His last act of service to his Country had been his greatest. He retired from the service of the Crown to continue the service of his Maker.

The closing scenes were sad but screne. With fortitude he had borne the loss of his clder son in World War II. His wife died in 1962. He lost his sight and his hearing; but he retained his Faith. His daughter and his daughter-in-law were with him at the end. He died in October 1964.

The reader will enjoy this book. There is much for soldiers to learn from it, and it is very well written.

MCAH

## A DICTIONARY OF BATTLES (1715-1815)

BRIGADIER MICHAEL CALVERT DSO AND BRIGADIER PETER YOUNG DSO MC

(Published by New English Library, London. Price £11.95 UK) THIS is the second volume in a series of four which will cover all the significant battles fought on land, sea and in the air since ancient times. The previous volume, 1816–1976 is already published as the authors decided to start with Volume IV and work backwards in time.

The purpose is to list and describe all the essential military and naval battles and engagements (including important insurrections, guerrilla actions and riots) of the period often referred to as the Second Hundred Years War, as more major wars were fought all over the world between European powers than ever before.

The conflicts are listed in basically geographical or campaign sections and each entry is treated as an entity. An effective cross reference system and a good index enable the reader to "find his way" around with ease. The basic format for the entries is the name of the battle, its location, the name of the war or campaign, its date, the forces engaged coupled with the full name and rank of the commanders, the estimated strengths of the opposing forces, an analytical description of the battles and the tactics involved, the casualties suffered, the result of the contest and the consequences (if any) of the engagement. A number of clear outline maps are incorporated at the beginning of each section for the various wars and campaigns within that section.

The authors and their researchers have certainly succeeded in produing a balanced reference work of immense value, both to the specialist researcher and to the increasing number of general readers who are interested in military history, which is both readable, interesting and informative.

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