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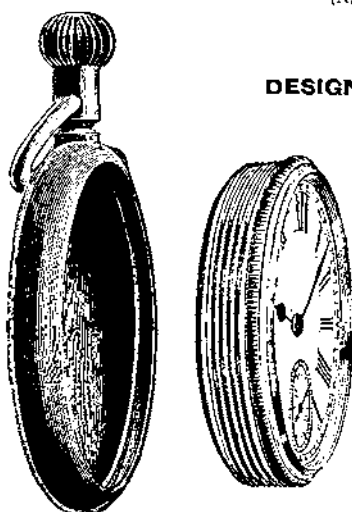
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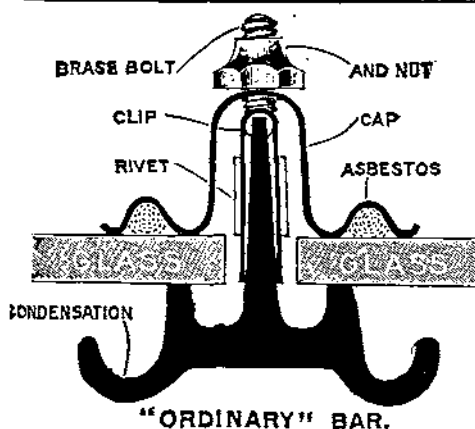
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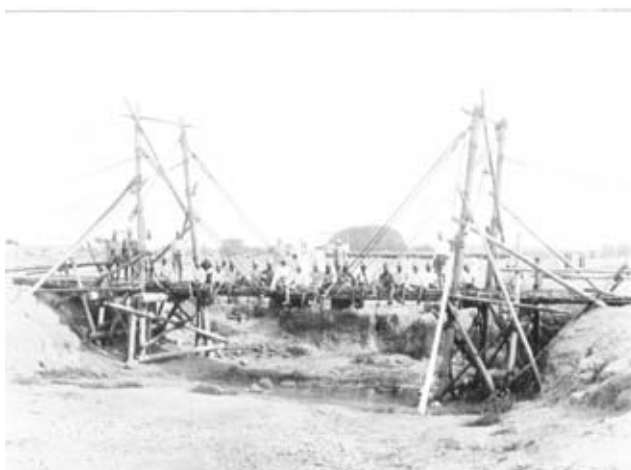
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Authors alone are responsible for the statements made and the opinions expressed in their papers.



A FIELD DRAWBRIDGE

A FIELD DRAWBRIDGE.

By CAPT. E. K. MOLESWORTH, R.E.

DURING the annual fieldworks course of the 13th (Field) Company, "Q.V.O." S. & M., I was asked to construct the ingenious drawbridge described by Major Wilson in the *R.E. Journal* for April, 1912. As it appeared that the number of tackles required was considerably more than a Field Company of Sappers would carry on service, a somewhat simpler type of drawbridge was designed and constructed, and it answered the purpose excellently.

The accompanying photos (see *Plate*) show the details so clearly, that a long description is unnecessary.

The bridge was designed to give a 30-ft. opening, and to be capable of being opened or closed in a minute or two. It carried infantry in fours.

The two tall frames were 28 ft. high and were well braced; the bays immediately in rear of them had a span of only 5 ft.

The movable bays were each 18 ft. long, 15 ft. of this length projecting in front of the tall frame and 15 ft. behind it. The road-bearers were lashed to a transom capable of revolving round the transom of the tall frame, and the bays were easily raised in about one minute by two double blocks near their front extremities, the returns passing through snatch blocks lashed at a convenient height to the legs of the frames.

As the lashings rub round the transoms when the bridge is raised or lowered, they will wear out in time, and it will be advisable therefore to countersink them. No signs of wear appeared, however, in the present instance after the bridge had been raised some twenty times. Plenty of grease is necessary on the revolving parts.

It was found that the movable transom had to be prevented from riding close up to the leg of the frame, for, when it got into this position, it revolved on its own axis when the bay was lowered, instead of rolling down the other transom. This was easily prevented by moving forward the horizontal struts (shown in the *Plate*) a couple of inches. The transoms must be absolutely horizontal, and cylindrical, or else there will be a tendency to creep sideways. All lashings must be very tight, and each chess should have a nail behind it, as no slipping must be allowed when the bridge is being raised.

As the bay is very nearly balanced when fully raised, a couple of foot-ropes are necessary at its rear end to give the necessary start downwards for lowering. For the same reason a good counter-weight is necessary on the front end. If the roadbearers overlap a little, no false bay is required; and to raise the bridge, there is nothing whatever to be done but haul on the tackles. Steel guys relieved the tackles of the weight when the bridge was horizontal.

The roadway was stiff enough, and the lateral stiffness was obtained by diagonal bracing with telegraph wire.

The bridge was simple to make, worked most efficiently and required only such stores as would probably be available.

THE INFLUENCE OF HIGH GROUND IN DEFENCE.

By D.O.L.F.

It is now recognized that the adoption of the tactical offensive is the surest road to decisive success in war; yet it will often be necessary, for good strategical reasons, that some portion of a force should occupy a defensive position. In selecting such a position, especially when doing so from a map, it is natural to look for a well-defined line of high ground, if strategical conditions permit of any choice. It is open to question, however, whether this is sound under modern conditions of warfare.

For instance suppose that a hostile force, moving north, is to be checked somewhere between Aldershot and Guildford. The Hog's Back at once suggests itself as a suitable line, but might not the line of the Wey or one between the two be as good or better?

The respective advantages and disadvantages of high or low sites for trenches in a defensive position are briefly discussed in *F.S.R.*, I., p. 125, but on the broader question of how far high ground generally is suitable for defence little is to be found.

We are told however (*F.S.R.*, I., 108, 3) that "the influence of ground must be one of the first considerations in selecting a position."

What then is the influence of commanding ground under modern conditions?

Until recently such ground has been regarded as almost a necessity for the defence. For example the occupation by the Boers of the line of the Modder River on November 28th, 1899, came as a surprise to many in Lord Methuen's force who expected that they would make their next stand in the hills near Spytfontein.

Before the introduction of firearms high sites for defence works may be said to have had no disadvantages and many advantages. These were :—

- (i.). All approaches could be watched.
- (ii.). Ground inside the work or the front line was hidden from the enemy's view.
- (iii.). The possession of such positions denied them to the enemy.
- (iv.). The enemy had to attack uphill, so that the defence had a great advantage in the use of both missiles and other weapons.
- (v.). The moral effect of being above the enemy was considerable.

As however firearms developed these advantages became less marked and certain disadvantages appeared.

Its value for purposes of observation still exists ; further, modern weapons make it possible to hit an enemy whenever seen so that the importance of seeing him has increased.

The development of aircraft is reducing the value of high ground as a screen and lessens its importance to an enemy for reconnaissance.

As regards actual fighting as the range of artillery increased it became more effective against a target on high ground. Then it began to be realized that the effects of its fire could best be avoided by resorting to concealment. This was not possible to any great extent before the invention of smokeless powder as the smoke would give away a position naturally inconspicuous. Now however such a site is eminently desirable and a high prominent one very much the reverse. The full value of the flat trajectory of the modern rifle is not obtained when the firing is downhill.

A steep slope below a work, in early times a great advantage to the defence, now favours the attack. It greatly facilitates the artillery support of an infantry assault, because the fire of the guns can be kept up to the last moment. The defenders have, unless provided with overhead cover, to expose themselves considerably in order to fire their rifles. The same is true in a greater degree of artillery which will often be altogether unable to cover the immediate front of a steep slope.

A position on high ground has a definiteness about it which has a certain moral value for the defence ; it constitutes, however, a greater advantage to the attacker, especially if he is in a hurry as it facilitates the organization and general conduct of the attack ; also the capture of one locality is more likely to be decisive than in the case of one on lower ground.

The facilities which high sites give for opening fire at long range are an important factor in a rear guard or similar action where the chief object is to delay the enemy. In the case of artillery, it is not necessary for the guns themselves to be high up as long as their fire can be observed and the result communicated to them.

The present advantages of high ground as a defensive position, then, may be said briefly to consist of

- (i.). The facilities afforded for observing the enemy and the effect of the fire of the defence ;
- (ii.). The possibility of concealing troops behind such features ;
and
- (iii.). The denying to the enemy the use of such localities.

These advantages are likely to be minimized as the development of aircraft proceeds.

The disadvantages, on the other hand, are

- (i.). A good target is given to the enemy.
- (ii.). Such a position is clearly defined, and this assists the attackers.
- (iii.). The slope up to the position favours the attack.
- (iv.). It is difficult to sweep the immediate front with artillery fire.

The Boers opposed to Lord Methuen in 1899 were quick to realize these disadvantages from their experiences at Belmont and Graspan. Accordingly at Modder River, Magersfontein, and subsequently Paardeberg, they occupied a very different class of position.

It would seem, then, that except in the case of a rear-guard action, a position on high ground is only advantageous on account of the facilities for observation which it confers.

Can this advantage be retained without incurring the disadvantages above mentioned? The best way is, doubtless, to occupy a line further forward so as to deny the high ground to the enemy. This can then be used for purposes of observation and for positions for some of the artillery; it will be of some use for screening movements in rear and will also be inaccessible to the enemy.

The main position should be far enough in front to give sufficient room for manœuvring the local reserves between it and the high ground. Such a position has many advantages. It will probably be inconspicuous owing to the background; there are usually spurs running out from higher ground which give good sites for "pivots," and facilities for their mutual support. The position is likely to be indefinite, that is to possess no "key" the loss of which will compromise the whole defence, or if there is one it is not likely to be easily recognizable by the enemy.

Para. 156-6, Field Artillery Training, approves of such a position as being likely to facilitate co-operation between the artillery and infantry defence, and in the case before mentioned it would appear that a suitable main line of defence could be found between the Hog's Back and the Wey.

Fig. 1, R.E. Journal for February, 1912, shows part of a position sited very much on the lines suggested above, possibly for similar reasons.

We may conclude then that, as a rule, a line of high ground is not in itself a suitable position for defence under modern conditions but may be very useful in rear of one on lower ground. Unless

there is a suitable position in front it will be better to disregard the attraction of the high ground and keep well away from it.

This conclusion is of course subject to many limitations as ground is of an infinite variety. One special case is that in which the high ground is the edge of a plateau; here a line well back from the crest will sometimes be satisfactory. Again if the country is very close, hill features have little or no influence unless the slopes are very steep. The same applies at night or in thick weather. Hence if much night fighting is to be expected there is still less to be gained by looking for a defensive position on high ground.

SOME ROYAL ENGINEER ORDERS AT THE SIEGE OF GIBRALTAR.

THE following interesting orders for the construction of batteries, etc., were issued at the commencement of the Great Siege of Gibraltar to Colonel (afterwards Sir W.) Green, the Chief Engineer. They formed part of a book which evidently contained the contemporary office copies of all orders issued by the Governor, and they are signed by his Secretary—J. Raleigh.

Most of the orders in the book are dated before the commencement of the Siege and are of no Corps interest. Some however are dated on the 26th of June and in July and were therefore issued after the Siege began as Mrs. Green in her journal mentions that the Governor attended by all the Colonels and Field Officers of the Garrison visited the Governor of St. Roque on the 19th June to congratulate him on his promotion to the rank of Lieut.-General, and that the blockade itself actually commenced on the 21st June.

The first set of orders for the construction of batteries, etc., was issued in February, 1779, in anticipation of the outbreak of hostilities, whilst the second and longer set are dated July 26th *i.e.* within a month of the Fortress being invested. Both sets of orders as well as the other documents transcribed have been purchased for the R.E. Museum.

(1).

Field Pay allotted the Engineers.

The Engineers doing duty in the Garrison having represented to me the customary authoriz'd allowance as Field Pay, when employed on actual service. This Fortress being at present Invested, I therefore do empower you to give your Orders to the Paymaster of the Ordnance to issue an additional allowance as Field Pay, agreeable to the undermention'd sums per day from

Colonel Green as Chief Engineer	...	...	...	£0	15	0
Capt. Phipps...	...	...	...	...	0	7 6
Capt. Evelegh	...	...	...	...	0	7 0
Lieut. Booth...	...	...	...	...	0	6 0
Lieut. Skinner	...	...	...	...	0	5 0
Lieut. Johnson	...	...	...	...	0	5 0
Lieut. Hay	...	...	...	...	0	5 0

Gibraltar, 25th June, 1779.

G. A. ELIOTT, *Govr.*

To Colonel GREEN, C.E. of the Garrison of Gibraltar.

(2).

THE RIGHT HON. G. A. ELLIOTT, ETC.

You are hereby required and directed

To establish a Barbette Battery for two guns in the Demi Bastion of the upper Polygon of the South Front, with the proper Communications for Conducting on the Artillery.

To establish four platforms of Masonry for 13 Inch Sea Mortars—one at the Saluting Battery—one at Columbine's Battery—one on the South Bastion, and one upon the heights of Bona Vista.

To establish a Barbette Battery for four pieces of Artillery of a heavy nature and near the western extremity of the old Moorish Intrenchment.

To establish a Barbette Battery for two guns at the Devil's Bowling Green to flank and rake more effectually any Shipping or Boats endeavouring to approach or annoy our Batteries at the Back of the New Mole or Rosia Bay.

To carry on a path of communication through the Rocks round the high ground commencing at Bona Vista Guard Room, in such a manner as may most effectually preserve the commanding power that situation has over the flat ground called the Devil's Bowling Green.

To establish a Stone Bridge of communication with proper leading roads between Cumberland Battery and the Battery lately erected on Scud Hill.

To establish a Cannon Communication behind the Town from near Southport leading thro' the Moorish Castle into the King's and Princes' Lines.

To establish a Casemated Battery of one Gun, and to admit of two guns more over and contiguous to the arch, on a spot of ground to the Westward extremity of the Queen's Battery, now occupied by the Heirs of the late Mr. Crachet and to purchase from said Heirs a small building and other walls of inclosure their property, in order to admit of a communication to the said Battery which is intended to command all along that space of ground at the foot of the King's Line and the Inundation between the Glacis at Landport and the point of the Rock at the lower Forbes's. To blow and clear away at the foot of the Rock near Forbes's Guard, in order to render the access up into the Princes' Line more inaccessible by adding from 12 to 15 feet, or if possible from 15 to 20 feet in height (if time is allowed) to that part of the Rock.

To repair and reform an old Moorish Cistern under the Signal House, to save rain water to supply such works and repairs as may be carried on in that part of the mountain.

To clear out, repair and reform an old well which has been lately discovered in a favourable situation in the main street, to assist in preventing accidents by fire.

To Build an Officers' Guard Room in addition to the Non-Commissioned Officers' Guard Room in the cover'd way at Ragged Staff.

For the execution of which several works this shall be your sufficient warrant.

Given at Gibraltar the first day of February, 1779,

G. ELIOTT, *Gouv.*

By the Governour's Command,
J.R., Secr.

(To Colonel GREEN, Chief Engineer).

(3).

Storekeepers' Pay Increased.

Colonel Green, Chief Engineer, and Colonel Godwin, Commanding Officer of Artillery, having represented to me that in the present situation of this Garrison, the Duty of Storekeeper to the Ordnance requires a more arduous and constant attendance, and is also become a far greater charge on the person who does that duty, and as it has been customary in Sieges for the Storekeeper, or Person doing that Duty, to receive Extra Pay on such particular occasions; I do therefore authorize Colonel Green and Colonel Godwin to give their orders to the Paymaster of the Ordnance to pay Mr. Samuel Cockcraft, Acting Storekeeper, the sum of Eight Shillings per diem from the date hereof.

Gibraltar, June 26th, 1779.

G. A. ELIOTT, *Gouv.*

(4).

THE RIGHT HONBLE. G. A. ELIOTT, ETC.

Warrant for Erecting Sundry Batteries, etc.

Whereas this Garrison being now actually invested by the Spaniards both by sea and land, you are hereby required and directed

To erect the following Batteries along the edge of the Precipice from the Eastern Extremity of the Old Moorish Castle to the Rock Guard Room with their sufficient Cannon Communications.

A Battery of 3 Guns at the first Catalan Post.

A Battery of 4 Guns at the second Catalan Post, to reform the Queen's Battery at Willis's and to form an Embrasure for one Gun on the East Flank.

A Battery for 4 Guns *en barbette* immediately above and to the S.E. of the East Flank of the Queen's Battery.

To reform Farrington's Mortar Battery for 3 Guns *en barbette*, and the remaining part of about 80 feet in length to be duly prepar'd for the reception and service of Mortars.

To erect five Terrace Batteries for one Gun each on different levels along the edge of the precipice between Farrington's Battery and the North Lodgment.

A Battery for one Gun at the North Lodgment.

A Battery for 5 Guns under the Rock Guard about 900 feet above the level of the Isthmus, to be called Green's Lodge.

A Battery *en barbette* for three guns of a heavy nature, about 15 feet below the Rock Guard, with its communication 6 feet wide leading out of the Middle Hill road, 1,600 feet in length.

To establish 29 Lodgments for Marksmen with wall pieces on the edge of the precipice between the North Lodgment and the East Flank of Willis's.

To erect Batteries for 18 Guns with the necessary Epaulments along the wharf and jetties of the Navy Building Yard at the New Mole.

To repair, reform and augment such Batteries as may require it at Europa Point, and between that all along the Europa line wall to the Five Gun Battery included. Also to form such works and obstructions at the Pass of Europa upon the main road, and at the Pass of Bona Vista, leading from the Devil's Bowling Green, and may become most likely to contribute to our endeavours in preventing an Enemy's attempts to break through these passes.

To establish Lodgments, Palisades, Entrenchments, Flèches and Traverses of safety and precaution in the King's and Princes' Lines. Also temporary Traverses for the security of the communication along the Rampart of the Line Wall, the Streets of the Town and every other work exposed to the Northern attack.

To scarp, blow and quarry the Rock all along from the back of the Spur Guard Room at Landport to the Bluff point at Lower Forbes's to oppose an Enemy's attempts to break into the King's and Princes' Lines by way of a *coup de main* or surprise.

To prepare Chevaux de Frize, make Fascines, fill Sand Bags, deposit Battery Timber, intrenching tools and other necessary materials at the different posts and Batteries; to purchase timber of all kinds, Casks, Iron Hoops, Wool, Oakum, Hides, Cordage, Canvas and every material or Military Implement not in His Majesty's Stores that may be thought necessary for carrying on the present service on this particular occasion.

To form a work with a small rampart and parapet composed of a dry rubble walling and logg'd timber, framed and braced together and fill'd in with sand and stone rubbish, sufficiently high enough to become a *Couvre port Flèche* to the Drawbridge and entrance into the Covered Way at Ragged Staff from the Bay, as well as to protect and defend the several dead angles in this point of the Line Wall.

To repair, reform and augment the 1st Rosia Battery from two pieces of Artillery to six, particularly for the more effectual defence

of the bank of, and the access to the New Mole, and the South Front of the New Mole Fort.

To add a thickness of earth to the 20-inch parapet wall, and to be supported with Casks so as to form altogether a parapet of between 7 and 8 feet thick, with a Banquette 4 feet 6 inches broad and to sink the ground behind the Banquette ^{F. 1.} 6 or 2 Feet, so as to gain a cover of ^{F. 1.} 6 6 or 7 Feet from the fire of an Enemy's Fleet in the Bay, all along the Line Wall from Ragged Staff to the New Mole Fort.

To lay a Boom of obstruction across the Town Wharf, from the head of the Old Mole to the North-west angle of the Glacis at Landport, against the Enemy's attempts by boats upon the Old Mole and Waterport.

To pull down the steeples and such other remarkable objects as may invite or direct the Enemy's fire.

To erect and establish a work without the Ragged Staff Draw-bridge as a Couvre port ; at the same time to protect and defend this Communication ; also the several re-entrant and dead angles in this quarter of the Line Wall.

To erect and establish a Lunette in the place of arms opposite the Navy Sally Port, between the Montagu and the Prince of Orange's Demi Bastion, for the more effectual defence of the adjacent branches of the Cover'd way, and the approach to the Beach, and all that Glacis between the back of the Old Mole and the Prince of Orange's Demi Bastion.

To cover the roof of the principal powder magazine in the Moorish Castle with a Capping of Stout Square Timber, fastened to proper Cables, secured against Fire, by putting over it a foot of earth and mortar composition for its better security against the effects of the Enemy's shells ; also in forming a high Traverse mound of Earth and other local precautions against any attempts the enemy may form to bear upon it from their Batteries on the Isthmus.

To prepare the levels at and about the post of Middle Hill Guard, so as to suit and receive occasionally four pieces of Artillery.

To pull down the Guard Room at Bona Vista in order to establish upon that situation a Battery for three guns towards the Bay.

To fit up a Cave near the back of the Artillery magazine leading up to Willis's (commonly called Poca Rocca's Cave) for the reception and accommodation of the Governor and his family.

For the execution of which several works this shall be your sufficient warrant.

Given at Gibraltar the 26th of July, 1779,

G. A. ELLIOTT, *Govr.*

By order, etc.,

J.R., Secr.

(To Colonel GREEN, Chief Engineer).

(5).

Ordnance Artificers allotted Double Pay.

The Warranted Artificers belonging to the office of Ordnance in this Garrison having represented to Colonel Green, Chief Engineer, that it has been usual for Persons of their respective professions to receive double pay when employed during Sieges, particularly at the late Siege of Minorca, and this Fortress being actually invested: I do therefore empower him to give his orders to the Paymaster of His Majesty's Ordnance to issue to each of them 1 Dollar per Diem from this date.

Gibraltar, 1st August, 1779.

G. A. ELLIOTT, *Govr.*

*AN ENGINEER OFFICER UNDER WELLINGTON
IN THE PENINSULA.*

(Continued).

(Edited by COMMANDER THE HON. HENRY N. SHORE, R.N., RETIRED).

Sunday, April 9, 1809. "The army commenced their march this day."

Jones, under orders to join Major-General Murray's Brigade, left Lisbon on the 11th, expecting to find it at Torres Vedras:—"It was very dark and wet during the latter part of the ride, and upon my arrival here I was surprised to find no English troops; I got a billet upon a small house, and found the people very civil." Next morning, he set off for Mafra—hearing that English troops were there, and found his brigade:—"Spent the remainder of the day in viewing the Church, Library, Convent, etc." This wonderful structure—one of John V. extravagances—built to rival the Spanish Escorial, is still one of the chief sights of Portugal. It served a variety of useful purposes during the war.

Next morning, the German Brigade—to which he was attached—consisting of the 1st, 2nd, 5th, and 7th Battalions of the Line, marched to Torres Vedras, where he occupied his former billet. The advance was resumed next day, as far as Obidos, where the division remained seven days:—"The rainy weather still continued; Lt. Hamilton and myself amused ourselves sketching this place." Jones was now attached to Major-General Tilson's Brigade; and on April 28th, "The army marched from Caldas; employed sketching the ground till this day." Here follow detailed and lengthy descriptions of the ground traversed, and of the repairs effected to roads in certain parts, to facilitate the passage of artillery, but as these details are of no interest to the general reader they need not be introduced. The magnificent convent of Alcobaca—of whose kitchen and commissariat arrangements Beckford gives such a delectable account—was reached the same night; and here ample accommodation would be found for troops and officers; we know, moreover, from the diary of many a British officer, that a generous hospitality was extended to them by the monks. Jones' diary contains the brief entry, "Dined at the Convent, in which I also slept; saw the library, Chapel, etc."

The march was resumed next morning, the division, about mid-day passing through the village of Aljubarrota, close to which was fought and won one of the most epoch-marking battles in Portuguese history.

Here, in 1385 the Castilian Army which had invaded Portugal was defeated with great slaughter. Amongst the spoils of victory was the King of Castile's tent, his "travelling Chapel" with all its priceless contents, and an immense bronze cauldron in which the food of the Spanish soldiers had been prepared. The latter—having escaped the devastating effects of Massena's invasion, is still one of the treasured mementos of Alcobaca. Little did the British soldiers who marched through Aljubarrota, on this occasion,—unless, indeed, they were better posted up in Portuguese history than is usually the case—realize that they were treading on classic ground, hallowed by the shedding of British blood in the cause of Portuguese independence, some four hundred years earlier. It was a singular coincidence that, at the crisis referred to, the King of Portugal,—aware how little chance his country, unaided, would have in the struggle with Castile,—had sent post-haste to England for assistance, whence arrived 500 of the famous English archers in time to share in the glorious victory of Aljubarrota. "The English archers," it is recorded, "did yeoman service, and repeated the glories of Crecy and Poitiers." It was to commemorate that great and glorious victory—in which British soldiers played so brilliant a part—that King John I. built the magnificent Convent of Batalha—the "Battle Abbey" of Portugal. And it was in that noble memorial that the Brigade to which Rice Jones was attached passed the night of April 23rd, 1809, he being billeted "upon a small house facing one of the doors of the church, where the people were extremely civil." The glory of Batalha was its Church; the Refectory and general style of living being on a much humbler scale than at Alcobaca.

The brigade advanced next day to Leyria, where Jones "got an indifferent billet in a house occupied by Staff Surgeons."

Next day, April 25th, 1809, was destined to be ever memorable in the annals of the Peninsular Army, "Sir A. Wellesley is arrived at Lisbon; Sir J. T. Cradock left this place and the command of the army this morning. Lt.-Col. Fletcher set off for Lisbon in consequence of all heads of Depts. being ordered to meet Sir A. Wellesley there." From this moment a new spirit was instilled into the allied troops; no further disaster befell them; strength, discipline, organization, mutual trust, and confidence in their leader increased from day to day, until, after many vicissitudes, but never defeat, four years later, in the glorious campaign of 1813, they drove the last of the invaders from the Peninsula, and on that ever-memorable 10th November, 1813, "the summit of the great Atchubia Mountain just lighted by the rising sun," to quote the inspiring words of the great historian, "fifty thousand men, rushing down its enormous slopes with ringing shouts, seemed to chase the receding shadows into the deep valley. The plains of France, so long overlooked from the towering crags of the Pyrenees, were to be the prize of battle, and

the half-famished soldiers in their fury broke through the iron barrier erected by Soult as if it were but a screen of reeds." And the sequel ? Is it not known to every schoolboy ?

The brigade halted at Leyria five days ; here our author fell ill, and though unable to accompany the troops when the advance was resumed, managed to overtake them at Pombal, where, owing to its crowded state, he was unable to obtain a billet, and had to push on to a village near, where "we were quartered in a good house belonging to a lady who seemed rather afraid of us, and frugal." Next morning, though "extremely ill" he accompanied the brigade to Condexa where, through the good offices of some officers of the German Artillery, he got a house "which was a very good one and the people civil." Coimbra was entered next day, May 2nd, "The approach to it, as you descend the hill, along the road from Pombal, is the most beautiful I ever saw, the Rio Mondego being below, having a long stone bridge over it, and the town with its numerous fine Convents on the hills in front." Here Jones was unlucky in his quarters again, "Procured a billet a great way up the hill in a poor house ; slept there, but found myself extremely ill in the morning."

MAFRA, *April 12, 1809.*

MY DEAR FATHER,

In my last I informed you of the arrival of Lt.-Col. Fletcher and the other officers. To my great annoyance since that time the army have moved forward, and, in the Brigading our officers, it was the intention to have left me in charge of the works at Lisbon, but fortunately Capt. Chapman heard of it and told Col. F. that it would be very cruel, (as he knew I had made up my mind to be attached to him) to leave me behind, and in consequence of his representations I have just arrived here to relieve Lt. Wedekind of the German Engineers who is to return to Lisbon. You cannot imagine how much I feel obliged to Capt. Chapman for his kindness. I really should have been in a state of despair had I been left. I believe I informed you of my making a Report upon the country I have been reconnoitring ; Capt. Chapman was good enough to assist me with his advice and opinion in drawing it up, and I understand the Commander-in-Chief was pleased with it. I am, for the present, attached to Maj.-Gen. Murray's Brigade consisting of the German Legion which forms the Advanced Body of the left wing of the Army ; but I have applied to be appointed to the Brigade of cavalry, under Maj.-Gen. Cotton ; and this I have done for two reasons ; the first is that I intend to make use of Sir W. W. Wynn's name when I see the General, and the other is that I think I shall like the active service of a Dragoon Brigade. The Brigade I belong to-morrow morning to Torres Vedras, and from thence to Obidos and Leyria. . . .

It is now generally understood that an engagement will certainly take place previous to our evacuating Portugal. Whatever may be the result I shall certainly endeavour, as well as the rest of the Army, to do my duty as a good soldier. My servant turns out very well indeed and is of very

great service to me. I have been obliged to get another horse for him and my baggage, for which I gave 90 dollars, but he is so poor I am dubious of his standing the campaign. All my baggage is once more afloat; we are ordered to embark it in the *Britannia*, No. 92, where it is now deposited, and I only have a blanket and portmanteau with me, besides the valise I carry behind at all times.

We are all quartered in an immense palace here, belonging to the Kings of Portugal; it is so large that although there are seven Regiments now in it, it appears capable of holding several more; it is also very grand and beautifully situated. . . .

I remain your most loving son,
RICE JONES.

LEYRIA, April 24, 1809.

MY DEAR FATHER,

I have just arrived here. I wrote to you on the 12th inst. from Mafra, since that we have marched to Obidos where we halted a week, and where I was removed from M.-Genl. Murray's Brigade to M.-Genl. Tilson's. I liked Gen. Murray very much the little time I was with him, and Genl. Tilson is very civil and kind to me; I accompany him the whole of the march; this is all I have to do with him as yet. We marched on the 22nd inst. from Obidos to Alcobaca, and proceeded to Batalha yesterday; we this day marched into Leyria which is at present the Head Qrs. of the army and is uncommonly full of troops; all the army being here except Genl. Murray's Division and . . . You have no idea of the difficulty there is to procure quarters and provisions at the different places we march through; very little or nothing is to be purchased after a Brigade has occupied a town a day or so, and we are obliged to depend upon the Commissariat issuing the rations we are allowed, but which it is often impossible to get, particularly forage for the horses; however my horses both get on extremely well, and if we halt here a day or two (which I rather think we shall) they will be quite fresh again. . . .

My servant turns out very well; he is not yet quite up to foraging and buying provisions when they are scarce, but I daresay he will improve. . . . It certainly would have been as well if I had seen Genl. Beresford, but I thought it would appear forward or impudent to call often upon him; he is now a Field Marshal in the Portuguese Service, and a great number of officers have got rank along with him; however I am not ambitious of their honours, and would much rather serve with my own Brigade in Action than with them; indeed I should certainly have declined any of his appointments had they been offered to me. I understand that Sir A. Wellesley is arrived at Lisbon; I suppose that will cause a new arrangement of the army, if not new measures. We are quite ignorant of our intended operations, but imagine we are to advance towards the French. The following is the disposition of the army. (Full particulars are here given). . . .

We are now nearly 100 miles from Lisbon on the way to Oporto. This is a city and the largest place we have seen since Lisbon. . . .

I am particularly well in health, notwithstanding we march very early (in general about 4 o'clock) and it is seldom we can get breakfast—tea or milk, butter or cheese, it is useless to expect.

Your loving son,
RICE JONES.

ADDRESSED TO:—

CAPT. R. JONES,

ROYAL DENBIGH MILITIA,

STRATFORD COFFEE HOUSE, OXFORD STREET, LONDON.

For the stirring events of the next few days, we must turn to other sources for information. Our diarist is no Boswell; he indulges neither in gossip, nor in criticism of his superiors—as was so much the fashion in the Peninsular Army. Nor does he take one behind the scenes. Apart from this, he was laid up with illness during the stay of the army at Coimbra, and unable to take part in any functions, military or social. The only entries of interest are as follows:—"May 2, Sir A. Wellesley arrived here this morning; May 3, Marshal Beresford arrived; May 5, Maj.-Gen. Tilson's Brigade marched for Viseu, I was too ill to accompany them; Lt. Boothby took my place. Mr. Fitzpatrick pronounced my disorder as ague and ordered me Bark."

Sir Arthur Wellesley having been selected for the command of the army destined to drive the French out of North Portugal, the troops were ordered to assemble at Coimbra; the British regiments as they marched in, meeting with a most enthusiastic reception from the inhabitants; their advent "being announced," wrote an eyewitness, "by a ringing of bells which brought out crowds of people who lined the roads, bridge, and the streets of the city, receiving us with vivas and huzzas; the soldiers, as they passed, being covered with flowers, showered down from all the windows which were thronged with *senhoras*." At night, a grand illumination took place, which was repeated every night during the stay of the army. "And with every inducement to tempt us out; the streets being graced with a charming supply of *Bonitas Senhoras*, who professed '*gustar muitos os Officiales Ingleses bonitos*,' (to be greatly pleased with the handsome English officers) we were, indeed, so cordially received and delightfully entertained, that it can hardly be called vanity to say we believed them in earnest."

Popular enthusiasm reached a climax on the 7th of May, when the army was reviewed by the Commander-in-Chief, on a sandy plain near the city; and an eyewitness wrote "a most imposing and magnificent spectacle it presented." The troops formed a line extending for over two miles; and when, after receiving the General, the regiments wheeled into column and marched past, "the excitement and enthusiasm of the spectators knew no bounds; the speedy and

final deliverance of their country from the French being looked forward to with the utmost confidence."

Lord Londonderry, an officer on the Headquarter Staff declared that, "to some of the troops which stood that day under arms, it is not going too far to affirm, that the whole world can produce none superior"; and he singled out for special commendation, the Brigade of Guards, the 29th and 83rd Regiments, and the four battalions of the King's German Legion, and he went on to state that the whole were in "the highest state of discipline and efficiency, and all appeared animated by one spirit—an ardent desire to meet the enemy."

A feature of this display, which attracted little attention at the time, and the enormous significance of which escaped the notice of nearly everyone present, was the appearance for the first time, in line with British troops, of the newly-raised Portuguese battalions, under British officers. Who, indeed, at that moment would have dared to foretell of these raw, half-disciplined, mean-looking recruits, the glorious part they were destined to play in the future liberation of the Peninsula? "It was impossible not to be forcibly struck with the superiority of the English over the Portuguese soldiers in external appearance," wrote Lord Londonderry, in comparing the two; adding, however, that "the latter seemed to be inferior specimens of their nation, being diminutive and narrow-chested in the extreme; yet were they extremely steady under arms." In justice to the Portuguese soldiers who cut such a poor figure, I would recall a circumstance which was probably unknown to the distinguished critic, and is habitually ignored by British writers, namely, that the cream of the Portuguese Army had been skimmed off by Marshal Junot, after his seizure of the country, two years previously, and these men, in accordance with Napoleon's invariable custom, were sent off to fight his battles in other lands, some even surviving to oppose us at Waterloo. Several of the Portuguese officers, to the eternal disgrace of their cloth, enrolled themselves under the Republican banner of France, and subsequently accompanied Massena, in the capacity of advisers, during his invasion of their country in 1810-11.

During the stay of the army at Coimbra, provisions were abundant, and, contrary to expectation, "the inhabitants supplied every article at a moderate price." Would that this noble example had been copied on certain notable occasions, in modern times! The enormous expense of supporting the army may be gathered from the statement, on reliable authority, that the British troops, alone, circulated in Coimbra a sum of not less than £10,000 a day; while the money spent by the entire army exceeded £100,000 per week; practically the whole of which was defrayed out of the British Exchequer.

The day after the troops had been reviewed by their new commander, was commenced the advance which reached its climax at

Oporto five days later, in that brilliant feat of arms commemorated in the title of the Duke of Wellington's eldest son—Lord Douro, followed by the expulsion of the French from North Portugal. The exultation with which news of the victory was received at Coimbra may readily be conceived. But had any one of the inhabitants of that proud and ancient seat of learning, whose towers were haunted by a thousand memories, at this moment of delirious rejoicing, been vouchsafed a peep into futurity, and venture to disclose his vision, like a modern Jeremiah, he would have been relegated forthwith to the Mondego, or an asylum.

Poor Jones was not fit to move before the 9th, when he rejoined his brigade, but "was unable to make any observations on this part of the country in consequence of illness." He was, however, sufficiently recovered to be able to be in the saddle at 2 o'clock next morning, and to accompany his Chief, Lieut.-Colonel Fletcher, on a long day's work, in course of which, news reached them that the army was in contact with the enemy; and towards evening, they passed over the ground from which the French had just been dislodged; and later, caught sight of the enemy retiring along the road to Oporto. The troops were halted; Colonel Fletcher and his party returning to Bemposta, near Pinheiro, where Headquarters were for the night. "I find myself nearly recovered now" is the final entry for the day. No tonic so good as a brush with the enemy!

An English traveller passing over the same ground, a few years later, tells us how he was shown "with pride the bed-room in which Wellington slept," in the Quinta of Meelhadas, on the night in question, and the very "log of wood in the courtyard upon which our hero, who had reached the Quinta before preparations could be completed for his reception, was found asleep, wrapped in his military cloak."

May 11th. "Rose early and rode with Lt.-Col. Fletcher to Oliviera where we waited until Sir A. Wellesley's arrival; we then accompanied him with the advance until about $\frac{1}{2}$ mile from Grijo, when we perceived a body of the enemy's cavalry on a hill close to the road at a little distance from us. Our cavalry formed ready to charge, and our light troops commenced firing with those of the enemy that were in a wood which concealed the village and the French line. General Stewart's Brigade advanced also, and upon bringing up a gun the French cavalry retired immediately. The 16th Portuguese Regiment then turned their right flank, whilst M.-Genl. Murray's Brigade attacked their left and obliged them to retreat with precipitation. As soon as they had descended a hill on which they had encamped our cavalry charged them to Carvalhos, whilst our artillery played upon them from the hill. I was with Sir Arthur's suite this day." Headquarters were at the Convent of Grijal this night.

May 12th. "Rode this morning early to Carvalhos where we heard the enemy had retired across the Douro during the night, and had blown up the bridge of boats across the river at Villa Nova. I was then ordered with Capt. Burgoyne, R.E., and a squadron of the 14th Light Dragoons, and the 2nd Battalion of the King's German Legion to the village of Vintos, in order to collect boats for the passage of the troops across the river. I proceeded with Capt. B. to the ferry above the village, where we found it was easy to procure boats. Capt. B. therefore directed me to rejoin the army and report to Col. Fletcher. I took the road to Villa Nova, and upon arriving at the Convent in that place, found Col. Fletcher with Sir A. Wellesley in a redoubt which had been evacuated by the enemy. I reported the state of affairs at Vintos and remained with them for some time, during which I observed the French retiring from Oporto, but their guards and sentries very quiet at their posts. A few boats then crossed the Douro to us, and General Hill's Brigade began to go over in them; as soon as they landed they marched up a steep hill and took possession of a large unfinished building. The French perceiving this marched down towards them in column, their light troops being posted behind the walls and in the gardens all round; the former were soon checked by the fire of some guns we had brought to the spot where Sir A. and we remained; while the latter were at length and with some difficulty dislodged. M.-Genl. Murray having now arrived with his brigade from Vintos, and Major-Gen. Sherbrooke with the Guards, and B.-Genl. Stewart's Brigade having crossed the river below, the enemy retreated immediately, and our cavalry charging them brought in many prisoners and left a number on the field. I crossed the river with Genl. Stewart's Brigade." A bed was found that night at Genl. Howorth's quarters.

The only entry of interest, next day, is that Colonel Fletcher had nearly completed a new bridge across the river, by the evening, to replace the bridge of boats destroyed by the French; "it was very wet all day." Next day, May 14th, Jones was ordered by Sir A. Wellesley to join Major-General Hill's Brigade, which he accompanied to Braga. Continuing the advance on the 17th, orders were received to return to Braga, which was reached again the same evening. Here, it was "reported that the French had dispersed, and our army was returning." Our author took no further part in pursuing the French over the border,—in which famous retreat they shed nearly everything but the clothes they stood in.

During the late fighting, two Engineer officers had been captured by the enemy, "May 19th, Lt. W. Thomson who has escaped from the French during their retreat, arrived, and dined with me." And next day, "Col. Fletcher arrived here with Capt. Goldfinch who has been fortunate enough to make his escape from the French."

Next day, May 21st, Jones returned to Oporto; May 23rd, "Employed all this day drawing a plan of the ground where we passed the Douro on the 12th. Went to the Opera in the evening with Col. Fletcher. I was this day very ill; rather better at night."

Oporto, *May 13th*, 1809.

MY DEAR FATHER,

I have only time to let you know that thro' divine Mercy I have escaped unhurt during all the late severe but glorious affairs we have had with the enemy. Soon after writing to you from Leyria, I was taken very ill with an ague which I suppose I had brought from the coast of Essex; and at Coimbra, where the army halted, I was so bad that when M.-Genl. Tilson's Brigade, to which I was attached, was ordered on a service by itself, I was unable to accompany it. However when the army moved I persevered in accompanying them and very providentially recovered the very first day's march, and am now as well as ever I was in my life. Sir A. Wellesley's Dispatches will inform you more of the affairs than I have time to do. On the 9th instant we marched from Coimbra; on the next morning we fell in with and drove in their advanced post about 9 miles, and took their position at Oliviera. I was a little in the rear during this business, but came up in time to see the enemy retire from ground they had occupied about 400 yards in front of us. On the 11th instant after marching some distance we found them posted very advantageously at Greija, but in a little time we turned both flanks, and they retreated precipitately. I was near Sir Arthur all the day, and it was certainly a very fine sight, but was far exceeded by the passage of the Douro yesterday, and the defeat of the French at this place, which was as gallant a thing as was ever done: I was with the artillery cannonading them from the other side of the river at the commencement, and afterwards crossed with the 29th Regt. and B.-Genl. Stewart in time to make them scamper off. I have great reason to be thankful for my preservation. . . .

Poor Hamilton of our Corps was very badly wounded yesterday; I understand a musquet ball entered one of his thighs and lodged in the other; the ball is extracted; I am now endeavouring to find him, to render him what assistance I can. . . .

Your very loving son,
RICE JONES.

Oporto, *May 22nd*, 1809.

MY DEAR FATHER,

You must allow me again to write you a very hurried epistle; in fact we seldom hear of an opportunity of writing to England until a short time before the letters are sent; however I always write a letter if possible. I have just been favoured with yours which I was very happy at receiving. I wrote to you from hence the day after we took this place; the next day the whole army marched, and after pursuing the enemy as far as the borders of Spain through a country that they had burnt and destroyed wherever they could, and where it was impossible to procure

any provisions or forage (the inhabitants having all quitted their houses, most of which the French burnt) we have given up the pursuit, and great part of the troops are returned here, whilst the rest are returning as fast as they can. I believe we begin to move back again towards Lisbon to-morrow, in consequence of a French force having marched for that place under Marshal Victor; and it is said that we shall probably enter Spain as soon as we have beaten his army.

We are rather disappointed at our not having taken Marshal Soult and the whole of his army, but however, his troops are in a very distressed and scattered state, and certainly had a complete run for the narrow escape they have had; they have gone into Galicia and the force they have got off with are by some people estimated at 8,000 men; they have blown up great quantities of their ammunition, left great part of their guns, and an immense number of horses all along the road, some killed and others wounded, etc.; they have also lost great part of their baggage, and even left some of their knapsacks and kits about the roads.

Ever since the passage of the Douro on the 12th instant (which was a most daring, and as it turned out, most glorious attempt, and which the French all own they had not the most distant idea we should try to do, as they had destroyed the bridge) I have been attached to M.-Genl. Hill's Brigade, instead of Lieut. Williams who was left here ill, but who is now well and has relieved me. We marched from here on the road to Ponte de Lima for two days, when we received an order to join the rest of the army on the road to Braga: this turning out of one road into the other, threw our brigade into the rear, but which turned out rather fortunate than otherwise, as we did not advance so far in the country the French have destroyed, and consequently did not suffer so much as the rest of the army. Genl. Hill is a very good kind of man. I lived at his table during the time we were on the march, when it was impossible to get anything to eat elsewhere, and slept in the same empty houses along with his staff. Genl. Tilson's Brigade was at Chaves the other day. I expect to join them as soon as we can ascertain the way they are going; in the meantime I am with Col. Fletcher at Hd. Qrs., detached about in all directions, whenever a Brigade wants an Engineer with them. The Colonel is a very good man; he was particularly kind and attentive to me during my late illness, as were all our officers; Capt. Burgoyne removed me into his own quarters at Coimbra, and rendered me every little assistance which a sick person required. I am now getting quite strong again, and feel as well as ever I was in my life, thank God;—notwithstanding we have had a great deal of rain all the time we were marching after the French, and in general were obliged to sleep in our wet cloaks, etc. It is now very fine weather again. I should like to know what the people in England think of our attack of this place, as well as our other operations; I assure you we think it altogether a very gallant affair. . . . Capt. Goldfinch and Lt. Thomson are here, they escaped from the French during the confusion of their precipitate retreat and are very well. . . .

Your loving son,
RICE JONES.

P.S.—I assure you my losing the adjutancy had not any tendency whatever to make me uncomfortable; I believe I resigned it with as good a grace as most people would have done. I am only anxious to continue with the troops that keep the field, as I am very much afraid of being left in some garrison town; I have hitherto escaped, but had some near chances for it. My sickness was so far fortunate as it prevented my being detached with Genl. Tilson's Brigade which has not been in action, and perhaps also from being sent back to Lisbon with Capt. Chapman from Coimbra; he made every effort to remain with the army but could not. I have now made up my mind to be perfectly satisfied with whatever occurs, or as the French prisoners say, with the *Fortune de la Guerre*. My best horse stands the campaign very well, the other's back is very sore, I fear I shall be obliged to get another here until he gets well, altho' I cannot afford it. I am quite delighted at having been in all our actions; I am now beginning to be used to the whizzing of the bullets about one, which at first was not very agreeable, altho' everyone of course took it quietly.

The following interesting sketch of Wellington, during the pursuit of Soult's Army, is supplied by a Portuguese gentleman:—"I was a boy then, living at Salamonde. I recollect seeing the first two soldiers of the British Army who entered the city. They were two dragoons with carbines in their hands, who rode up the street without uttering a word to any one, and then halted like two statues. Soon after, others followed; and I cannot express to you the joy of our hearts—the enthusiasm with which your countrymen were received. My father, who spoke English perfectly, had received notice that Sir Arthur Wellesley would take up his quarters in his house, and dinner was prepared accordingly. It was towards evening, and I was with my father, when an officer wrapped in a large cloak entered the saloon, and told him that he had come to remain there. "I regret," said my father, "that I cannot give you the best accommodation my house affords, as the General is coming here himself." "I am the General," said the officer; and for the first time I saw your great Duke. Throwing off his cloak, and an orderly bringing in a case of maps, he desired my father to accompany him into an inner room, and there, for two hours did they sit looking over them, while my father was describing the country. During all this time dinner was waiting; but not a particle of food would the General touch till he had formed his plans. The following morning the army again marched in pursuit of the French."

The extreme difficulty of supplying the troops with food during the pursuit may be gathered from Wellington's General Orders; thus, under date May 17th, 1809:—"The troops will have observed the extreme difficulty of supplying them with bread in this part of the country. . . . Till the army be in a more plentiful country the allowance of bread is to be one pound, and one pound and a half of

meat each man. . . . When bread cannot be delivered to the troops, they must have two pounds of beef for their ration." Short commons, as is invariably the case, brought demoralization in its train, and drew from the Bishop of Braga, who seems to have assumed the rôle, for the nonce of Commissariat Officer—the following mild protest:—"I likewise avail myself of this opportunity to inform your Excellency that, notwithstanding my endeavours that supplies of provisions of all kinds should be brought forward at this place for the use of the army under your command, I have not succeeded until now to that extent that I promised to do, on account of the arbitrary manner in which the provisions are taken possession of at this place by the different soldiers of your Excellency's army, etc., etc."

Another difficulty Wellington had to contend with was the improvidence of his troops, who, when entrusted with three days' rations, in advance, would consume the whole at a sitting, "from want of attention to this, and care of their bread, the best operations are necessarily relinquished." With a view to the prevention of the practice, orders were issued for the men's bread to be inspected twice a day.

On the return of the army to Coimbra, the Commander of the Forces issued the following stinging rebuke. "Not only have outrages been committed by whole corps, but there is no description of property of which the unfortunate inhabitants of Portugal have not been plundered by the British soldiers, whom they have received into their houses; or by stragglers from the different regiments of the army." And after describing the disciplinary measures rendered necessary by these disgraceful proceedings, the Commander of the Forces goes on to state that, "The people of Portugal deserve well of the army: they have in every instance treated the soldiers well; and there never was an army so well supplied, or which had so little excuse for plunder."

The sequel to this disastrous retreat is thus described by Capt. Charles Boothby, who was made acquainted with the facts by an intelligent French officer:—Marshal Soult, after he had effected his retreat from Portugal, immediately repaired to the quarters of Marshal Ney, at Lugo, and was ushered in by the officer above-mentioned, who, from the ante-room could distinctly over-hear the altercation that ensued. Soult on entering the room where Ney was, went forward with open arms to embrace him.

"Stand back," said Ney, "I don't know you, where do you come from? You come flying, like a coward, from the enemies of the Emperor."

"Allons donc," returned Soult. "I come to save Lugo, which you were on the point of losing."

"I neither want assistance," said the other, "nor are you in a condition to give me any. I have been met by hundreds of your

straggling fugitives. They all had abandoned their arms, that they might fly the faster; but their packs, heavy with plunder, were religiously preserved! It is you, Monsieur le Maréchal, who have taught them to throw away their muskets in order that they might carry the more booty, when your orderly-book gave up such a town as Oporto to a three days' pillage. Is that the way, sir, you consult your master's interests? To give up the second city of the country, you take in his name, to the horrible excesses of your brutal soldiers! You are no longer a Marshal of France. I will no longer acknowledge you as a chief in authority under the Emperor."

Ney, at length, became so grossly abusive that Soult, unable any longer to command his temper, used some expressions which so infuriated Ney that suddenly drawing his sword, he said, "Villain, defend thyself"—a mandate which was instantly obeyed; and the furious combatants were only, at last separated by General Mathieu rushing into the room. Meanwhile the quarrel had extended to the troops commanded by the respective Marshals, who had commenced firing at each other; and it was only by the personal intervention of their chiefs that the affray was stopped.

Headquarters having quitted Oporto on May 24th, Jones was ordered to reconnoitre the river Tamega from Chaves to the Douro; "but was prevented by illness and the advice of Surgeon Fitzpatrick; I still continued very ill indeed." The arduous duties of a campaign must have been trying to a young man who had just risen from a sick bed; and when on top of all this we come across such an entry as "arrived in the dark, and very wet; slept in my wet cloak, having waited in vain for my servant, until late," it is no wonder he was knocked over again, so soon. His brother officers had all gone with the army. "I am now quite alone and very unwell; consequently have little to do or write." Two days later, "Rode to Mr. Fitzpatrick's; I am considerably better than yesterday; continue taking quantities of Bark." Many a man would have grumbled at the hard luck which kept him in the rear, in such stirring times; but he writes;—May 28th. "The end of this day has nearly completed my 21st year, and therefore I shall begin a new book, hoping that when I arrive at the end of another I may have as much reason for thankfulness to God for his Providence as I have at present."

(Signed) RICE JONES.

Convalescence went on steadily; he was soon able to walk about the city; bought Lalande's *Tables of Logarithms*, and obtained the loan, from a wounded brother officer of *Zimmerman on Solitude*.

May 31st. "Rode with General Howorth and Surgeon Fitzpatrick over the ground of the action on the 12th; then crossed the bridge to Villa Nova, and visited the spot from whence we cannonaded the enemy on that day. NOTE.—We had four guns on the old French

work and one more, to the left. This was a very fine day, and the views of the city and river were delightful."

The operations pertaining to the passage of the Douro have been so fully described in various histories, that it is needless to recapitulate them here. It may be of interest to state, however, that, with the exception of the ground immediately adjoining the famous Convent whence Sir Arthur directed the operations on that memorable occasion, which was a good deal cut up for purposes of defence during the subsequent Civil Wars,—the river banks and the unfinished building which our troops seized and held after crossing, are but little changed since the eventful day in question.

Sunday, the 4th of June, finds our author once more on the march, after the army. "I rode a pony I have bought from Burgoyne for 60 dollars, and my large horse carried my baggage; the other's back being sore. In the afternoon it rained very fast. I halted here (St. Joao de Madeira) and got a billet upon a good house near the Church where I was used very well." Here follow as usual detailed descriptions of the ground traversed, from day to day, June 6th, he reached Coimbra. "Quartered in a poor house in Rua do Corpo Santo, and found to my surprise that Sir A. Wellesley had proceeded towards Abrantes." Setting off, in pursuit of Headquarters, on the 8th, with a friend, they called at the Quinta da Bouca,—“where we were very hospitably received by the Fidalgo who resided there, and who directed us the nearest road to Venda das Figueras.” They halted for the night at Almofalla, “where I was taken by the Capitao Mor into his own house and was very well treated.”

(To be continued).

*HISTORICAL DOCUMENTS OF MAJOR-GENERAL
SIR J. T. JONES, BART., K.C.B., R.E.*

(Concluded).

The following report on the Artillery preparations for the Siege of Badajos was written for Sir J. T. Jones by Sir A. Dickson, R.A.

Preparations for the Siege of Badajos in 1812.

1812.—*Jany. 20.*—Immediately after the Capture of Ciudad Rodrigo, Lord Wellington made a Confidential Communication to the Departments most immediately concerned, of his intention to attack Badajoz as early as it was possible to prepare for the same. His Lordships first idea was to move to Elvas the Battering train that had been employed against Ciudad Rodrigo, or at least a certain number of the Guns, and to compleat the equipment from a proportion of besieging ordnance then in the Tagus, but the depreciated State of the Gun Bullocks, from Scarcity of Forage and the Severity of the Season having been pointed out, which gave every reason to fear they would be unequal to make such a march as that by Villa Velha with 24 Pr. Guns, it was suggested to his Lordship to apply to Admiral Berkeley, the Commander-in-Chief on the Lisbon Station, to know if he could supply a proportion of 24 Pounders from the fleet, to form in Conjunction with the besieging ordnance in the Tagus a new battering train for the proposed Undertaking, and if the answer should prove favorable, that an adequate proportion of the Gun Carriages alone belonging to the Ciudad Rodrigo Battering train should be sent to Elvas, together with 16 Iron 24 Pr. Howitzers, and a certain quantity of Ammunition. These Suggestions having been approved of by his Lordship, he immediately wrote to the Admiral to request if possible to be supplied with twenty 24 Prs. from the naval Department, which with 16 Iron 24 Pounders on travelling Carriages laying in Transports in the Tagus, and the resources of Ordnance that might be derived from Elvas, it was thought would afford Sufficient means for the attack.

Admiral Berkeley in his reply informed Lord Wellington, that the *Elizabeth* had lately gone to England, which was the only Ship on the Lisbon Station that carried 24 Prs., but as he always understood that 18 Prs. were good battering Ordnance, if that nature would answer for the purpose required, he could supply 20 Guns with Carriages and Ammun. Compleat.

The Admirals answer was Communicated to Col. Fletcher and Major Dickson, who both agreed the Service could be undertaken with the above mentioned proportion of 18 Pounders, though they would have greatly preferred the whole train to be 24 Pounders.

Jany. 26.—In the Interval however whilst waiting for Admiral Berkeley's reply, Lord Wellington drew up the following Memorandum.

Memorandum for Mr. Bisset, 1st. As soon as the Gun Bullocks will have brought in the Ordnance to Almeida M. Genl. Borthwick, and Major it is desirable that the Sixteen 24 Pr. Dickson, *Jany. 26th, 1812.* Carronades (Howitzers) should be sent off to the Alentejo by Eight Bullocks to each.

They might go by easy Stages; and the 150 Bullocks required to draw the Bridge, might accompany them in order to assist in their removal.

2nd. Twenty 24 Pr. Guns and their Carriages, and Six Spare Carriages with their necessary Small Stores should likewise be removed from Almeida to Barca d'Alva. They should there be embarked in boats and Sent down to Oporto, and thence by Sea to Setuval.

3rd. A letter has been written to Mr. Boyes, to request him to send to Oporto all the 24 Pr. Shot and Spherical Case Shot that is at Villa da Ponte; and all the Powder 900 Barrels that is at Pezo de Regoa to Oporto; to be there embarked, and sent to Setuval by Sea without loss of time.

4th. As soon as the timber will be brought to Almeida from Cuidad Rodrigo, and the Bridge will be brought on the transporting Carriages to the same place from the neighbourhood of Gallegos, the Bullocks should be turned to grass.

5th. 1,000 Barrels of the Gunpowder recently arrived from England at Lisbon to be ordered immediately to Setuval.

W.

Jany. 28th.—This day Lord Wellington gave out a further Memorandum as follows:—

Memorandum on the operations against Badajoz, for M. Genl. Borthwick, Major Dickson, Colonel Fletcher, and the Commy. General, Jany. 28th, 1812. Major Dickson will proceed to Setuval in order to arrange the removal of the Ordnance and Stores from Setuval to Elvas; passing by Elvas.

5th *Feby.*—He will require to go to Elvas 7 days.

7th *Feby.*—To go to Evora 2 days.

8th *Feby.*—To Alcaçer do Sal 1 day.

10th *Feby.*—To Setuval 2 days, in all 12 days.

Mr. Bisset will be so kind as immediately to order an intelligent Commissary to Setuval with directions to make the preparations of Boats to convey the Heavy Ordnance and Stores from Setuval to Alcaçer do Sal.

The Same Commissary is likewise to Communicate with the Magistrates of Evora, and Alcaçer do Sal, and Setuval, to procure Bullocks and Carts to remove the Ordnance and Stores from Alcaçer do Sal to Elvas.

Supposing these arrangements to be ready by the time of Major

Dickson's arrival at Setural, and that he can immediately Commence
 17th Feby. to remove the Ordnance and Stores from the transports.
 21st Feby. It will then take Seven days to remove the Ordnance and
 25th Feby. Stores from the transports to the Boats, 4 days to arrive
 8th March. at Alcaçer do Sal, 4 days to prepare to move from Alcaçer do Sal,
 12 days to March to Elvas. In all 38 days.

W.

Jany. 30th.—Lieut. Love marched from Almeida with 16 Iron 24 Pounder Howitzers, and a proportion of General and Laboratory Stores on his route for Elvas.

Feby.—In the beginning of Feby. Capt. Power marched from Almeida for the same destination, with 20 Travelling 24 Pr. Carriages, and 5 Travelling 18 Pr. Carriages, with a Considerable proportion of Stores. From the Heavy rains, and the difficulty of the route in the Winter season the Bullocks Suffered so much, that these Convoys were greatly retarded on the March, Lieut. Love not arriving at Elvas till Feby. 25th, and Capt. Power not till March the 3rd.

Jany. 30th.—Major Dickson Commenced his Journey this day for Elvas and Setuval.

Feby. 5th.—Major Dickson arrived at Elvas, and immediately proceeded to examine into the resources of that place, to ascertain what means it would afford for the intended Siege.

He found the following available Ordnance and Ammn. :—

English Iron 24 Pr. Geo. II.	...	...	...	4
Do. Do. 18 Pr. Do	...	...	...	2
24 Pr. Round Shot	...	...	...	10,000
18 Pr. Do. Do.	...	from	3,000 to	4,000
Barrels of Powder Chiefly English	...			3,500.

There were also 16 Portuguese Iron 24 Prs. and 5 Portuguese Iron 18 Prs., but it was thought better not to reckon on these, to avoid complication of Ammn. on account of the difference of Calibre.

Feby. 6th.—Major Dickson proceeded on his journey to Setuval, which place he reached on the 10th Feby., and on his arrival there he found the transports with 16 24 Pr. Guns and a full proportion of Stores and Ammn. at Anchor in the Bay, and the Same day Captain Gardiners Company of Artillery under Capt. Dansey arrive from Lisbon to be attached to the train.

Feb. 11th.—This Morning the Operation was Commenced of Shifting the Guns and Stores into boats, and sending them up to Alcaçer do Sal.

Major Dickson having ascertained that the 20 18 Pounders Admiral Berkeley had undertaken to supply, were Russian Guns equal to 20 Pounders of English Calibre, he proceeded to Lisbon, and made every effort to get this appropriation changed, but without Success, Admiral Berkeley not considering it advisable to take any part of the

Armament of the *Barfleur* 98 for this purpose, which was the only Ship in the Tagus having 18 Prs.

As the English Shot therefore would answer very badly for these Guns, recourse was had to the Stores of Portuguese 18 Pr. Shot at Lisbon, of which a very large quantity were sent to Alcaçer do Sal, but many thousand of these were obliged to be rejected being far too low.

Feby. 12.—A Detachment of 160 Portuguese Artillery men joined this day from Lisbon, under the Command of Captains Julio Cesar Pereira de Amaval, and Captain Thomas Cox.

14.—Capt. Dansey and Capt. Cox, with a Detachment of Artillery men, proceeded this day with the first Division of loaded boats for Alcaçer.

15.—Second Division of Boats proceeded up the river to Alcaçer.

14 of the Russian 18 Pr. Guns arrived.

16.—The whole of the 24 Pounder Guns, Stores, &c., have been forwarded to Alcaçer—as also all the Engineer Stores.

18.—14 18 Pr. Guns, with about 10,000 18 Pr. Shot sent off this day to Alcaçer.

Major Dickson removed this day to Alcaçer do Sal.

26.—From the 16th to the 26th Feby., the Artificers were hard at work in fitting Poles to the Gun Carriages, in repairing Block Carriages, fitting Sling Carts for Bullock Draft there being a deficiency of means for moving the Russian 18 Prs., and also in making Frames to keep the Shot from rolling off the Bullock Cars.

Within the same period, the remaining 6 18 Prs., and Considerable quantities of Shot and other Stores arrived from Lisbon by way of Setuval. In the mean time Convoys of Cars, Mules, and Asses, were dispatched for Elvas with Stores and Ammn. as fast as they were supplied by Mr. Laidley, the Commissary appointed to assist in the movement of the train.

This day Capt. Cox marched with a Division of 16 24 Pr. Guns for Elvas.

Feby. 27.—10 Russian 18 Prs. marched for Elvas under the charge of Capt. Julio Cesar.

Captain Barreiros arrived with a Portuguese Company from Elvas.

28.—The remaining 10 Russian 18 Prs. marched for Elvas under the charge of Capt. Barreiros, these Russian Guns have been received so nearly destitute of Side Arms and Small Stores, that Elvas and the equipment from the North must be depended on to furnish nearly every thing they want.

The Admiral is sending round 10 English 8 foot 18 Prs. which arrived at Lisbon in the *Nyaden*.

March 2.—Lord Wellington has ordered the 10 *Nyaden* 18 Prs. to be forwarded to Elvas. They were brought as far as Estremoz, and there halted, in consequence of the Siege Commencing.

6.—The operation of sending off Ammn. of all descriptions was Continued with the greatest Activity, the Asses proved very useful in

the Conveyance of shot, a great many were employed, and though the loads they took were very Small they made long Marches, and returned with great expedition, scarcely Sustaining any Casualty.

The operation being in a great degree Completed at Alcaçer do Sal, Major Dickson set off this day for Elvas, leaving Capt. Daniel of the German Artillery in charge at Alcaçer, to send forward the remaining Shot and Powder required and also the Nyadeus 18 Prs.

March 8th.—Major Dickson arrived at Elvas this day, where he found the train assembled and in good order as follows—the last division had just arrived :—

24 Prs. Iron	...	...	...	...	...	16
18 Prs. Do.	...	...	...	...	...	20
24 Pr. Howrs. Do.	...	...	...	...	...	16
Total						52

March 11th.—This day Lord Wellington arrived at Elvas from the North.

15th.—The preparations being Completed, the large Boats and other Pontoons marched this day from Elvas to the Guadiana, about Four miles below the Tower to form Bridges, and General Le Marchants Cavalry with a Brigade of Infantry were passed over the river.

16th.—Marshal Beresford marched with the 3rd, 4th, and Light Divisions and invested Badajoz on the South Bank.

At this period the State of the Battering train for the Siege was as follows :—

Pieces of Ordnance as above	...	...	...	...	52
24 Pr. Round Shot from the North, from Alcaçer do Sal, and collected at Elvas, including 6,720 22 and					
23 Prs. ...	...	...	...	...	22367
18 Pr. Round Shot from Alcaçer do Sal, and Collected at Elvas	...	...	...	...	17837
5½ Inch Common Shells	...	...	...	...	2562
5½ Do. Spherical Do.	...	...	...	...	2440
24 Pr. Grape	...	...	...	...	1680
24 Pr. Case	...	...	...	...	424
18 Pr. Grape	...	...	...	...	1000
18 Pr. Case	...	...	...	...	500

With an ample Supply of Powder. Additional Supplies of 24 Pr. and 18 Pr. Round Shot arrived from Alcaçer during the operation.

The inequality of the 18 Pr. Shot was so great, that they were divided into three sizes, which were painted of different Colours to preserve regularity of practice.

March 17th.—Major Halcombe marched from Elvas for the Siege with 8 24 Prs., 10 18 Prs., and 8 24 Pr. Howrs.

Trenches were opened this night.

18th.—The remainder of the besieging Ordnance moved from Elvas under Capt. Rettberg, very heavy rain this day.

19th.—Head quarters moved to the Camp before Badajoz.

Half the Battering train was left at the Bridge, and the remainder moved up to the Siege, the Park was formed about 2,500 yards from the Place and out of sight from the Town.

As yet the Enemy have not fired any Shells.

Heavy rain in afternoon.

The Corps of Artillery for the Siege was as follows :—

	Rank and file.
British Artillery including 30 Artillery men of Kings	} 296
German Legion	
Detachments of the 2nd and 3rd Regiments of	} 566
Portuguese Artillery	
	862
British and Portuguese Artificers	25

Officers Names.

Major Dickson—Directing the operations of the Siege.

British Artillery.

Major May, Asst. Adjt.-Genl.

Major Halcombe.

Captain Gardiner.

Captain Power.

Capt. Latham, killed.

Captain Dansey.

Captain Dundas, wounded, lost an arm.

Lieut. Bouchier.

Lieut. Weston.

Lieut. Coumel, killed.

Lieut. Grimes, dangerously wounded.

Lieut. Love, slightly wounded.

Assistant Surgeon Fitzpatrick—Acting Surgeon.

Assistant Surgeons Frazer and Kenney.

German Artillery.

Captain de Rettberg.

Captain Daniel.

Lieut. Luchow.

Lieut. Thiele, slightly wounded.

Lieut. de Goeben, severely wounded.

Portuguese Artillery.

Major Tulloh, wounded severely.

Captain Julio Cesar Pereira de Amaval, killed.

Captain Antonio Vellez Barreiros, killed.

Captain Cox.

Captain Mitchell.

Lieut. Diogo Francisco.
 Lieut. Rodrigo Pluto Roby.
 Lieut. ——— Paez.
 Lieut. Joaquim Felipe Lamprea.
 Lieut. Joze Maria de Amaval.
 Lieut. Roque Landeiro Pa. de Araujo, killed.
 Lieut. Francisco Xavier Pa. da Rosa, lost an arm.
 Lieut. ——— Maximiano Vieira da Silva, killed.
 Lieut. Joao Alberto Guerreiro.
 Lieut. Carlos Anto. da Silveira, wounded.
 Lieut. and Adj. Theodoro Jose Duarte Quirido.
 Lieut. and Adj. Jose Joaquim Barreiros.
 Assistant Surgeon Graça.

March 20th.—Much rain last night the Trenches were very full of water.

22nd.—The Enemy at work on an intrenchment under the Castle. A Spaniard delivered up a dispatch from General Philippon to Marshal Soult in which he states that matters look serious.

23rd.—This night the Ordnance was taken into No. 1, and No. 2 Batteries, as follows :—

No. 1.—3 18 Pr. Guns, and 3 24 Pr. Howitzers.

No. 2.—4 24 Pr. Guns.

Three Artillery men were wounded in the operation.

3 24 Pr. Guns, and 1 18 Pr. Gun, brought from the Bridge this day.

The enemy kept up a heavy fire all this day.

March 24.—This night the following Batteries were Armed in readiness to open to-morrow viz. :—

No. 3.—4 18 Pr. Guns.

No. 4.—6 24 Pr. Guns and 1 24 Pr. Howr.

No. 5.—4 18 Pr. Guns.

No. 6.—3 24 Pr. Howitzers.

The Corps of besieging Artillery was formed into three daily reliefs, each relief consisting of proportions of British and Portuguese Artillery according to the strength of their respective Corps.

1st Relief Commanded by Major Halcombe,

2nd Do. Do. Capt. Gardiner,

3rd Do. Do. Capt. de Rettberg.

these being the three senior Captains with the train.

Lieut.-Colonel Framingham, Commanding the Royal Artillery, was present with the Head Quarters of the Corps, but he did not interfere with Major Dickson in the operations of the Siege.

Major Tulloh and Major May had a general Superintendence of the fire, to see the Batteries were properly directed.

Capt. Latham had the Superintendence of the Laboratory and of the Supply of Ammn. to the Batteries.

The Ammn. was conveyed in Bullock Carts from Elvas to the

Bridge, and from thence it was brought forward to the Park by the Small Arm Ammun. Mules of the Army.

March 25.—This morning Major Halcombes relief went on duty in the batteries, and at $\frac{1}{2}$ past 10 o'clock the fire opened as follows from 28 pieces.

	24 Pr. Guns.	18 Pr. Guns.	24 Pr. Howrs.	
No. 1 ...	—	3	3	} To enfilade Commn. from Town to Picurina and against the defences.
No. 2 ...	4	—	—	
No. 3 ...	—	4	—	} against Fort Picurina.
No. 4 ...	6	—	1	} against Lunette St. Roque.
No. 5 ...	—	4	—	
No. 6 ...	—	—	3	} on the production of the right face of Trinidad Bastion.
Total ...	10	11	7	

The fire was kept up very briskly on both sides during the day, but Fort Picurina and Lunette St. Roque were soon silenced.

Captain Julio Cesar Pereira de Amaval, an experienced officer of the Portuguese Artillery, was killed, and Lieut. Grimes, Royl. Artillery, wounded.

The Howitzer in No. 4 was rendered Unserviceable by a shot from the Enemy soon after the batteries opened.

Fort Picurina was carried by Assault this night.

March 26th.—Capt. Gardiner with his relief on duty. Batteries 3, 4, 5, and 6, and the three Howitzers in No. 1, Continued their fire against the Enemies defences with the greatest activity during the whole of this day, the Enemy also kept up a very Vigorous fire.

A 24 Pounder Gun was disabled in No. 4 by the Enemies fire.

The Ricochet fire of the batteries was less effectual than might have been expected, but None of the distances were less than 600 yards, the lines to be enfiladed were short, and it required the greatest attention to keep the Artillery men, particularly the Portuguese, to the proper system of direction for this species of fire, they would not believe they were doing good in firing over the parapet, and they preferred striking the wall whenever they could do it unobserved, and this was done to such a degree, that the left face of the Bastion La Trinidad was very much injured at the Salient Angle.

March 27th.—Capt. Rettberg with his relief on duty. The fire from batteries 3, 4, 5, and 6 was kept up with vigour the whole day, and the Ricochet fire was now brought to more steadiness and effect.

The Enemy replied with equal activity, and one 18 Pr. Gun in No. 3 was rendered Unserviceable by their fire, and another in No. 5.

This day the remainder of the heavy Ordnance belonging to the Battering train was brought from the Bridge to the Park.

March 28.—The fire continued as before from batteries 3, 4, 5, and 6, but in the Course of the day two of the Howitzers having been dismantled in No. 6, and a number of Casualties having taken place in it from the plunging fire of the Castle, that Battery was dismantled and the Howitzers placed under cover.

Lieut. Counell of the Royal Artillery was killed this day, he had been very distinguished in the former Siege of Badajoz.

No other changes made this day or night with regard to the Artillery in the Batteries, except compleating and making good by exchanges all damaged Carriages, &c.

The Artificers hard at work in repairs.

N.B. The battering train never had more than 52 pieces as stated in page 9 of this detail.

March 29th.—The fire Continued as before from batteries 3, 4, and 5.

This night breaching battery No. 9 was armed with Eight 18 Pr. Guns, Three of which were those employed in No. 1, and Five were brought from the Park.

March 30th.—Batteries 3, 4, and 5 Continued their fire, and breaching Battery No. 9 of Eight 18 Prs. opened against the flank of the Bastion of Santa Maria, the practice was excellent, but the wall proved so hard and Solid, that apparently very little progress was made in breaching.

Soon after this breaching battery opened, the Magazine for its supply which was in the ditch of the right face of Picurina, was Unfortunately blown up by a Shell from the Enemy, by this four Artillery men were killed and Several wounded, and it also occasioned a good many Casualties otherwise. There were upwards of 300 18 Pr. Cartridges in the Magazine when the explosion took place, but no delay was occasioned in the fire of the Battery, as Cartridges were obtained from No. 3 till a Supply arrived from the Depot.

This night Batteries No. 7, 8, and 10 were armed as follows :—

No. 7 Breaching battery, 12 24 Pr. Guns against the right face of the Bastion of Trinidad, viz. :—

5 24 Prs. from No. 4.

1 24 Pr. formerly employed in No. 2.

6 24 Prs. from the Park.

12

No. 8 Breaching battery, of 3 24 Prs., and 3 18 Prs., against Flank of Santa Maria, viz. :—

3 24 Pr. Guns formerly in No. 2.

3 18 Pr. Do. from Park.

6

No. 10 Battery, 3 24 Pr. Howitzers to enfilade the ditch in front of the principal breach. These Howitzers were brought from No. 6.

March 31st.—The Distribution of the Battering train ordnance was now as follows :—

No.	24 Pr. Guns.	18 Pr. Guns.	24 Pr. Howrs.	
1...	—	—	3	
3...	—	3	—	
5...	—	3	—	
7...	12	—	—	To breach Trinidad.
8...	3	3	—	Do. Flank Sa. Maria.
9...	—	8	—	Do. Do. Do.
10...	—	—	3	
In the Park...	—	1	9	
Unserviceable...	1	2	1	
	16	20	16	

6 Portuguese 24 Prs. were prepared at Elvas for Arming Battery No. 11, but these Guns never moved from that Fortress.

N.B. Col. Jones says No. 8 was directed against Trinidad, this is a mistake its fire was against flank of Sa. Maria. Batteries 3, 5, and 9 Continued their fire, and 7, 8, and 10 opened for the Objects before mentioned.

At His particular request, Lieut.-Colonel Robe, lately returned from England, took the charge of Breaching Battery No. 7 at its opening.

The fire against the two breaches was kept up with the greatest Vigour during the day, and the practice was excellent, but as yet it had little effect on either point, and particularly Santa Maria, which was but little injured notwithstanding the increase of fire upon it.

The fire of the Enemy this day was particularly active.

Captain Antonio Villez Barreiros, Portuguese Arty., who distinguished himself in the former Siege by bravery and good conduct was mortally wounded by the Splinter of a Shell.

Lieut. Thiele of the German Artillery was slightly wounded.

During the night a fire of Grape Shot and Spherical was ordered to be kept up from No. 7, 8, 9 and 10, to prevent the Enemy from raising the Counterguard in the front of the right face of Trinidad.

April 1st.—It was discovered this morning, that the Enemy had succeeded in raising the Counterguard Several feet, in consequence of our batteries not having been sufficiently active during the night.

The following order was given to prevent a recurrence of this neglect :—

“ Reserve Orders, Camp before Badajoz, 1st April.”

“ It having been reported to the Commanding Officer by the Commanding Engineer, that the batteries with the exception of that Commanded by Lieut. de Goeben, did not fire at the breach last night according to the orders given, he is determined to report every officer to Lord Wellington who shall neglect this duty.”

The Batteries Continued their fire the Same as Yesterday, and by this Evening the revetment of the face of Trinidad was much ruined.

The flank of Santa Maria begins now to show some injury, but it is a very Solid Mass of Masonry, and is evidently Casemated.

Capt. Dundas lost an Arm and was dangerously wounded in the Side this day.

A fire of Grape was actively kept up this night, to hinder the rubbish being cleared away from the breaches, or any work being done in the ditch.

April 2nd.—A most active and well directed fire was kept up from the breaching Batteries the whole of this day.

The escarpe of the face of Trinidad is nearly down, but the clay stands very perpendicular being Supported by the Counterforts.

In the flank of Santa Maria, the piers of the Casemates are now opened to View, but they prove a Serious impediment to making a breach.

Lieut. Roque Landeiro Pa. de Araujo, Portuguese Arty., was mortally wounded by the Accidental explosion of Some Cartridges in Battery No. 7.

Lieut. Love of the Royal Artillery was slightly wounded.

This night Battery No. 11 was Armed as follows, to be employed against Lunette St. Roque, and afterwards to breach the Curtain of that front :—

3	18	Prs. from No. 3.
1	18	Pr. from Park.
2	18	Prs. from No. 5.
<hr/>		

Total ... 6 18 Prs.

3 24 pr. Howitzers were brought from the Park to No. 5 which now is Armed as follows :—

1	18	Pr. Gun.
3	24	Pr. Howitzers.

A fire of Grape Shot kept up on the batteries during the night.

April 3rd.—The fire of the breaching Batteries continued all this day with Unabated activity, and in the Evening both breaches wore a very promising appearance—a fire of Grape kept up during the night.

Battery No. 11 Commenced a fire against the Curtain between the Bastions Trinidad and St. Pedro, but after a Short time the fire was turned against the right shoulder of the Lunette.

Lieut. Maximiano Vieira da Silva of the Portuguese Artillery was killed, and Lieut. Francisco Xavier Pereira da Rosa lost an Arm, this Officer after Amputation could hardly be prevailed on not to return to his duty in the Batteries, and such was his Strength of Constitution, that he actually returned to Elvas on horseback the day after he was wounded. He was afterwards promoted for his good Conduct.

April 4th.—The fire of the breaching batteries Continued as before, and by the Evening both breaches appeared practicable.

An attempt was made to open the wall in the gorge of the Lunette of St. Roque by the fire of two 24 Pounders from No. 7, but the distance was too great, and the Wall too oblique to obtain the effect desired.

An 18 Pr. Gun in No. 11 rendered Unserviceable by a Shot from the Enemy.

Lieut. Carlos Anto. da Silveira, Portuguese Artillery, wounded.

During the night a fire of Grape kept up on the breaches.

April 5th.—The fire was continued on the breaches though they are now quite practicable and in a State to be Assaulted.

About 11 o'clock this morning three Guns of No. 8 were turned upon the Curtain, through the opening between the Trinidad bastion and the unfinished ravelin—the wall being visible to the bottom, the effect of these Guns was so great upon the Curtain, that Lord Wellington at noon when he reconnoitred and declared the breaches perfectly practicable, at the Same time determined to defer the assault another day, to afford time to open a third breach in the Curtain.

As many Guns therefore as would bear in No. 7, 8, and 9, were directed against the Curtain, and at night such other embrazures as could be turned to see it were altered.

The fire of the Enemy this day was very heavy.

A brisk fire of Grape Shot was kept up on all the breaches during the night.

Fourteen 24 Pr. Howrs. were taken to No. 12 this night.

April 6th.—This morning Eight 24 Pr. Guns, and Six 18 Pr. Guns of the breaching batteries, opened upon the new breach in the curtain, the wall of which was so bad that the escarpe was Speedily brought down, and by three oclock in the afternoon the breach was perfectly practicable. The remaining Guns of the breaching batteries were turned against the defences.

Lord Wellington in the afternoon having again examined the breaches, ordered the assault to take place this Evening.

The following was the disposition of Artillery for the Assault :—

Lieut. Bouchier with 20 Artillery men	...	{	to accompany column of 4th Divn. against the great breach.
Lieut. Weston with Lt. Joao Alberto Guerreiro	{ 20 Do.	...	{ to accompany Light Divn. in assault of flank of Santa Maria.
Lieut. de Goeben with	20 Do.	...	{ to Accompany 3rd Divn. in the Escalade of the Castle.
Lieut. Sinclair with	20 Do.	...	{ to accompany the esca- lade of the 5th Divn.

The above parties were under the command of Captain Latham, who attached himself to the 4th Divn. Column.

Captain Gardiners Company to follow the Column of the 3rd Divn. in the Escalade of the Castle, and to occupy the batteries bearing on Cristoval, &c.

Major Halcombe with a Sufficient number of Artillery men to man and prepare battery No. 12 of 14 24 Pr. Howitzers, in readiness to open its fire against the new battery under the Castle bearing on the breach, as soon as it is evident the enemy are aware of the attack, and to continue his fire till he sees the 3rd Divn. are in possession of the Castle.

Capt. de Rettberg with his relief to occupy the breaching and other batteries.

The Assault took place at the hour appointed, and though the Columns against the breaches were repulsed, the place was carried by the two escalades.

Lieut. Bouchier particularly distinguished himself in the Assault of the breach in the face of Trinidad, by leading the Column up the breach, when the Engineer appointed to that duty had fallen.

Capt. Latham was killed on the same breach, he had been very distinguished both in this and the former Siege of Badajoz, and he was an Officer of very Superior talent and ability.

Lieut. de Goeben was Severely wounded in planting the ladders for the Escalade of the Castle.

Major Tulloh was Severely wounded in the breaching batteries during the attack.

The Killed and Wounded of the British and Portuguese Artillery during the Siege were as follows :—

		Officers.	Killed.	Total.	Officers.	Wounded.	Total.
			N.C.O. and Gunners.			N.C.O. and Gunners.	
British Artillery	...	2	27	29	5	55	60
Portuguese Artillery	...	4	13	17	3	46	49
Total	...	6	40	46	8	101	109

The expenditure of Ammunition during the Siege was as follows :—

Powder	...	...	Whole Barrels of 98 lb. each	...	2'523
Shot...	...	{	24 Pr. Round	...	1'8832
			18 Pr. Do.	...	13'029
Shells	...	{	5½ Inch Common	...	507
			5½ Inch Spherical	...	1319
24 Pounder...	...	{	Grape	...	893
			Case ...	...	112
			3 Pr. Shot 1268 made into Grape...	...	158
18 Pounder...	...	{	Grape	...	328
			Case ...	...	168
Total					35'346

Five pieces of Ordnance were unserviceable by the effect of the Enemies fire, viz. :—

24 Pr.	...	...	...	1
18 Pr.	...	...	...	3
24 Pr. Howr.	...	...	...	1
				—
				5

The 24 Pounder Guns were much blown at the Vent, and all required Breecching.

The 18 Pr. Guns however were very little blown at the Vent, which may be attributed to the great windage of the larger proportion of the Shot, the effect of which was very observable, in want of force and precision.

Lord Wellington in his dispatch expresses himself as follows with regard to the services of the Artillery on this occasion :—

“Major Dickson conducted the details of the Artillery Service during this Siege as well as upon former occasions under the general Superintendence of Lieut.-Colonel Framingham, who, since the absence of Major-Genl. Borthwick has Commanded the Artillery with this Army. I cannot Sufficiently applaud the Officers and Soldiers of the British and Portuguese Artillery during this Siege, particularly Lieut.-Colonel Robe, who opened the breaching batteries ; Majors May and Halcombe, Capt. Gardiner, and Lieut. Bouchier of the Royal Artillery ; Capt. de Rettberg of the Kings German Artillery, and Major Tulloh of the Portuguese.”

“Adverting to the extent of the details of the Ordnance department during the Siege, to the difficulty of the weather &c., with which Major Dickson had to contend, I must mention him most particularly to your Lordship.”

Great Praise also was due to Mr. Butcher, the Commissary of the train, for the activity, exactness, and good order he displayed during the operation.

Nor should Acting Surgeon Fitzpatrick be overlooked, who in the treatment of the numerous Severe Cases of Casualty, displayed the greatest talent and humanity.

The greatest attention and Activity was displayed on the part of the Governor, and the Officers of the Arsenal at Elvas, in forwarding Stores during the Siege, but particularly Captain Joze Joachim Sabugal, who had the immediate responsibility of this duty ; Capt. Sabugal had been promoted for his good conduct in a Similar way during the former Siege.

A.D.



Major General F R Festing CB FRS

MEMOIR.

MAJOR-GENERAL E. R. FESTING, C.B., F.R.S.

By COL. SIR COLIN C. SCOTT-MONCRIEFF, K.C.S.I., K.C.M.G., LL.D., LATE R.E.

THERE are, I think, not more than nine or ten of our Corps now alive who were serving in the Army in 1857 and 1858 and who took part in the campaigns for the suppression of the great Indian Mutiny. One of these passed away on the 16th May.

Edward Robert Festing, well known as "Bob" Festing, was born on the 10th August, 1839. He was a pupil first of King Edward's School, Bruton, and then of the Ordnance School at Carshalton, and entered the R.M. Academy in 1854. These were stirring times when the long peace of Europe was rudely broken by the Russian War, and there was a great demand for officers in the Crimea. Young Festing then got his first Commission in 1855, before he was 16 years old, the youngest officer who ever entered our Corps.

He did not go to the Crimea, however, and I made his friendship a year later when we were at Chatham together. In May, 1857, the Mutiny broke out, and four companies of our Corps were despatched, two to Bengal and two to Bombay, the first Royal Engineers who had ever served in India. They went by what was then a new route, by sea to Alexandria, and by land across the Isthmus of Suez—for there was no Suez Canal for 12 years after that. At Suez the companies separated, two going round to Calcutta and two to Bombay. Among the latter was the 21st, under the command of Capt. Glastonbury Melville, and in this company young Festing was a subaltern.

The 21st Company was attached to a force commanded by Sir Hugh Rose (afterwards Lord Straithnairn), which had for its object to restore order and peace among the native states of Central India and Rajputana. The actors in these campaigns have never received their due. The agony of Cawnpore, the heroic endurance of Delhi and Lucknow, have overshadowed all else, and even historians tell the tale of the storming of Jhansi, or the long pursuit of Tantia Topee, as if they were chiefly concerned to be done with it as soon as possible. The recently published third volume of Mr. G. W. Forrest's *History of the Indian Mutiny* gives some idea of the

combination of headlong reckless courage and dogged endurance required from those who hunted Tantia Topee up and down the country until his betrayal by his own kin. The heat was fearful; and on one occasion our troops were forced to give battle to the enemy at once, because so many were dropping down with sunstroke and other complaints that delay would have meant having none left to fight. Festing was unfailingly cheerful, even when confined to his tent with an attack of ophthalmia, or so covered with boils that he could not sit on horseback, and must march on foot, sufficient dooly-bearers not being procurable. His diary records "The General told me that he was very angry with me for coming out when I was laid up with boils, but that '*when I got to work, nothing could have been better.*'"

One of the finest incidents in the campaign of 1858 was what the official despatches term the "dashing and brilliant action" on the night of December 22nd, when a handful of our men surprised some 2,000 of the enemy encamped in a deep ravine among the jungles, attacked them, and put them to flight. Lieut. Festing was thanked in despatches for his share in this night's work, which is thus described in his diary:—"Heard that some of the enemy were encamped about 11 miles off in the jungle. Went after them at 6 p.m. Found the place by the aid of the guide at about 11—a wonderful ravine. We surprised them, but only killed one or two. Got lots of horses, but they took away their elephants. All over at 11.30."

It was after his return to England that the Department of Science and Art was formed, and Festing was employed in the formation of the South Kensington Museum. For the whole remaining years of his service he was connected with these great public buildings, and as I was employed during these same years in India and Egypt I cannot pretend to an intimate acquaintance with this part of his life, but I shall never forget the hearty welcome which I used to receive from him and Mrs. Festing when I returned on furlough. He had charge of the works of construction and maintenance of the buildings. He devoted much time to the arrangements for heating and ventilating and lighting the halls, which were a marked success. I believe that the installation of electric lighting in Government buildings began in South Kensington. All that Festing did was done thoroughly; and in his work he was assisted by the possession of an unusual gift of mental arithmetic which he retained throughout his life. All his tastes were scientific. He carried out many scientific investigations, and in 1886 had the honour of being elected a Fellow of the Royal Society.

Few were aware of how hard Festing's work was at one period of the Museum's history when, because of the risk from fire and the inadequate staff, he was occasionally obliged to stay on the premises day and night for weeks together, and could not even go out for a

walk. At one time, also, his work involved much travelling since he was obliged to inspect in person every school in the United Kingdom that applied for a building grant from the Science and Art Department.

One of his greatest achievements was the development of the Science Museum at S. Kensington. When first he took it in hand, it consisted of a conglomeration of wooden buildings on the western side of Exhibition Road. The fact that the roofs leaked in wet weather mattered comparatively little since the Science Collections then contained few items besides "Puffing Billy," the old steam engine, and almost the sole visitors were telegraph boys who took a short cut through the galleries, and small children who found free entrance here when it was pay day in the Art Collections.

Science was then the Cinderella at S. Kensington, to whom occasional half-pence were doled out by the Treasury with more than even the usual reluctance. But "when the Children of Israel made bricks without straw, they were learnin' the regular work of our Corps." Festing made the utmost of the very slender resources at his disposal, obtained loans or gifts of models from private sources, arranged and labelled his spoil with infinite pains; and when he was Director of the Science Museum, the collections were the admiration of scientific and practical workers of many nationalities.

His task was rendered easier by the fact that his subordinates worked for him gladly—despite his being no easy-going Director. "His eyes were everywhere," said one of them; "he never fidgetted you when you were doing your work properly, but he never passed over anything, and you could always speak to him as man to man and get justice from him." The letters received by his family in the last few weeks show how he was esteemed and regretted by all sorts and conditions of men; though many were written by civilians (some of whom professed a horror of "militarism") it is upon his soldierly qualities that they lay most stress. "It was very good for me," says one, "to know what an Engineer officer could be."

But busy as he was, he found time to follow other pursuits. No work for the welfare of boys ever appealed to him in vain. For 50 years he was on the Committee of the Boys' Home in Regent's Park Road—the first in London for destitute boys unconvicted of crime. For 21 years he was a Governor of Parmiter's Foundation in Bethnal Green. He was a School Manager, a friend to Boy Scouts, a patron of village Cricket Clubs. He was an ardent fisherman, and a good bridge player.

The reader of this article will readily believe that Festing was a man of many friends, a man much beloved. One of his colleagues writes, "His bright disposition and cheery manner made him always a welcome visitor, and did much to promote ready agreement on whatever business was on hand."

Another writes, "He brought when he came into the room I feel I may almost say a ray of sunlight."

Another distinguished colleague writes in *Nature*, "Festing was one who was universally beloved by his colleagues and by the subordinates who served under him. He was strict but absolutely just, and was no self-seeker. He was always ready to further the welfare of his men, or to assist in aiding the science teaching or research with which he daily came in contact at the Royal College of Science."

He leaves a widow and daughter and two sons. One of his sons, a Captain in our Corps, is now serving in India. The other is in the Ceylon Civil Service. His daughter is not unknown in literary circles.

The large number of mourners, old friends, and those who had served with him and under him in many capacities, who knelt by his coffin in the Brompton Church on the 21st May, bore witness to the width and depth of the affection which he inspired.

TRANSCRIPTS.

MY RECOLLECTION OF AN INDIAN BATTLEFIELD.

By CAPT. M. POWER.

Few Europeans now living have any recollection of the Battles of Moodhkee and Ferozeshahur, for it is more than 50 years since they were fought. I was at the time quite a youngster, just arrived in the country, and staying with a relative on the staff of the Governor-General Sir H. Hardinge. We left Calcutta in steamers and barges (called flats) under a salute of 19 guns, which were all the Governor-General was allowed in those days. Great crowds assembled on the river banks to see the "Moolkey Lat" (Lord of country, the Commander-in-Chief being called "Junghey Lat" or Lord of the Army) start on his long tour of two or three years in the Upper Provinces. The Governor-General's band on board one of the steamers struck up "Auld Lang Syne," and we steamed away past Barrackpore and Moorshidabad into the great river Ganges. Ignorant and inexperienced though I was, I could not help observing that we made all the speed we could, and that the fleet was kept going so long as there was light to see and avoid danger. Advantage was taken of moonlight nights to push on against the stiff current of the river, but the Government steamers of those days were such ancient affairs, and of such small power, that our progress was slow. I have often seen the whole flotilla take hours to get round a point, where the current happened to be stronger than usual—now gaining two feet, and then losing this small advantage. We got to Allahabad, passing Monghyr, Dinapore, Gazipore, Benares, Mirzapore and other towns on the river banks, in 18 days (the East India Railway now does the journey in 18 hours), or just three days under the ordinary time, and went into camp the same day. I went over the strong fortress here, which has the river Jumna on one side and the river Ganges on the other and was afterwards a tower of strength to us and a rallying point in the Mutiny of 1857, and thought it impregnable. Very little time was given us to settle down and arrange for camp life, as we began our march up-country two days after landing. The Governor-General was without his usual strong escort of infantry, cavalry and artillery; and we had only three companies of Native Infantry and two guns of European Horse Artillery with us. We pushed on, by forced marches, until we reached Bhurtpore, then, as now, the capital of an important Native State. We halted here for a few days in order, it was said, to rest the cattle and

camp-followers, but after events made me think that the real object of the halt was to give the Governor-General an opportunity of patting the Rajah on the back, and encouraging him to keep square during our coming struggle with our powerful and dangerous neighbours, the Sikhs. Like all native towns, Bhurtpore was a crowded, dirty place, with long narrow streets. It had, however, a good deal of interest for us, as the British found its fortress a hard nut to crack in the good old days gone by. It defied Lord Lake, and forced him to raise the siege and retire from before it; but Lord Combermere gallantly took it a few years afterwards. There was a curious tradition connected with its capture. It had been predicted and believed that Bhurtpore would never be taken by an enemy until a *koomer* (alligator) appeared before its walls. When, therefore, they heard that another British Army under Lord Combermere (pronounced *koomer* by the natives), was advancing against the fortress, the defenders lost heart and did not make such a good fight of it as they did before and probably would have again, had their enemy come with another name. We saw some of the alligator's teeth in the shape of marks of round shot in the great gates and in the walls.

The Rajah gave the Governor-General and his followers a splendid entertainment at his palace in the city, and after lunch there was an exhibition of wild animals—elephants, tigers, leopards, buffaloes, etc., etc., several of which were made to do battle with each other for the amusement of His Excellency. All I can recollect now was a fight between two elephants—one a tall, strong brute with long tusks, and the other just as strong, if not stronger, but shorter, with thick stout tusks. Both animals were led blindfolded into the walled arena, specially built for such purposes, having balconies around for the spectators. One entered from one end of the enclosure, and the other from the other end; the body of each being covered with a strong network of rope to enable the mahout, or driver on the back, to hold on and move about and encourage his beast during the fight. When all was ready and the ring cleared of the attendants, the covering was removed from the eyes of the elephants and they saw each other. Up went their trunks, and they hurled shrill and ear-piercing blasts of defiance at each other. The mahouts encouraged them by screaming and shouting, and they rushed at each other, the little fellow being most eager for the fight. I expected to hear a tremendous thud when they met, but there was not much of a shock. They seized each other by the trunk, and pushed with their heads, trying to prod with their tusks. The great object of each seemed to be to get on the side of the other so as to find a place to drive in the tusks, but both were wary, and, encouraged by the mahouts, who were shouting and gesticulating with mad excitement and looked like demons, kept face to face pushing and trying to prod with their tusks. After a time, the tall one seemed to get exhausted, and gave way a little. At last he lost ground, half turned, as if he had enough of it, and the little fellow took advantage of this and gave him a dig with his tusks near the shoulder, which nearly upset him. This ended the fight as the big chap groaned, turned tail and bolted towards his own gate of the enclosure which, seeing how the fight was going, the keepers had opened ready for him to get through. The

victor started in pursuit but had no chance against the long legs of his antagonist, who got through the gate a long way ahead, and it was closed and barred before the little fellow reached it. It was late when all this, and the fireworks which followed, were over, and it must have been 10 p.m. when we mounted our elephants to return to camp.

I have said that the streets of the town were narrow; they were barely wide enough to allow an elephant to pass, but would not admit the passage of two abreast. The night was pitch dark, but a torch-bearer trotted in front of each elephant. We had got about half-way through the town, when a stampede took place among the elephants, about twenty in number, carrying us. They trumpeted their fright and dashed off at top speed, shuffling along at a rate, that one, who has never seen a frightened elephant going, would not believe possible. The torch-men, knowing that frightened elephants are not particular where they tramp or rush, jumped aside and escaped into the houses, and away we were carried into black darkness expecting every moment to be pitched off by a stumble or tumble of the brutes below us. One elephant did actually jerk itself so suddenly from side to side in its fright as to send the occupants of the *cherjama* (a concern like the body of a jaunting car on which the riders sat on her back), on to the tops of the houses on each side of the street, but they luckily all escaped with a few bruises only. Some of the mahouts (they ride straddle on the necks of the elephants) tried to soothe and quiet them by soft words and by bending over and rubbing their foreheads soothingly, while others tried to stop the stampede by bullying the brutes and striking them with their *gugwaps*, (a short iron instrument like the end of a boat hook), but nothing had any effect until we got clear of the town, and then the beasts gradually cooled down and got quiet, except one which rushed into some jungle and damaged its *houndah* and the occupants, Major Somerset, Military Secretary to Sir Henry, and his wife rather seriously against the overhanging branch of a tree. I never could find out what caused the stampede; some said one thing, and others another, but I believe it was caused by a leopard. In former days, it was common for wealthy natives, in cities like Bhurtpore, Lucknow, etc., to keep hunting leopards, and I feel sure that our elephants must have scented or seen one of these while passing through the town, and hence their fright.

A rather funny occurrence took place during our visit. I think it is worth relating. The Governor-General, while in camp there, held a *darbar* for the reception of the Rajah. After the usual ceremonies and *attar* and *pan*, the Rajah said he had brought some of his best swordsmen and wrestlers to display their skill before His Lordship. A space in the centre of the great *Durbar* tent was at once cleared for the exhibition. The swordsmen commenced the performance, doing wonderful things with short and long swords. One of them brought in a sword about 8 feet or 9 feet long. The handle, a sort of hollow tube, was from 18 inches to 2 feet in length, and the arm went into it up to the elbow, and then the hand grasped a cross bar near the blade, and the holder was ready for action. The man who had it used the unwieldy weapon most dexterously, whirling it and flashing it about in all directions and cutting oranges off another man's hand and head with wonderful precision and ease. When they

finished, the wrestlers were introduced. They were fine, tall, powerful men, and their wrestling was magnificent. After looking at them for some time, the Governor-General turned to the Artillery Officer, who was in command of the guns, doing duty outside as part of the guard of honour, and asked whether he thought he had a man among his gunners who would have a chance with one of the wrestlers. The officer said, he thought he had, and left the tent. He returned after a few minutes, followed by a bulky red-headed horse artilleryman in full uniform boots, breeches, sword, brass helmet and all. The man came to attention and saluted. The Governor-General enquired if he could wrestle, and he said he could a little. His Lordship asked him if he thought he could throw one of the wrestlers; the brass helmet, who was an Irishman, replied: "I'll thry any way, ye'r Honour," and he stripped. He was a fine big fellow, no doubt of it, but all knew he would have no chance with a practised and trained native wrestler. One of the wrestlers, the biggest, stepped forward to meet Pat, and they faced each other. Paddy stood slightly bent, keenly watching his adversary. The native bent still lower, one hand resting lightly on his thigh just above the knee, and the other held out in front, ready to take a grip when opportunity offered. The native went around and around the gunner, now moving low and cat-like, and then bounding right and left—now raising himself almost upright, and again bending low as if ready for a spring, but never taking his eyes off Paddy. The latter turned as he turned, and kept a bold front to his enemy. Suddenly they were together, and poor Paddy was on his back, his red head coming down on the carpet with a thud. The wrestler strutted and swaggered about and looked contemptuously at Pat who had picked himself up, and was rubbing his red head and looking at the wrestler with no friendly eye. The Governor-General and all the Europeans laughed, but it was no laughing matter to Paddy. "I think, my man," said His Lordship, "you have had enough of it"; but Pat did not think so, as he replied with a look that meant mischief, "I'd like another thry, Sur." Sir Henry hesitated, but at last said: "Very well, try again." Once more the wrestler and Paddy fronted each other and went round and round as before. Paddy's right arm with a fist at the end of it like a sledge hammer was slightly drawn back, and the muscles of his great bare arm (the shirt sleeves were rolled up) stood out large and hard; his teeth were close set and his eyes had a wicked look in them, and he never for a moment took them off his antagonist. His legs were braced and well apart, one a little in advance of the other, and his feet were firmly planted one after the other as he turned, following every movement of the wrestler. Suddenly the latter bent as if to spring forward, and like a flash of lightning Paddy's big right arm shot out like a bolt from an engine, and the sound of the sharp harsh smash when flesh and bone meet flesh and bone followed, and the wrestler was on his back bleeding badly from nose and mouth, with cut lips and flattened nose and several teeth lying on the carpet. "Take that, ye thafe," said Paddy, and, looking as if only still half satisfied, he began to dress. All jumped up from their seats, and the poor wrestler was picked up and taken outside. The Governor-General looked half angry, but a twinkle

in his eye showed that he was not altogether dissatisfied with Paddy's way of settling the question. He, however, went over to Paddy, who was quietly getting into his boots to get back to his gun, and said, "That was hardly fair, my man." "And do ye think, Sur," said Brass Helmet, "That I was going to let the Nagur throw me about for nothing?" Saying this, he put on his helmet, saluted, turned and left the tent. The Rajah went away shortly afterwards, not, apparently, overpleased at the way his favourite wrestler had been handled. When he had gone, and the guard of honour had been dismissed, Sir Henry gave way to the fun of the thing, had a good laugh, and ordered the gunners an extra ration of grog all round. It will be difficult to persuade people in these days, when the British soldier is comfortably and suitably clothed, that the head covering of the Horse Artillery under the blazing sun of India was—gunner and officer alike—a brass helmet like that of a London fireman with the addition of a horse-hair plume, red or black, according to the brigade the troop belonged to. The infantry wore a small forage cap in a white cap-case with neck flap.

We left Bhurtpore after a stay of three days, and again pushed on by forced marches until we reached Umballa, tired and worn-out, and the escort and camp-followers nearly on their last legs. Here we found assembled a small army of 3,000 or 4,000 of all arms, including the 3rd Dragoons, which did such splendid service in the fields that followed. We remained some days at Umballa, and there was a good deal of hurry-scurry—dragoons and staff officers riding, for dear life, here and there and everywhere. Fresh troops joined the camp every day. There was a review of all arms after a few days, and though the number was small, not probably more than 6,000 or 7,000 Europeans and Natives all told, they looked splendid, and His Excellency was much pleased with their appearance and fitness. I was too young and careless to trouble myself about the cause of all this, and I had not the remotest idea of what it portended. It is true, I heard that the Sikhs were disturbed, but life in camp, with its marching, shooting and riding, to a raw boy just from home, had so many pleasures and was so delightful that I did not bother about anything else or look at the serious side of things.

We were joined by Sir Hugh Gough, the Commander-in-Chief, and by Major Broadfoot, the Political Agent on the frontier, and a general move was made towards Ferozepore. What with the Governor-General, the Commander-in-Chief, the troops and followers, there could not have been less than 20,000 people in camp, and we were joined here and there on the way by more troops who came across country by forced and trying marches to swell our numbers. The marches were long and distressing. The road, along which we moved, was a narrow unmetalled country road and altogether insufficient for the passage of such a host. All the cavalry, and most of the infantry, had to take to the fields and march on our right and left, leaving the road to the guns, carts, baggage animals, etc.

It was the month of December and the dust was something awful; and to add to our troubles, a drink of water became a luxury not easy to be got, as we crossed no rivers or streams, the country being flat, dry and sandy; and such wells as we met were instantly surrounded by hundreds of stragglers and native followers all dying of thirst who drew up the

water in brass *lotahs* attached to strings. A man was pulled up nearly as often as a *lotah*, as the pushing and fighting around the wells were so great and fierce, that every now and then two or three of the foremost would fall in; but there was little danger, as the wells were not more than from 12' to 20' deep, and the unfortunates got what they most wanted, viz., a good drink, and had then only to lay hold of half a dozen of the 20 or 30 strings around them, to be pulled up and placed on dry land again.

As we got nearer to the frontier, we found the villages more or less deserted, and it became difficult, and sometimes altogether impossible, to get anything to eat; and were it not for Jotee Persad, the famous Commissariat contractor, matters would have been very bad indeed. Every European, soldier or otherwise, in camp, received a loaf of bread and a pound of meat late in the evening, and as the fields all round were full of turnips, we had a sort of gypsy stew at about 10 o'clock at night and made a hearty meal, reserving half of our bread for next morning's breakfast. I recollect having to part with a portion of my half-loaf one day, but I did it willingly. It was in this way: I was going along on an elephant at a snail's pace among crowds of camels, carts, elephants, etc.: the heat was not much, though it was then about midday with a bright sun shining above, but the light sandy dust was something dreadful; it got into our eyes, down our necks, up our pants, half filled our mouths, and rested thickly on hair and eyebrows. I saw through the cloud of dust a European boy, about my own age, poorly clad and covered from head to foot with dust half inch thick, trudging along on his tired legs among the camp-followers. I made the elephant move to where he was, sit down and pick him up. He told me that his father was a private in one of the regiments with us; he had no mother, and as his father was too poor to support him, if left behind with the women of the regiment, he had to follow his father. He was very hungry and devoured the bread and raw turnip I gave him in no time. Years afterwards I met this boy, grown to be a clever, intelligent and rising man. He filled a high and important office under Government, but died a year or two ago in India which he had made his home. By this time, I got a general idea that the Sikhs were not behaving well, and that the Governor-General with the Commander-in-Chief and the army were going to bring them to reason. We had several ladies in camp, who had accompanied their husbands; but an order was issued directing all to return at once to Umballa. I saw them leaving: some bore up bravely against the great sorrow in their hearts at leaving husbands whom they were perhaps—nay more than likely—never to see again; whilst others broke down altogether. The grief of one sweet-faced kind-hearted woman, the wife of Capt. Beecher, Deputy Quartermaster-General, a fine fellow, a good soldier, and a kindly man who, I am glad to say, got through the campaign without a scratch, was uncontrollable, and I am not ashamed to say that I absolutely cried in sympathy as she passed me leaving camp on an elephant.

One morning, about the sixth after leaving Umballa, I was riding my pony and, as I was anxious to be out of the dust, I kept well ahead of nearly everything. A troop of cavalry was on the road in front, and I could see more cavalry on the right and left. It was about 1 or 2 o'clock, and I was

riding behind a party of mounted officers. Suddenly, and without any previous warning, two guns were fired from a village on high ground right in front of us, and I heard whizzing sounds passing to my right. The officers and cavalry pulled up, and all remained still for a few seconds; then a fine burly old man called out excitedly: "By God, those guns were shotted, and there are the Sikhs." This was quite enough for me. The officers dashed to the front, and I dashed to the rear. While getting to the rear, I noticed that the horse artillery, that magnificent arm of old John Company's army—which Prince Waldermar of Prussia, who was then in camp, afterwards pronounced to be the finest in the world—had left the road and were dashing at top speed, the guns bounding after them, over fields and ditches, to the front. The baggage carts, camels, elephants, etc., were halted, and the army got clear of the tangle, and formed up in front. But nothing further occurred, and after an hour or so, we were ordered to move forward. We passed the village whence the guns were fired, and found that it was named Moodhkee, and encamped just on the other side of it. There was not a man in the village, but there were a good many women and children who were brutally treated by our sepoys, when they looted the village next day.

The tents were up and things were settling down, and we were looking forward to getting something to eat. My tent was not far from the Governor-General's breakfast tent. I was lying on my bed munching a raw turnip, and wishing that I had some of the nice things which I knew were being discussed in the tent near me by Sir Henry and his staff—his son Charles, Private Secretary, a mild, good-natured man, and Ensign Arthur, the wild young Aide-de-Camp (afterwards Commander-in-Chief of Bombay), his nephew, Major Wood (Bob, Sir Henry called him), Capt. Munro, Capt. Hilliard, Major Somerset, Military Secretary (killed a few days after at Ferozeshahur) and Capt. Herries, who was killed that evening and buried by us next morning in his own tent—Sir Henry, and a few others being present. The Rev. Mr. Cowley read the funeral service. If I recollect rightly, Mr. Cowley was the only Protestant clergyman in camp. There was also with us a fine old Irish Roman Catholic priest belonging to the 50th Regiment, who lost his life three days after at Ferozeshahur while administering, midst shot and shell, carnage and death, the rites of his church to his dying countrymen. But to return to my turnip: before I got half through it, a sowar covered with dust dashed up at full speed, dismounted and rushed into the breakfast tent without any of the usual ceremony. He almost shouted at Sir Henry in his excitement, as I afterwards learnt—"Lord Sahib, you are eating when the Sikhs are at your door?" A grand commotion followed. Sir Henry, attended by his staff, rushed out swinging his one arm, called for his horse, and all mounted and galloped off in different directions. In five minutes bugles and trumpets were sounding all over the camp, and the wearied, footsore soldiers, who had done a long march and had not a bite that day, were everywhere hurrying from the tents they had just pitched, and taking their places in the ranks. In less than half an hour, the whole force, with the exception of a guard here and there, had left camp and marched, I was told, towards Ferozepore, and there was a hush

over everything about us. I had an idea that a battle was coming. I asked a friend in civil employment what was the meaning of all this, and was told laughingly that they had caught some Sikhs and were going to hang them. I was green and was trying to make myself believe that it was nothing more than this, when I heard the booming of guns not very far away, and I then knew that a battle had begun. I felt anxious and uneasy, and stood outside my tent listening to the guns. Several European soldiers who had broken down on the march and mounted the baggage carts, passed me hurrying on with blistered feet and limping gait, some without boots or muskets, looking neither to the right nor the left, but keeping their faces steadily towards the spot whence the sound of the battle came. Now and again one would stop a moment to ask me which way his regiment had gone, but I could give him no information, and he pressed on. On the other hand, I noticed that most of the rear guards and stragglers of our old Poorbia Army—the men who had been told in Government published orders over and over a hundred times and so taught to think that they, and they alone, had gained all our battles for us—and who in time actually came to believe, as proved by the Mutiny twelve years later, that they could beat us when they liked—did not in reality like getting to close quarters with our formidable enemy. They came into camp shouting “Bum! Bum! Bahadoor,” and flourishing their muskets about frantically as if the prayer of many years to get at the Sikhs had been granted at last; but when they got through the camp and had a clear run before them to the battle, their ardour cooled; there was no more bum-buming, and they sneaked about the edge of the field until all was over. Some, however, (but they were a small minority), kept gallantly on with bayonets fixed and muskets at the trail. I saw two such plucky parties disappear at the double into the smoke before me. I saw all this and some of our troopers, Regular and Irregular, who had left the field, and were chasing and capturing loose horses as *loot*, when I plucked up courage a little later on and went towards the battlefield. I got as far as a big tree where a few wounded were being attended to by a gruff Scotch doctor. There was no ambulance in those days; simply a dooly and its bearers with the doctor’s instruments and bandages. I may note here before I forget it that I was up in the village of Moodhkee, where the hospital had been established, next day, seeing if I could be of any help to the wounded. The doctors were busy cutting, carving and sewing; and each unfortunate was put in one of the many doolies scattered about when done with. I looked into one dooly and saw a poor body without arms or legs, wrapped in bloody bandages. As I looked, the lids lifted slowly, and the eyes looked at me full of dull sadness and pain. I dropped the covering of the dooly and turned away, as I could do nothing for the poor fellow. Near by, the doctors had General Sir Robert Sale, the hero of Jellalabad, on a native bed, and were cutting his leg off. They had thrown a handkerchief over his face as he lay patient and passive, but the first gash of the knife around the thigh was more than I could stand, and I felt sick as I ran away. The poor, brave, old General died the next day. The spot, where I was with the gruff doctor, was not altogether out of danger as cannon balls ricocheted past now and again. Had the ground

been hard instead of ploughed and soft, they would have gone into our camp. I stayed here for some time, giving what little help I could by carrying water to the poor fellows around me, and then returned to my tent. Towards dusk the sound of guns ceased and musketry only could be heard, but after awhile even this ended, and there was a great hum throughout the camp from the voices of the returned victors. I then heard that our small army, although taken by surprise, had beaten 30,000 Sikhs on a field of their own choosing, and taken 21 guns from them. The tired and hungry army that fought and won that battle after a long and weary march, consisted of five troops of horse artillery, one European (3rd Dragoons) regiment of cavalry, two or three regiments (including the Body Guards) of Native cavalry, four European regiments of infantry (9th, 31st, 50th and 80th) and some five regiments of Native infantry, or about 10,000 men all told; while the Sikhs had more than 40 guns and numbered over 30,000 men, the *élite* of the Khalsa Army. It was a battle to be proud of, but it was a touch-and-go all the same, because the Sikhs should and could have won, had they sent against our small and surprised army 50,000 instead of 30,000 men and more guns from the 80,000 or 90,000 men and any number of guns they had in their entrenched camp, only 18 miles away, at Ferozeshahur. I ate my stew in a hurry, put on my big coat, and went out to gather all the news I could about the battle.

I remember I got into the camp of the 31st, a fine regiment, nearly all Irish. The poor fellows had just had their dinner and grog after a long fatiguing march, a hard-fought battle, and a fast of twenty-four hours, and were excited over their victory. They were boisterously relating to, and reminding, each other of the occurrences of the fight. I heard how this "baste" of a "Sake" (Sikh), and that "baste" of a "Sake" in armour made for Paddy Doolan and Jim Flanigan, and how poor Paddy "was kilt, sthruk on the head wid a battle ax," Dan Casey bayoneting the "thafe that kilt him," and how Jim shot the other "clane through and through." But I noticed here and there one sitting apart smoking with quiet, sad face, thinking perhaps of some old comrade who had marched shoulder to shoulder with him for years and all that long day, now lying stark and cold in the dark jungle not a mile away. One soldier gave me a splendid bow and quiver, half full of steel-tipped arrows, taken from an "ould Sake" he had "skivered," and bade me remember it was a 31st man gave it to me. The brunt of the fight fell, of course, as it always did, does, and ever will, on the European portion of the force, and, handful though they were, well did they sustain the honour and glory of old England. Each troop, battery and regiment was as steady under the terrible artillery fire opened by the Sikhs at about 1,000 yards, as on parade, and every movement was executed with coolness and precision. The Governor-General said the day after that, much as he had heard of the Bengal Artillery, their behaviour in action surpassed his greatest expectations.

The Sikhs, beyond all question, fought bravely and stood well to their guns, and would have played long bowls with us as long as we liked as their guns were heavier than ours and their artillerymen were well up to their work. They did not care much for our European cavalry, though the 3rd Dragoons charged through and through them more than once;

they cared less for our native infantry, and certainly not at all for our native cavalry. But they could not stand the European infantry and the bayonet; and when we were at Lahore afterwards, I heard them strongly objecting to the cheers of the European regiments as they charged; they said, it was not fair, as it frightened them. The lusty British cheers and the glittering line of deadly bayonets in the hands of men whose set faces showed how well and fearlessly they would use them, were too much for the Sikhs, and they broke and fled. I heard that the Sikhs fought well and pluckily, and was told of many acts of obstinate bravery on their part, and they did not give in, even when lying wounded, but went on using their muskets, matchlocks and pistols, often shooting down the men who had just spared them. When they gave way, one dismounted chief in chain armour, disdaining to run, placed his back against a tree, and sword in hand kept a whole troop of the bodyguards at bay. He took a slice off an officer of the troop who tackled him, and was ultimately shot down by some passing infantry as he refused to surrender.

The British soldier of those days was a man fit to fight our battles, and no more like the boys of the present day than a beam is like a lath; the pluck remains, but the stuff and stamina are wanting. Both come of course with years, but when they come and the boys are seasoned soldiers, the short service system removes them to make way for more boys. Those were the days of long service in India, and the ranks were filled with fine bronzed powerful fellows fit for any work and any danger, and it seemed to me that two out of every three were Irish. When the 92nd Highlanders were quartered at Chinsurah, previous to moving upcountry in the Mutiny, I went up there one evening with some friends to see that fine corps. We waited in front of the barracks for some time thinking the regiment would come on parade, but were disappointed. Turning to leave, I met a splendid specimen of a Highlander with legs like those of a billiard table, dressed in white jacket, kilt, etc. I asked him if there would be any parade that evening, and he replied, "No, Sor." "Why," I said, "you are an Irishman," and he answered walking away, "Begorra, we'r all Irish."

But to return to my mutton. I got back to my tent at about 10 o'clock feeling elated and happy. I was tired and went to bed at once: I was, however, too excited to sleep for many hours afterwards.

I rose early next morning and after a cup of coffee and a bit of dry bread I got on my pony and went to look at the battlefield. I passed the big tree where I had been the previous evening, and came on a dead horse in artillery harness, but there was nothing unusual about the horse, no ghastly wound or anything that way, and I passed on. A hundred yards further and a little to the left, I saw something in a heap, with blue cloth here and there about it. I went up to the something and became sick and faint. The mass before me had been an European foot artilleryman; a cannon ball had struck the poor fellow below the chest and scattered everything right and left, leaving only the head and lower part of the body intact. It was an awful sight for a youngster. I turned away and went on, and strange to say in a short time, I got so used to what was about me, that I passed more than one equally distressing sight without experiencing much return of the

previous feeling. I came across many wounded European and Native soldiers who had been lying in the field all night. The latter and worse part of the fight took place in a sort of a jungle of low broad-leaved trees, Dhak I think they were called, into which the Sikhs retired with their guns after our first onset, and owing to the darkness that set in before the battle was over, many of our wounded were overlooked in this jungle and lay there all night. The European soldier bore this negligence and his sufferings calmly and patiently, and I found more than one chewing a bullet, but the wounded sepoy (then nearly always a Poorbia) was invariably whining or crying. I helped to get doolies for more than one poor fellow, European and Native, and saw them started for camp, and when no more doolies could be got, I gave my pony to a man of the Soth who had a bullet in his instep, sent to him apparently from one of the neighbouring trees. I cut his boot off with my penknife and found the bullet in it. A good deal of popping of muskets and pistols was going on, but not near me, and I thought they were only putting the poor wounded horses out of their agony, but I afterwards heard that some of this popping was done by wounded Sikhs who kept firing at our people until they turned and treated them like wounded horses. I was now on foot. Lying around me were lots of dead Sikhs, fine stalwart fellows, but mostly men of middle age, and many had long grey beards. They were dressed in blue breeches with a red stripe down the sides, and many had red jackets. One quite close to me was lying on his face with his pouch upwards, and a camp-follower had opened the pouch and pulled out the inside tin under which it was believed the Sikh infantry kept their gold-mohurs, but he was disappointed and hardly dropped the tin, when a bullet, no doubt fired at him by a wounded Sikh lying somewhere near, whizzed past close to my right temple and actually shook my hair.

This was worse than the two guns the day before, and I moved away from the dangerous spot in quick time, making homewards. I had not gone many hundred yards when I heard behind me a great noise and the galloping of horses, and on looking over my shoulder, I saw our people, black and white, mounted and on foot, following me as fast as their horses and legs could carry them. I felt that something must be wrong, and began to run too. A mounted artilleryman was the first to pass me, and in doing so called out, "Keep it up, youngster; the Sikhs are behind you." And I did keep it up, until I thought my heart would burst. I was passed by hundreds on horse and on foot. I looked back once and saw beyond the rushing crowd behind me, and in the jungle I had just left, bright spear-heads glittering in the morning sun; and as I was sure that these spears were held by mounted Sikhs, I kept it up over the ploughed fields until I could keep it up no longer, and dropped exhausted close to camp. I had on a pair of shoes when I began to run, but I do not know when or where I parted from them, and when I got cool, I found my woollen socks covered with burrs picked up in this desperate run, which gave me great agony then, but which I did not feel at all while "keeping it up." The alarm was sounded everywhere, and the troops got under arms. The cavalry and horse artillery were galloped to the front, but returned after an hour or so, and

the whole were dismissed to their tents. We were afterwards informed that our stampede was caused by a large body of Sikh cavalry sent out from their entrenched camp at Ferozeshahur to try and recover some of the 21 guns which we took the previous evening and left on the field to be brought in next morning; and I believe that they did succeed in getting back two. Some of our wounded were still lying in the jungle on the further side of the battlefield when this force surprised us, and I heard from more than one of them afterwards that the Sikhs, who brought oranges to give to their own wounded, threw some to our Europeans, but as often as not dropped a spear into the sepoys they came across. The Sikhs were, and are, a fine brave race, and I have liked them ever since.

I was present a few days afterwards at the touch-and-go battle of Ferozeshahur, which lasted, from beginning to end, nearly two days and two nights, and which the Sikhs would have won, had they been properly commanded and their chiefs been free from dissensions among themselves. Even as it was they must have won, had they held out a little longer, as our men had been fighting all the time without bite or sup, were starved, worn out and exhausted, and our ammunition all expended. I recollect seeing a well-dressed European woman—probably French, as the Sikhs had some Frenchmen in their service—lying dead within the entrenchment, who had apparently been accidentally killed by a stray bullet during the fight. I first thought she was a Cashmiri, who is often very fair-complexioned, but her white skin and clothes left no doubt as to her race.

A camp-follower tried to remove a Cashmere shawl from the body, but an Irish soldier of the 31st drove him off and nearly bayoneted him. He called to a few comrades and they buried the poor woman shawl and all.

I was also present as a spectator at the last great battle of the campaign—"Sobraon" or "Hurree ke-puttun" as the Sikhs called it, and at the unceremonious visit paid by Golab Singh, the Sikh Ruler of Cashmere, with little Duleep Sing, the Ruler of the Punjab, who was then a boy about 12 years old, to Sir Henry Hardinge, before we reached Lahore. They came on an elephant, escorted by four or five mounted men in chain armour and iron head pieces.

THE DEMOLITION OF WIRE ENTANGLEMENTS BY MEANS OF EXPLOSIVES.

Extracts from an article by N. Bobir in the January, 1912, number of *Injenerni Jurnal*.

THE translation and publication of the instructions which have been recently issued in France, led the author to study the best method of cutting a passage through a wire entanglement, and subsequently to carry out certain experiments.

The method of cutting a passage by sappers armed with wire-cutters can hardly be considered satisfactory. Only a fortunate accident would allow three or four men to creep by night up to the obstacle, and there unperceived to carry out their work in absolute silence. They must cut the wires not only at the nearer posts, but also at the farther ones, and besides this must try to remove them entirely, as their long curling ends will otherwise twist and entwine themselves together and round the remaining posts, and form a new and difficult obstacle, which being unforeseen may cause disorder in the attacking columns under the close fire of the enemy, and may seriously jeopardize the whole undertaking.

In the method of cutting passages by means of explosives adopted in Russia, the charges are made up into lengths of 8 to 10 ft. and are thrown over the top of the obstacle. If the latter is about 21 ft. in width two charges are required, and must be thrown with great accuracy, one further and one nearer, from a lying-down position. The success of the operation depends entirely upon the degree of accuracy with which the charges are thrown. It might be possible, though difficult, to push the nearer charge under the obstacle, but it might catch in the ground, and in any case it would reach only to a distance of 8 to 10 ft., and longer charges are unsatisfactory on account of their weight. In this case the passage cleared by the explosion does not exceed 10 ft. in width, and it is generally found that portions of the obstacle are left undemolished, owing to the more or less accidental position of the charges.

The method accepted by the French, and also by the author in the experiments which he here describes, is that of attaching the charge to a long wooden bar which can be divided into three or more sections. The sections can be carried separately to the scene of the demolition and there put together and launched under the obstacle.

The bars used in the experiments were cut out of 1-in. or 1½-in. plank, and were made 3 in. wide to fit the shape of the pyroxiline cartridges. For convenience of weight the sections were made 6 ft. in

length, except the head which was $6\frac{1}{2}$ ft. The method of joining any two of the sections together is shown in *Figs. 1 to 4*. A thin wooden rod is fastened in a slot on the under side of the front end of one section, and its projecting end fits into a tubular cavity formed by a slot and iron plate in the rear end of the next section. The front end of the first section is pointed and fits into a recess in the rear end of the next section, this being done to ensure that the charges, which are bound along the upper side of both sections, may fit together with an even surface.

Figs. 5 to 7 show the head, which is intended to force its way under the entanglement and to protect the charge from damage during the operation.

The metal cap is made of galvanized iron sheeting, and covers on the upper side of the bar the front end of the charge, and on the sides a pair of wooden wheels, which must not exceed 6 in. in diameter, as otherwise they might prevent the charge from passing freely under the lowest wires of the entanglement.

The portion of the charge resting on each section is sewn up separately in canvas and lashed securely to the upper side. A fair proportion of fuzed primers is inserted in it. The charges average about $2\frac{1}{2}$ lbs. of pyroxiline to the running foot.

The number of sections of the charge can be decided by the width of the obstacle. If the obstacle has an average width of 21 ft. the length of the charge should not be less than 18 ft., if of 28 ft. four sections will be required, making a total length of 24 to 25 ft. The explosion may be counted upon to clear a space 5 ft. wider than the length of the charge, but for greater security it is better that this figure should be reduced.

The charge must be made ready beforehand. It requires from three to four men, 16 to 17 ft. run of planking, 7 in. wide and not less than 1 in. thick, about $2\frac{1}{2}$ square ft. of galvanized iron sheet, and two hours of time. The sections are dragged to the place where the charge is to be joined up, each in charge of one sapper, the men following one another at intervals of 5 to 10 paces. The firing should be confided to a non-commissioned officer, who should carry two port-fires, one spare.

The sections must be joined up at the place from which the charge is to be launched, and as each joint is carefully completed the bar is pushed forward under the entanglement.

The site of the demolition must be selected by means of careful reconnaissance beforehand. This is especially important where the entanglement is screened by a glaciais, which however is very rarely the case. Here it is necessary to find a breach in the glaciais made by a friendly shell, and both the breach and the direction of its approach must be carefully noted.

In the experiments carried out, the obstacle was made 21 ft. wide and was protected by a glaciais in which a breach had been artificially made by the explosion of a mine. As a result of the explosion a clearing was made completely through the entanglement, with a width of 16 ft. on the near and far ends of the passage and 18 ft. in the middle of it.

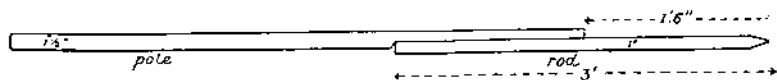
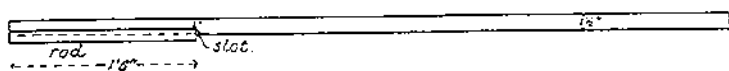
Fig. 1. Front end of 2nd Section.Fig. 2. Rear end of 1st Section.

Fig. 3. Method of joining the Sections (seen from below).

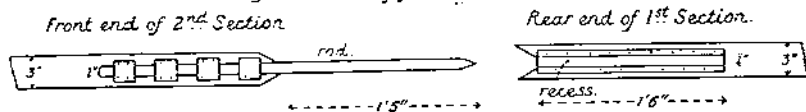


Fig. 4. Seen from above

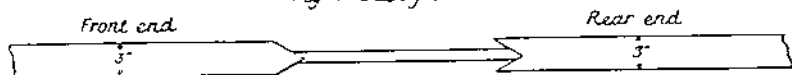


Fig. 5. Front Section of Charge with fixed head.

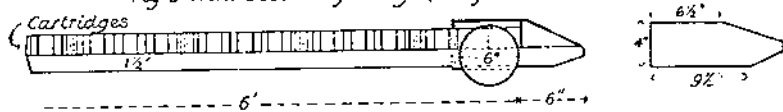


Fig. 6. Seen from above.

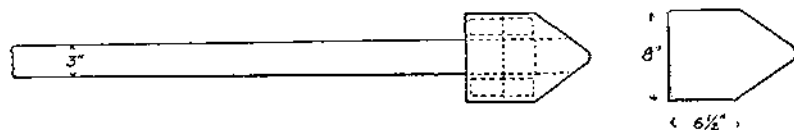


Fig. 7. Seen from below

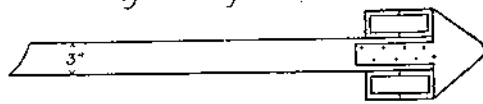
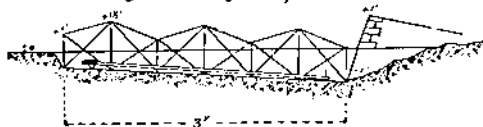
Figures 1 to 7. Scale $\frac{1}{10}$ th

Fig. 8. Charge in position



The following special advantages are claimed for this method of cutting through obstacles :—

- (1) The charge may be made to fit any width of obstacle ;
- (2) The length of each section is optional and depends only on weight and portability ;
- (3) The metal-capped head and wheels enable the charge to be pushed easily under the obstacle ;
- (4) The charge can be brought up and exploded in five minutes, and this in absolute silence ;
- (5) The explosion leaves a perfectly clear passage, of fully sufficient width.

It should be added that in order to bring up the charge and launch it skilfully, frequent practice, and practice only, is necessary. Actual demolitions should always be carried out by night, in the presence of infantry who are prepared to attack through the gap, and who will gain useful instruction by witnessing the demolition. Infantry should also be taught to carry out such demolitions themselves, as sappers may not always be available.

It would be worth while trying a similar experiment with the charge lashed on the under side of the bar, when the results would probably be better and the clearing wider. Also it could be tried upon various kinds of entanglements, with high posts or low ones, placed nearer or further apart from one another. As the expenditure of explosive is heavy, care should be taken to record and report the conditions and results in every case.

F. E. G. SKEY.

CORRESPONDENCE.

NOTE ON EXPERIMENTAL MODELS OF THE ARMSTRONG
PROPELLER AS APPLIED TO SUBMARINES AND
AEROPLANES.

DEAR SIR,

The following notes and drawings taken from the *English Mechanic* of August 25th, 1911, explain fully the nature of a propeller, as applied to submarines and aeroplanes, which I have invented and which I think would prove of interest to readers of the *R.E. Journal*, and briefly explain the construction and properties of this invention :—

"This propeller is of the nature of a feathering fan or paddle, and is adapted to work immersed in any single fluid, such as air or water, as well as in the ordinary way. This is effected by rotating the blades or fans so as to oppose their effective surface to the fluid operated on for only one-half or less of a rotation, the blades or fan being on edge through the major portion of the rotation, and so to give a thrust on the fluid in one constant direction.

With this is combined a means by which the position in which the changes of the paddle or fan blades from surface to on edge can be adjusted, from a line horizontal to one vertical, thus giving the propeller the means of raising or sinking the submarine, airship, etc., to which it is attached, irrespective of changes in ballasting.

In the drawing, *Figs. 1* and *2* represent an edge and front elevation; *2* represents the fan blades, to which are attached the cams *4*. These would be free to rotate but for the shape of the Geneva stop, cam *4*, which bears on one of its faces on the disc *5*. This disc *5* carries usually a pair of pins, *7*, with recesses cut around for clearance (opposite, or at a lesser angle), which constitutes the means of rotating the Geneva stop and blade as it passes over these pins. Owing to the well-known properties of the Geneva stop action, this is accomplished without shock or vibration, even at considerable speeds.

Figs. 3 and *4* show anti-friction arrangements of this action. The disc *5* runs loose on the driving axle *6*. It is shown fitted to a worm and screw adjustment, *9*, *10*, by which it can be rotated, and the turn-over pins *7*, *7*, made to dip up or down as required, with reference to the vessel to which it is attached.

Fig. 6 shows an adaptation to a wheel and a tyre. *Fig. 5* shows how snugly a pair of propellers will fit to the under curve of a vessel. This particular pattern hardly needs any description; it can be modified by using a balance-gear drive, as in a tricycle, to drive the propellers with the discs 5 placed inwards, and regulated from inside the vessel; also with drum-brakes on the half-axes each side of the balance gear, as a means of steering by applying resistances to the brakes; it also forms a means of equalizing variable resistances, due to currents, side winds, etc. These wheels may be employed singly or in combinations. *Figs. 7 and 8* show the propeller inclosed in a casing for use as a motor, pump, fan, exhauster, etc."

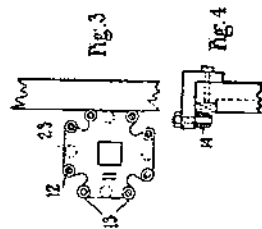
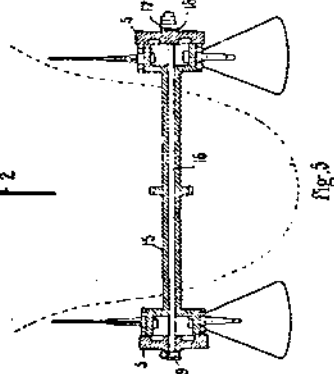
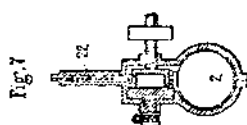
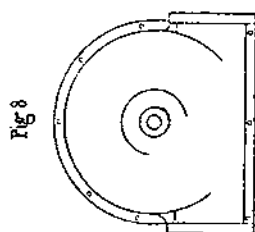
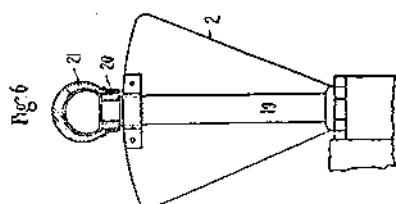
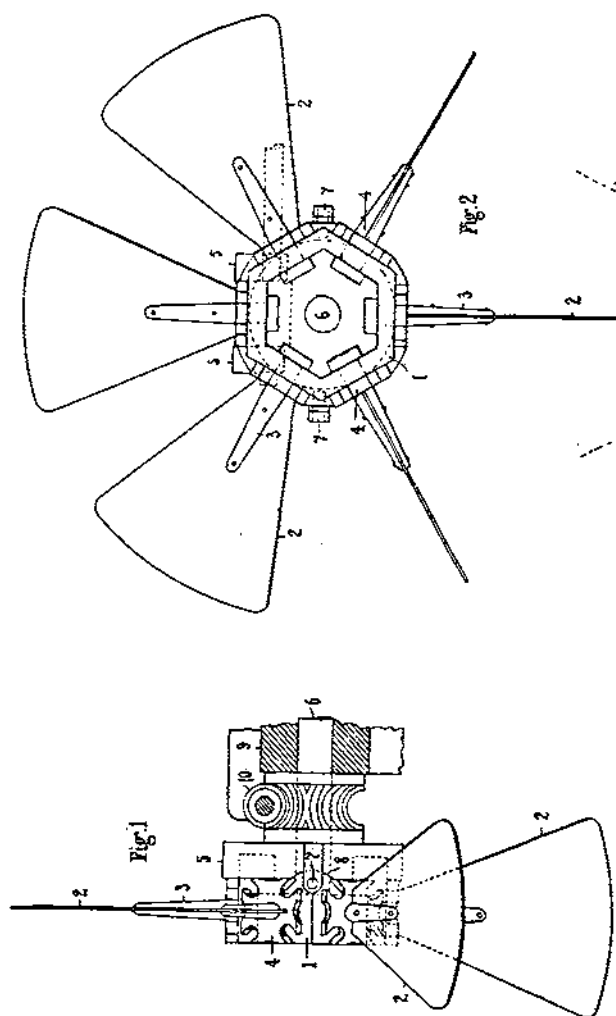
Nearly all existing submarines and aeroplanes depend upon inclined planes to convert a part of their forward motion into a rising or a falling one, and have no power to rise or fall except as a function of their proper motion, they are in fact but horizontal rudders and act in the same manner as the ordinary vertical rudder but in another plane, apart from the initial forward or backward motion they are unoperative.

My invention propels in any direction tangentially to the plane in which the propeller is being driven with the means of producing that tangential propulsion at pleasure at any position about the arc of the circle in which it operates, either vertically, horizontally or at any angle, apart from the motive power operating the propeller, there is hence no interference with or reversal of the motive power to propel up, down, forwards or backwards or any intermediate direction, this is an important point with internal combustion engines.

The submarines at present diving or rising being a diagonal or inclined motion, the turmoil created by the body of the submarine and the drag of the periscope betray the position of the vessel when in action.

With respect to my models as I am an old man and make up my models entirely with my own hands and appliances they are but small and roughly put together yet I have experimented with some dozens of arrangements and with respect to submarines can show that a rubber spring model which in my bath will

1. Propel itself forward "awash."
2. Propel itself downwards to the bottom on an even keel. Discharge a dummy torpedo.
3. Propel itself backwards "submerged."
4. Propel itself vertically up to the surface and is then in a position to repeat the cycle of operations. All this is effected by the propeller alone (without aid from any planes or fins) governed by the rotation of the disc with its engaging pins which determine the part of the arc of the vertical circle in which the turn-over of the vanes or paddles is to be made operative, it is actually an all-round vertical propelling gear. Horizontal steering may be by a rudder, or positively by the use of balance gear between pairs of propellers as noted towards the end of my descriptive note in the *E.M.*, this type of gearing might be easily controlled by a plumb or level to create the requisite resistances to



cause the propellers to maintain or correct any tendency to side or end deviation from a cross plane or line of direction.

With respect to models of aeroplanes, etc., my propellers are mostly fitted with tyres so as to drive the machine to which they belong along the surface until the velocity is sufficient for it to rise by the wing or kite surface supplemented by the upward beat of the propeller blades. As I am still experimenting with their applications and may have yet to secure protection for certain devices I may later on have more to say if this note creates any interest.

Yours faithfully,

J. A. ARMSTRONG,

Lieut.-Col., R.E. (Retired).

The Editor, *R.E. Journal.*



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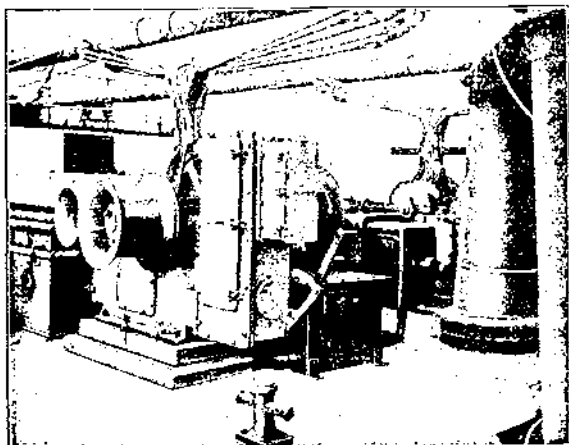
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