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NOTICES.

All correspondence connected with the *C. M. Review* should be addressed to the Secretary, R.S.G., Kingston.

Communications intended for publications in the next issue of the *C. M. Review*, must reach the Editor not later than the 20th of the month.

Officers of the Militia are requested to kindly forward to the Editor, for insertion in the "Militia Item" column, any information respecting their own regiments which they think will be of interest to their brother officers.

For sale, published at the Royal School of Gunnery, Kingston, Ont.:-

Indian Militia Field Artillery Manual, (by Lt.-Col. T. G. Sanderson)	75
Handbook of the late Franco-German War (same author)	50
Field Gun Drill, (extract from C.F.A.M.)	15
For Competitive Practice for Artillery	15
Drill	15
Ordnance, (drill and exercises)	15

AVIS.

Conformément à la loi, toute personne qui reçoit un journal et qui ne le renvoie pas, se trouve abonné de droit.

Les personnes qui auraient quelques communications à nous adresser sont priées de nous les envoyer avant le 20 de chaque mois.

Les personnes qui désirent entrer dans la Batterie "B" sont priées de se présenter au Commandant, (Kingston,) tous les jours de 10 heures à midi, ou de lui envoyer leur demande avec leurs certificats de bonne conduite. Il faut aussi qu'elles sachent lire et écrire qu'elles jouissent d'une bonne santé, que leur hauteur ne soit pas moindre de 5 pieds 4 pouces, la mesure de la poitrine de 34 pouces. Enfin, nous les prévenons que les ouvriers charpentiers, menuisiers et forgerons ont une extra paie de 20 cents par jour.

La Batterie "B" informe le public militaire qu'elle tient à sa disposition les ouvrages de drill pour la smooth bore, le mortier, les canons rayés etc., ouvrages imprimés par les presses de l'École Royale d'Artillerie sous la haute surveillance du commandant.

## Canadian Military (and Literary) Review.

### TO THE GENERAL PUBLIC.

The success during the past year that has attended the experiment of establishing the *Canadian Military Review*, as a monthly journal especially devoted to the interests of Canada's militia, and the diffusion of artillery knowledge and military science generally, and the patronage bestowed from all quarters upon the effort, has induced the promoters to believe that a liberal treatment of the important topics of the day, combined with military intelligence, would be acceptable to the readers of the *Review*.

It is therefore proposed henceforth to devote a portion of its columns to social and domestic matters of interest—party politics being rigidly excluded—trusting by so doing the *Canadian Military (and Literary) Review* will earn for itself an extended circulation, and should its success warrant the experiment the size of the paper will be increased in proportion and published fortnightly.

Subscription, \$1.00 per annum, 50¢ per copy.  
A serial tale of a military character by Lieut. G. F. Cole, C.A., will be commenced in the next number of this journal.

### TO ADVERTISERS.

In commencing another year with the publication of the *Canadian Military Review* we wish to return our sincere thanks to our friends for the cordial support we have received, and beg respectfully to solicit its continuation for another year.

No effort on our part will be omitted to make the paper a greater success than last year.

We wish to draw the attention of the public generally, especially those firms supplying military uniform accoutrements and appointments fire arms etc., to our advertising medium. Viz: a circulation of over 500 and extending from P. E. I. to British Columbia also East India and London England. Among our London subscribers are several West end clubs our circulation extending over such a vast space offers a good opportunity for advertising we therefore respectfully solicit a share of the patronage of the general public.

### TERMS.

Subscription to C. M. R. 1 year payable in advance..... \$1 00

### ADVERTISEMENT.

* Column including 1 copy of the paper for 1 year	\$ 6 00
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In forwarding remittances procure a Post Office order if possible if not register the letter. The former is much better as it protects us as well as the sender.

All letters and communications relative to english part of C M R to be addressed to

Staff Sergeant G. STEWART, R. S. G.  
Kingston Ont

## The Canadian Military Review,

APRIL 1st. 1881.

### Short Tactical Lessons for all arms at the Ontario Gunnery School.

"B" Battery, Royal School of Gunnery, Kingston.

#### OUTPOSTS.

The outposts are to an army halted or in position by day or by night, what the advanced cavalry, flankers and rear guard are to an army on the march, (viz.) its eyes, ears, fingers or feelers and screen.

Their first duty is to provide for the safety of the army, by unceasing vigilance and constant patrols.

Their second to delay the enemy's advance by such defence as they are capable of making.

The commander of an outpost should therefore use every means of fortifying his post towards his front, but not so as to impede his own retirement on the reserve, he should block the roads and tracks approaching in the direction of the enemy. A tree felled, to fall across the road, would not take a Canadian axeman long to accomplish, but the sound of an axe—especially at night—may be heard a long distance, therefore all such arrangements are best made by day light, when also the immediate vicinity of his post should be carefully scrutinized as soon as possible after his arrival.

He would not make such obstructions as would long impede the advance of his own troops, especially when acting on the

offensive, and would never destroy a bridge unless ordered to do so.

He should not as a rule—except, perhaps, on a Canadian winter's night—select a farm house for his headquarters, as inducing too much security from its comforts. If a cavalry outpost, he will utilize the stables and forage of the establishment, but keep his men outside, at the same time every good officer knows the value of doing his utmost to have the men well fed, and cheerful, as a well fed man can endure cold and hardships, and fight better than a braver man with an empty stomach and depressed spirits. Soldiers are naturally very improvident, therefore the officer should provide for them.

He should, of course, endeavor to ingratiate himself with the people of the country, and set an example in this respect to his men.

"Politeness," says the Persian proverb, "is a coin, unlike any other: it enriches both the giver and receiver." Even in an enemy's country the same holds good.

The people should be dealt with, if need be, with an iron hand, but in a velvet glove.

If the enemy is in close proximity, fires in the open must, if possible, be concealed or placed in a hollow.

In the event of alarm the party should be instructed to rally behind the fire, as in front of it they would be very visible to the enemy.

An outpost should not be placed as a rule in the centre of a wood or with a wood immediately in its front, but the outskirts of a wood towards an enemy is a good place for an outpost.

In sending back reports the same accuracy is to be observed as to time and place, name of corps, etc., as on the march, and distinction made between what is observed personally and what is mere hearsay. The time of sending being noted is a special element of importance in military matters, being the best measure of distance in an unknown country, the order bearing the message stating the rate at which he rode.

The out-lying picket sentries, vedettes and patrols are in the daytime generally taken by the cavalry, at night they are replaced by infantry. Vedettes and sentries in the day time should be posted on high ground, where they can see, if possible, without being seen. At night they are pushed forward into the hollows, when an advancing enemy would show against the sky line. They should not be retired at night, otherwise, the enemy's vedettes might be pushed forward on to the high ground you had abandoned.

Outposts, as before stated, may be of cavalry or infantry it is generally advisable to have a couple of troopers attached to an infantry picquet to carry reports.

#### ARTILLERY ON OUTPOST.

Artillery are seldom put on outpost duty, except when a bridge or defile has to be defended, as they have to be kept harnessed day and night, it is very trying to horses, and they are very subject to gall under such circumstances. At night when attack is expected by exposed guns on outpost, they should if possible be run back behind a rise, so as to bring an advancing enemy on the sky line, and laid for a certain point the enemy must pass. The guns double loaded with case shot, if the ground favors close attack. The officers and men lying down beside them should be covered from musketry fire by the gentle rise of ground in front. The officers should keep the lanyards in their pockets, and fire the guns themselves, for fear a hasty man might fire into our own patrols—who should all be warned not to enter the lines by the front of the guns. Though it leaves the artillery *en l'air* it is best for them to have no infantry in their front who might be fired on when driven in, but the gunners must do their own look out sentries' work, they would know best how to retire by the flank guns when driven in. Under such circumstances guns should never be posted on the edge of a ravine or ground so steep they could not fire down—nor, of course, with a wood in front or anything that would give cover for approach and a *coup de main* rush.

POSITION OF OUTPOSTS.

The position of the outposts depends upon the character of the country and the habits of the enemy.

If it is necessary that the most advanced body should be a considerable distance from the army itself, they must consist of three lines, viz. :

The *outlying picquets* and their sentries.

The *supports* and their sentries, and the *reserves*.

Generally speaking, two lines are sufficient, that is, *outlying picquets* and their supports.

The distance between these lines depends also upon the character of the country, and that of the enemy.

The advance sentries may be four hundred yards or a quarter of a mile from their picquets; the picquets double that distance from their supports.

The general direction of the beat of the picquets of the first line is *parallel to the front* of the army, to *intercept passage to the rear*.

The general direction of the beat of the sentries of the supports and reserves, is *perpendicular to the front*, their duty being mainly to *connect* the picquets with the supports and the supports with the reserves or main body.

STRENGTH OF OUTPOSTS.

The numerical strength of the outposts will depend upon the character of the country, open or close, the extent of front of the army they cover, the character of the enemy and the average length of the beat of a sentry.

The strength of the army is a measure of the *space to be occupied* by its front, and that length *divided by the average length of a sentry's beat gives the number of posts required*.

The *length of the sentries' beat* should be the maximum that the closeness or openness of the country allows of; the sentries being able to see each other.

The greater the length of the sentries beat the fewer the number of posts and picquets to supply them, their number should be the minimum.

1st. Because an enemy can *always force outposts* if he determines to do so, it is useless therefore to have a greater number of outposts than that necessary to sufficiently delay him, and give the main body *time to get under arms*.

2nd. Outpost duty is of all duties the most wearying.

3rd. Noise and confusion of numerous outposts being driven in (at night especially) causes panic.

Single sentries retiring on their picquets, and picquets being driven in on their supports, should endeavor to avoid *retiring directly in the line of fire* of the supports and reserves.

The lines of retirement should be indicated to all parties in the daytime. Indeed, no one who has not had practical experience of the fact, can realize the extreme difficulty of moving even small detachments of troops by night.

sun being south at noon, East at 6 a. m., S. E. at 9 a. m., S. W. at 3 p. m. Of course if a man faces N. E., is right—W. left—South to the rear. Churches are almost always built E. and W. i. e., altar to the East steeple to the West. An officer can get a reliable compass no larger than a 25 cents piece, to carry on his watch chain, officers should not be ordered to hide watch chains, but shown them with the compass attached. In reporting, the right bank is the right hand looking down stream.

Every advantage should be taken therefore, which may offer itself to reconnoiter favorable situations for the outposts in daytime, and the officers and men should familiarize themselves with the character of the country and its general features. The commander should point out to the men the direction from which the reliefs and patrols, will come and the position of each sentry, and the line of retirement on the supports, the direction the enemy may be expected,—pointing rods, placed by day are a safe means of keeping attention to certain points at night.

APPROXIMATION IN FIGURES, TO COVER A MILE OF COUNTRY WITH OUTPOSTS.

Take 1600 yards or say a mile, as the length of the front of a Division (that is 2 Brigades,) 10,000 men or thereabouts, 32 posts will be required. Taking the average length of a sentries beat to be 50 yards in an ordinary open country, you have 1600 divided by 50 equals 32.

Suppose the sentries for these 32 posts to be furnished by six picquets, furnishing six posts each, the four central picquets, the two flank pickets, five posts each.

The sentries are generally double, and the duty two hours on and two hours off, i. e., six men for each post for 24 hours. A Canadian company of 42 men should, therefore, furnish for one picquets five or six posts with double sentries—30 or 36 men with the necessary officers and non-commissioned officers.

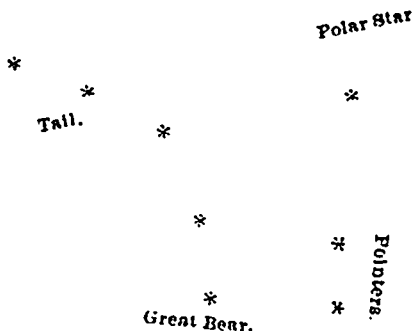
The officers and non-commissioned officers being visiting patrols not only at reliefs but in the intervals. Six Canadian companies therefore at intervals of 250 or 300 yards would furnish efficient picquets, The supports would be formed by the other four companies of a battalion.

One Canadian ten company battalion, therefore would suffice for the outposts of 10,000 men under ordinary circumstances, but if there are no reserve, portions of the main body would be told off as inlying picquets to sleep with their accoutrements on.

The Burst Guns.

The recognised method of combating a public evil is to educate the public; in the same manner, should what we conceive to be an evil appear to be creeping into Her Majesty's Service, our duty is clearly to educate, educate, educate, and thus, if possible, make it plain to even the reading cadet at Woolwich, and the studious lieutenant in the Navy, that such guns as we illustrate elsewhere are not trustworthy, that their construction is at variance with first principles, and that our arguments have been proved to be correct by notorious explosions; fortunately, as yet, not in our ships, as these guns, though ordered, have not yet been placed on board.

With regard to the guns we illustrate, it should be remembered that in both instances the trunnions remained in their places. The front portion of the *Duilio's* gun remained in its place, the muzzle resting on the ship's deck, while the breech portion, as shown in the drawing, was blown against the turret wall, smashing it, and opening the huge plates like doors on outside, all the men in the turret being more or less burnt by the escaping powder flames. In the case of the *Angamos' gun*, the trunnions only remained, the rest of the gun having been blown overboard to starboard and to port, killing a lieutenant and the captain of the gun and—let it be carefully noted—scorching the gun's crew in the same manner as on board the *Duilio*. Now what is the cause of these disasters, especially when it is



Soldiers should be taught to recognize the stars which from the constellation of the Great Bear, whose two forelegs or pointers are in a straight line with the north star. The points of the compass can be found in the day time by a watch, the

considered how mild the powder is? In the first place, we have a thick steel tube, in itself an untrustworthy article, but to make matters worse, this thick tube is hacked about in various ways, as seen in the drawings. These nicks and chasms cause this untrustworthy mass to expand unevenly under the pressure of fired gunpowder, and an uneven and sudden expansion is the worst possible strain to which steel can be subjected. To make matters worse, the tube is subjected to the uneven pressure of the various rings shrunk over it in building up the gun, and as those rings are mere patchwork, the gun is absolutely devoid of all longitudinal support excepting what it can obtain from its hacked-about steel tube. All these arrangements conduce to "ring fracture," the deadliest manner in which a steel-lined gun can break up.

The bursting of the *Duilio* gun was plainly due to "ring fracture" from longitudinal strain, as an inspection of the drawing will show. In a former article we stated that the *Angamos* gun had burst in front of the trunnions, but a closer inspection of the constructions of the gun inclines us to believe that the point of fracture was exactly the same as shown in the *Duilio* gun. In the latter gun the whole of the huge trunnion coil nipped the coil over the steel tube, keeping the front of the gun in its place; whereas, in the *Angamos* gun the rupture in the chambered breech chasm was followed by the parting of the joint under the centre of the trunnion coil, the nipping of only one half of which was insufficient to prevent the front of the gun being blown overboard, leaving the trunnions only in their place, and causing the splash in the sea under the smoke reported by Captain Lynch. As long as steel tubes are used the only remedy for these glaring faults is to follow the system now adopted at Woolwich, and supply solid casings, so to speak, with the appliance of a step in rear to meet the longitudinal strain, which would thus be transferred from the smaller area of the inner tube to the larger area of the casing, according to the law enunciated by Sir William Palliser to the late Ordnance Select Committee, and fully explained in our issue of July 17 of last year, viz, that Barlow's law of transverse strains in a gun holds good for longitudinal strains as well.

If we take up any cause, we think our readers will admit that it has all along been for the protection of the lives of our officers and men. Our correspondent who writes so vigorously against the introduction of dangerous weapons into the Navy happens to be a naval officer in no way connected with any system of artillery, so we have not "gone off the track" in publishing his incisive letter. He laughs to scorn the idea of this burst gun slipping through its trunnion loop "like an eel." He calls attention to the fact of the sailors being burnt by the escaping powder flames from the sides of the bursting gun, probably because in all his long experience he never knew of a gun's crew being burnt from the muzzle flames of a sound gun, much less from a gun 18 feet long. Finally, in true sailor fashion, he wants the gun, or its remains, fished up in order that his argument may be refuted and confidence restored, or the system condemned from the evidence of the pieces. It is stated that the writer from the scene of the disaster may yet have to fight these guns himself. We do not think so. We think and hope we have given these deadly weapons—deadly to those who may have to fight them—their death-blow, and that the necessary alterations we have pointed out will be insisted on by the authorities, and the powder charges reduced before any further orders are given for the manufacture and service of such guns.

In our review of the explosions caused by want of scientific knowledge in artillery construction, we have dwelt on the successful system adopted by the Canadian Government, for which the distinguished inventor receives no

pecuniary payment from either that Government or its manufacturers, any more than we do for showing the construction of this excellent artillery to our readers. We apologise for this statement, rendered necessary by a contemporary, which the ability of its contributors will, we feel sure, lead them to change for a line of scientific argument, showing, if possible, that the guns we this day illustrate were indeed good sound guns, fit to be placed on board Her Majesty's ships, or to be used in battery on shore. Such an argument will, we feel convinced, be one of great interest to our readers and all concerned.—*United Service Gazette*.

### General Roberts on Short Service.

To the Editor of the "Daily Telegraph."

Sir,—Sir Frederick Roberts' speech at the Mansion House recalls to me very vividly many deep impressions and significant events of the Afghan War. I visited General Roberts' camps at Kohat and Thall, and the letters describing my experiences were all, I believe, duly published in *The Daily Telegraph*. But the speech at the Mansion House, contrasting, as it does, the 8th King's with the 72nd Highlanders, reminds me that in one of my letters I made the same comparison a prominent feature of my description of General Robert's force. That distinguished officer said on Monday:

The Kuram Field Force in October, 1878, consisted of one regiment of British and five regiments of Native Infantry, one squadron of British and two regiments of Native Cavalry, one battery of Royal Horse Artillery and two batteries of Native Mountain Artillery. "The British element was so weak that it was imperative it should be of the very best material."

This does not mean, of course, that the native element was not of the best material, for if General Roberts had his pick of the Indian army I am convinced that he would choose a large proportion of such native regiments as he then commanded, notably the two splendid Ghoorka corps which formed part of his force, and which General Roberts, in his generous despatches, never failed to mention with the high honor of his soldierly approval. But, nevertheless, let your native infantry be what they may, they require British comrades before they can be depended upon to do their very best, and as General Roberts says, it was necessary that the English element of his army should be first-class in material, so that the native force should have always before it, whether in camp, on the march, or in the field, such a standard of good soldiering as should keep them up to a high mark themselves. How completely the 8th failed to set their native comrades a good example I remember telling you at the time.

In the artillery and cavalry which General Roberts had with him in the Kuram, the British element undoubtedly was first class, for as Sir Frederick Roberts said, "nothing could have been finer than Field Artillery, R. H. A. and a squadron of the 10th Hussars—and why? Because the short service system has as yet been only partially applied to those branches of the service. The men were old and seasoned soldiers. I believe," said the distinguished speaker,

I am correct in saying that there was not one death in the battery or among the Hussars from disease for several months; and such a thing as a man falling out on the line of march was unknown.

I remember well seeing the R. H. A. working their guns up a desperate mountain side on the road to Thall—it was a sight to do Englishmen good—a branch of the 72nd coming by also set to with their shoulders, and all of them cheered, as the jammed wheels jolted on to the road again, with a ring in their voices that made a

Ghoorkha regiment on ahead of them send back another cheer out of simple good comradeship and that contagion of stout-hearted spirit which is never so strangely marked as among old soldiers on the march. Let them grumble as they would at their "woman's work" in cantonments, their cheery pluck as they lead the way over such hills as they had to cross—those men of the Kuram force—is always conspicuous and always admirable. In illustration of this, General Roberts may well quote his gunners as Highlanders. But he goes on to say—and how reluctantly those who have read his despatches, remarkable among those of recent generals for their never-failing tribute of recognition to merit in the ranks, can understand—that,

With the infantry, matters were very different. The regiment, the 2nd Battalion of the 8th foot, is one that bears a name second to none, and which has distinguished itself on many a hard-fought field. It had been stationed at Rawal Pindi, one of the healthiest cantonments in Upper India, during the two years it had been in the country, and had had every opportunity given to it of recovering from the effects of a system which two years previously, had collected together in the battalion a number of untrained boys, unknown to each other and to their officers. The result proved that two years were not sufficient to remedy the evils of the system.

I was at Rawal Pindi while the 8th were there, and, if I remember rightly, I told you in one of my letters of the demoralisation of the regiment even when in cantonments. The reason was notorious in the station: What else can you expect from such a mob of boys" they said. Again, I saw the 8th on the march and it is miserable work recalling such a scene. On the first occasion they were on the high road the day was hot, and the hills were trying, no doubt. But the boys were in their shirt sleeves, their uniforms and accoutrements piled on the backs of the animals they were "escorting" or heaped upon the coolies which the native bearers were carrying. Some were smoking, some indulging in horseplay; but all were as unsoldierly as it is possible for British regulars to look. On the next occasion that I saw them on the march they were on their way to the front, and it was then that I was struck with the contrast which Sir Frederick Roberts has now brought forward with such terrible effect against the fatal system that gives us these boy soldiers.

The particular piece of road was, a very nasty hill, and the 8th were, apparently, thoroughly beaten by it. The complement of those who had fallen out was already so large as to have filled all the transport immediately available, and so others sat mopping their faces and looking utterly disheartened by the roadside, as the stream of native troops and baggage animals, cavalry and artillery elephants, wound up the way past them. A native regiment, the number of which I forget, but I know they were Punjabis, came striding along in capital form, and, as they passed one stalwart fellow, with moustachious that you could have hung your hat on said in Hindostani to the next man, "Wah-wahl if those are European soldiers, we had better put them into the coolies and carry them up the hill." But I had my revenge of them for the sneer, for very soon after I saw the same regiment halted to let the 72nd go by, and it was a sight all the nation should have seen, these Highlanders swinging along up the hill! But hear the gallant General!

To return to the 8th Foot. "When the regiment reached Kohat, about 100 miles from Rawal Pindi, my attention was drawn to the youthful appearance of the men; to a listlessness in the performance of their daily duty; and to the frequent admissions into hospital. After repeated and careful examinations, I was forced to represent to the Commander-in-Chief in India that I did not think the battalion was in a fit state for a campaign, and to request that another regiment of British infantry might be attached to my column. My request was so

far acceded to that a wing of the 72nd Highlanders was ordered to join me, also three guns of a field battery. With this addition the force under my command crossed the frontier on Nov. 21. 1878. The country presented no difficulties to the infantry soldier, the climate was all that could be wished, and no forced marches had to be made; but on arrival at Kuram, only seventy miles from our own territory, I found that the 8th Foot had dwindled down to a weak half battalion. Fortunately the 72nd Highlanders had been nearly eight years in India, and were composed of seasoned soldiers, very few of whom were on the sick list. Perhaps I shall be better understood if I give you figures. When we left Kuram, on Nov. 28, to attack the Afghan army on the Peiwar Kotal, the whole battalion of 8th Foot only mustered 366 men fit for duty, while the wing of the Highlanders had 330 men in its ranks. Now, gentlemen, I would ask you to reflect what would have been the fate of the Kuram field force if it had been called upon to storm and capture the Peiwar Kotal with the troops originally allotted to it. I have no hesitation in stating my firm belief that the force would have been annihilated."

How near a touch, indeed, that Peiwar fight was the country probably has never understood so well before, for General Roberts has assured it that but for a wing of the 72nd—that is to say, but for some 300 old soldiers—that very important victory might have proved a tremendous disaster. Yet General Roberts does not mean to say the 8th did not fight well. On the contrary, in his despatches of the day, he gives them a place of honour, and tells us that they were as brave as any. But nevertheless, had it not been for the presence of that one wing of disciplined veterans, the great fight at the Kotal might too easily have gone against us. In another part of his patriotic speech Sir Frederick Roberts reminds the country that bravery is not all the generals require in the men they lead. He said.

Young soldiers of eighteen or twenty may be, and probably are, individually as brave as their comrades of maturer age, and as well able to fight when everything is *couleur de rose*; but I will never admit that young soldiers, or those new to each other, are as reliable in times of difficulty as old and tried soldiers. What is it that has enabled a comparatively small number of British troops, over and over again, to face tremendous odds, and win battles against vastly superior numbers? The glorious annals of our regiments give the answer—discipline, *esprit de corps*, and powers of endurance—the three essentials which are absolutely wanting in the young soldier. Discipline enables a man to obey his leaders implicitly, and to rely as implicitly on his comrades, but it cannot be instilled into a young soldier in a few months, and the more short service men there are in a regiment the longer the process takes. *esprit de corps* is, as I said on a former occasion, the backbone of the British army. It is this feeling which teaches our soldiers to take in the traditions of their regiment; and consequently to take a pride in helping to keep up its good name. My lords and gentlemen, it must be remembered that fighting is not the only demand made upon our soldiers. It is, of course, the main object to be kept in view in any system of training; but all, especially British soldiers, must possess great powers of endurance. Without them they are really worth nothing. What is it that causes the long casualty roll during a campaign? Not the losses in battle, but the steady, never-ceasing disease, brought about by insufficient and badly cooked food, hard work, night duties, and by exposures to extremes of heat and cold. Against such trials only the strongest can bear up, and unless our regiments are composed of men, full grown, and of tried stamina, our armies, in point of numbers, weak enough, at the best for the work they have to do, must dwindle away very rapidly when they take the field. My lords and gentlemen, if you will only inquire for yourselves you will find that during the late Afghan war the boy regiments broke down without an exception."

Further illustration of this was afforded on another critical occasion—namely, that memorable march from

Cabul to Candahar, which concluded with the victory over Ayoub Khan on the Arghandab. While on the march General Roberts made inquiries every day as to the number in each corps which were fallen out, and the result was that the very regiment of Highlanders which had shown such splendid endurance before was now found to be the weakest. But why? For the very same reason that, in the year before the, 8th, once a regiment that a general might swear by, and second to none in all the Queen's army, had come so miserably out of the ordeal—namely, young drafts. The regiment had been "reinforced" (save the mark) 170 men from home, and the result was that on the march to the relief of Candahar, when the fate of a British column and the honour of the country depended upon powers of physical endurance, the 72nd Highlanders had to confess to a worse marching average than their comrades of the 92nd or the Rifles.

"The average service of the 2nd Highlanders, on our leaving Cabul was—sergeants, 13½ years; corporals, 12½ years; privates, 7 years; and of the 92 Highlanders, sergeants, 15 years; corporals, 11 years; privates, 9 years. I have not the return of the 2nd Battalion of the 60th Rifles, but feel satisfied that the men were not of less service than those of the 72nd Highlanders. Such a return as this it will be quite impossible ever to prepare again if our system of short service is persisted in; and, my lords and gentlemen, let me add something more, it will be as impossible for a British force ever again to perform such a march as those magnificent troops I had the honour and pride to command made from Cabul to Candahar. No commander would venture to undertake such a service except with soldiers on whose discipline, spirit, and endurance he could thoroughly rely. I never for a moment had a doubt as to the result, but then I had tried men, not untried and untrained boys to depend upon."

Now it happened, by the chances of war, that on three separate occasions the whole weight of the Afghan war fell upon General Robert's column, and on each occasion—at the Poiwar, at Charasiab and on the march to Candahar—he was splendidly successful. The secret of his success—he now tells us was that which all eye-witnesses of his campaign will bear out namely—that the soldiers who won his victories for him were the long-service men, and it needed no apology from General Roberts for telling the country of a fact so all-important. Yet the apology itself is a powerful appeal; for soldierly feeling and patriotism combine in it to commend his weighty words to the earnest attention of the country:

General Sir Frederick Roberts, who was loudly cheered, in response, said that the services of the troops who had served under him in Afghanistan had been so signally recognized in his person that he thought he should best show his gratitude by giving the result of his experience as to the merits of our past and present system of army organization. It would not be possible to avoid touching upon debatable ground, but he was actuated by a sincere and honest desire to place the truth before the public. The army being a volunteer army, they would defeat their object if, after securing their services, they dealt with them as mere machines. Many men had a preference for certain corps, and they should not be removed except at their own choice or at the most pressing demands of the service. Every soldier experienced in war would tell them that they should do all in their power to uphold the regimental system and to foster that sensitive plant *esprit de corps*. Our requirements and those of Continental nations were different. As it was necessary to fall in with the requirements of the short service that the youngest and most unfitted soldier had to be drafted into a regiment ordered abroad the result was that, when a regiment reached its destination it was in the worst possible condition to take the field. The more men and the fewer boys there were in our army the more efficient would our regiments be. (Cheers.)

"I crave pardon," said the gallant speaker "for having

spoken at such a length. But it has long been in my heart to say to my countrymen what I have said to-night. These are trying times in which it behooves every Englishman to think of what is best for the country and the State. We have enemies without and within, and we must not hope to maintain the place we hold but by the wisdom of our council and by the strength and valour of our arms. At such a time it were little less than treason to know, or to believe that there was a flaw in our armour and not to call attention clearly and earnestly to the fact. This must be my apology. I have spoken warmly and strongly because, had I not seized this great opportunity to do so, I feel that I should have failed in my duty not only to the noble service to which I have the great privilege to belong, but also to country, and Queen."

I have sought permission to comment on these few and pregnant extracts of a memorable address that I might, from my own recollections, offer a humble support to the momentous representations of General Roberts.—I am Sir,

*Your special correspondent in Afghanistan.*

### Sir Garnet Wolseley and Our Italics on Short Service.

The facts discussed in the General Return of the Army, Sir Garnet Wolseley considers, prove "incontrovertibly the improved condition of our army since the introduction of the short-service system," and in endeavoring to account for the dislike with which short service is generally viewed in the army he points to the fact that it adds very considerably to the daily work of regimental officers, and remarks:—

"Henceforward the mode of life of the regimental officer will have to be very different from what it used to be; many hours of idleness daily, the long periods of leave, must be abandoned, he must make up his mind to the constant drudgery of teaching his own men as the officers of the German army do; and, like them, he will sooner or later have to content himself with the six weeks' leave, which is the maximum allowed, even to the officers of the Emperor William's Guard Corps. Hitherto our army has been a pleasant home for idle men; generation after generation of officers have been attracted to it by the ease and pleasure it secured to the English gentleman—enjoyment that was only heightened by the opposite extremes of privation and hard work which an occasional campaign afforded. All this must sooner or later be entirely changed by the system of short service; is it therefore to be wondered at that short service should be unpopular with many of our regimental officers?"

In inquiring why short service was adopted, Sir Garnet says that all serious thinkers upon our army requirements at last seemed to agree to the three following postulates:—

"First. That for the protection of these Islands from invasion, for the defence of our foreign possessions, for the maintenance of our race in India, and to enable us to fulfil our treaty obligations in Europe, we might at any moment find it necessary to put in the field an army of 60,000 men, which should have behind it a thoroughly efficient Reserve of well-trained soldiers of at least equal numbers." *Why did not Sir Garnet say 600,000? Could we confront Belgium with our army of 60,000, and over reserve of ditto.*

"Secondly. It would only be by a system of keeping the great bulk of that force during peace as an inexpensive Reserve that we could hope to induce a Parliament to sanction its formation." *Why not state what 99 out of 100 soldiers believe, viz: that the least expensive and the only efficient reserve is, conscription for the militia exempting efficient volunteers. What is Sir Garnet afraid of that he shuts his eyes tight against even considering the question of conscription? Will he tell us its disadvantages? Perhaps the answer would*

be, "Parliament would not accept it." That is none of his business, or any soldiers' business. If he speaks, he should tell the truth, the whole truth, and nothing but the truth. If the Parliament and people of England won't accept truth that is their look out.

It is only possible to have a reserve capable of meeting any continental nation in arms, by passing our reserve through the mill of our national army, a conscripted militia of every able bodied man. The number a maximum the time a minimum consistent with the production of discipline for drill may be learnt at school, our poor little professional army is not a big enough mill to grind up a national reserve, therefore don't sacrifice to the dream of a futile reserve. The gist of the question was put shortly for those who run to read in the last number of the *Canadian Military Review*, under "Our Disasters."

### Militia Report.

If brevity be the soul of wit, then there is both wit and wisdom in our General's report. The briefest and most practical yet issued in Canada, let us hope a practical use may be made of it by those who hold the sinews of war "the purse strings." We copy from the excellent résumé of the *Mail* :—

We give a recapitulation of the Major-General's report, and would ask all to read it, even if they do not care to spend sufficient time to peruse the short report which precedes it, and they will see that the first thing asked for is the establishment of Military Schools. And of what would they consist? The General's demands are moderate—a half company of Engineers, a few companies of Infantry, and a few more horses for the Artillery, so that four guns may be horsed and the cavalry taught to ride. Some may say that we already have schools which are opened for a few weeks in each year under the staff officers of certain districts, but these are only of a temporary nature, and are not up to teaching the interior economy and discipline so necessary to the force, and which can only be learned by attendance at a permanent school whereat everything is carried on with a regularity equal to, and in accordance with, the rules of the regular service. Uniformity of system is a very important item when troops are got together in large bodies. Permanent schools would have the effect of establishing this uniformity, and our annual camps would show a marked improvement on their present condition.

It is no secret in the militia that the Major-General found at some of his visits to rural corps officers and non-commissioned officers extremely ignorant of their duties. How could it be otherwise? What chance had they had of learning their duties? It would be remembered how the allowance, and in consequence the amount of drill, has been reduced of late years. Anyone thinking the matter over must come to the conclusion that six days' drill one year, and then an interval of one or more years without drill, gives little or no chance to officers or men learn their duties. It is evident that the Major-General considers that to enable officers and non-commissioned officers to teach their men they must themselves be taught, and that in the absence of the permanent staff of an adjutant, a sergeant-major, and a sergeant to each company, which are allowed to militia regiments in England, permanent schools are essential in Canada, that is supposing always that we wish for as much efficiency as can be obtained by the expenditure of a certain sum of money.

The following are the recommendations previously alluded to :

First—Schools of military instruction on a permanent basis.

Second—Additional expenditure on rural corps in order

to give them instruction in camp for sixteen days, which would cost, it has been estimated, about \$15 per man. The Major-General says : " This is the least time I would recommend, and the Government should decide the number of rural corps they mean to maintain, multiply the same by fifteen, and that will be the cost, or if they decide upon a fixed sum, then divide that by fifteen and the result will show the number of rural corps that I would advise that branch of the force to be restricted to —to attempt to maintain a larger force than the means will allow is, in my opinion, ruin to the force ; it leads to indiscipline and future trouble."

Third—Forts, expenditure on fortifications at Montreal, Quebec, and Toronto.

Fourth—Royal Military College, expenditure for ventilation and additional rooms for professors and cadets, and civil appointments to passed cadets.

Fifth—City corps, expenditure to be the same as for present year.

Sixth—Equipment and dress, the former to be "Oliver's" pattern, the latter modified in the direction of serviceability and economy.

### Non-Commissioned Officers.

What a mouthful for a title ! and why give a man a negative title of disability ? A title should be of honor as well as for use. Our term is neither one or the other. Why designate a man by explaining what he is not ? We might as well style our captains "non-field officers." The French call this non-commissioned rank "*sous officier*." Sub-officer might be confused with subaltern, but "*under officer*" would answer all practical purposes, and not be a long negative mouthful. The windiness of military journals that have been blowing hurricanes round the subject of doing something to raise the position and status of our under officer rank might surely have come to the point before this. The continuance of such a title as "non-commissioned officer" could only be tolerated among a people that refuses the decimal system for money, weights and measures, and expects to have armies without serving in one or the other. On ! no, we never mention it—it's name is never heard—"CONSCRIPTION."

—Lieut.-General Sir P. L. Macdougall, in an article to the *Times*, deprecates the idea of promoting officers in the English army by "selection." He strongly advocates qualified seniority, and thinks that the *esprit de corps*, which is now so powerful a factor in the service, would be broken into units were the former system adopted. He says, referring to his work on "Modern Warfare" :—"A *bona fide* system of advancement in the army on the ground of merit alone, which shall always insure the selection of the best men, must remain for the present a pleasing dream, and is indeed an impossibility under any human institution."

—The Austrian *Militar Zeitung* publishes the following comments on the recent disaster in the Transvaal :—"One would have thought that the practical Briton would have turned to account the proverb that experience teaches wisdom ; but we see them making the old blunder over and over again, in spite of them. . . . If England does not wish to risk the loss of her colonial possessions, she must reorganize her army on the basis of conscription."

"O ! would some power the giddy gize us,  
To see oursel's as ithers see us."

—The Militia Department seeing the force of the General remarks, have increased the Militia vote, for this year by \$61,000 this sum to be expended, in extra drilling the rural battalions.



### Correspondence.

To the Editor of the CANADIAN MILITARY REVIEW.

SIR, - In last month's number of the *Review*, I find some remarks on my pamphlet, "How not to do It," in which the writer, as the Yankoo says, "lots me down easy," but rubs me up a little at the same time. He says I have contempt for age and unbelief in experience either of war or peace. Now, I do not mean this at all, but if this grey hair we hear so much of (silver threads among the gold) has no experience, what is the good of it, that is of war; no one can deny for a moment that they have no experience of peace—they have lots of that; but almost any fellow can get experience of peace, provided he does not live with the mother of his wife. I have a great respect for old age, always have had, and like to see it comfortable, happy, and well cared for—which it never can be padded, booted, spurred and mounted, as it sometimes appears. I think I differ slightly from the little boys in the Sunday School story, who, not being in the artillery, had no right in the world to ridicule the old cannons of the church in the way they did, and I always looked on this attack on the old *smooth bores* as most uncalled for, especially when we know they were nothing like as aged as my old men. However, they paid the penalty when the bears came along, and I sincerely hope there is nothing of the kind *bearin'* for me,—“bring on your bears.” He further insinuates that I am descended from one of the old loyalists with the damaged cheek; as I mention two loyalists and two cheeks, (in all four cheeks), it would be well to state which cheek I have so prominently inherited—a *fundamental* question like this should be settled. I wish I had his story of the “hull darned place stinks of colonels,” it is so true their *rank* is everywhere. As to the important Imperial officers, we want *some*, but not too many, and less now than ever. As to our treating them as oranges, in some cases we have sucked, are still sucking, but have not yet thrown over, which is only done when they get sour, and have nothing in them, and are not worth skinning.

Yours, &c.,  
THE BLUENOSE.

The Quebec *Chronicle* remarking upon an article which appeared in our last issue—“An Artillery Team for Competition in England,” says:—it does not believe that any one offered to subscribe one thousand dollars towards the expense of sending a team of Canadian artillerymen, to compete with England's volunteers at Shoeburyness. Allow us to inform the *Chronicle*, that Captain Oswald, Montreal Field Battery is the gentleman who has offered the money, and his word is as good as his bond.

—The late officers of the 10th Royals, are ventilating their grievances against the Militia authorities in the columns of the *Toronto Globe*.

Now that the Militia votes are passed, we trust that we have for ever heard the last of the growls of those who did not think the Royal Military College, an institution beneficial to the progress, and educational development of the country. The money spent annually over this institution by the country in spreading broadcast over its immense domain, a high standard of civil and military education is sure to return in future years, a far higher rate of interest, that can be contemplated by those would be economists, whose motto is “penny wise and pound foolish.

—A change is being carried into effect in the constitution of the infantry portion of Halifax and Bermuda garrisons. We have at each of these stations respectively maintained up to the present time, two battalions of 688 men each, or a total of 1,374.—Whereas henceforward only one battalion of 895, will do duty at each of the stations.

—We have been favored with a perusal of Lieut.-Col. W. D. Otter's (Queen's Own Rifles) work on “Interior Economy of Militia Corps,” and strongly recommend the same to officers commanding Corps. It is another instance of the zeal and ability which some of the officers of the Canadian Militia have shewn, in devoting great labor, time and expense to advance the efficiency of their corps and the service generally, not from any emolument derived therefrom, but from the deep interest they take in the welfare of the service. It is to such officers that the Militia of Canada are indebted for their present efficiency, and we wish every success to Lieut.-Col. Otter's deserving work.

It is noticed that the men employed at Krupp's manufactory are working night and day in supplying orders for guns from abroad. Roumania has ordered 100; Greece, 700; Sweden, 50; Holland, 120 and Italy 400 guns.



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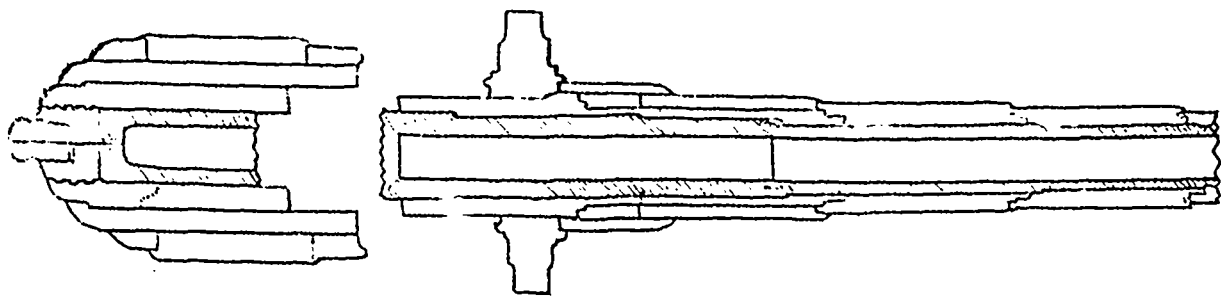
AGENT for DAVIE'S XXX Ales, Porter and Lager Beer.

Kingston, April 1, 1881.

1<sup>st</sup> April 1881.

THE BREST GUNS

Canadian Military Review.



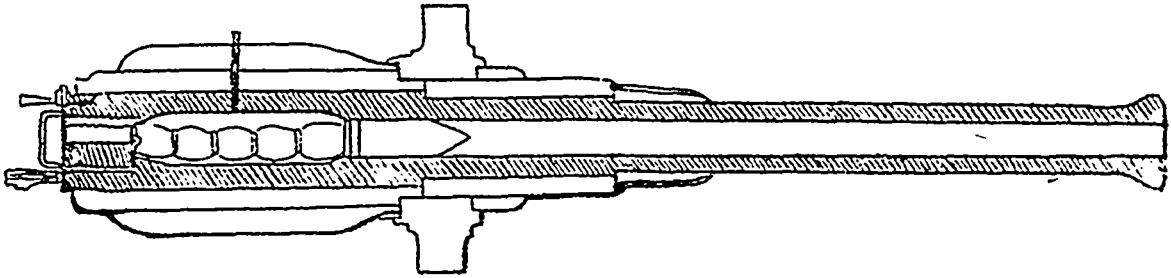
100-ton gun which burst on board the Italian Torpedo Ship "Dulio". (Four of these guns have been issued to the Royal Artillery.)

E. Monin. "B. Battery, Kingston, Ont.

1<sup>st</sup> April 1881.

THE BUITT GUNS.

Canadian Military Review.



The 8-inch Steel Lined Breech-Loading Gun on the French System; which bears  
on board the Chilean Frigate "Angamos." (It ordered for Her Majesty's Navy.)

E. H. H. "B" Battery.

# Supplement to the C. M. Review.

1ST APRIL, 1881.

AN interesting and lengthy correspondence has, during the past month, appeared from time to time in the columns of the *Toronto Globe*, upon the subject of "Our Canadian Militia,"—a discussion between the editor of that journal and correspondents, signing themselves a "Lieut.-Colonel," "Observer," and "Non-Com," resulting, we fancy, in each being convinced against his will, but remaining of the same opinion still. "Lieutenant-Colonel" thinks that what the Militia requires is, having a highly trained class of officers scattered throughout the various battalions and batteries composing the force that protects our extended frontier, diffusing something like efficiency and discipline in the service, and the rank and file, believing in the ability of their commanders, would, in the hour of need, be led confident in their own power of victory—a power which more than once has won a battle.

"Observer's" letter being short and to the point, from the cadet point of view, we insert it:

SIR,—In a letter to THE GLOBE of the 21st Inst., signed "Lt.-Col.," I am surprised to learn that although the theoretical knowledge of the cadets who have graduated at the Royal Military College is no doubt superior, their practical experience is inferior to the militia officers of Canada.

I should like to know if "Lt.-Col." considers the practical experience obtained by the average militia officer to be equal to that of the cadets, who live in barracks during nine months of the year, for four years, under the strictest military discipline, and who parade several times a day for either practical engineering, artillery, infantry, or cavalry, and in addition, very frequently route marching; who also all consecutively the different positions of private, non-commissioned officer, and officer, thus obtaining a thorough practical experience of a soldier's as well as officer's duties. Will "Lt.-Col." please explain how the average militia officer is superior in "practical experience" to the graduate of the Royal Military College?

I will not further trespass on your valuable space.

I remain with many thanks,

OBSERVER.

Toronto, March 21th, 1881.

"Non-Com" seems chiefly concerned in the abuse of men who have served the country, and are—some of them—ready to do so again.

The "proof of pudding is in the eating." No one who has read the last Militia Report, but must feelingly regret the unwelcome remarks made by the Assistant Inspector of Artillery for the Maritime Provinces in reference to the state of the New Brunswick Artillery. He is compelled to say that this Brigade which at one time held a leading position among the corps of the country, has greatly deteriorated. He advises the retirement of the Colonel commanding, and mentions that he was obliged to reprimand the Adjutant on parade for the want of discipline in the ranks, and he thinks that this latter officer, who was qualified at one of the Gunnery Schools, lives too far away from the head-quarters of his brigade to be of effective service. Here is the whole mistake. The Government cannot ask this officer to forego his country business and remove to town without any occupation, but if they had given him, upon his return to St. John from the School, a yearly allowance as Adjutant-Instructor of the Brigade, then the present state of things might have been different. No! We suppose the instructional money is distributed to the Colonel and Captains of corps, as instructors who have not taken advantage of the opportunities afforded artillery officers to acquire that thorough knowledge of the profession and duties of a soldier which would enable them to keep their brigades or batteries to the standard of efficiency, demanded by the wonderful scientific improvement in "modern Artillery," and hence the above result.

"Lt.-Col." points to the fact that at Ridgeway the volunteers were thrown into confusion through the utter incapacity of the

officers, and shews that militiamen and volunteers, when led by experienced officers in whom they have confidence, are superior to raw regulars under the same conditions.

The editor of the *Globe* agrees with all this, but thinks the Royal Military College will, in the future, furnish all that is required in the way of highly trained officers. With this we agree, but are we to wait for years until a sufficient number of cadets have passed out of the College and grown to that age of ripe manhood which commands the respect and confidence of the men whom they control. We must wait also until the cadets have made money in civil life sufficient to enable them to devote time to a non-paying militia, and in the meanwhile are we to allow our Canadian army to drift into inefficiency. We have before pointed in these pages how desirable it is to offer to those officers of the Militia who have taken certificates at the Royal Schools of Gunnery and to the passed graduates of the Royal Military College, some yearly remuneration that would make it worth their while to devote a part of their time and energies to keeping up the discipline and efficiency of their respective batteries, troops or companies.

— Why is England so slow in following the mechanical improvements in weapons of war adopted into the services of continental nations. Her recent disasters abroad shew that the savage is sometimes a match for us with our breech-loading small arms, and muzzle-loading field guns; had Britain the breech-loading shielded field guns and the repeating rifle, as in the German army, we would not hear of all the gunners being killed by rifle fire around their guns, or of the hill of Majuba, being cleared by the Boers.

The German rifle is made into a repeating arm only in cases of emergency, when by fixing on to the breech a reservoir containing a number of cartridges, a stream of bullets can be poured with the greatest rapidity without taking the right hand from the rifle, so as to effectively check a sudden rush of an enemy, be they cavalry or infantry. These weapons combined with a less conspicuous dress, that scarlet which, though associated with so many glories, has had no slight share in our reverses from the days of old Braddock ambuscade by French Canadians, to the last fight on the Spitz Kop, where the gleaming white helmet raised above a tuft of grass or boulder, (as it must be to take aim,) brought instant death to the owner. The probable result was that men blazed away without aiming—hence the marvellously small loss of the Boers. It would seem the Staff Competition wallahs, if they have learnt much, have forgotten something they had better have remembered, if they ever knew it. In the Indian Mutiny Campaign, we adopted the Kakee color of the skeiks of the old Kalsa army—neutral grey tint—easily obtained by soaking the material in a solution of ashes. Our poor fellows' helmets stained an ashen grey would have saved many a life, if we must persist in the scarlet which not only is dangerous under fire, but interferes with instruction in peace, because soldiers can't be got to add to their tailor's bill by lying down in the mud to skirmish in a scarlet coat. The instruction with the rifle is equally unpractical. Both our musketry instruction and volunteer associations practice under conditions exact'y opposite to those of war. The Wimbledon and Dominion Rifle Associations give their prizes for skill at measured ranges, with the effect of each shot signalled. In war the ranges vary incessantly, and you can't persuade a Boer to hoist a red or white disk where he is hit. Soldiers are not judges of distance, and their fire is ineffective. The Wimbledon or Canadian volunteer need not boast himself to be much if anything better, or imagine himself to be a match for a marksman accustomed to stalk his game.

**Railway Operations in Afghanistan.**

**BUILDING A LINE ACROSS A DESERT—A REMARKABLE UNDERTAKING**

Before commencing a detailed description of the remarkable operations by which the track of the Iron horse has been taken across the fiery plains of the Baluchistan desert, into that portion of Southern Afghan territory lately acquired under the treaty of Gandamak it will be well to describe in as few words as possible, the topographical and strategic of our Indian western frontier. The true natural boundary towards the west of the sculling plains of Hindustan consists of the river Indus, which course approximately from north to south from the point where it debouches through the Himalayan mountains near Attock, till it fall into the Arabian Sea near the port of Kurrachee. Parallel with this great river, there runs a double chain of mountains popularly known as the Sulleman Range, and above and to the west of this mountain barrier which extends from the Himalayas; also to the sea, there lies a parallelogram of table land mountain, bounded on the east, as we have said, by the Sulleman Range, and on the west by the Persian frontier. To complete a mental picture of this parallelogram, it only remains to add that its northern boundary consists of the Hindoo Khoosh extension of the Himalayas and of the river Oxus or Amoudarya, whilst its southern boundary is the Arabian Sea. In a political sense this parallelogram is roughly divided into two equal squares, the northern, or what may be termed the Afghan quadrilateral, and the southern that of Baluchistan. The Afghan or northern quadrilateral may be described as mountainous, but interspersed with fertile valleys capable of supporting considerable bodies of men. The Baluch or southern quadrilateral is on the contrary much less mountainous and consists mainly of arid deserts sparsely populated. The southern quadrilateral has long been associated with the British power under arrangements which, if not fully satisfactory, are at any rate not calculated to give more disturbance than is due to petty cattle lifting raids. It is the Northern quadrilateral which at present absorb the attention of the public and engages the Indian army in the attempt to secure more permanent safety to the Indian Empire by occupying all the passes through which serious invasion might otherwise enter. Although the Sulman Range has been described as running parallel with the River Indus, it will be readily understood that the line of these ranges is an irregular one, and that broad valleys occupy several re-entering angles of the hills and in some instances lead to those historical passes through which the tide of invasion has often swept since the days when Alexander the Great forced his way into India. The more northern of these valleys are as a rule well watered and fertile, whilst those to the south, like the Kachee Plain leading to the Bolan, are not only wildernesses, but at least in the hot season quite unfit for human habitation or in deed animal existence.

Foremost of all the passes is the Khyber, through which the Kabul force and its supporting columns are at present operating. This celebrated series of dells attacks the north-east corner and northern face of our quadrilateral through the fertile and well watered valley of Peshawar which has now for many years been held by British troops. Circumstances which it would be tedious to relate have entirely precluded the immediate occupation of this line by railroad communication, and although the work is being actively pushed, it can scarcely be completed in time for the present campaign. The same remark applies to the important line of the Kurram Valley, and indeed none of the numerous passes of the south of Kohat are likely to secure the attention of the railway department in our day until we come down to the famous line of the Bolan, of which the natural extension through the Pishin Valley on the line of Quetta, Kandahar, Gushk and Farrash (the two latter between Kandahar and Herat) marks the boundary between the northern and southern quadrilaterals between the turbulent Afghans and more peaceable Baluchees. It should be added that this road has from time immemorial carried the commercial traffic between India and Central Asia via Herat and Merv, and whilst successfully turning the more mountainous and unsettled northern quadrilateral it commands all the valleys running from north to south which form the inhabitable portions of Afghanistan. A warlike and yet commercial nation like the British in India could scarcely fail to appreciate the advantages, whether for peace or war, trade or military operations, which such a line of communication naturally presents, and it is, therefore, no matter of surprise that the opening of this first section of a railway into Afghanistan, which is probably destined to connect the east with the west, has been received by all as a great political event. At the time, however, when the Afghan war broke out, in the autumn of 1878, the Government of India discussed and finally negatived as impracticable a project of Sir Andrew Clark's (then Public Works Minister) to construct a railway in six months from a point on the Indus Valley, Railway across the Lind desert, a distance of over 130 miles, to Dadur, at the lower mouth of the Bolan Pass. The connection between Ruk (the proposed starting point with Sukkur, on the River Indus), and also with the seaport town of Kurrachee, had already been established by the Indus Valley Railway, with the very serious exception that there is as yet no bridge across the Indus at Sukkur, the railway is connected in Moultan and Lahore with the whole railway system of India. Last year when the massacre of Major Cavagnar (the political resident at Kabul) rendered a new campaign an Imperial necessity, the railway project was again taken up, and no longer merely to the foot of the Bolan, but with the avowed object of reaching Kandahar and commanding Southern Afghanistan. The object of the present paper being to describe the work of making the first section of the railway across the desert to the foot of Baluchistan Mountains, it will suffice to say that a new and easier denho than the Bolan Pass has been decided on by Sir Richard Temple, Governor of Bombay, for ascending to the plateau of Southern Afghanistan, and the end of this first section is therefore not at Dadur, but at Sibi, at the entrance of the gorge of the Narl River. To describe the precise geographical situation of the line, it is necessary to mention that the River Indus runs along the crest of a ridge from which the ground falls into a gradient of about six inches to the mile to a point near Jacobabad, some forty miles or more from the river's bank. Down this slope and along the slight depression at its foot the inundation water of the Indus has of late years flowed to an average depth of some three or four feet. This flood, locally

known as the "Kusmore Spill," has proved so destructive to cultivated land, and has so greatly injured commerce by cutting off all communication between the towns, which are only preserved from utter ruin by being encircled by embankments, that the Government a few years ago undertook the costly task of levelling this part of the river in spite of the strenuous opposition of all who were interested in land on the opposite bank. These persons feared, and not without reason, that the prevention of the Kusmore escape for flood water could not fail to increase the damage done to their property by the same cause. Fortunately these fears have not yet been realized, and the Kusmore embankment may therefore be looked on as an accomplished fact, and the first forty miles of the railway is consequently secured, and if the embankment holds the thirteen miles continuous bridging which was estimated for this section of the line, reduces itself to some 127 openings, very few of which exceed 100 feet in span over irrigation canals. These works have already been constructed with piles and timber beams, and will shortly be replaced by more substantial structures. In this part of the line there is no lack of either food, water, fuel, forage, or shelter. But beyond the depression at the fortieth mile, three miles north of Jacobabad, the circumstances are entirely changed, as the whole country gradually raises with a gradient of 1 in 200 up to the foot of the mountains. From these mountains streams emerge which are at first considerable, but ultimately die out into the deserts, whose greedy sands devour their ordinary supplies of water.

The beds of these streams and those immediate neighbourhoods are very unsuitable for a line of a railway, being liable to extremely heavy floods, which course hither and thither across the plain without having any defined channels susceptible of being bridged in a satisfactory manner. It was therefore decided that to make a railway rapidly, and with any pretensions to safety, it would be necessary to avoid the desert watercourse altogether, and as it fortunately happened that the most direct line lies between two of these desert streams which are from fifteen to thirty miles apart, that alignment was adopted. It will be understood, therefore, that in the last ninety miles the railway line never goes within eight or ten miles of either a running stream or water course, or of even those moist spots in the desert sands at which precarious supplies of drinking water might have been procured by sinking wells or pits; for it will be readily understood that the track which the stream follows is the only place where these pits are and any chance of tapping fresh water. The precision to avoid entirely all possibility of local water supply was not taken without such serious consideration as time would allow, but the engineers having accepted it have never found reason to regret their decision, and it turns out that the water which could have been procured locally in the river beds would never have sufficed for a tenth part of the 5,000 men and 2,500 animals which it was ultimately found to mass at the plate-laying head.

To make this question of water supply more clear it seems desirable to recapitulate the fact that for ninety miles no local water supply whatever was available, and it should be added that the supply tank at the beginning of these ninety miles had to be excavated for the purpose, and could only be supplied by closing up all the irrigation canals of the district, except that by which the tank was fed from the River Indus. When it is remembered what this means, and that notwithstanding the work being undertaken at a time when every little cultivation was going on, there was still a great risk at a great many points that local villages might cut the embankment, and draw off the water for their own purpose. When all these risks are considered it will be apparent that the grateful expressions of the railway engineers in reference to the services of the irrigation department were no empty compliments. It should further be mentioned that along these last ninety miles there were no inhabitants, no food supplies whatever, very little forage for cattle, and positively no shelter and no fuel, for even the men's cooking arrangements, far less fuel for the engines. It was therefore, necessary, in addition to the above arrangements for water supply to collect large stores of forage, food and fuel, in the latter of which the forest department gave every assistance at Jacobabad. The plan of operations in the desert section was as follows:—Two trains, and two only, left Jacobabad daily, the first of which, in addition to its complement of permanent way material—which latterly averaged a mile and a quarter, and weighing 30 tons in each train—took out also the twenty tons of forage, ten tons of cooking fuel, three or four tons of food, and ten to fifteen tons of material for building fresh tents for the men as the railway advanced and was time to arrive at the "Tip" about 11 a. m. daily. Here the unloading of all these stores by a strong body of men occupied a couple of hours, during which time the bullocks which drew the carts and distributed all materials on ahead were being watered by means of troughs supplied from tanks which had been left over night by the evening train of the previous day. By the time, therefore, that the first or morning train was quite unloaded the last drop of water in it had been drained from the tank waggons and these being empty were hooked on to the engine, and returned to the nearest station along with the now empty material train of the morning. At the first station back, that is to say at the first station at which sidings had been made this returning empty morning train intercepted and passed the afternoon train from Jacobabad, which in addition to its load of 30 tons of railway material, contained tank waggons filled with a hundred tons weight of water, or say 20,000 gallons.

To make the evolution of the second train quite clear, it should be remembered that the railway being only a single track, the vehicles of a train can only return in the reverse order to that in which they went forward, and it was therefore, necessary in order that the water waggons should be left all night for the use of the men's animals that these should be propelled from the last station to the end of the line in front of the engine, which was thus free to return with the empty material waggons for a fresh load. The way in which the water waggons were emptied were renewed by the morning train to make room for further supply by the next afternoon's train has already been described, and it only remains to add that to provide against any mishaps whatever, a small reserve supply was always kept locked up in waggons which were never brought back, but only pushed further on as the track advanced, until a new station and siding being made, new waggons with a fresh supply could be established. Moreover, at the last station, in the rear of the plate layers a further reserve of water waggons was always kept on hand, and besides these tanks were placed on the ground and refilled at suitable intervals for the supply of the maintenance men engaged in perfecting so much of the line as had

layers were supplied either by pack bullocks and animals carrying water in skins or by carts filled with casks, but this mode of supply was known from the first to be so difficult that the novel expedient was resorted to of preparing a soft bed of earth for the sleepers by ploughing the hard saline crust of the desert instead of throwing up an artificial embankment. The bullocks engaged on this work came from the remote and scattered villages along the watercourses on either side of the Iluo, and it was customary for these animals to work the whole of one day without water, and then to spend the next few days in going to and returning from their homes where, doubtless, they took in a good supply of food and water. Of course, now the line is laid, and water can be obtained by train, the earth works are being raised to a suitable height in more orthodox fashion. Whilst on the subject of bullocks, a curious fact may be mentioned that owing to the comparatively hot and cold of the nights on the desert as compared with the days in the cold season, the carting bullocks with characteristic obstinacy, refused to drink water except in the very heat of the day, and this action on their part absolutely necessitated the arrangement of train time bill as above described. For housing the men engaged in the plate-laying, the first proposal of the Superintendent of Works, was that they should live in a train of waggon or more properly speaking in consideration of the vast number of native workmen which were required, that the men should sleep under large awnings spread out at night, and attached to and carried by a train of waggon which formed one gigantic ridge pole. The central waggon in this arrangement would be used in part as stores, hospitals, shops, for the sale of food and liquor, and as receptacles for the men's clothes, cooking poles, &c., during the day whilst the awnings were furled, and whilst the whole structure was being propelled along so much of the railway as had been laid during the day. It turned out, however, that owing to caste and other native prejudices, their plan did not offer sufficient advantages to warrant its being enforced on a discontented and nervous mob, ever on the alert, to raise the cry that they had been led into the desert only to be sacrificed for what they deemed the new fangled whim of the governing race. And, indeed, when all these things are considered, it is an extraordinary marvel that a compact body of less than twenty Europeans of all grades should have succeeded as they did in leading five thousand undisciplined natives through a series of hardships and risks, when the slightest failures of many complex arrangements might have resulted in some frightful catastrophe such as the massacre of the leaders.

As to the actual plate-laying, there is little of novelty to record. The rails, as it is well known, are laid to the amount of work which may possibly be done on a single face, owing to the fact that each rail requires to be linked to that last laid, and that it is impossible to begin at several places at once without finding that the gaps between the different sections are either too long or too short to be filled exactly by the length of a rail. Of course it is quite feasible in many cases where sea or river carriage is available, and still more so where the railway track connects two different systems already established. But in this instance the nearest water communication would be the Caspian, and there was, in fact, no access for materials except from the further end of the line, of any kind; and the railway itself was the only means of getting to the end of it. This being so it is justly claimed that the present, viz., the Rocky Sibi Section of the Sukkur and Quetta Railway is by far the most rapid piece of railway construction on record, for while the engineers laid one hundred and thirty-four miles of road in one hundred and one consecutive days, inclusive of ten days occupied in workmen's strikes and native religious holidays, it is clear that, with an equally strong party working from the other end, the whole could have been completed in half the time, or taking the astounding result that the last sixty-two miles were laid from one end in thirty-one consecutive days, viz., from noon of the 14th of December to noon of the 14th January, we might, with equal energy and skill, working from both ends have seen one hundred and thirty-four miles of railway laid down and traversed by trains in the course of a single calendar month. In the parallel case of the Union Pacific Railway, which, as it is known, connects the eastern and western railway systems, there was ample access of material from both ends, and moreover the rails used are understood to have been the flat-footed Vignoles sections which is simply rivetted to the wooden sleepers without the intervention of either chains or keys. Indeed it is highly probable that the eight-four pound rail and thirty pound chains scraped together from the old-fashioned surplus stores of all the railways in India, and used in the present case, weighed, yard for yard, nearly double the amount of iron in any previously rapidly constructed railway. It should be remembered also, and fully borne in mind, that on the railway now under notice the changes from one style of material to another, involved inexperienced workmen—all natives—very serious delays, and the only wonder is that rails and other iron work from seven different sources were collected and utilized with such amazing rapidity and such extraordinary results. Not to mention the fact in the last place, that the nearest depot at which sleepers could be procured was six or seven hundred miles distant by railway, and that much of the timber was floated by raft from the far-off valleys of the Himalayan mountains, whilst part of it came immediately from England and doubtless primarily from Canadian forests.

It but remains to say that this section has been completed to, and opened at Sibi on the 15th January, 1880, on the broad gauge metre, the engineers are now actively engaged in pushing a lightly equipped mountain trainway, on the narrow metre gauge, along a series of narrow defiles, open passes and across extensive valleys via Harnai and Durgai to the table land, on which it will emerge near Quetta. It is sanguinely hoped that less than two years will see this section of 131 miles in length, completed, and the locomotive ascending this tremendous incline on its way, eventually, to Kandahar.

**HISTORICAL ANALYSIS OF RUK SIBI SECTION SUKKUR AND QUETTA RAILWAY.**

1. Sir Louis Cavagnari, political President at Kabul, murdered 3rd September, 1879.
2. News received at Simla, Viceregal headquarters, on 7th Sept.
3. Decision regarding railway given by Viceregal Council on 10th.
4. Orders published on 13th.
5. Staff of three or four engineers met at Sukkur on the 25th.
6. Sufficient men, tools and materials collected to commence operations at Ruk on the 5th October.
7. Shikarpore 104 reached 13th October.
8. Jacobabad, 30 miles reached on 5th November.

9. Laborers struck work on 6th Nov. and refused to go beyond the limits of cultivation and civilization into the desert beyond. Ten whole days were occupied in this strike, during which no work was done. Pathans were ringleaders, and were so faint-hearted that.
10. The 5th mile was only reached on the 30th Nov.
11. First two months, 5th October to 5th December, the entire length laid was only 67 miles whilst.
12. When every thing was in full swing the very same length, viz, 67 miles exactly was laid in precisely one calendar month, 13th December to 14th January.
13. Best week's work amounted to 10 miles within a few yards.
14. Best day's work amounted to 2 miles and nine-tenths.
15. Two slight accidents occurred in the last month; an engine and several waggons were derailed; diversions were made in each case and traffic resumed without many hours interruption and without loss of life.
16. Mortality was much below the average, not exceeding two per cent. per mile per month.
17. Owing to excellent arrangements of the supply of vegetables and blankets, scurvy and pneumonia the scourges of this part of India, were most entirely unknown.
18. Shelter was given by light reed screens and sheds 4 ft high roof 1/2 ft wide, placed in rows to windward, protecting the men from the cold wind. These camps were pitched at every three miles, and were thus seldom occupied for more than two days, the fact to which much of their healthiness may be attributed.
19. One European surgeon and one native assistant sufficed for 5,000 men.
20. Ordinary campaigning tents were used by European officers. This camp was shifted every six miles.
21. Absence of rain was an unlooked for blessing to all concerned, both as regards comfort and rapidity of work. Rain would have driven workmen to refuge of waggon awnings.
22. Two hundred feet on each side of railway made at public expense.
23. Plate laying cost about one shilling per yard.
24. Cost of railway material unknown.
25. Cost of laying line exclusive of cost of materials—iron and wood—but including plate laying, that is to say cost of relaying permanent way is, to be safely workable, £500 per mile.
26. Ten locomotives and 30 waggons were employed on this section itself, besides those engaged on parent line in bringing up materials. This was all borrowed by Government from other Indian railways.
27. The railway Ruk Sibi section 131 miles in length, was opened at Sibi on the 15th January, 1880.
28. Congratulations from all quarters were received during the day.
29. May—attached.

W. HENNELL, Capt-5th Regt. Bombay N. I. I  
Camp Harnai, Southern Afghanistan, 24th February, 1880.  
N. B.—This paper was compiled with Mr. James Bell, the chief executive engineer of the line.

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