THE ROYAL ENGINEERS JOURNAL.—AUGUST, 1913. Pages 65—128.

THE ROYAL ENGINEERS JOURNAL.

Vol. XVIII. No. 2. AUGUST, 1913.

CONTENTS.

THE ROYAL ENGINEERS JOURNAL.

VOLUME XVII.

JANUARY TO JUNE, 1913.

CHATHAM:
ROYAL ENGINEERS INSTITUTE.
AGENTS AND PRINTERS: W. & J. MACKAY & CO., LTD.

VOLUME XVII.

Subject Index.

Original Articles are entered in thick type; Translations, Reviews, and Notices of Magazines in thin type.

Index to Authors.

(Memoirs and Reviews Omitted).

CONTENTS.

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

NIGHT MARCHING.

Lecture by COLONEL F. R. F. BOILEAU, *General Staff, 3rd Division.* (*Given at the S.M.E.*).

THE subject of my lecture is night marching, interpreted in the very broadest sense. I propose to touch on many points from the moment of leaving camp or bivouac until the moment of assault. Forgive me if my lecture is somewhat like a tailor's bill, a mass of disconnected items. I will try to extract the points which may be of use to the majority of officers here, and make no apology for mentioning details.

The closer night enterprises are studied, the more patent it becomes that their success depends on the forethought given to points of detail before initiation. In fact it is the lack of this forethought that has led to more failures than the enemy himself.

Let us endeavour to realize wherein lies the difficulty of conducting a night operation as compared to an operation by day. This may be taken under three headings :—First, the difficulty of supervision or co-operation ; secondly, the exaggerated effect of what by day are minor causes ; and lastly, the difficulty of simulating in peace the tension which prevails in a night operation during war. In fact it is the curtailment of one of our senses which renders these operations so very much more liable to accident than those carried out by day. So, before the very smallest operation by night, we want to foresee everything we possibly can to avoid such accidents. When you have been through the detail, and, before starting to march, have explained to everyone the duties he has to perform, allow no changes from the original plan, as it is obvious that any deviation from that plan, the details of which have been communicated to all concerned, may and probably will lead to disaster.

When the Japanese embarked on their last war, their tactics did not legislate for either night marches or night attacks ; however, it was comparatively easy for them to learn during those difficult circumstances of war, in that they are passionately devoted to detail and have that mutual confidence from highest to lowest which is so especially vital in night operations.

To sum up, do not undertake lightly any night operation, exert all possible care and forethought to avoid fatigue to men and the chance of failure, and lastly, once a plan is adopted and initiated do not deviate from it. Though caution in council is advisable, boldness in execution is essential.

Now we will imagine, each one of us, that we have got to carry

out a night march. The first thing necessary is reconnaissance. To a lack of a proper reconnaissance most failures may be traced. In 1685, at Sedgemoor, Monk's reconnaissance revealed two ditches over which he got in safety, but there was a third which defeated his object and cost him his head. In 1799, at Seringapatam, Wellesley with his regiment was told off to attack a position and capture it before dawn; he returned at midnight cursing himself for not having reconnoitred the ground before he marched. He too had run into an unseen nullah.

So that we come to this: a detailed reconnaissance is equally essential in a night advance or a night attack, and in a night march off a road or when the enemy is close up. When the enemy is distant, and good maps, good roads, and good guides are available, some latitude may be allowed, but if time will admit even in these circumstances a reconnaissance should be made.

Too much time cannot be devoted to this reconnaissance. Find out all you possibly can about the roads that you intend to go along, or the intervening ground that has to be crossed, and also about the enemy. One very important thing about the enemy is, that once touch with him has been obtained it must not be relaxed either by day or by night until the operation has been completed.

This reconnaissance must be carried out by two officers, so that if necessary one may be left to observe the enemy and the other go back to report to the G.O.C. Or one may get damaged and the other can still carry on with the work.

R.E. officers should always be prepared to carry out this duty, but before you can hope to be entrusted with this responsible task I would urge on you to prove your capability for it during peace training. There is a tendency among officers of other arms to think you are too hard-worked to undertake it. My advice to young officers is, push yourselves into every night operation you can get a chance to attend—a welcome will always await you.

When doing a reconnaissance, if along a road, observe physical features but do not observe too many; compass bearings are hardly necessary here.

Suppose we cannot cover the ground and our reconnaissance has to be carried out from a distance, how then? Go up to any piece of high ground where you can get the best view of the country to be reconnoitred, scan every inch of it with your glasses and watch movements of the enemy, inhabitants, cattle, or anything else that may indicate incidents of ground.

To make a very rough panorama of the ground to be covered is of the greatest assistance to reveal the incidents of the ground and the point which has to be reached. This will enforce the study of the ground and fix it in the mind. All bearings should be very carefully checked.

Field Service Regulations very rightly lay down that information as to the distance to be covered must be obtained, and, in order

that you may not be caught in a state of unpreparedness, use every possible means to get this distance. If you have got a good scale map measure it off on that. A range finder may not always be handy.

As a last resource, triangulation with the service pattern compass carried by all officers gives results which are quite useful. (See *Fig.* A). An additional advantage is that bearings which cannot actually be measured on the ground can by this triangulation be obtained by a rough plotting, which should be done at a scale of 3 to 6 in. to the mile on any piece of paper.

A good plan, if you can cross the ground, is to put out marks that may assist you to pick out points, such as pieces of paper, etc. Care must be taken that such marks afford no indication to the enemy, that they are distinct in darkness, and that they are not liable to be blown away. During the retreat on Corunna poles were put up with bundles of straw on the top; these were blown away, with the result that 2,000 men were lost.

Lastly, I would urge you not to neglect reconnaissance even if good guides are available. You have got to remember that the pace is slow, the responsibilities are very great, and the conditions are so strange to a local guide that he is apt to lose his sense of direction. You should invariably have some check on him.

One word about plotting the reconnaissance; this should invariably be done, even if it only consists of one bearing and one distance. There is always a chance that an officer may get damaged, and another have to carry on. There should be some uniformity of plotting. This was advocated some years ago but has now been omitted. (See *Diagram No.* 2).

Figures $\frac{3}{4}$ inch by $\frac{1}{4}$ inch broad in black ink on white paper can easily be read on the very darkest night. If plotted on luminous cardboard the figures can be made smaller.

Do not have too many figures and do not try to remember too many points, otherwise confusion will result.

Let us be clear how we are going to guide a column. If it happens to be along a road, have marked on your reconnaissance one or two culverts, trees, houses, or anything that may indicate to you a point you have met with before. Great difficulty comes in if you are marching across country with nothing to guide you. In that case you are bound to rely on the compass.

The Japanese on one occasion only used a compass, as far as I can find out. Most of their night marches took place in a country prolific in physical features and they marched from one to another. These may not always be available, and you may sometimes have to march for a distance on a compass bearing.

To alter the bearing set on a compass demands a light. Each officer guiding the column should have an "ever ready" electric torch or bull's-eye lantern, but lights of any sort are always to be deprecated. But we must have some means of altering our bearing,

and for this two or three compasses should be carried, each set to a particular bearing and labelled very distinctly.

Another method is to fix the compass in a piece of cardboard perforated to grip the instrument. On the cardboard the various bearings required are marked off in thick black lines from the outer edge of the compass. (See *Diagram No.* 1). It will be observed that the line with the arrow-head is always the direction of the march.

In all cases the compass should be tied to your person. On two occasions it has been my luck to see the owner of a compass parted from it—in one case the officer went down a blind well and in the other it was dropped on a rock and broken.

When the north star is visible, a quick method is to "span the heavens," *i.e.*, go round the horizon starting from below the north star with a span of the hand, which equals 18 to 20 degrees, *vide Field Artillery Training, Fig.* 21.

I know of a case of a well-known officer who had to march to a point over ground strange to him to find a flag planted by two other officers during the daytime. Arrived at the place of departure he found his compass broken. He was not a bit nonplussed although he had to march on three or four bearings. He went in for "spanning the heavens," the north star being visible, marched the 3 miles and fetched up within 50 yards of the point selected.

The text book tells us that the stars may be of use to us, but most books on the subject are so deep, or so long, or so complicated that we cannot apply them to tactical purposes. The only way to use the stars tactically is to make friends of them by getting to know the names and habits of a few of them.

Tel-el-Kebir is always quoted as a magnificent example of how a column can be led by the stars. I am quite sure that the gallant naval officer who led that column did not undertake any complicated calculations, but observed for a night or two and saw several stars he knew which came up in the correct alignment at required intervals. I firmly believe that that is the only practical use of stars for our tactical purposes.*

Amongst other methods of guiding a column, one is by means of two lights aligned. The Japanese used that method on two or three occasions. See that one light does not obliterate the other. If possible have one above the other. There is always the chance of these lights giving away your intention to the enemy.

On a very dark night when there are no pronounced features to assist, and the compass, only, has to be relied on, a light should be put up to act as a reference point which should be visible to the officer guiding and not to the enemy.

Another system often advocated is that of aligning men one in front of another, but to do this while at the head of a column is too

* For making friends of the stars I strongly recommend *The Star Pocket Book*, by R. Weatherhead, R.N., price 1s. 6d.

slow. The aligning of men is not easily done. There is only one method, and that is to take advantage of the twilight and push forward with 30 or 40 men, dropping them at suitable intervals in pairs. When the column comes to one pair, one of the men leads it to the next pair, and so on. One man should not leave his post until the column has gone by. A small rear guard from the unit to which they belong should collect these men.

In dense forests and along narrow tracks where men could not be put out beforehand, some 20 to 30 men should be pushed on from the head of the column with the guiding officer. Files are dropped along the track at easy communicating distance from one another. Thus some 1½ miles can be covered. Word is then passed back for the column to advance. By this method the continual halting and starting is avoided. When the guiding officer is reached the procedure may be continued.

A word of advice to the guiding officer: in case of doubt, above all things keep your head. Examine carefully the lie of the land and do not show what is passing in your mind, as uncertainty will soon communicate itself to those behind you. Halt the column and carry out any necessary reconnaissance, leaving your assistant at the guiding point. If absolutely lost much better own up and do not risk disaster.

To the officer in command: do not worry the man at the wheel—unless you can trust him he should not have been put there.

The diagram issued shows a night march diagrammatically as a basis for the consideration of certain points which have to be seen to from the moment of leaving bivouac to the moment of assault. From bivouac or billets to the outpost line is some 3 miles or so, and scouts have been pushed on to piquet the enemy. If the column is composed of two or three units, they should be assembled before starting, an officer from each unit meeting the commander at the starting point.

The formation along the road would of course be in column of route until reaching the outpost line. Here we leave the road, so that we drop our normal marching formation at this point, which usually would be called the position of assembly, and adopt a suitable formation so that we can deploy easily should we come on the enemy before he is expected. Marching is continued across the intervening ground until we reach the position of deployment. The formation on the diagram is for the purpose of an attack by night and not for a dawn attack.

There must be absolute silence until the moment of assault, when to my mind it becomes a very moot point as to whether you should go in in silence with the bayonet, or whether you should go in with cheers. Silence would seem on the whole to be best.

The guiding officer has to set the pace; let that be as slow as you can. The longer the column or the rougher the ground the slower

the pace. 2½ miles along a road and 1½ miles per hour across country would be good. If the pace is too fast connection will be lost, which not infrequently happens when the pace is quite steady. So it is necessary that the column should occasionally be patrolled from beginning to end to see that march discipline is strictly enforced and connection is maintained. It has a reassuring effect on the men to see an officer from the front come down the line, especially in the case of a long column.

Connection between units must always be maintained by means of files of men, so that one can go forward with a message while the other remains at his post. Usually we hear that 10 paces should be the distance between these files, but the governing factor should be the condition of the ground and the intensity of the darkness.

We have also tried keeping up connection by means of ropes such as are used for a skeleton enemy. The use of ropes presupposes open country.

Another method tried in India was the use of a candle in a tin with perforations in the sides and rear. This worked most excellently, but the use of any sort of light is to be deprecated.

Before starting on the march one officer from every unit would report to the officer commanding the column to carry messages to his unit. Each unit commander, also, should have with him two or three orderlies who have been trained to deliver messages slowly, accurately, and in a low voice.

Now imagine we are marching across the intervening country and we have to deploy, a matter of some difficulty. Nowadays we are better at it as troops are more highly trained.

Deployment has to be carried out before leaving the position of deployment, and the formation should have been clearly explained to all officers before starting. If deployment has to be carried out on a new alignment, this would be assisted by putting out marks or markers.

Two examples may be given to bring out points which have been mentioned. The first is that of Lombard's Kop, the day before Ladysmith was sealed. The scheme was a bold one. The enemy was believed to be on Long Hill, and one brigade with artillery was to advance up to a position to the south of Long Hill. Another brigade was to march out early in the morning and take up a position on Limit Hill with a view to an attack on Pepworth Hill. A third column was to push forward and seize Nicholson's Nek to protect the left flank of the attack on Pepworth Hill and Long Hill. The cavalry were to push out at daybreak and come up on the right flank.

The first column should have started at 10 p.m., but did not rendezvous until 11 p.m., due to restive pack mules. It got off eventually, but the progress was slower than anticipated.

As the column to attack Long Hill marched off some artillery

turned up with orders to sandwich in between the second and third battalions. This artillery also had orders to leave the column at a certain place and take up a position at Limit Hill, which fact was not communicated to the battalions and artillery in rear, with the inevitable consequence that the rear of the Long Hill column and all the artillery moved off to Limit Hill. Moral—See that a column is patrolled.

The enemy was not at Long Hill at all, but was away on the right flank. At daybreak a change of front had to take place. Moral—Piquet your enemy and see that he does not change his position.

The next example is the Battle of Adowa in 1896.

The Italian Commander (Barateri) proposed to move at night to a position of readiness from Mount Esciascio to Mount Belah in three columns. The right and the left composed of one brigade each, and the centre of two brigades. (Routes of the brigades shown on the map). The country is rugged and the hillsides covered with scrub. The movement of the troops was confined to the paths shown, along which they could move in file. Movements off the road were not possible in the dark. Each column was to be led by a local guide. In the same year the Italians had been all over the country, but it had not been reconnoitred with a view to a night march. The right and centre columns were directed to the vicinity of Col de Rebbi Arienne, and the left column to Col Chidane Maret by route south of Addi Cheras.

There was a moon with clouds occasionally passing over it. At 9.30 p.m. the three columns started, and at 11 p.m. for some unknown reason the column on the left cut in between units and the centre column, the bulk of which had to halt until the left column was clear.

Question 1—What should be the action of O.C., centre column? Answer—Immediately report to Barateri.

About midnight Barateri rode up and saw a long line of sleeping men of the centre column. He made enquiries and was told that the column on the left had crossed their path.

Question 2—What should he have done? Answer—Seriously have considered the abandonment of the project, and if much delay caused, to have tried another night instead.

The left column moved to Col Chidane Maret, where it proposed to halt in accordance with instructions; but the guide insisted that the place intended was Enda Chidane Maret, 4 or 5 miles further on.

Patrols sent out to the right to gain touch with the centre column returned about 3 a.m. and reported no sign of it.

Question 3—What should be the action of the O.C. left column? Answer—Not move on until communication was established with Barateri or right column.

The left column pushed on as advised by the guide, the other two columns halted as intended.

The result was that the Abyssinians completely defeated the unsupported left column after daybreak, and later the other two columns. The total result was appalling—261 officers and 5,900 men killed, 31 officers and 1,400 men wounded.

It was Blucher who said, " I fear a night march more than I fear the enemy." Very likely in his day that held good, but I do not think in these days with our higher state of training in these operations the risk is so great if we take the precautions I have mentioned. If frequently undertaken in war, however, troops will lose efficiency through want of sleep, so that night marches should not be lightly embarked on.

Whenever you get an opportunity to make these marches during peace, make them as difficult as possible. Try them over unknown ground on dark nights with only those instruments that would be available on service. All special instruments should be regarded as an additional precaution should they happen to be available when wanted. Accustom yourselves to the ordinary compass.

To my mind training in these matters divides itself into three parts. First, the individual training of officers in the leading of these night operations, and during which each officer picks up his personal error. You learn that you pace 8 per cent. shorter by night than by day, and that you generally step shorter with one leg than with the other. You learn what physical features you can recognize at night. Secondly, there is the individual training of the men. Most of our men are town bred and have hardly ever been in real darkness.

A system I recommend is what is called in India " dog-and-stick " parades. Men are sent out in twos and threes with instructions to report to their company commander at a certain place after dark, having two or three days previously been indicated the position by day when returning we will say from a route march. The men will get a good walk in the evenings and learn to look after themselves.

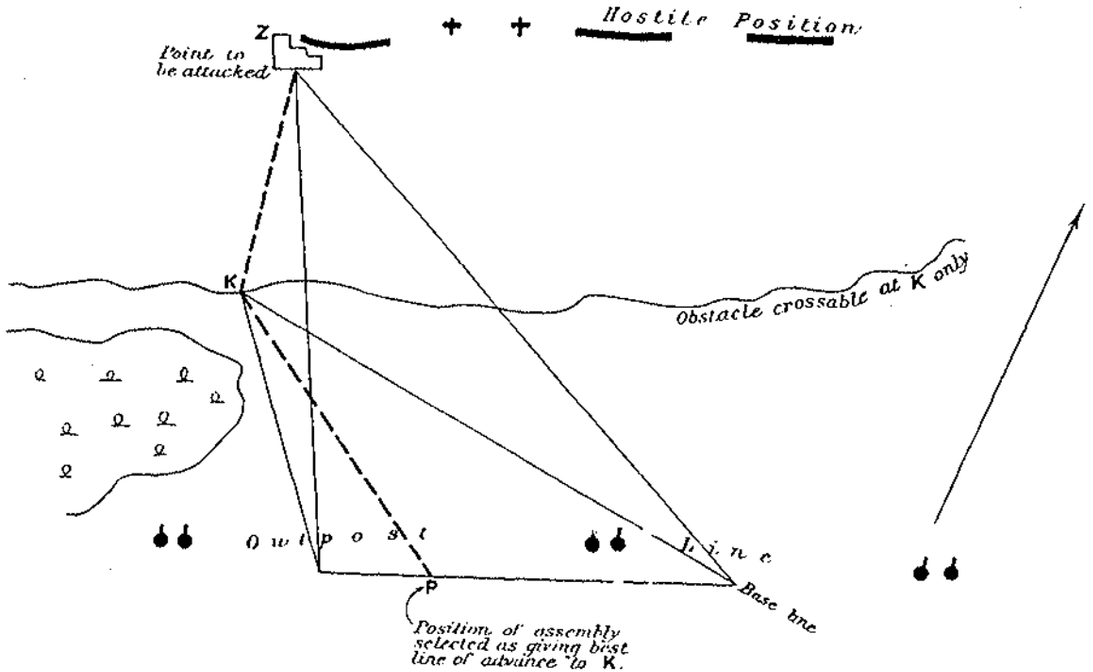
The last thing is the collective training. That is for the training of the higher commanders in the management of these operations.

In conclusion, one word of warning, and that is, do not be deceived by the amount of training that we do in night marches into thinking that they are to be used frequently. Remember that they must be used with the very greatest caution. A night operation is a very delicate weapon which if not used with great judgment will rebound and wound the user.

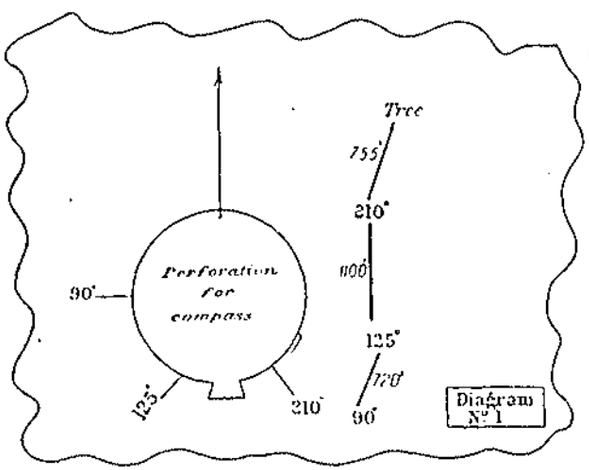
Finally you ask me how long scouts should remain out to the front or whether they should go right into the attack. I can only add that it is found in practice that after a few hundred yards have been covered the scouts have generally melted away, that is, they have fallen back into the troops ; as these latter are deployed, or in other words cleared for action, the surprise of striking the enemy should not seriously affect them.

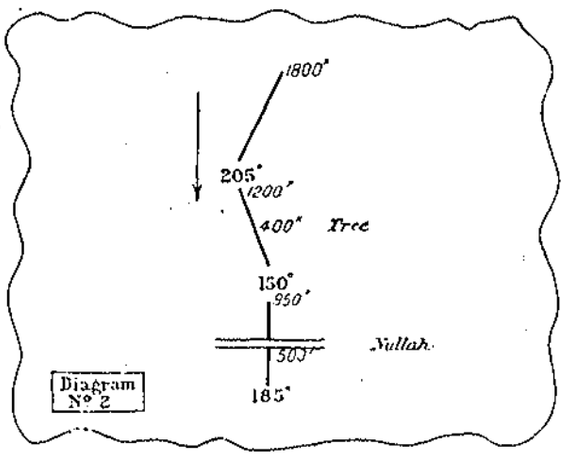
NIGHT MARCHING.

Fig. A.

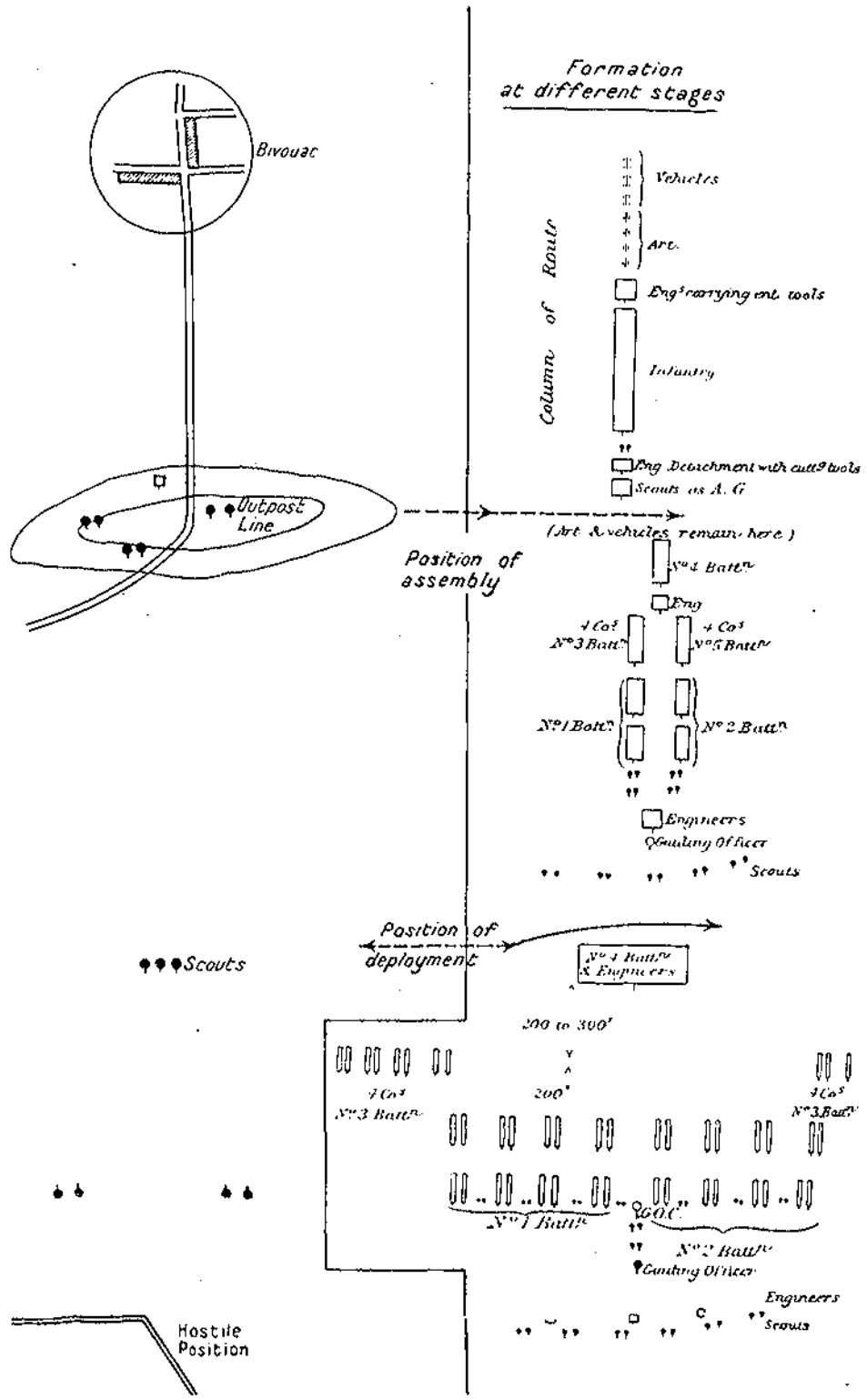


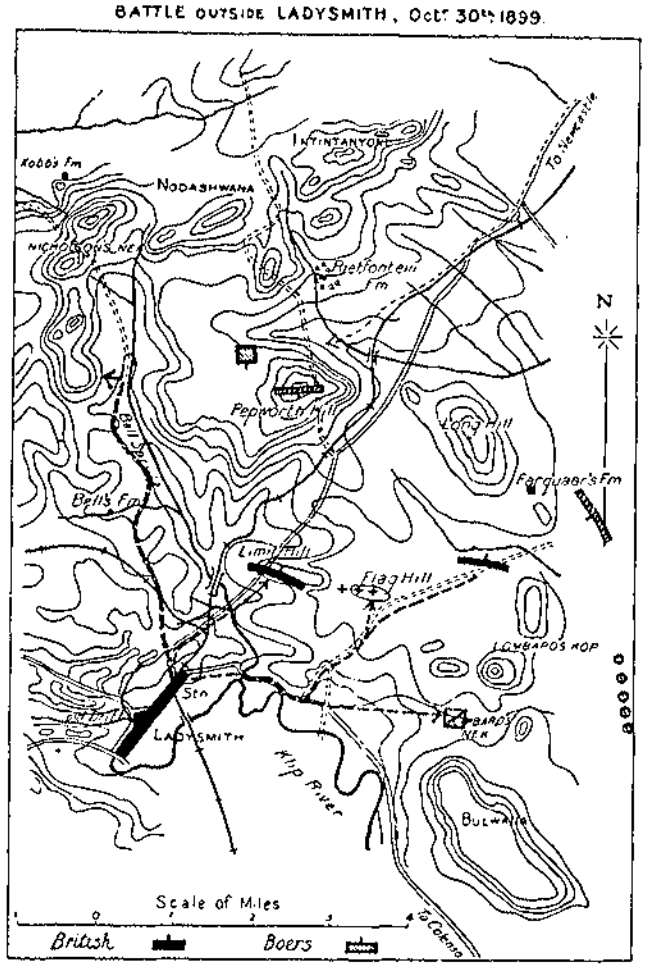
The bearings and distances PK & KZ can be measured from the plotting.

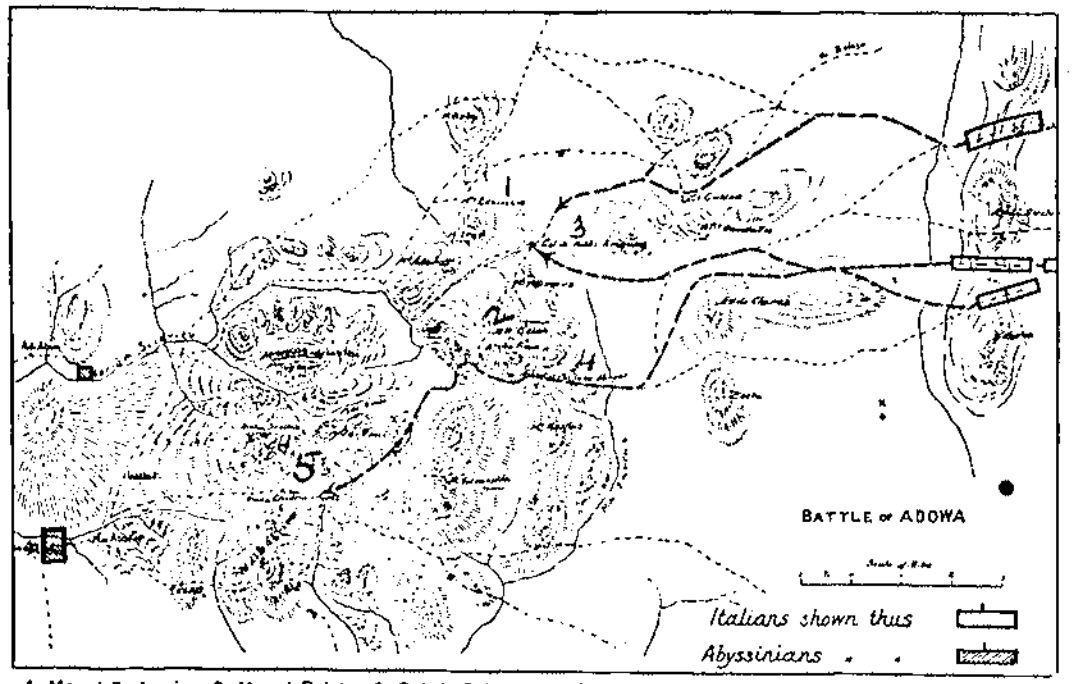




NIGHT MARCHING.







1. Mount Esciascio. 2. Mount Belah. 3. Col de Rebbi Arienne. 4. Col Chidane Maret. 5. Enda Chidane Maret.

INFLUENCE OF WOODS ON MODERN WARFARE.

By CAPT. W. G. S. DOBBIE, R.E.

SINCE the very earliest times woods have exerted a very considerable influence on war, both in the region of strategy and tactics. Wood fighting, that is to say fighting in the interior of woods, has only in a very slight degree been affected by the improvements in weapons due to the discoveries of science. This being so we can learn from history more of the tactics of wood fighting than of any other kind of fighting we may have to undertake nowadays. To go back no more than 3,000 years we read of one of King David's battles which took place in the wood of Ephraim, and we are told that "the wood devoured more people that day than the sword devoured." So that even in those far-off days the influence of woods on war seems to have been appreciated.

I have said that woods influence both tactics and strategy, and so I propose discussing these two points separately. Taking tactics first, let us approach the question broadly to start with. Many officers are of the opinion that woods are only shell traps and should be studiously avoided by all prudent soldiers. One has frequently heard this opinion expressed on manœuvres, staff rides, etc., and I cannot help thinking that this opinion is the result of jumping to conclusions rather than the outcome of careful consideration. The teaching of history is altogether opposed to this view. Woods, far from being death traps, have frequently proved to be the salvation of the troops fighting in them, and have enabled these troops to perform deeds which would otherwise have been impossible. A very striking example of this is the fight of the Prussian 7th Division in the wood of Maslowed at the Battle of Sadowa, to which I will have occasion to refer later. In this wood the 7th Division was engaged with two Austrian corps for many hours. Colonel Malcolm in his book on this Campaign says:—"By 11 a.m. 40 battalions and 128 guns were attacking 14 battalions and 25 guns. Nothing but the shelter of the wood, the breech-loading rifle and their own individual bravery saved the Prussians." And yet we are told that woods under modern conditions are only shell traps. In this case the wood not only saved the Prussians from disaster, but also had a most decided influence upon the result of the battle, by attracting from their proper positions two Austrian corps which should have faced north,

and which should have been able to oppose the advance of the Crown Prince.

There are numerous other examples that might be quoted, but the one I have mentioned will suffice to show that woods need not be the *bête noir* to the modern soldier that some would make them out to be. Their characteristics are very similar to those of villages, and most of the arguments about villages apply in a greater or less degree to woods. As a matter of fact, whatever our views on this subject may be, we will have to fight in woods whether we like it or not. In most countries there are a large number of woods, and we shall not be able to do in war what we do on manœuvres, and put an inconvenient wood out of bounds, or call it an impassable morass. Jackson virtually did this at Fredericksburg, leaving unguarded a portion of a wood which he thought was impassable. The Federals of course chose this point for their advance, and caused him some very anxious moments. I think that we can less afford to ignore woods than villages, as the former cover a greater extent of country than the latter, and so cannot be avoided. We may frequently exercise our choice as to whether we will fight in villages or not, but usually we will not have any choice in the matter of woods. In these days of aeroplanes woods have greater importance than ever before. All this being so, I think it behoves us to study the subject and try and find out how we can best turn woods to our advantage.

Artillery Fire.—The chief reason given for avoiding woods is the supposed effect of modern artillery fire, and this was, I believe, the reason advanced by General Bernhardi. Let us therefore examine as far as possible the effect that guns will probably have on troops in woods. In doing this we should differentiate between the cases of troops holding the edge of a wood and those in the interior, as the conditions are totally different.

Effect against Edge of Wood.—Against troops holding the edge of a wood the conditions are not very different to those prevailing in any other part of the battlefield. If the edge is well defined the target for the hostile guns will be good, and their effect should be great. Both shrapnel and high-explosive shell could be used with effect. Shells that just pass overhead, which in ordinary positions would burst some distance beyond, will be caught by the trees at the edge of the wood and be exploded just above the defending troops. The effect of these may not actually be very great (in the case of shrapnel the effect will probably be *nil*), but the effect on the nerves will be considerable, as, owing to the greater number of shells exploding near them, the troops will think they are under a much heavier artillery fire than is really the case. Of course the troops can leave the front edge unoccupied until the last minute, but in this case the attacking infantry will be able to approach to

short range without loss. If the defenders can be supported by their own artillery, the circumstances will be much the same as in any other part of the field—but if they are not supported by artillery, they will not usually be able to hold the edge for long. A good example of this occurred in the Battle of Worth, where the Germans were enabled to bring heavy artillery fire against the edge of the Niederwald, and, as the French did not support their troops with artillery fire, the former had no difficulty in gaining the edge of the wood.

Against Interior of Wood.—Against the interior of a wood, artillery fire must be more or less at random. It will be impossible for the gunners to know exactly where the enemy is, and aeroplanes can give no assistance here. In the case of a small copse things are of course different, as the occupants have no room for changing their position, but in the case of a large wood a very small proportion of shells will find a billet, and so, in order to achieve a certain result, an enormous expenditure of ammunition will be necessary.

Time Shrapnel.—Time shrapnel is generally considered ineffective, though this view is not universally held. Colonel Bethel in his book *Modern Artillery in the Field* on page 367 says:—"The effect of shrapnel fire upon troops among trees is very good, as the bullets seem to glance in all directions." The general opinion, however, is that the trees will stop a great number of shrapnel bullets, and will partially stop a great many more, so that they will be spent before they hit the man. Although most trees are not sufficiently thick to stop a rifle bullet, they are quite a match for shrapnel bullets. The presumably official view as expressed in *Military Engineering*, Part I., § 285, is that "Troops will to some extent suffer from splinters of wood and falling branches, but these mostly give slight wounds. A certain number of shrapnel bullets will be stopped by tree trunks and branches."

Percussion Shrapnel.—Perhaps percussion shrapnel might be employed, but I do not think that this would help matters very much, as the shrapnel fuze is so sensitive that the shell will be exploded on contact with the topmost twigs, and it will therefore have no advantage over time shrapnel. Percussion shrapnel fitted with a delay action fuze would no doubt be better, but even so it would not be as effective as high-explosive shell.

Plunging Fire Essential.—But whatever kind of shell is employed, it is obvious that a steep angle of descent is imperative, as it is necessary for the shell to get to the ground level more or less before it bursts. This plunging fire can only be obtained in three ways:—

(*a*). By the use of howitzers.
(*b*). By guns firing at extreme range.
(*c*). By guns placed on commanding positions.

The use of howitzers is the best way of gaining the desired result. Even at very long ranges the angle of descent of an 18-pr. shell is only one in three, and as even this will not be sufficiently steep, field guns may be considered as unsuitable for fire against the interior of woods.

Nor are convenient commanding positions likely to be found. To get an appreciably improved angle of descent in these days of high velocity and long range guns, a position would have to be found on the top of a fairly high mountain. There is of course the classic instance of the fire of the Austrian guns against the Maslowed Wood. The guns were perched up on some fairly high ground overlooking the wood. But it was only their low velocity that enabled them to bring plunging fire on to the wood. Put a modern 18-pr. in the same position and its shells will skim the top of the trees and not penetrate into the wood.

High-Explosive Shell.—As regards high-explosive shell, and their effect in a wood, we have no reliable data on which to base our theories. Opinions of artillery officers vary very considerably. Some think that a few high-explosive shells will have an extraordinary effect and quickly clear a wood of its defenders. Others are not quite so sanguine. To quote again from the text book of *Military Engineering*, Part I., para. 285, we are told:—"As for high-explosive shell, their effect will presumably be no worse in a wood than out of it, though here and there a tree may be brought down. A large number of splinters will be stopped, and the concussion will be somewhat modified." It certainly seems to me that the trees will localize the effect of the shell burst, and will form ready-made splinter proofs, though of course the effect of the detonation in the actual area in which the shell falls will be very complete. *Field Artillery Training*, para. 109, draws attention to the fact that only a very local effect is caused by the explosion of high-explosive shell. Personally, I think that I would rather have a high-explosive shell fall 25 yards from me in a wood than at a similar distance in the open.

It therefore seems that the only shells likely to produce any appreciable effect against troops in woods are the high-explosive shells fired by howitzers.

As I have already pointed out, in order to produce a given effect, a tremendous amount of ammunition will have to be expended and will it be considered advisable therefore to use up possibly all the high-explosive shell against a target, when the effect cannot be seen or found out in any way?

If the whole brigade of howitzers is detailed to shell the interior of a wood, the guns will either fire rapidly and so use up all their high-explosive shell very quickly, or they will fire slowly, and only do what one battery firing quickly could do. If one battery were detailed alone, it would soon use up its high-explosive shell, or it

would have to borrow from the other two batteries of the brigade, a course which seems to be teeming with objections and practical difficulties. As in the case of villages, ammunition supply will be the deciding factor.

Moral Effect.—The effect then of artillery fire against troops in woods will not be nearly as great as is generally supposed. But the effect on the nerves will be very considerable, and it is this which tells in the long run. It seems to me that peace training can do much to help in this matter by making the troops appreciate rightly the limitations of artillery fire. The attitude of a great part of the British Army in this connection is due to a misconception, and if troops are taught that woods positively limit the effect of shell fire, their *morale* will start at a higher level when they find themselves subjected to this fire.

Historical Examples. (*a*). *Maslowed.*—Before leaving this question of artillery fire I would like to refer briefly to two historical instances. The first is one to which reference has already been made —viz. the fight at the wood of Maslowed.

In this case 100 Austrian guns were playing on this wood, which is considerably less than a square mile in area. The guns were on high ground and were able to fire down into this wood with a plunging fire. Marks had been previously fastened to the tops of the trees to assist the aim of the gunners, and there were a very considerable number of Prussian troops in the wood at the time of the bombardment. Further, the Austrian gunners were hardly molested at all by the Prussian artillery, and so were able to devote all their energies to the task of exterminating the Prussian infantry in the wood. The whole of the circumstances were entirely favourable to the Austrian gunners, and yet the result was not very striking. During the whole day's fighting the 7th Division lost 2,000 out of 14,000 men or 14·3 per cent. The greater part of these losses was incurred in the fighting with the Austrian infantry, and the amount due to the artillery fire in the interior of the wood must have been very small. The total loss of 14 per cent. cannot be considered excessive when one remembers that this fight is usually considered as one of the most desperate on record.

Wood of Sadowa.—Another similar fight was being carried on in the adjoining wood of Sadowa, the 8th Division being subjected to very heavy artillery fire. The range was very short (under 1,000 yards in some places) and the Austrians knew exactly where the Prussians were; and yet Hozier says in his book on *The Seven Weeks' War*, "the guns did not inflict as much loss as would be expected."

Bois de la Garenne.—Towards the close of the Battle of Sedan a considerable body of French troops was occupying the Bois de la Garenne. This wood was to be attacked by the Prussian Guard

Corps, and the whole of the artillery of the Guard Corps commenced shelling the wood so as to pave the way for the infantry advance. The right-hand gun of each battery fired at the edge of the wood, the next gun 50 yards in, and so on, so that a very considerable area was covered with shell fire. The French were very much shaken by this fire, and when the Prussian infantry advanced, they surrendered without any further opposition. The large number of unwounded prisoners, however, bore witness to the comparative harmlessness of the artillery fire, though the moral effect was very pronounced.

Three Phases.—Wood fighting seems to be divisible into three distinct phases. The first is the fight for the edge of the wood, the second is the struggle in the interior, and the third is the debouching on the enemy's side of the wood. The conditions in each of these three phases are totally dissimilar. In the first the attacker is apt to have artillery predominance. In the second, the guns on both sides can do little or nothing, while in the third the defender will probably have superiority in artillery fire. This being so, the advantage will at first rest with the attack, but the pendulum will gradually swing over, until the defenders are in the better position. Of course a statement like this can only be very general, but it is the sort of thing that has happened many times in the past, and will presumably happen again. The general inference is that a wood will not be a suitable point for the decisive attack.

Front Edge.—To discuss these three phases in turn. The fight for the front edge should be considered first. The attackers here will have the advantage unless the defenders can gain superiority of artillery fire. If the defenders cannot support their troops with gun fire, the front edge will probably become untenable. One sometimes sees it advocated that the front edge should not be held, but that a position some 200 yards or so in front, with the idea of escaping the effect of the hostile artillery fire, should be taken up. In the text book on *Military Engineering*, § 278, we are told that "where the line of defence of necessity follows the general direction of a wood, the firing trenches should if possible be thrown out 50 to 150 yards towards the enemy, for the sharply defined edge of a wood is easy for artillery to range on, and the noise of bullets and shell crashing through the branches overhead has a most unsteadying effect." Some may consider that this plan presents difficulties, for in the first place the trenches will be completely isolated, unless communication trenches to the wood are dug, and these may possibly prove to be conspicuous and give away the position of the fire trenches. The attacking infantry, also, may sooner or later discover the position of these trenches and pass the word to the supporting artillery, and one of the chief advantages of woods is that the supports can move about under cover and reinforce the firing line wherever necessary. If the firing trenches are put 150 yards in

front of the edge of the wood, this advantage is given up. This question is really exactly the same as the question "should fire trenches be placed at the bottom or the top of a hill?"

If it is considered likely that the enemy will have overwhelming artillery superiority, and if it is still desired for any reason to hold the front edge, I think that the best plan will usually be to hold the front very lightly, and concentrate the defenders at some point within the wood, and, as soon as the attackers gain the edge of the wood, counter-attack with the bayonet. This plan was adopted by the French at Worth, and only failed in some instances because the counter-attacks were carried too far. When the advanced guard of the 11th Corps approached the Niederwald, the edge was only held by two companies of the 3rd Zouaves, who retired in front of the 10 Prussian companies. As these attempted to penetrate into the wood they were counter-attacked by the Zouave Battalion and driven out of the wood and across the Sauer. Thus although the edge of the wood was under heavy artillery fire, four French companies repulsed the attack of 10 Prussian companies. In this case the pursuit was not carried beyond the edge of the wood—and the operation from the French point of view was entirely successful. Colonel Henderson considers this an ideal counter-attack.

If on the other hand it is considered advisable to hold the front edge in strength and to dispute the advance of the hostile infantry, it will, I think, be best to hold a line a few yards clear of the wood. This has not got the objections of the line 150 yards in front, but has many advantages. The actual edge of the wood is generally very difficult to entrench owing to the roots and the trees. If the line is chosen just clear of the roots, a trench can be dug as easily as anywhere else, and the advantages derived from a wood are not given up.

The Bayonet.—The fight inside the wood is very primitive in character, and it is the kind of fighting on which improvements in firearms have had little or no effect. Troops armed with spears would not be at a very great disadvantage against troops armed with the magazine rifle. The corollary is, of course, that the bayonet is the most suitable weapon for this kind of fighting. Fire action will be used to some extent, but most of the work will be done by the bayonet. The Americans did not hold this view in 1864. In the fighting in the Wilderness the bayonet was but little used, and nearly all the casualties were caused by rifle fire. In 1866 and 1870 the very opposite was the case, and I think that this latter is the true teaching of history. Many of the American soldiers were accustomed to the use of firearms in peace time, and I think that they naturally were more inclined to shoot than to use the bayonet, which is essentially the weapon of the Regular soldier. Colonel Henderson says:—"Troops that will use the cold steel in woods have the best chance of success." General du Cane says:—"The value of the long range

of modern weapons must be considerably reduced in wood fighting, and that of the bayonet correspondingly enhanced.

Effect of Counter-Attack.—Perhaps the most striking lesson we learn from the study of accounts of wood fighting is the extraordinary effect of counter-attacks. Even very small bodies of men, led boldly to the attack, have driven far greater numbers of the enemy in disorder from the wood. This is of course due to the confusion that is bound to arise among the attacking troops during their advance through the woods, even though the resistance be slight. In the fight in the Niederwald at the Battle of Worth the French repeatedly drove the Germans back out of the wood. The French charged with the bayonet, and the sight of the compact mass of men sweeping down on them was too much for the disordered Germans.

There seems to be no limit to the effect of these counter-attacks, so long as they are carried out judiciously. It is said that "the best is enemy to the good," and the French certainly made the mistake of carrying their counter-attacks too far. To stop a victorious charge of this kind is not easy—but it must be done, and it requires good troops and good peace training to accomplish this result. Troops that are lacking in discipline are bound to fail in this, and will be at the mercy of a far smaller number of good troops so far as wood fighting is concerned.

The same principles apply to the attacking side, that is the side that is attempting to advance through the wood. At all hazards must the men be kept together. Compact bodies of even a company or less will have a very great influence in restoring the battle and gaining ground to the front. The success gained by the 26th Prussian Regiment at the Maslowed Wood was due almost entirely to the compact formation in which its battalions traversed the wood. It is interesting and instructive to notice the way this same regiment failed four years later in wood fighting through disregard of this principle. General Clery in his *Minor Tactics* on p. 311 says:—"Should they (the supports) become eventually engaged, great efforts should be made to collect small bodies to act as fresh supports. Groups of this kind under control may be made to intervene with great effect either to parry a local flank attack or to effect one, or to serve as temporary rallying points. It has been asserted that the success of the Prussians in maintaining themselves in the Swiepwald at Sadowa against nearly four times their numbers was greatly due to the use made of small bodies of this kind.

Clearings.—Clearings will be frequently met with, and they will be extremely difficult to cross. The 2nd Bavarian Corps was hung up nearly the whole day by a clearing at Worth. It would seem that they made rather more of the difficulty than necessary, as their losses during the whole day were only 700 men. The 11th Corps also found considerable difficulty in crossing the clearing between

the Niederwald and the Elsasshausen Copse. It was only through an ill-judged counter-attack of the French which was carried too far, that the Germans succeeded in crossing the clearing along with the discomfited French.

There seems to be no reason why guns should not be run up by hand to assist the troops at a clearing. This was done on several occasions in the Wilderness in 1864, and if it could be done then it will be easier to do now owing to the shields with which guns are provided. Of course if it is possible to edge round the clearing both sides will attempt to do so, and the clearing will become a sort of No Man's Land. Clearings undoubtedly strengthen the defence.

Tenacity of Troops in Woods.—Troops that are well trained in wood fighting will be very difficult to drive out of a wood, even if they are but few in number. The advanced guard of the 11th Corps hung on to the eastern piece of the Niederwald, that projects towards Spachbach, after the rest of the corps had been forced across the river. This of course greatly assisted the further operations of the 11th and 5th Corps. The way in which the 7th Division resisted the attacks of the Austrians at Maslowed, although outnumbered by four to one, has already been referred to, and is a striking example of the tenacity with which woods can be held.

Penetration of Bullet.—I have pointed out how little this kind of fighting has been affected by the improvements in firearms. Since 1864 and 1870 there has, however, been one important change, and that is the greater penetrative power of the small-bore bullet. Trees which in 1870 would easily have stopped a bullet, will now no longer be able to do so; in fact a tree that is bullet proof will be a very rare exception, as 3 ft. 6 in. in the case of hard-wood trees and 5 ft. in the case of soft-wood trees is the minimum thickness required. Troops should be made to realize this in peace time, as otherwise they may have a rude awakening in war. There is, I am told, nothing more disconcerting than to be struck by a bullet which passes through cover which one has fondly believed to be bullet proof. Often and often one has seen troops sheltering behind fir trees 1 ft. 6 in. thick, while exposed to heavy fire at close range, and feeling so very well satisfied with the excellent cover that nature has provided for them.

Whether this increased penetrative power of the bullet will have much effect on wood fighting, I cannot say, but I do not think it will. Possibly the proportion of casualties from rifle fire will be slightly increased. The tendency will be, I think, all in the direction of increasing the amount of work with the bayonet.

Importance of Knowing the Way about the Wood.—I have pointed out the advantage the defence will have in the use of the counter-attack after the attackers have penetrated into the wood. This will of course be partly due to the fact that presumably the defenders know the geography of the wood better than the attackers. It is very

easy to lose one's direction in a wood. The Federals frequently did this in the Battle of the Wilderness, and the local knowledge of the Confederates stood them in very good stead. It will generally pay the defender to get to know the way about his wood, better than the construction of elaborate fortifications would pay him.

Position Behind a Wood.—To turn now to the fight at the edge of the wood nearest to the defenders. Here the defence will generally have the advantage. In fact, if a purely passive defence is required in this part of the field, a position commanding the rear edge of the wood will usually be overwhelmingly stronger than any other position. In the first place the wood will be between the defenders and the hostile artillery, and so will shield them very often from gun fire. Then the defenders should be able to bring artillery fire to bear against the edge of the wood, and so make it very difficult for the attackers to debouch from it. Thirdly the attackers will have had all the disadvantages of working their way through the wood, with all the attendant disorder and confusion. The lessons of history are unanimous in pointing out how difficult, if not impossible, it is for troops to debouch from a wood if the defenders are unshaken and are in a position covering the rear edge. The Prussian 8th Division found it impossible to debouch from the wood of Sadowa while the Austrians were holding the open ground beyond. A few Prussian companies at the action of Nachod, held a position covering the open ground in rear of the Wenzelsberg Wood, and completely defeated the efforts of two Austrian brigades to advance from the wood. There are instances also at the Battles of Spicheren and Worth. Bonnal says:—"History has not yet recorded a single great attack that has debouched from a forest or an extensive wood." Of course if one intends taking the offensive, a position behind a wood will be bad, as there is then no point in putting a difficult piece of ground like a wood between oneself and the enemy.

Entangling Edge, and Mines.—If one holds such a position, and if time permits, much can be done to make the task of the enemy of getting out of the wood more difficult. It is a good thing to cut the edge into V-shaped pieces, and entangle the re-entrant angles. The enemy advancing will naturally avoid coming out into the open sooner than necessary, and so men will collect in large numbers in the salients. This is one of the few cases, I think, in which land mines will be useful. A mine exploded at the right moment in one of these salients will have the effect of damping the ardour of the attackers, and if the dose can be repeated two or three times in approximately the same place, the salient will soon lose its charm.

Artillery.—I have pointed out already that guns may be used at clearings, being run up by hand. They can also, of course, be run up to the edge of the wood by the attackers. The Germans did this at the Niederwald, and it was the fire of these guns that enabled

these troops to emerge from the copse and advance against Elsasshausen. But wood fighting is uncertain at best, and the tide of battle ebbs and flows with bewildering rapidity, so that guns may find themselves suddenly stranded, unless great care is taken. Clery says :—" The uncertainty of wood fighting is always so great, that pushing guns very far forward would be attended with danger."

Fortification.—As regards the fortification of a wood, a few words may not be out of place. Generally speaking much time and labour will be required to make a satisfactory job of the fortification of a wood, and time will not often be available. As a rule, in the strictly limited time which will usually be at one's disposal, it will be best to devote one's energies to improving the communications. Since the greatest difficulty of wood fighting is due to the disorder that the passage of the wood entails, anything to assist the passage through the wood will be of great utility. This principle is in fact laid down in *Military Engineering*, Part I., § 281, together with certain other practical points. R.E. companies will usually be required to assist in placing a wood in a state of defence, as the number of cutting tools carried by the infantry is so very limited. When the front edge of a wood is entrenched, overhead cover should, if possible, be provided so as to guard against the heavy shrapnel fire to which the occupants of the trench will be subjected. Frequent traverses will also be necessary so as to localize the effect of any high-explosive shell that may pitch in the trench. I have already referred to the ways in which the rear edge may be treated.

The Americans in 1864 made defensive works in the woods of the Wilderness, whenever they halted. This, however, could not be done so easily nowadays, as the greater penetrative power of the modern bullet necessitates a far greater thickness of breastwork. The Germans, French, and Austrians did little in the way of fortification.

Sundry Points.—The following further points are worth considering very briefly. Firstly, the commander of a force fighting in a wood can exercise little or no control over his troops. A great deal must be left to the subordinate commanders and to the individual private soldier. This emphasizes the value of men who think for themselves and are prepared to act for themselves. The French soldier is, I suppose, second to none in this matter, and General Du Cane in an article in the *Army Review* says :—" The French have claimed considerable superiority in this form of fighting, and their claim appears to be fully justified. They attribute their superiority to the fact that their troops were self-reliant, resourceful and imbued with initiative." Troops must be taught to rally to any officer or N.C.O. in whose neighbourhood they happen to find themselves.

The Unknown.—Again, a wood hides the movements and presence of troops in it. Since the terror of the unknown is a very potent

factor in the human temperament, defenders can, with a very small outlay of force, cause their enemy much disquiet. Imagine a large body of troops (say a division) approaching a large wood through which it intends to advance. A few companies of the other side may cause the division to waste much time in deploying for the attack, as they cannot know whether the wood is held by 100 or 10,000 men. As the troops work through the wood they will be seeing an enemy behind every tree, and crouching in every bush, and their frame of mind will be such that a panic will easily occur. This is really the reason why counter-attacks in woods are so very effective.

Shooting Wrong People.—Another point is the extreme danger in wood fighting of shooting one's friends. Jackson was killed in this way at Chancellorsville, and Longstreet was wounded a year later near the same place. This is a point to which a great deal of care will have to be devoted, and it is a question whether some means should not be adopted of distinguishing friend from foe as in night operations.

Surprise.—Another point is that extensive woods facilitate surprise. On May 12th, 1864, Edward Johnson's division was surprised by the Federals and 3,000 of them were captured. In a wood, far greater precautions against surprise will have to be taken than in open country.

Flanks.—Lastly, in wood fighting the flanks are the points of danger. The tendency of both sides always seems to be to edge away to a flank. Both Federals and Confederates did this at the Wilderness, and the local knowledge of the latter enabled Longstreet to bring off a very fine turning movement against Hancock's flank, which was only spoilt by Longstreet's untimely wound.

Summary of Tactical Lessons.—We may now summarize the tactical lessons I have attempted to deduce, and so see what is the proper use to which woods may be put in a modern battle.

In the first place we see that woods may be very tenaciously held by a comparatively small number of well-trained troops, even though subjected to a combined onslaught of infantry and artillery. They will therefore be suitable for that part of the battlefield where passive defence only is intended.

Secondly, they exert a peculiar attraction on all troops in the vicinity. For example we may quote again the wood of Maslowed where two Austrian corps were drawn out of their proper places into the fight with the 7th Prussian Division. They are therefore very suitable as advanced posts in front of a defensive line, as they will go a very long way towards breaking up the enemy's attack. The wood near La Folie was held by the French in this way at the Battle of Gravelotte.

For the same reasons woods form suitable pivots, as they enable

the garrison to engage the attention of considerably larger forces of the enemy. To quote an extract from the *R.E. Journal* of August, 1911, the writer speaking of these pivots says:—"Their business is not to repulse attacks but to encourage them, and to be a terror to the neighbourhood; to be a hornets' nest when stirred with a stick, and yet able to roll themselves up into the prickliest ball of a hedgehog that ever baffled a pack of terriers." I think that woods fulfil these conditions better than most other localities.

Training.—But no success in wood fighting can be gained without good peace training. This is perhaps of greater importance in the case of woods than in other things. Here the private soldier must often act on his own, and he cannot be expected to know what to do from the light of nature. He must be taught. It is only by means of a thorough training that he will gain that self-confidence which is so absolutely indispensable to this kind of fighting, and no amount of bravery on his part will make up for lack of training. Presumably we train our men sufficiently in this work, but we must bear in mind that the great continental armies have had much war experience in countries where woods are very numerous, and have distinguished themselves in this kind of fighting a generation ago. Our army has not had any experience in wood fighting against a modern civilized army for nearly 100 years, and so it would seem that we have a considerable amount of ground to make up.

Effect on Strategy.—Woods have, in the past, excited very considerable influence on the strategy of a campaign—and I think that their influence on strategy will be still greater in the future. By "woods" I now mean of course large tracts of wooded country, and not mere isolated patches of woodland. Aeroplanes are likely to minimize the chance of surprise in modern war, and it will very often be found that the only chance of effecting a surprise is by operating in woods. Just as, tactically, woods favour the defence, so in strategy they assist the weaker side. The fighting in the Wilderness is a proof of this. Lee deliberately chose this ground for his operations, as his army was very much smaller than the Federal Army, and he hoped by protracting the fighting to make his opponents tire of the war. In this he nearly succeeded.

Forest of Orleans.—The Forest of Orleans also had a considerable effect in 1870 on the German strategy. We see Prince Frederick Charles sitting down in front of it, and not showing a great deal of keenness to enter it. His views about this forest can be clearly seen from an extract from a letter he wrote to the King on November 26th. He says:—"But far more difficult than this question is that of driving the enemy out of the Forest of Orleans. If the Emperor Napoleon III. said with truth he had never been able owing to the numerous cavalry which covered my advance to the Moselle, to find out where the main body was, so can I say the same

as respects my own situation now. I only know with certainty that this or that village or farmhouse is occupied—where some large bodies of troops are, is also occasionally known: where the main body of the army is, I do not know."

The King of Prussia writing to Moltke on the 2nd December said:—"The great Forest of Orleans keeps us in doubt as to what the enemy is doing."

This uncertainty might have had very dire results, and it was only thanks to Moltke's determination, that Prince Frederick Charles was instructed to advance through the forest. He did it, though he did not like doing so.

Alvensleben, commanding the III. Corps, referring to this advance subsequently said:—"I went, I was fully aware, into a den, of which the door closed of itself after my last man had passed Chilleurs. With every step forward diminished any chance of support and also the possibility of withdrawing or of sending any news about myself or of receiving news. No use was there in previous calculations and speculations. I knew nothing as to the state of affairs south of this forest. Of only one thing was I sure, the impossibility of employing all my guns. And was it quite out of the question that the Prince's attack might be repulsed, that I should be for one or two days in front of the Bridge Head and with the enemy on my line of retreat? In this case we should certainly hold out, but my corps could hardly escape a catastrophe."

The French did not take advantage of the possibilities of success provided for them by the Forest of Orleans. It is interesting to speculate what would have happened if Lee had commanded them.

In conclusion, it seems that strategically large forests favour the weaker side, and enable it, through the concealment afforded, to assume the offensive under favourable conditions, and give it a chance of achieving decisive success. It requires a commander of very strong character to bring to a successful issue any campaign in this sort of country. Any weaker man than Ulysses S. Grant would have been beaten by Lee in 1864.

The worst thing one can do is to stand still. This gives the enemy time to execute his plan against a flank. This was Hooker's great mistake at Chancellorsville. A commander must keep moving, as this movement will, if it does nothing else, upset the enemy's aim by putting his opponents in a place where he does not expect them to be.

Lastly in wood fighting, more perhaps than in any other kind, salvation lies in taking the offensive, and so anticipating the enemy. A defensive attitude engenders all sorts of fears, such as those that beset the King of Prussia and Prince Frederick Charles, and thus greatly increases the danger of ultimate defeat.

PLATE II.

EARLY INDIAN CAMPAIGNS AND THE DECORATIONS AWARDED FOR THEM.

ARMY OF INDIA MEDAL. 1803-26.

ARMY OF INDIA MEDAL 1803-26

EARLY INDIAN CAMPAIGNS AND THE DECORATIONS AWARDED FOR THEM.

(Continued).

By MAJOR H. BIDDULPH, R.E.

THE ARMY OF INDIA, 1803–26.

In 1847–8 the issue of a medal and clasps was authorized by the Queen to the survivors of the army who had served at those battles, sieges, etc., from 1806—1814, for which gold medals had been granted at the time to the general and commanding officers engaged. The only service included in this list in which troops from India had been engaged was the expedition to Java, 1811. Consequently, in 1851, a medal was authorized to those surviving soldiers, European and Native, who had served at certain battles, sieges, etc., in India from 1803—1826, as set forth below, with the following exceptions, viz. :—Such native soldiers as had received the medal for the Nepaul War, granted at the time by the H.E.I.C.S., were ineligible for the Queen's medal and clasp for this campaign ; and for the same reason no native was eligible for the Queen's medal and clasp for " Ava."

It will be noted that the date on the medal is 1799—1826, whereas the services for which it was granted were between 1803—1826. The reason for this discrepancy is that originally it was intended to include the Mysore War and Capture of Seringapatam in 1799 in the list of services for which the medal would be granted ; but it was pointed out that the H.E.I.C.S. had granted medals at the time to *all* ranks, both European and Native. This service therefore was struck out of the list, and authority given for troops in the service of the Crown to wear that medal on all occasions, but the date on the new medal die escaped observation.

Medal to the Army of India, 1799—1826. (1803–26). *Authorized* 1851.

1·4-in. diameter. Silver.

Obverse.—Crowned head of Queen Victoria.
Legend : " Victoria Regina."

Reverse.—Victory seated beside a palm tree and trophy.
Inscription : " To the Army of India, 1799—1826."

Ribbon.—Pale blue, 1¼ in. wide.

Mounting.—Silver scroll bar and swivel.

Clasps.—Allighur, Battle of Delhi, Laswaree, Defence of Delhi, Battle of Deig, Capture of Deig, Assye, Asseerghur, Argaum, Gawilghur, Nepaul, Kirkee, Poona, Kirkee and Poona, Corygaum,

Seetabuldee, Nagpore, Seetabuldee and Nagpore, Maheidpoor, Ava, Bhurtpoor.

The medal rolls for the Europeans of the Queen's troops exist practically intact, though there is a strong suspicion that a few names may be missing. The reason of this is that claims came in piece-meal from 1851 to 1858, and the rolls were made up in batches, some of the later rolls containing a few names only. It is probable that some rolls containing a few names were mislaid before they were bound.

For the Europeans in the Company's service no proper medal roll exists; only a rough book of issues, which is almost certainly incomplete, although perhaps the entries omitted are few. The original rolls are probably in India. For the Native troops, such rolls as exist are to be found for the most part in India, and as (for the reasons stated above) they are to be numbered in dozens, were scattered over seven years, and emanated from different Presidencies, the verification of a Native's medal is more a matter of luck than anything else.

One thing, however, is certain, viz.; that practically every medal issued to a native, was sent out to India unengraved; and in that country some were rudely punched, others engraved, and probably a good number were issued plain.

Subject to the above remarks the following brief notes on the Army of India medal and the campaigns for which it was granted, may be of interest:—

Medal to the Army of India.

(i.). *Lake's Campaign*, 1803–4.

8th Light Dragoons	..	42	medals issued	(officers & men)	
27th ,, ,,	..	20	,,	,,	,, ,,
29th ,, ,,	..	14	,,	,,	,, ,,
22nd Foot ..	..	8	,,	,,	,, ,,
76th Foot ..	..	31	,,	,,	,, ,,
H.E.I. Co.'s Service	..	52	,,	,,	*to Europeans* (officers & men)

(ii.). *Wellesley's Campaign*, 1803.

19th Light Dragoons	..	13	medals issued	(officers & men)	
74th Foot ..	..	20	,,	,,	,, ,,
78th Foot ..	..	37	,,	,,	,, ,,
94th Foot ..	..	40	,,	,,	,, ,,
H.E.I. Co.'s Service and miscellaneous	.. ..	27	,,	,,	*to Europeans* (officers & men)

(iii.). "*Kirkee and Poona.*" Single bar.

65th Foot ..	..	16	medals issued	(officers & men)	
H.E.I.C. Service (Europeans) ..	.. ..	71	,,	,,	,, ,

(iv.). "*Poona.*" Single bar.

65th Foot	44	medals issued (officers & men)
H.E.I.C. Service (*Europeans*)	32	,, ,, ,, ,,
"*Poona,*" "*Ava*" ..	5	,, ,, ,, ,,
"*Poona,*" "*Bhurtpoor*" ..	1	,, ,, ,, ,,

(v.). "*Maheidpoor.*" Single bar.

22nd Light Dragoons ..	28	medals issued (officers & men)
1st Foot	12	,, ,, ,, ,,
H.E.I.C. Service and Miscellaneous (*Europeans*)	83	,, ,, ,, ,,
"*Maheidpoor,*" "*Ava.*"		
1st Foot	19	,, ,, ,, ,,
H.E.I.C. Service (*Europeans*)	18	,, ,, ,, ,,

(vi.). *Nagpore.* Single bar.

1st Foot —	40	medals issued (officers & men)
H.E.I.C. Service (*Europeans*)	43	,, ,, ,, ,,
"*Nagpore,*" "*Ava.*"		
1st Foot	43	,, ,, ,, ,,
H.E.I.C. Service (*Europeans*)	5	,, ,, ,, ,,

(vii.). "*Nagpore,*" "*Maheidpoor,*" four medals issued to Europeans (officers and men).

"*Nagpore,*" "*Maheidpoor,*" "*Ava,*" three medals issued to Europeans (officers and men).

"*Nepaul,*" "*Maheidpoor,*" one medal issued to Europeans (officers and men).

"*Nepaul,*" "*Nagpore,*" four medals issued to Europeans (officers and men).

"*Nagpore,*" "*Bhurtpoor,*" one medal issued to Europeans (officers and men).

(viii.). The *total* number of certain rare clasps, issued singly, and in combination with others, to Europeans and Natives, appears to be as follows :—

"*Seetabuldee and Nagpore,*" 20 Europeans and 194 Natives.

"*Corygaum.*" Single bar. 8 medals in all.

"*Poona,*" "*Corygaum,*" 10 medals in all.

"*Kirkee and Poona,*" "*Corygaum,*" 64 medals in all.

"*Asseerghur,*" "*Kirkee and Poona,*" "*Corygaum,*" 1 medal.

The information about certain other rare clasps is somewhat indefinite, for it is not clear how many Natives received them. For instance, it is possible that a good many received the clasp "Kirkee" who were survivors of the 1st (Dapuri) Battalion, Peishwa's Brigade

Poona Auxiliary Force (afterwards the 23rd Bombay N.I.), which was engaged at the Battle of Kirkee, but not at the Battle of Poona, but the available records of any such issues are very indefinite. Only one man of the 65th Foot received the clasp "Kirkee," and this medal is in Lord Cheylesmore's collection. Another man of the 65th Foot received the two clasps "Poona," "Corygaum"; this medal came into Dr. Payne's possession, but the "Corygaum" clasp was removed, owing to a most unfortunate misapprehension, and the medal has been irretrievably damaged.

I am not aware that there exists in any collection *genuine* specimens of medals with the clasps "Seetabuldee" or "Defence of Delhi"; while to my certain knowledge several medals with fraudulent "Corygaum" bars have been sold in recent years, and fetched very high prices.

The numbers of medals issued for "Nepaul," "Ava" and "Bhurtpoor" are too numerous to require cataloguing. The number of naval recipients of the medal and clasp for "Ava" will be given later.

Mahratta War, 1803–5.

This war was occasioned by the jealousy of the Mahratta confederation at the expanding influence of the British power.

Scindia, Maharajah of Gwalior, and Bhoonsla, Rajah of Berar, were the two foes opposed to the British at the moment; and the operations may be roughly divided into those conducted by General G. Lake, with the Grand Army, in the Doab, and those conducted by Major-General the Hon. A. Wellesley (and Colonel James Stevenson, commanding the Hydrabad Subsidiary Force), in the Deccan. Minor operations in Cuttack and Bundelkhund were undertaken by small detached forces.

Lake's Operations, 1803.

The Grand Army was directed to concentrate at Secundra on the 26th August, 1803,* and on the 27th (before the concentration was complete) Lake marched. On 29th August, an insignificant cavalry skirmish took place at Coel, before Allighur, which ended in the retreat of the Mahratta cavalry under Fleury, a Frenchman, who thereupon made a raid on Shekoabad, in British territory.

On the 3rd September Lake determined to seize by a *coup de main* the fort of Allighur, which was held by a garrison of several thousand men under the command of M. Pedron, son-in-law to M. Perron, Scindia's French Commander-in-Chief.

The assaulting party was composed of four companies H.M. 76th Foot, supported by the 1-4th N.I. and four companies 2-17th N.I., under the command of Brigadier the Hon. W. Monson, 76th Foot. The surprise, which was timed for 4.30 a.m. failed, and the assaulting party thereupon tried to escalade the walls; a fruitless

* For composition of force see later on.

attempt carried on for a long time under a heavy fire at a few yards range. The 2-4th N.I. was pushed up to reinforce them, and two 12 prs. sent for, with which the gate was blown open ; three successive gates had to be forced before an entrance into the main fort could be effected. Once inside the fort, the British troops cleared it out and some 2,000 Mahrattas were killed. The British casualties were also heavy, numbering 265 in all, including 6 British officers and 21 Europeans killed, and 11 British officers and 71 Europeans wounded ; the chief sufferers being the 76th Foot, who lost 9 officers and 66 men, and by whose valour the fortress was captured. That night Lake received news of the raid on Shekoabad referred to above, and immediately despatched the 3rd Cavalry Brigade (29th Light Dragoons, 1st and 4th Bengal Light Cavalry) to repel the incursion and relieve Shekoabad which was held by five companies 1-11th N.I. with one gun 2-1st Battalion Artillery.

The 1-4th N.I. was left to garrison Allighur, and without waiting to strengthen his weakened force, Lake pushed on, and on 11th September, near Delhi, encountered the enemy, 19,000 men with 100 guns, under M. Louis Bourquien who had succeeded Perron as Scindia's Commander-in-Chief.

The enemy held a strong position with both flanks resting on swamps ; Lake reconnoitred personally (as was his custom) with the cavalry, and then slowly retreated masking the approach of his own infantry and inducing the enemy to advance. The cavalry then opened out and let the infantry advance, who, in the face of the heaviest fire, continued their march until within a hundred paces of the Mahratta line, when they shattered it with a volley and a charge.

The British casualties, including two officers killed by sunstroke, were 486, of which the European portion was 6 officers and 47 men killed, 10 officers and 127 men wounded. The 76th Foot again bore the brunt and, as ever, were the backbone of the army ; their losses totalled 138. Their commanding officer was Capt. W. Boyes, all the senior officers having been knocked out at Allighur ; but Major W. Macleod, though wounded on that occasion, was present at the Battle of Delhi in his palanquin. The Mahrattas lost 68 guns and over 3,000 men, and on the 14th September M. Bourquien and other French officers surrendered as prisoners. The 2-4th and four companies 2-17th N.I. were left in garrison at Delhi ; Lieut.-Colonel D. Ochterlony, an officer soon to become famous in the annals of the Indian Army, being appointed Resident. In October, Lake was reinforced by the arrival of the remainder of his detached troops, including the 8th Light Dragoons ; and on the 4th October he commenced operations against Agra, which capitulated on the 17th ; the casualties numbered 230, confined to the Staff, Artillery, and Native infantry regiments. The treasure captured in Agra amounted to 22 lakhs of rupees. The 2-2nd N.I. was left to garrison the place, and on 27th October Lake marched with the rest of his men against

a large force summoned by Scindia from the Deccan to recover Delhi. On 29th October Lake left all his heavy guns and baggage at Fattehpur Sikri under guard of the 1-2nd and 1-14th N.I. and pushed on by forced marches. He overtook the Mahrattas near Laswaree on 1st November, and attacked them in a heavy dust storm with his cavalry, with indifferent success. When the tired infantry arrived on the field at mid-day, Lake attempted to turn the enemy's right flank, but the Mahrattas changed front with rapidity and ease; and the leading column headed, as usual, by the 76th Foot suffered severely. Led by Lake and Major-General C. Ware they pressed their attack home, and with the aid of the cavalry turned the defeat into a debacle. 7,000 Mahrattas were left dead on the field, and 72 guns were taken. The British casualties numbered 824, 15 British officers and 82 Europeans being killed, and 27 British officers and 282 Europeans being wounded; the 76th Foot contributing no less than 213 to the total. Lake had one or two horses shot under him; while Major-General Ware and Colonel T. P. Vandeleur, commanding the 1st Cavalry Brigade, were killed.

These victories, backed up by those in the Deccan (to which reference will be made later) and minor successes elsewhere, compelled Scindia and Bhoonsla to make peace. But to watch Holkar, Lake detached a column of Native troops under Monson to protect Jeypore, while he himself withdrew to Agra for the coming hot weather.

Monson's operations ended in complete disaster; advancing too far, he was compelled to retreat in the middle of the rains before Holkar's vastly superior forces. The retreat ended in a disordered flight, and the draggled remnants of his force reached Agra on 31st August, 1804, after a constant retreat of 350 miles. This rout compelled Lake to take the field in person once more.

On 1st October Lake marched from Agra, his first objective being Delhi, which was being attacked by Holkar's infantry and artillery. The defence of the city and fortress of Delhi from 7th—15th October by two and a-half battalions of N. Infantry and some 2,000 irregulars (many of whom deserted), was an extraordinary military feat; the more so, as the defenders had no regular artillery. A gallant sortie under Lieut. J. Rose, 2-14th N.I., later Lieut.-General Sir J. Rose, K.C.B., on 9th October, was completely successful, the breaching guns being spiked; and the repulse of an assault on the Lahore Gate on the 14th, combined with news of Lake's advance compelled the enemy to raise the siege. Lake relieved Delhi on the 17th and after strengthening the garrison finally decided to pursue Holkar's immense force of cavalry with his own cavalry, horse artillery and reserve, while Major-General J. H. Fraser with two regiments of native cavalry, the artillery, and three brigades of infantry marched toward Deig against Holkar's infantry and artillery. For nearly three weeks Lake pursued Holkar's cavalry; at last leaving his reserve behind, he marched by night with his six regiments of cavalry

and one troop of horse artillery, and surprising Holkar's camp in the morning (17th November) at Farruckabad, defeated him with fearful slaughter. The pursuit continued for miles, and no less than 3,000 Mahrattas were killed, the British losses being 3 men killed, 25 wounded, and 75 casualties among the horses. This crushing defeat finished off Holkar's cavalry; and meanwhile Fraser had finished off his infantry and artillery; reinforced on 10th November by a detachment of the Bengal European Regiment, he attacked the enemy outside the fortress of Deig on the 13th. The 76th Foot, as usual, led the right and leading column; the troops forming for the attack at 3 a.m. The Mahrattas were defeated at all points, at least 2,000 were killed, 87 guns were taken, and the slaughter only ceased at 3 p.m., when the Fortress of Deig, which belonged to the Rajah of Bhurtpore, received the fugitives and opened fire on the British troops with its guns. The British casualties were 652, to which total the 76th contributed 153. General Fraser was mortally wounded, while leading the 76th Foot in the attack, and the command devolved on Monson.

Monson withdrew the army with the captured guns to Muttra, where Lake joined him; and on the 11th December, after the arrival of a battering train, the army marched to the Siege and Capture of Deig. On the 13th the place was invested, and at midnight, 23rd—24th December, the breach was stormed, the 22nd, 76th and Bengal European Regiment forming the bulk of the assaulting troops. The casualties at the successful assault were 225 (and during the siege about 90). The citadel fell the next day, and leaving the 1-4th N.I. in garrison, Lake marched on 28th December to the Siege of Bhurtpore. Although strengthened by the 75th Foot and troops from Bombay, the four assaults delivered in January and February, 1805, were uniformly unsuccessful, due to an insufficient battering train, and want of care and deliberation in the siege. Lake was however undeterred, and the Rajah of Bhurtpore seeing that it would be merely a matter of time, made overtures of peace, which were accepted. The total casualties before Bhurtpore were over 3,000 men; the 76th Foot lost 16 officers and 188 men, and other European regiments fared as badly.

The corps actually present at the foregoing battles, etc., are given below, as also a list of *some* of the Engineer officers engaged.

MAHRATTA WAR, 1803–5.

(1). *General G. Lake's Campaign, August, 1803—March, 1804.*

The Grand Army was composed as follows:—

Commander-in-Chief's personal escort, one company, 1-11th Bengal N.I.

Cavalry Division:—Colonel W. St. Leger, 27th Light Dragoons.

1st Brigade:—Colonel T. P. Vandeleur, 8th Light Dragoons.

H.M. 8th Light Dragoons.

1st and 3rd Bengal Light Cavalry.

2nd Brigade :—Colonel W. St. Leger, 27th Light Dragoons (commanding the Division).
H.M. 27th Light Dragoons.
2nd and 6th Bengal Light Cavalry.
3rd Brigade :—Colonel R. Macan, Bengal Cavalry.
H.M. 29th Light Dragoons.
4th Bengal Light Cavalry.
Artillery and Park :—Lieut.-Colonel J. Horsford, Bengal Artillery.
1st, 2nd and 3rd Companies, 1st Battn.
1st, 2nd, 3rd and 4th Companies, 2nd Battn.
Engineers and Pioneers :—Capt. T. Wood, Bengal Engineers.
Infantry :—Right Wing :—Major-General C. Ware, H.E.I.C.S.
1st Brigade :—Lieut.-Colonel Hon. W. Monson, 76th Foot.
H.M. 76th Foot.
1-4th, 2-4th, and 4 Companies 2-17th Bengal N.I.
3rd Brigade :—Colonel J. McDonald, 15th B.N.I.
1-15th, 2-15th, and 2-12th Bengal N.I.
Left Wing :—Major-General Hon. F. St. John, H.M.S.
2nd Brigade :—Colonel E. Clarke, 9th Bengal N.I.
2-8th, 2-9th, 1-12th and 6 Companies 2-16th Bengal N.I.
4th Brigade :—Lieut.-Colonel J. Powell, 8th Bengal N.I.
1-2nd, 2-2nd, 1-14th Bengal N.I.

Troops Present at the Storm of Allighur, 4th September, 1803.

2 Brigades of Cavalry, brigaded as under:—
2nd Brigade :—H.M. 27th Light Dragoons, 2nd and 3rd Bengal Light Cavalry.
3rd Brigade :—H.M. 29th Light Dragoons, 1st and 4th Bengal Light Cavalry.
Artillery, Engineers and Pioneers.
1st, 3rd, and 4th Infantry Brigades, as given above.

The 1st Infantry Brigade, with details of artillery, etc., were alone actively engaged, though the 27th Light Dragoons also sustained slight casualties.

Casualties :— 6 British officers and 21 Europeans killed.
11 ,, ,, 71 ,, wounded.
Total casualties, including Natives, 265.

N.B.—The 8th Light Dragoons were on the march up from Cawnpore, the 6th Bengal Light Cavalry were in charge of a convoy marching to join the army, and the 2nd Infantry Brigade was detached near Anupshahr.

Early on 5th September Colonel Macan with the 3rd Cavalry Brigade (29th Light Dragoons, 1st and 4th Bengal Light Cavalry) was ordered to Shekoabad to repel an incursion into the provinces; the 1-4th Bengal N.I. was left in garrison at Allighur, and the army (thus reduced) moved forward.

Troops Present at the Battle of Delhi, 11th September, 1803.

The 2nd Cavalry Brigade :—H.M. 27th Light Dragoons, 2nd and 3rd Bengal Light Cavalry.
Artillery, Engineers and Pioneers.
The 1st Infantry Brigade, less the 1-4th Bengal N.I.
The 3rd and 4th Infantry Brigades.

The 4 Companies 2-17th Bengal N.I. (1st Brigade) formed the camp guard and sustained no casualties.

The 6th Bengal Light Cavalry, with its convoy, got into touch with the rear guard of the army on the evening of the 10th September, and remained on the 11th September in charge of this convoy ; but survivors received the clasp for the " Battle of Delhi " in 1851. Total casualties, 486, of which the European losses were 6 officers and 47 men killed, 10 officers and 127 men wounded, and 8 men missing. 68 guns were captured.

The 2-4th and 4 Companies of 2-17th Bengal N.I. were left in garrison at Delhi.

Between the 2nd and 12th October, the 8th Light Dragoons, Macan's Cavalry Brigade (29th Light Dragoons, 1st and 4th Bengal Light Cavalry) and the 2nd Infantry Brigade (Colonel E. Clarke) joined the army ; and the cavalry being now united was brigaded as shown on page 93 ; Colonel T. P. Vandeleur succeeded St. Leger as senior cavalry officer, when the latter quitted the army on 27th October.

After the capitulation of Agra, 17th October, 1803, the 2-2nd Bengal N.I. was left in garrison there, and on 29th October the 1-2nd and 1-14th Bengal N.I. were left at Fatehpur Sikri with the heavy guns (probably 2nd, 3rd, and 4th Companies, 2nd Battalion Artillery) and baggage.

Troops Present at Laswaree, 1st November, 1803.

The 3 Cavalry Brigades (8 regiments).
Artillery (less the Companies at Fatehpur Sikri), Engineers, Pioneers.
Infantry, H.M. 76th Foot, and the 2nd and 3rd Infantry Brigades.

The casualties were 824, of which the European were 15 officers and 82 men killed, 27 officers and 282 men wounded. 72 guns were captured.

Colonel J. McDonald, 15th Bengal N.I., succeeded Major-General C. Ware, and Colonel R. Macan succeeded Colonel T. P. Vandeleur, both these officers having been killed.

The cavalry brigadiers were:—1st Brigade:—Colonel T. P. Vandeleur (and senior officer). 2nd Brigade:—Lieut.-Colonel J. O. Vandeleur. 3rd Brigade :—Colonel R. Macan.

Lieut.-Colonel J. Gordon, 1st Bengal Light Cavalry, succeeded to the command of the 1st Brigade.

(2). *Lake's Campaign, September, 1804—March, 1805.*

Cavalry Division :—Colonel R. Macan.

1st Brigade :—Lieut.-Colonel J. O. Vandeleur, 8th Light Dragoons.
H.M. 8th Light Dragoons.
2nd, 3rd, 6th Bengal Light Cavalry.

2nd Brigade :—Lieut.-Colonel T. Browne, 2nd Bengal Light Cavalry.
H.M. 27th and 29th Light Dragoons.
1st and 4th Bengal Light Cavalry.

Horse Artillery :—*Experimental Troop. Capt. C. Brown.

Infantry Divisions :—Major-General J. H. Fraser, H.M.S.

1st Brigade :—Lieut.-Colonel Hon. W. Monson, 76th Foot.
H.M. 76th Foot.
1-2nd and 1-4th Bengal N.I.

2nd Brigade :—Lieut.-Colonel G. S. Browne, 4th Bengal N.I.
1-15th, 2-15th, 1-21st Bengal N.I. (6 Companies).

3rd Brigade :—Lieut.-Colonel G. Ball, 8th Bengal N.I.
1-8th, 2-22nd Bengal N.I. (7 Companies).

Reserve :—Lieut.-Colonel P. Don, 15th Bengal N.I.
Flank Companies, H.M. 22nd Foot.
1-12th, 2-12th and 2-21st Bengal N.I.

Artillery :—Lieut.-Colonel J. Horsford.
1st, 2nd, and 3rd Companies, 1st Battalion.
1st, 3rd and 4th Companies, 2nd Battalion.

Engineers, Pioneers :—Capt. J. Robertson, Bengal Engineers.

On 1st October Lake marched from Agra, and on the 16th relieved Delhi.

Defence of Delhi, 7th—15th October, 1804.

Resident :—Lieut.-Colonel D. Ochterlony, 12th Bengal N.I.

O.C. Troops :—Lieut.-Colonel W. Burn, 2-14th N.I.

Garrison :—2-4th, 2-14th and 4 Companies 2-17th Bengal N.I.

Capt. Harriott's Battalion.
Lieut. Birch's Battalion.
Lieut. Scott's Najibs.
Irregular levies.
} Irregular Troops, a number of whom deserted.

The garrison was reinforced by the 1-21st N.I.; and the 2-14th N.I., with two corps of irregular infantry, marched for Saharanpur, but was attacked by Holkar at Shamli.

On 31st October Lake marched from Delhi to Burn's relief and in pursuit of Holkar with all the cavalry (except the 2nd and 3rd Light Cavalry), the Horse Artillery, and the Reserve under Lieut.-Colonel Don, with six guns and two howitzers. After 16 days' continual marching, Lake left the Reserve and heavy guns behind, and marching by night with his six regiments of cavalry and troop of horse artillery, cut Holkar's army to pieces on the early morning of 17th November. His casualties were only 3 men killed and 25 wounded, so sudden was the surprise and complete the defeat of Holkar.

* Afterwards 1st Troop, 1st Brigade, Bengal Horse Artillery.

Meanwhile on 5th November Major-General Fraser marched from Delhi with the 2nd and 3rd Light Cavalry (Lieut.-Colonel T. Browne), the Foot Artillery, 1st, 2nd, and 3rd Infantry Brigades (less the 1-21st N.I. left near Delhi), Engineers, Pioneers and Hearsey's Irregular Cavalry, towards Deig against Holkar's infantry and heavy guns.

On the 10th November he was reinforced by a detachment of the Bengal European Regiment (350 strong) at Goburdan, and early on the 13th November attacked Holkar's army outside the Fortress of Deig.

Troops Present at the Battle of Deig, 13th November, 1804.

Cavalry :—Lieut.-Colonel T. Browne, 2nd L.C.
2nd and 3rd Bengal Light Cavalry.
Artillery :—
Engineers, Pioneers :— } as given above.
Infantry :—1st, 2nd, and 3rd Brigades as given above, less the 1-21st Bengal N.I. and plus the detachment of Bengal European Regiment, added to the 2nd Brigade.
Hearsey's Irregular Cavalry.

Casualties :—652 in all ; of which 6 British officers and 57 Europeans were killed, 16 British officers and 189 Europeans wounded and 12 missing. Fraser was mortally wounded, and died at Muttra on 24th November. 87 guns were captured.

The Fortress of Deig opened fire on the British, and Monson withdrew the army to Muttra, with the captured guns, where Lake joined him with his troops from Farruckabad on 28th November, and on the 11th December, after the arrival of a battering train, the whole army marched to invest Deig.

Troops Present at the Siege and Capture of Deig, 11th—25th December.

The whole army, as enumerated above, less the 1-21st N.I. The casualties during the siege were about 90, of whom two British officers were killed ; at the assault on 23rd—24th December, they were 225, of whom two other British officers were killed.

Assault on Deig, Midnight, December 23rd—24th, 1804.

Right Column :—Capt. S. Kelly, European Regiment.
4 Battalion Companies European Regiment.
5 Companies 1-12th Bengal N.I.
Left Column :—Major J. Radcliffe, 1-12th Bengal N.I.
4 Battalion Companies European Regiment.
5 Companies 1-12th Bengal N.I.
Centre Column :—Lieut.-Colonel K. Macrae, 76th Foot.
Flank Companies H.M. 22nd and 76th Foot, and European Regiment, also 1-8th Bengal N.I.

A proportion of artillery, engineers and pioneers accompanied the assaulting columns.

The citadel capitulated on 25th December ; the 1-4th Bengal N.I. and Hearsey's Irregulars were left in garrison at Deig, and Lake marched on to his unsuccessful siege of Bhurtpore.

Casualties in action of the British Infantry :—

	Killed.		Wounded.	
	Offrs.	Men.	Offrs.	Men.
4th Sept., 1803—21st Feb., 1805. H.M. 76th Foot..	13	177	22	611
23rd Dec., 1804—21st Feb., 1805. H.M. 22nd Foot (Flankers)	—	33	9	145
23rd Dec., 1804—21st Feb., 1805. Bengal European Regiment	—	45	14	206

N.B.—Casualties during the investment of Deig are not included, as they are not known.

Average monthly strengths of rank and file :—

	1. 9. 03 to 31. 3. 04.	1. 9. 04 to 31. 3. 05.
H.M. 8th Lt. Dragoons ..	607 men	540 men.
„ 27th „ „ ..	358 „	321 „
„ 29th „ „ ..	370 „	331 „
„ 22nd Foot	200 (Flank Cos.)	882 „ (whole regt.).
Bengal European Regiment ..	588 „ „	331 „

1ST MAHRATTA WAR.

An Incomplete List of Engineer Officers engaged.

I. LAKE'S OPERATIONS.

Bengal Engineers.

Capt. Thos. Wood, Commanding Engineer, Storm of Allighur, Battle of Delhi, Capture of Agra, Battle of Laswaree, Reduction of Rampoora (1804).

Capt. Jas. Robertson, Battle of Deig, Siege and Capture of Deig, Siege of Bhurtpore (1805).

Lieut. H. W. Carmichael Smyth, Storm of Allighur, Battle of Delhi, Capture of Agra, Battle of Laswaree, Battle of Deig, Siege and Capture of Deig, Siege of Bhurtpore, Capture of Gohna (1806).

Lieut. Rd. Tickell, Battle of Deig, Siege and Capture of Deig, Siege of Bhurtpore (1805).

Ensign J. H. Jones, Siege of Bhurtpore. Killed at the assault of Fort Kamona, November, 1807.

Bombay Engineers.

Lieut. Wm. Cowper, Siege of Bhurtpore (1805). Chief Engineer with Bombay Force under Major-General Rd. Jones.

II. OPERATIONS IN ATTACK, UNDER LIEUT.-COLONEL GEO. HARCOURT.

Capt. J. T. Blunt, Bengal Engineers.

Lieut. W. Ravenshaw, Madras Engineers.

III. OPERATIONS IN BROACH UNDER LIEUT.-COLONEL H. WOODINGTON.

Capt. J. Cliffe (or Clift), Bombay Engineers.

FORTRESS DEFENCE—CONVENTIONS OPPOSED TO THE OFFENSIVE SPIRIT.

By MAJOR J. C. MATHESON, R.E.

IN the April number of the *R.E. Journal*, Major Sewell deals with some conventions of permanent fortification opposed to the offensive spirit, and incidentally takes my Paper (*R.E. Professional Papers*, No. 3, Vol. III., 4th Series, "The Growth of the Offensive in Fortification") upon which to base his criticisms. With permission, I should like to reply to some of his remarks, as I cannot but consider that he has read into the pamphlet what is not there. It is to be regretted that the reply must be so belated, but that is accounted for by the distance of South America from England.

Major Sewell comes to the conclusion that the offensive spirit is only nascent in fortress design and has not yet attained to maturity. This cannot be wondered at. Indeed, when the history of the art is remembered, the progress made in the last 40 years is unprecedented.

Undoubtedly we are in agreement, as who is not, that "the offensive is the soul of defence." But in the case of a fortress it is often intended strategically to cover an offensive movement, while tactically it is obliged to cover a locality (*e.g.* a coast fortress). As Colonel Klein points out in his now well-known book, a *point d'appui* is the fulcrum of a movement and must be fixed. Therefore it seems that a fortress, which is a strategical *point d'appui*, must very often cover a locality in covering an offensive movement.

The fewer the number of men who are required to keep the fulcrum fixed, the more will be available to do the useful work on the lever. Now the object of fortification is to effect this economy. If the *points d'appui* or key-points, call them what you will (a prize should be given for an English word), are to be at an average interval of 8,000 yards (say 4½ miles), as Major Sewell recommends, it would seem that more men would be required to keep the fulcrum fixed, or in other words to defend the fortress, than if the *points d'appui* were closer together. The flanking fire from the *points d'appui* in ordinary accidented ground cannot be very great over this interval, especially in a night attack, and without the support of this flanking fire the mobile force of the garrison would be very much on an equality with the enemy.

Major Sewell would seem to indicate that any works in an interval

partake of the nature of a continuous line. It is not clear whence he obtains this idea. It is certainly not put forward by me. In the nature of things offensive movements on the part of a fortress garrison must be on a small scale and should be aided by the provision of a few trenches and obstacles to cover unseen ground, and to force the enemy into areas where he can be attacked with advantage. The quoted portions of the official manuals would seem to bear this out fully.

An objection is also made to the inclusion of "Fire of all kinds" amongst offensive methods. This seems hypercritical. The actual words of the pamphlet were "every effort must be made to bring into use to their fullest extent rifles, guns, and howitzers." Surely a defender who carries this out may be said to be doing something towards an active defence. The defender of Belfort was very keen on the development of fire.

Considerable criticism is expended upon the general design of a *point d'appui*. And first of all exception is taken to my choice of an example of ground for the siting of this work. But there was no choice if this particular fortress was selected. The site occurred in the line of defence and it had to be occupied. There would have been little advantage in choosing a flat site, it seemed better to select a site typical of English contours and presenting a few difficulties. It was impossible to go beyond the valley, and the latter could not be flanked properly, while it is not possible to cover a large area of ground by indirect fire when no observing stations are available. Therefore the best had to be made of the site.

As regards actual design Major Sewell says that "the solution would appear to lie in a reconsideration of the design of a fort, rather than in siting a fort of obsolete design on the reverse slope." Apparently this has reference to the "fort nucleus" shown in my example of a *point d'appui*. But I gave no design. On p. 45 of my paper I ventured to give the main requisites of a fort, and if these, fairly obvious, requisites are supplied the actual design of the fort need not be much criticized. One would rather have a bad fort on a good site than a good fort on a bad site. Surely the one thing that the history of fortification has pointed out is that niceties of design are of very little, if any, account.

He also objects to the rear crest position because he says it is a second line. This I most emphatically claim that it is not. The definition of a second line would seem to be a line on which the defenders of a front line would retire when they were beaten out of their first position. Here, there is no question of retiring from one line to another. The "fort nucleus" will have its own garrison from the commencement, and it forms the key-point of the group. No one is keener than myself against the idea of successive lines, but it finds many adherents on the Continent. Flogging dead horses is

unprofitable work, but in rooting up weeds from a flower bed it is equally unprofitable to tear up all young shoots unless one is quite sure that they are weeds.

It is somewhat difficult to see very much difference between the organization of Major Sewell's group and that which I put forward. He proposes to have retired bombproof barracks with radial galleries to the front, and my proposal is very similar. The main difference would seem to lie in the position of the deep ditch obstacle. I propose to concentrate it round the fort nucleus, and he would apparently use it only in front of the front line trenches, but this is not very clear.

A great point is made against the "geometric trace" of a fort. By this I gather is meant a fort with straight lines on plan, since the idea of pentagons, etc., is prehistoric. I hold no brief for straight lines, as naturally one would follow the contours of the ground as much as possible. At the same time, considering the low command of a modern fort (especially on the rear crest) and the fact that the enemy's artillery will have ample time to get familiar with the shape of the fort whatever it is, it does not seem that straight or wavy lines will make much difference. The fort nucleus shown on the plate referred to was diagrammatic only.

In permanent fortification there is no reason why "engineered" slopes should be conspicuous. There are at least two forts, not unknown to R.E., possessing glacis which were "engineered" to a very large extent. At the present day those forts have an absolutely clear field of fire for at least 500 yards, and the glacis show no difference to the surrounding fields.

As regards "closed" works or "open" works, a distinction would seem to hold between the group and its *point d'appui* The group should not be a closed work, but its key-point should be.

Finally, Major Sewell runs a tilt with me as regards retrenchments. To make retrenchments when the front line seems to be falling is only human nature. It is the duty of a fortress to hold out as long as it is possible, even a day or two may make a difference in the event, it nearly did at Belfort. And a retrenchment may make this difference, and therefore it would seem to be advisable. There is no necessity why it should be a continuous line, it should not be, but it may afford very valuable assistance to the last reserve of the garrison in its (to-be-hoped-for) counter-attack. The garrison for the retrenchment would probably come from a portion of the last fortress reserve.

It is to be hoped that these remarks will not be considered as running counter to the original premise, that "the offensive is the soul of defence." The whole object of the Paper *The Growth of the Offensive in Fortification* was to try and prove its truth.

MEMOIR.

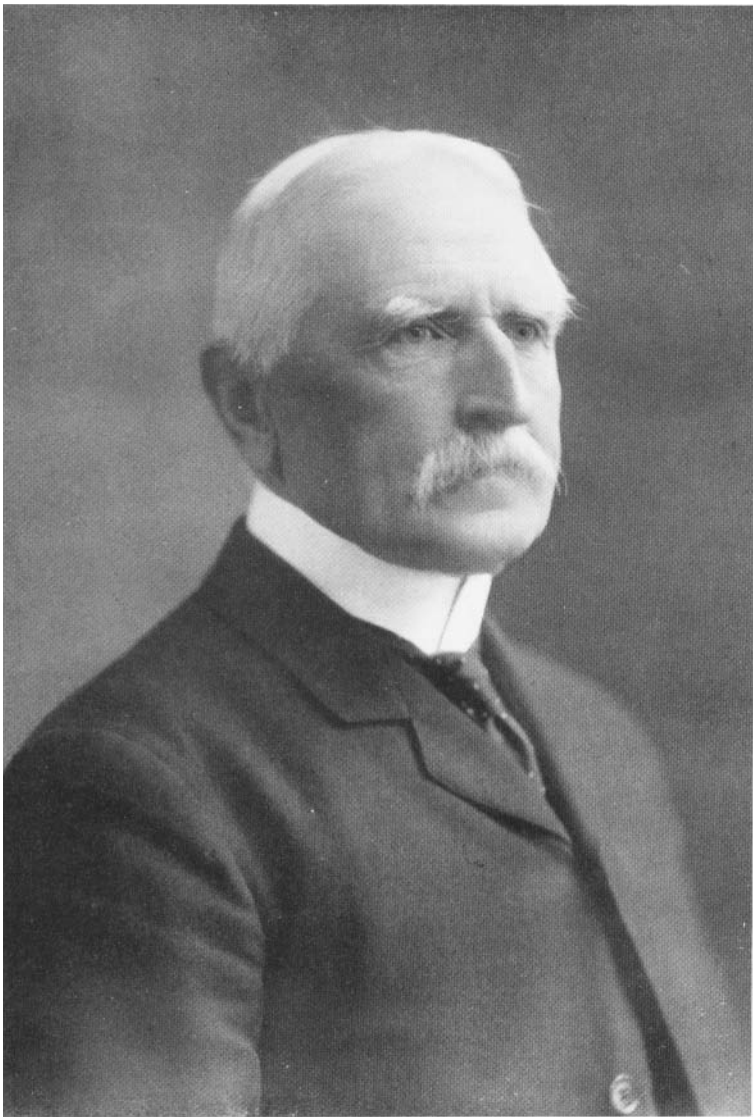
COLONEL RICHARD HENRY JELF, C.M.G.

To the many friends of Richard Jelf, the news that he had passed away after a very brief illness at dawn on Saturday, the 26th of April, came as a great shock and with a feeling of profoundest regret. There will have been but one thought amongst his friends of all ranks in the Corps he loved so well, that a loyal servant of the King and the Corps, a great and good Christian, a very perfect gentleman, and a true friend has gone from amongst us to his rest. Our deepest sympathy is with her with whom every thought and interest of his life were one, and with his sons.

He had been living for some years since his retirement, at their home, Offcote Hurst, Ashbourne, in Derbyshire, the centre of his many activities; and, in need of rest, he had gone for a visit to his old friends, Sir Richard and Lady Harrison, at Ashton Manor, near Exeter. Whilst there, he contracted a chill, and serious symptoms soon appeared. He had taxed his strength to the utmost with never a thought of self, and his powers of resistance were weakened. His condition became gradually worse, and in spite of the most skilful medical aid and devoted nursing, he passed quietly away. His death was one of the most beautiful ever witnessed, meeting it as he did with the reverent and fearless spirit of the true Christian soldier, and almost with his last breath, sending messages of love and comfort to all those dear to him on earth. He was buried at Ashbourne.

Born at Christ Church, Oxford, on the 2nd of February, 1844, he was the son of the Rev. Dr. Jelf, Principal of King's College, London, and Canon of Christ Church, Oxford. His mother, Countess Schlippenbach, was a maid of honour to the Queen of Hanover. Of his two brothers, one, whom many Royal Engineers will remember, was a man of singular saintliness and personal charm, Canon George Jelf of Rochester, afterwards Master of Charterhouse; the other rose to considerable distinction as a Q.C., and retired in 1910, with the honour of knighthood, from the post of Judge in the King's Bench Division, a position he had held since 1901.

Richard Jelf was educated at Eton, and at King's College, London, of which he was a Fellow. He passed into the Royal Military Academy in 1863, and was commissioned as Lieutenant in the



Colonel Richard Henry Jelf CMG

Royal Engineers on the 22nd of June, 1865. He was then 21 years of age and those who knew him in those days, speak of him in terms which describe him all through his life. He was not only a very good officer, thorough in all his work and an ardent Sapper, but he had a charming personality, full of the *joie de vivre*, making hosts of friends, and filling his world with sunshine and laughter. Whatever he did, he did well.

He was a keen sportsman, and a first-rate oar. He stroked the four in the race between Seniors and Juniors at Chatham in 1866, and rowed many a hard course with Lieut. (now Colonel) C. F. C. Beresford, in a pair.

He and his inseparable friend, Lieut. M. Brackenbury (now Colonel), were the life and soul of the R.E. Dramatic Club. Of him, his friend writes: "No man ever had a truer friend. His cheeriness and sense of humour made him a delightful companion, but it was those who knew him well who were aware how kind-hearted and considerate he was."

One of his greatest friends of the Woolwich and Chatham days was J. J. Curling, one of those heroes of the Corps, whose unobtrusive devotion to duty is perhaps too little known by his brother officers. While yet a subaltern, Curling, filled with pity for, and keenness to help, the poor fisher people on the storm-bound coast of Newfoundland, laid down his Commission, took Holy Orders, and gave himself, his means, and his yacht, the *Laverock* (still flying the burgee and blue ensign of the Corps Yacht Club), to a service of devotion to those poor people, whose lives are filled with so much privation and sorrow. The friendship between Curling and Jelf was lifelong, and they had much in common in thought and ideal.

After finishing his course at the S.M.E., Jelf was ordered to Dover in November, 1867, and served there till posted to C Troop at Aldershot, at the end of April, 1869. In 1869, he married Margaret, the eldest daughter of the Rev. J. J. Blunt, Lady Margaret Professor of Divinity at Cambridge. There were six sons by the marriage, the eldest of whom, after doing fine service under most trying conditions with the Telegraph Battalion, through all the troublous time on the Tugela in South Africa, died on his way home. Two others were all through the war with the K.R. Rifles, and the Artillery. The latter is now with the Riding Troop of the Royal Horse Artillery at Woolwich. Yet another served with credit in the Royal Navy, while another has, in the Indian Civil Service, held responsible offices under the Government of India. The youngest is now serving under the Egyptian Government.

Those of his friends who had the privilege of serving with Jelf at Aldershot, will always think of him as specially identified with the old Troops, and in the happy days of close friendships in the huts

of the South Camp. A great friend, Lieut. (now Colonel) A. H. Bagnold, writes of the charm of his personality and friendship, and adds: "I think the principal characteristic of Jelf's life was, that he was a great enemy of any kind of strife. Wherever he was, it was no fault of his if there was not peace and sociability. He always strived for them, and worked hard and generally successfully to that end, and my impression is that wherever Jelf was quartered, there was peace, amiability and a good tone all round, due not only to his efforts, but also to his excellent example and natural influence." His friends were many both in the Corps, and outside it. It was at Aldershot that the friendship with Juliana Horatia Ewing grew close, a friendship which certainly coloured her books, one of which was dedicated "to the queer ones at Aldershot," the children of her devoted friends, the Jelfs.

In the end of April, 1873, he was gazetted Adjutant of the R.E. Train, an appointment which later on merged into the Adjutancy of the R.E. Troops and Companies.

A great friend of those days, Lieut. (now Colonel) C. F. C. Beresford, writes: "At that time Jelf and Mrs. Jelf were the centre of all social doings, and also of all the charitable and church work of the Royal Engineers at Aldershot. He was a delightful companion, full of intelligence and humour, and his great tact smoothed over many a difficulty. I often thought he would have made an admirable diplomatist."

Of his intensely happy home life of those days, it is not for us to speak, but it may be said that the glow and the interest of that charming home spread its influence far and wide.

In July, 1878, war with Russia was imminent, and a force was despatched to the Mediterranean. Jelf, who had been promoted Captain on the 17th April, was posted to the 31st (Field) Company, which was commanded by that good soldier, Major James Heriot Maitland (afterwards Major-General Sir J. H. Maitland, K.C.B.). The company, as a unit of the expeditionary force, was sent to Cyprus. Its interesting and useful sojourn there however entailed no active service, and the danger of war passed away. Jelf was struck down by a malignant fever, through which his brother officers nursed him successfully. He was sent on sick leave to England, and on the return of the company in March, 1879, he rejoined it at Shorncliffe, where he remained till May, 1880.

Being now due for foreign service, he was posted to Halifax, Nova Scotia, for two years, and then transferred to Gibraltar for a year. On the 24th of August, 1883, he was given command of his old troop (C Telegraph Troop) at Aldershot. Of this return to Aldershot, it is pleasant to think of the happiness to him and his. He threw himself heart and soul into the business of the Telegraphs, and into the raising of the Telegraph Battalion from the old C Troop, and the

Telegraph Companies. Things were already moving in the direction of vastly improved organization, but still Generals of Division and Brigade had not learnt the vital importance of communications. Jelf did his utmost by word and action to push the cause of the Telegraphs forward. Colonel Beresford writing of the time when, later on, he took over the command from him of the 1st Division of the Telegraph Battalion, says: "I found it in thorough good working order, all ready for the development of our work in the field. In his farewell speech at a lecture in the Prince Consort's Library, Jelf complained bitterly of the neglect of the use of the Telegraphs in the Field by the Generals, and Sir Evelyn Wood, who was present, said that it would not be his fault if more work were not got out of them in the future. It was owing to the efficient state in which I found the 1st T.B., that I was able not only to work up to Jelf's demands, but greatly in excess of them."

Though he never saw actual fighting with the 1st T.B., Jelf had the great happiness of proceeding with it to South Africa, he himself on special duty as Director of Telegraphs, under Sir Charles Warren, with the Bechuanaland Field Force in November, 1884. The history of this thoroughly workmanlike expedition is well known, and how the Boers thought it better to leave the force severely alone, and to make terms. The year in South Africa was however full of incident and of strenuous work, and where all did well, none did better than the Director of Telegraphs and the excellent officers and organization he had under him. His subalterns of those days were devoted to their C.O., and never was there a happier lot of comrades than the bearded, corduroy'd officers and men of the T.B. on their return to Aldershot. It may be said here that of his subalterns of those days, three have already reached the Substantive Colonel's rank, one is a Brigadier-General. They have amongst them a C.B., a C.M.G., and three D.S.O.'s. Yet another is a Fellow of the Royal Society. His subalterns all speak of Jelf's wonderful power of getting the best work out of his officers in the best possible spirit. A better trainer of young officers never was there in the Corps. He had been promoted regimentally to Major's rank on the 22nd of June, 1885. For his excellent services with the Bechuanaland Field Force, he received an honourable mention, and was gazetted to a Brevet Lieutenant-Colonelcy on the 9th December, 1885.

He held the command of the 1st T.B. till October, 1889, when he was posted in relief to Portsmouth. There he remained till September, 1892, having been promoted Regimental Lieutenant-Colonel on the 27th July, 1892. He was now made C.R.E. at Gibraltar, and a period of fresh activity commenced. Amongst other interests, he put in strenuous work as Chairman of the Sanitary Commission from 1893 till 1897, leaving a mark in immensely improved sanitary conditions, which long survived his time. In

acknowledgment of this good work at Gibraltar, he was gazetted a C.M.G. on the 22nd of June, 1897.

On the 27th of July, 1897, he was placed on half-pay, but only for a short time, for on the 3rd of September in the same year, he was gazetted Substantive Colonel, and appointed Colonel on the Staff, C.R.E. of the Eastern District. This appointment, his last on the Active List, he held till the 28th of February, 1901, being placed on the Retired List on the 1st of March.

He had only a brief rest in his home in Derbyshire, for in September of that year, he was recalled to serve as Governor and Commandant of the Royal Military Academy, with the temporary rank of Major-General. He held this office for three years, during which he was regarded on all sides as an excellent Governor. An old friend writes: "While he was Commandant at the shop, I paid him a visit, and could see how much he had done for the welfare of the cadets." Others of his friends had the good fortune to have sons at the Academy while he was there, and got to know the excellence of his discipline, coupled as ever with a courtly dignity and a warm-hearted kindness which endeared him and Mrs. Jelf to all the cadets.

It was a matter of regret to his friends that the rules of the Service did not permit of Jelf's receiving the honorary rank of major-general on relinquishing the appointment. It was a privilege he would have much valued.

On his final retirement, he at once took a lively interest in the Territorial movement, and on the resignation of the Duke of Devonshire, he succeeded to the Chairmanship of his County Association, a position he held till his death. His zeal, energy and enthusiasm kept up an excellent spirit in Derbyshire, and his services were invaluable. In every direction his assistance was freely given without stint. He was Honorary Colonel of the 4th North Howitzer Brigade of R.F.A., a magistrate, and Deputy-Lieutenant of the county.

In Ashbourne his influence was most especially felt. The local paper, from which much information has been derived, says of him that "The news of his death cast quite a gloom in the Ashbourne District, where Colonel Jelf was so highly esteemed, and universally respected. His life was so actively bound up with local institutions that it is well-nigh impossible to mention any which will not feel his loss. He was Vicar's Churchwarden, and in that capacity he applied most of his remarkable energies in supervising the restoration of the tower and spire of the Parish Church. He had a veneration for his Church, which one might well envy, and he did not mind how much he did on its behalf."

He was a Governor of the Ashbourne Queen Elizabeth's Grammar School, for which he had a strong affection, he was Chairman of the National Reserves, and Vice-Chairman of the Veterans' Association.

He was active in politics all through his life, and was at the time of which we are speaking Chairman of the Ashbourne and District Unionist League. He was interested in numerous other local institutions. His name has been perpetuated in the local troop of Boy Scouts of which he was a strong supporter. A staunch upholder of the Church and Establishment, he was, however, wide in his sympathies, and his courtesy and kindness were given equally to all. He was in all his thoughts and interests so perfectly sane and purposeful, that he was a delightful and convincing speaker. He lived his life to the full, and he has left to the many who loved him the example of one who loyally tried to do his duty.

The funeral took place on Wednesday, the 30th April, at Ashbourne, with full military honours, the Territorial Field Artillery and the 5th Battalion Sherwood Foresters being present, whilst the pall-bearers were officers of "M" Battery, Royal Horse Artillery. Besides the family and personal friends, an immense concourse of people attended. The procession was over half a mile in length, and was most impressive.

The service in the church was fully choral, and was conducted by the Bishop of Southwell, assisted by five other clergy. In his address, the Bishop said "the life of Colonel Jelf has been a glorious life, the life of a good soldier of Jesus Christ. He had a noble sense of duty. He was zealous in his love for his country, and for the Army, love for his Church, love for his parish, love for the very building. He died with a great love for these things, which he had loved all through his life. To-day they had to thank God for His goodness, in teaching them the beautiful lesson of the resurrection, and for the noble example of the beautiful life of their brother, who had just gone to his rest."

A wonderful mass of floral tributes showed by the names of the senders and by the beauty of the inscriptions, how widely he had been loved and valued all through his life, and what a depth of affection and of respect he had inspired.

(2). The Organization of the Russian Aviation Detachment and its Despatch to the Theatre of War.

At the beginning of the campaign a few Russian airmen, M.M. Efimov, Agafonov, and Lerche, had gone to the war as volunteers, and there the first-named carried out a number of flights over the fortress of Adrianople, where his machine was several times under fire, and through the insufficient height of his flights was pierced in several places. Aviator Agafonov made some trials with aeroplanes captured by the Bulgarians on the retirement of the Turkish Army, and on these aeroplanes he flew in the presence of ministers.

Aviator Lerche took with him two machines, one of which was lost on the way and the other was so damaged that it was impossible to use it. M. Efimov was therefore the only airman who carried out flights under war conditions. In these flights he threw down proclamations in the Turkish language, but his flights were rather demonstrations than actual reconnaissances, for the Bulgarians fully recognized that only an aviator, or more accurately an observer fully trained in tactics, can make full use of his opportunities.

The result of these attempts and experiments was that the Bulgarians came to a definite, though somewhat belated, decision to set about the training of *personnel* for an air fleet, and they proposed to M. Shchetinin that he should organize an aviation detachment as quickly as possible with a definite establishment of machines and pilot instructors, and should proceed with it to the seat of war, and there teach the required number of Bulgarian officers to carry out flights in the newly imported and existing aeroplanes.

It was required of him in addition that he should take absolutely everything necessary for all practical operations of the detachment, because in the region occupied by the Bulgarian Army it was impossible to obtain any aviation machinery or fittings.

The detachment formed by M. Shchetinin had the following establishment :—

Aviators :—Kostin (who came down in Adrianople and was made a prisoner by the Turks, an incident which called for a lengthy exchange of opinions between the representatives of the diplomatic world), Kolchin, Esiukov and Sielov. Besides these four aviators there were two mechanists and several unskilled labourers. Machines :—Four biplanes of Farman type N VII. (Gnome 50-H.P. engine), and for these there were taken in addition two motors, ten screws, and other spare parts.

For repairing the machines complete sets of all necessary tools were included, and for camp use waterproof hangar tents of the system designed by Lieut. Ulianin. The organization of the detachment was completed in five days and it was forthwith conveyed in a special train and by steamer on the Danube to its destination.

(3). Camp Experiences of the Detachment.

The camp of the detachment was pitched near Mustapha Pasha. The aeroplanes were housed in the hangar tents, while the men spent

the night in the aeroplane cases, in spite of the weather being exceedingly cold.

The lecturer gave interesting details of the mobility of the hangar camp. At the time of one of the floods on the Maritza, when the river overflowed its banks and threatened to wash away the aviation camp, the tents were struck and the machines were moved to a distance of about 250 yards, and everything was re-erected, by night, in less than one hour. This campaign also showed that it is possible on emergency for an aviation detachment to bivouac in the open, and that the machines may be left without tents, it being necessary to cover only the motors and screws with tarpaulins. In this case it is also necessary to secure the aeroplanes from the action of the wind by means of pickets and ropes.

The lecturer emphasized the necessity of providing the men of aviation detachments with specially warm clothing, preferably of leather, as that only gives protection against damp. To protect them from cold is not difficult by means of furs and wool, but damp will penetrate all other clothing, and continuous leather costumes should be provided for both aviators and mechanists.

With a view to equipping a detachment with means of communication the lecturer considered it necessary that it should have motor cycles, as well as motor cars of a light design, to enable the mechanists to follow an aviator who has descended, and in case of damage to bring him the necessary tools, and possibly benzine.

A special medical panier is also in his opinion a necessary addition to the costume, or rather to the equipment, of aviator and observer, and should be carried on a strap like a knapsack.

(4). THE VALUE OF AEROPLANES AT LULE BURGAS, CHATALJA AND ADRIANOPLE.

Unfortunately the lecturer limited his remarks on the military use of aeroplanes to a few rapid sketches, applied to the various theatres of war, showing how aerial reconnaissance might have been effected. The writer considering that this part of the lecture was extremely important allowed himself to amplify it to some extent. It is impossible to pass in silence the operations of the III.Bulgarian Army (General Radko Dmitriev) at Lule Burgas, where the value of aeroplanes might have been of especially marked importance. On the 29th October, 1912, the Turkish Army (XVI., I. and II. Corps) was entrenched on the line Bunar Hissar-Lule Burgas. (More accurately, the XVI. Corps was at Bunar Hissar, on the left of it was the I. Corps, and further to the left, at Lule Burgas, the II. Corps. In rear of their left flank, near Chorla, was one Nizam division in reserve, and in rear of the right flank three divisions of the X. Corps, and, in rear again, the III. Corps). The length of front occupied was from 20 to 27 miles.

The problem of fixing the direction of the Bulgarian attacks depended entirely on the posting of the Turkish Army, but the III.Bulgarian Army when advancing to the attack could not, it appears, determine the Turkish flanks with sufficient accuracy. General Dmitriev at the

commencement of the advance on 29th October supposed that the Turkish line extended only from Bunar Hissar to Karagach, whereas this last-named place was about the centre of the actual front Bunar-Lule Burgas, occupied by the Turks.

Thus in consequence of imperfect information as to the extent of the hostile position, and of inaccurate knowledge of its flanks, the Bulgarian Army had to waste the whole day in a reconnaissance in force, which entailed considerable loss. A probable task, which will in future be given to a modern air fleet, will be to define the flanks of positions occupied by the enemy, and to find out where his strong reserves are posted. In the present case the task could easily have been performed if there had been aeroplanes, but unfortunately there were not, and unnecessary loss of life was entailed by not making use of this modern means of reconnaissance.

Almost exactly the same thing occurred at Chatalja on the 17th—18th November, to which place the scene of action had then shifted, and the fighting, which ended unfavourably to the Bulgarians, again bore the character of reconnaissances in force. It resulted in the loss of two regimental commanders, in some parts of nearly all the officers and of a heavy percentage of rank and file. These reconnaissances in force would have been greatly facilitated by a judicious use of aeroplanes, especially as the Turks had no modern equipment for opposing them.

Turning to the use which was made of aeroplanes with the besieging army before Adrianople, one is obliged to admit that although it differed greatly from these other cases in quantity, yet in quality it fell far short of what might be called fully up-to-date aerial reconnaissance. The flights made by the civilian aviators over the fortress, resulting in the distribution of proclamations, could not be reckoned as active operations against the enemy, and yet in this case the Bulgarians could not act otherwise. Since the aviators were untrained in tactics, they were used in the only way which was possible.

It was unfortunate for the Bulgarians that they were not equipped with technically improved types of bombs, designed for dropping from aeroplanes, as this means of damaging the enemy should by no means be neglected, especially in the struggle for a fortress. The time is fully ripe for the organization of an instructional branch for teaching bomb-throwing from aeroplanes flying at a safe height (about 1,500 metres), and also for deciding upon suitable machines for discharging bombs. But this reproach directed by the lecturer against the Aviation Department, that they had not approached the question of bomb-throwing with sufficient energy, was rather ill-timed, as on the very day of the lecture there had been published the report of a committee which had considered the inventing and testing of machines for bomb-throwing from aeroplanes. In the operations before Adrianople, General Ivanov (commanding II.Army) recognizing the possibility of bombarding the central section (the town), made use of his aerial fleet as far as the fully appreciated defects of his bombs permitted.

The value of aeroplanes to a besieging army under present conditions requires no further explanation, but the Siege of Adrianople showed one interesting example of how great would have been the value of aero-

planes to the defence. At a distance of about 15 miles from the city, near Mustapha Pasha, the Turks had left undemolished the only bridge in that neighbourhood over the Maritza. This bridge served as the only means of communication for bringing up the supplies of the II. Bulgarian Army. If the defenders of Adrianople had had aeroplanes they might not, possibly, have been able to demolish this bridge, but in any case they could have impeded its use and thereby have seriously harassed the Bulgarians, the more so as the Maritza so quickly and so frequently overflows its banks that the maintenance of pontoon bridges would have been extremely difficult.

Without mentioning the use which an air fleet might have served as a means of communication between the Turkish Armies at Chatalja and in Adrianople, this one application of it, that of cutting the communications of the besieging army, is so important that it may be taken as a rule that every modern fortress must be generously equipped with aeroplanes.

(5). ACTUAL EMPLOYMENT OF M. SHCHETININ'S AVIATION DETACHMENT.

At Adrianople one of the airmen of the detachment completed not less than 20 flights, but one of these flights, that of the Aviator Kostin, ended extremely unhappily, as not having oriented his position with sufficient accuracy at a considerable elevation, he descended in hostile territory. The chief object of the majority of these flights was the teaching of officers of the Bulgarian Army, who made flights with the Russians as instructors, the passengers learning piloting, observing, and bomb-throwing. The bombs were of very primitive design, the weight of each approximating to 10 kilograms. They were hung from the feet of the pilot, and were thrown "by eye," by a sharp jerk on the rope by which they were suspended, which released a slip knot.

On one occasion the aviators were directed to establish communication between the II. Army before Adrianople and the III. Army before Chatalja. The task was accomplished in two hours, and the lecturer was of opinion that by using the existing roads it would have taken about a week.

The flight was carried out in company with airmen of the Bulgarian Army, the aviators being Lieut. Petrov on a Blériot and the Russians Esiukov and Kolchin on Farmans. Of these M. Esiukov accomplished the distance of about 94 miles without a descent. The danger of such descents was very evident in view of the presence of bands of marauders in the intervening district.

After completing their flight the aeroplanes remained in the open, only the motors and screws being covered with tarpaulins. The absence of the mechanists impeded their further use, and these only arrived after a long delay.

The services of the airmen before Chatalja were limited to two or three trial flights, which had no practical results.

The armistice put a stop to a scheme, which was on the eve of being carried out, of making a demonstration flight over Constantinople, with bomb-throwing. The aerial bombardment of the hostile capital was therefore not effected.

In conclusion the lecturer discussed the organization of a reserve of *personnel* for the air fleet, by making a timely and accurate registration of all non-military aviators, and directing that they should fulfil their military obligations in case of necessity in Aviation Sections. Individuals who on the declaration of war could do useful work in military aviation the lecturer would include in the special category of an aviation reserve or "Air Militia," as worthy successors of the Militia of 1812.

After he had completed the handing over of his detachment to the Bulgarians, and the training of several airmen in compliance with his agreement, M. Shchetinin journeyed from the seat of war to St. Petersburg where he shared with the public his interesting impressions and deductions.

F. E. G. SKEY.

TRANSCRIPT.

WAR SERVICE OF MILITARY AEROPLANES WITH THE BULGARIAN ARMY.

By S.A.B., in the April, 1913, number of *Injenerni Jurnal.*

THE following is a brief summary of a lecture delivered by Mons. S. S. Shchetinin, part-proprietor of the first Russian Aeronaut Company, who organized in Russia a special aviation detachment, and proceeded with it to join the Bulgarian Army in the Balkan Theatre of War. The two months spent there by the lecturer enabled him to form an estimate of its value. M. Shchetinin was requested by the members of one of the military societies in St. Petersburg to give a lecture on his experiences both in organizing and also in actual working of the aviation detachment, and this he did at a recent meeting of the society.

(1). THE AVIATION ESTABLISHMENT OF THE BULGARIAN ARMY AT THE OUTBREAK OF WAR.

When war was declared, the Bulgarian Army had one Blériot aeroplane and two airmen, Lieuts. Petrov and Terakchiev, who had been trained in Russia. In October, rapidly appreciating the importance of having an air fleet of their own, they purchased in Germany four Albatross biplanes, in France two biplanes (Voisin and Summers) and three Blériot monoplanes, and in England one Bristol biplane. In addition to this, the two young airmen were despatched to Russia with orders to purchase aeroplanes, and this they did, indiscriminately buying the first machines they found, without system and without consulting the cadre of trained airmen and instructors there existing. They procured a fairly large number of machines of various types, and a very limited number of airmen, including some officers who were only beginning to learn. The results soon proved very unfavourable for the Bulgarians. Three of the Albatross biplanes were wrecked at the very start of their practice in the aerodrome. Soon after, the Bristol was destroyed, and everything came to an end in a ghastly accident to Lieut. Toprakchiev, who was burnt to death in a fallen Blériot.

It seems that for a time this series of accidents so seriously affected the Bulgarians that they thought of giving up all idea of using an air fleet in the coming campaign, but they quickly recovered from the shock, and set to work upon the regeneration of their young aviation service, and in this regeneration Russia played an important part.

NOTICES OF MAGAZINES.

REVUE D'ARTILLERIE.

March, 1913.

PROGRAMME FOR ARTILLERY PRACTICE CAMPS.

A short article making suggestions for the best use of the limited time and ammunition generally available. It is not easy to evolve tactical schemes suitable to the narrow limits usually available for a range, these had better be left to war games and manœuvres. Coming into action and the disposition of the target on the ground should however be made as realistic as possible. For similar reasons groups and regiments cannot well be exercised together, and after all this training is more a question of organization of communications than anything else, and can be practised elsewhere without real fire. On ranges the battery will generally exercise by itself. All series of shots must be applications of the regulations, and limited to actual necessities, *i.e.* as soon as the correct range and fuze is determined fire should cease, and another exercise be commenced. Battery commanders should be given as free a hand as possible, but their chiefs also require practice, and should not leave all their control to the day of their inspection. Subalterns, and even N.C.O.'s, should be allowed to control the firing of a few rounds to accustom them to act in the next higher ranks in case of necessity.

THE INTRODUCTION OF A NEW FIELD ARTILLERY MATERIAL.

Lieut.-Colonel E. Lautereau du Part discusses the essentials to be borne in mind if modifications in the existing field artillery material were decided upon. He gives as the very first consideration the limits of weight imposed by the necessity for mobility across country, handiness when in action, and supply of ammunition. As the basis of his argument he takes the minimum weight practically realizable for the gun carriage and empty wagon. From this he argues out as first point, the maximum allowable weight for the projectile, and calculates to what extent alterations in the weight of the projectile affect mobility. This leads to a discussion of the diameters and lengths of the different projectiles practically worthy of consideration. The third point is the question of the stability of the gun carriage, the fourth the evaluation of the most suitable muzzle velocity. This leads to the consideration of the efficiency of the various projectiles in square metres of efficiently beaten area. The admissible solutions of the problem are then considered in terms

of the power and efficiency of the piece. The directing principle in the choice of the best solution is stated to be that an increase in mobility, beyond what has in actual practice been found necessary, ought not to be obtained by a sensible sacrifice of power.

Contribution to the History of the Artillery.

The Responsibilities of the French Artillery in 1870 (*continued*).—The artillery has been accused of having no tactics in 1870, or of not putting them into practice if they had them, and of playing for their own hand, and not supporting their partners of the other arms in the struggle. The writer combats this accusation, and quotes numbers of cases where they sacrificed themselves in attempts to extricate others. Another accusation is that they frequently left the battlefield prematurely, but the Prussian artillery in 1866 behaved in the same way and they were not so severely criticized. The writer quotes the praises bestowed on the artillery by many generals and by M. Gambetta the Minister for War, and argues that the accusation is mainly an unjust one.

The New Japanese Mountain Gun.

Recent wars have shown the necessity for a gun that can accompany infantry over all country, cooperate with it closely during the attack, and assure the possession of captured localities. This gun is an attempt to meet that want. It has a screw breech mechanism, hydraulic buffer, and spring recuperator. The calibre is 75 m.m. The buffer and recuperator are enclosed in a cradle on which recoils a slide carrying the gun. The latter is in two parts, the barrel which is fixed by clamps to the slide, and the rear portion consisting of the breech and the slide. The cradle is fixed to the axle. Six horses are required for the transport of each gun and its ammunition, their loads being about 100 k.g. (220 lbs.). The article is illustrated by three photographs and a diagram.

Various Information.

Mention is made of the probable use of shells charged with thermite against ships of war. Thermite is a mixture of powdered aluminium and oxide of iron, and burns at such a temperature that iron or steel in contact with it is melted. A short description is given of the light steel bridge material carried by batteries of artillery in Austria-Hungary, enabling gaps up to 7·2 metres to be crossed in a few minutes.

April, 1913.

Universal Projectiles.

Common shell and shrapnel have each their separate functions, but sufficient of each can only be carried either by increasing the number of ammunition wagons, by using two guns, one with flat trajectory for shrapnel, and one with variable charges firing common shell, or by employing a shell half common, half shrapnel. The ideal shell should combine the best effects of each description of shell of the same weight. A quadruple action fuze is also required allowing of firing shrapnel with time fuze, or common shell with time, percussion, or the latter fuze with a delay action.

Various shell invented up to date are described under the following headings:—

I. Projectiles with only one charge.

II. Projectiles with separate charges for the common and for the shrapnel portion.

(1) Charges in the base.
(2) ,, ,, centre.
(3) ,, ,, head.
(4) ,, divided.

Only I. and II. (1) and (2) are included in this number; the article is to be continued.

CONTRIBUTION TO THE HISTORY OF THE ARTILLERY.

The Responsibilities of the French Artillery in 1870.—The spirit of the offensive was inculcated, the defensive was hardly mentioned in regulations. The use of earthworks was decried, this led to rashness. The advantages to be gained by long range fire, possible with the rifled gun, was not recognized, the difficulties of observation being exaggerated. Too many guns were kept in reserve, and then were so badly employed by the higher commanders that they were either frittered away in small fractions, or were never brought into action at all. The Germans learned their lesson in the war in Bohemia, and were one campaign ahead of the French in experience. The writer considers that the blame for the failure of the French artillery in 1870 was on the whole not so much due to want of knowledge and training in the artillery itself, as to the incapabilities of the higher army authorities.

THE MULLER APPARATUS FOR LIMITING THE ANGLE OF FIRE OF RIFLES.

A full description of this apparatus is published, with various modifications introduced later, and is illustrated by two plates containing 17 figures.

VARIOUS INFORMATION.

Some data are supplied of the Italian 149-m.m. howitzer, and of the Norwegian 75-c.m. quick-firing mountain gun.

A.R.R.

REVUE MILITAIRE SUISSE.

April, 1913.

TACTICAL EXERCISES OF THE 9TH MOUNTAIN BRIGADE IN 1912.

The work for each day is described, but is difficult to follow without the necessary maps. It was the first year during which the new Alpine units were trained in the locality for which they are destined. Certain remarks are called for, and are given under the heads of mobilization, marches, bivouacs, signal services, distant and close reconnaissances, security, combat, food, and supply duties. The remarks all have reference to the special tasks to be undertaken by mountain troops.

Concerning the Bill for the Reorganization of the Cavalry in France.

The Act of 1905 by which two years' service was introduced into the French Army was a specially severe blow to the cavalry, and this Bill, which was passed by the Chamber in two sittings, aims at the best possible organization and utilization of the meagre resources available.

Of the 89 cavalry regiments, 53, of which some are in Africa, are now distributed by brigades between the *corps d'armée*, and the remaining 36 are concentrated in eight groups as independent divisions. At the present day, however, the *corps d'armée* has practically ceased to exist as a separate unit; owing to the large forces congregated in a modern battlefield, the corps has become submerged in the army of several corps. It is the commander of the army who requires large bodies of cavalry under his orders, and this fact is evidenced in that during manœuvres all the corps cavalry are combined into so-called "provisional" divisions. These divisions have no staffs, no artillery nor machine guns, and no signallers. The object of the Bill is to give the required organization.

All cavalry opinion supports the contention of General Lacroix in the *Revue de Cavalerie*, that the division of six regiments (three brigades) is the most useful formation. He would make 10 divisions, giving to each a group of horse artillery, machine guns, a group of cyclists (three sections of 100 men), sapper cyclists, etc. There must be three types of divisions corresponding to the types of regiments in the service, the heavy division composed of two regiments cuirassiers and four regiments dragoons, the mixed division of two regiments cuirassiers, two regiments dragoons and two regiments light cavalry, and the light division of four regiments dragoons and two of light cavalry.

Omitting the cavalry in Africa, there remain 19 regiments of light cavalry which will be distributed to the Metropolitan *corps d'armée*, the two extra regiments required being brought home from Africa and replaced by Spahis. Each regiment of four squadrons will mobilize as six squadrons so as to leave, after deducting the divisional cavalry, a small force in the hands of the corps commander.

This organization of the corps cavalry is much criticized in the fear that the regiments will be so isolated as to deteriorate. To prevent this the appointment of an inspector-general of cavalry is suggested. Cavalry officers would like the latter to inspect the cavalry divisions also, as the army commanders would be strong and independent men, who might have their own ideas as to the training of cavalry, and there would be no uniformity in the cavalry of the various armies. A single authority would correct this.

Since the above was written three years' service has been reintroduced, and the Cavalry Bill has been passed by the Senate also. An inspector-general has been created to inspect all units of cavalry except in Africa.

The Question of N.C.O.'s in the Infantry.

In the February number Capt. Schmidt published an excellent article on this subject. His conclusion was that the N.C.O.'s lacked authority and initiation because

(1). They are carelessly selected—each unit having to send a fixed number to the N.C.O.'s classes, irrespective of the number they considered properly qualified.

(2). The course at the N.C.O.'s School did not fulfil requirements.

(3). Many officers do not take the trouble to train their N.C.O.'s, nor to treat them properly. The officers do the work themselves as they cannot trust the N.C.O.'s, and N.C.O.'s are placed in the ranks and are frequently reprimanded before the whole company.

The present writer would add as another reason—viz. because they are N.C.O.'s of Militia.

To improve matters he suggests

(1). To allow more latitudes, and therefore greater care in the selection of N.C.O.'s.

(2). To modify the musketry course at the school, as suggested by Capt. Schmidt.

(3). A better utilization by the company officers of their N.C.O.'s during periods of training—they should be taken out of the ranks, given a short course of instruction early in the day, and then be given squads to drill and instruct, mistakes being corrected afterwards.

(4). To allow voluntary service of N.C.O.'s with recruit classes, where they would learn habits of smartness and authority that could not fail to be of use to their companies when they next train with them.

(5). To encourage zeal outside the Service, by encouraging N.C.O.'s Clubs, preparatory military courses, etc.

May, 1913.

THE BALKAN-TURCO WAR.

The mobilization in Bulgaria and in Turkey, and the operations in Thrace up to the Battle of Kirk Killisseh. The information given in this article is already so condensed that further abbreviation is hardly possible short of a complete translation.

THE MANŒUVRES AT PONT-DE-L'ARCHE.

Of historical interest, describing how, at the end of the 15th century, the Swiss were instructors in the art of war to practically the whole of Europe.

THE HOTCHKISS MACHINE GUN FOR AEROPLANES.

Gives a short description of this weapon and its mounting, accompanied by two excellent photographs.

THE MILLIÈME OF THE ARTILLERY.

Every artilleryman, except the English, now knows the millième, but few know that it was the invention of Capt. Ch. Dapples of the Swiss Artillery. The considerations which led to this method of stating the range are related. Shortly, it consists in graduating the back sight in thousandths parts of the line of sight.

BREAST HARNESS.

This harness proved a failure in the Swiss Army. The writer states what he considers to be the reasons for this, makes suggestions for overcoming it, and advocates the re-introduction of the harness.

THE QUESTION OF N.C.O.'s.

In order to meet the difficulty of obtaining good N.C.O.'s Colonel Monnier suggests reducing their number, giving them a better training in the recruits' schools, and so raising their prestige.

A.R.R.

RIVISTA DI ARTIGLIERIA E GENIO.

February, 1913.

A ROMAN LEGIONARY.

This number contains a full and detailed description of the equipment and weapons of a Roman Legionary of the time of the legion instituted by the Emperor Marcus Aurelius, 42 to 31 B.C. The model of this soldier exhibited in the museum of Castel S. Angelo and constructed with great care by Professor Cav. Carlo Panati, Captain of Bersaglieri of the Reserve, shows not a common *mannikin* devoid of life and sentiment, but a sympathetic work of art which is well worthy of study and consideration. The legionary reproduced belonged to the Legion XII. with the title of *fulminatrix*, the soldiers of which legion carried on their shields as a symbol the *folgore di Giove tonante* (the lightning of Jove) with two expanded wings. The model represents a soldier probably of the 1st century wearing heavy armour, and a guard for the standards of the legion. The weapons used by the Romans were offensive and defensive, and the legionary represented has among the former the spear and the sword, and among the latter, the helmet, the cuirass, the shoulder pieces, and the shield. The clothing is shown in the tunic, trousers and sandals, and the sword belt. In rapid marches (*militibus expeditis*) the *impedimenta* were carried with the rear guard on wagons. The helmet or casque (*cassis*) has the front, back, and top (*apex*) of hammered iron all in one piece, the helmet strap of leather fastening under the chin, the red plume, and horsehair brush (*crista crinita*). The straps have iron buttons on one side with circular button-holes, as shown in the model of a Roman warrior in the courtyard of the Conservatory of the Campidoglio. The cuirass of iron (*loryca ferrea*) consists of five plates protecting the breast, and of plated shoulder pieces (*humeralia*). Under the cuirass the Roman soldier of that period is believed to have worn a kind of close corset of copper (*loryca de corio*) closed in front with copper buckles (*fibulæ*) which were very rich, and ornamented; under the corset he wore a woollen tunic with short sleeves, and reaching to the middle of the thigh. Officers of noble birth also wore woollen trousers (*femoralia*); the tunic as well as the trousers were of various colours (white, red, blue, green) according to the legion. Round the neck the legionaries wore a woollen handkerchief, and we find a return to this custom in the handkerchief worn by the soldiers of modern Italy, led by Giuseppe Garibaldi. The shield (*scutum*) is of wood, convex, with iron edges, and ornamented with iron (*legionis tonantis signa*), copper sheathed, with the central part raised and plain in the form of a cup (*umbo*). As it is known, the hollow part of the umbo that was closed from the inside or outside of the shield with a kind of

small door or opening contained the money for the soldier's pay, or other valuables. The shield was the sacred part of the armour and its loss was considered the greatest dishonour. The Roman sword (*gladius*) was short and strong like a large dagger. The hilt was of wood or black bone, 12 c.m. in length, with a slight curve for the fingers; a large and heavy pommel; and a two-edged blade (*cusis*) and a sharp point (*mucro anceps*). The average length of the sword was from the breast to the middle of the thigh, as described by Livy, and was worn on the right side in a manner that it was easy for the legionary to draw it rapidly with his right hand and thrust it *under* the adversary in hand-to-hand combats. The sword was enclosed in a scabbard (*vagina*) that had a cap with two rings and an iron point and was suspended from the left shoulder by a belt (*balteus*) ornamented with bronze buckles. The spear (*pilum*), not to be confounded with the javelin, was a strictly Roman weapon, and was formed of a shaft of wood (*hastile*) with an iron butt (*spiculum*) and a point (*cuspis*) partly of iron and partly of steel. Thrown against an enemy at a distance of about 8 or 10 metres, when it struck the target, the man was beaten to the earth by the point which yielded or broke off so that the spear could not be used against the thrower. After throwing the spear the legionary drew the sword with his right hand, and covered by his shield, attacked in hand-to-hand conflict. The soldiers wore around their loins a band of copper (*cingulum*) with ornamented bronze plates (*pendagli*): for the common soldier three, for trained men five, as shown on the bas-reliefs of the triumphal arches at Rome, where a standard bearer corresponding to a non-commissioned officer has five pendagli. The cingulum was an indication of honour, and soldiers sent to fight as a punishment did not wear this. The shoes or sandals were admirable, and even now deserving of imitation. The Roman soldier first wrapped his feet (leaving free the toes) in a band of white linen that reached to the ankle, fastened also with linen bands passing between one toe and the others. The shoe had a strong sole with iron nails (*solea et clavi ferrei*) fastened to the foot by a band passing between the great toe and the next. Many of the trained soldiers however had closed shoes like those in modern use.

* * *

The Roman Legion, properly so called, with its method of fighting in open order, dates from the first Gallic War, 226—224 B.C.; its best description is that of Polybius about 140 B.C. Other writers mention incidentally the legion and its tactics, but the following refers specially to that of the Imperial Epoch:—Under the first emperor and under the orders issued by Servius Tullius (about 550 B.C.) the Roman Army fought in masses like the Greek phalanx. The soldiers were distinguished in *classici or principes*, who constituted the 1st and the 2nd lines; *hastati* who formed the 3rd and 4th lines; *triarii* the 5th and 6th lines. There were also light troops called *veliti*, who fought in extended order around the legions, and auxiliary troops *proletarii* who did not form part of the legions properly so called. To these may be added the workmen—engineers, carpenters, smiths or *fabri ærarii*, musicians (*liticenes or tubicines, cornicenes, etc.*), servants and reserve men (*adecusi velati*).

The *classici or principes* were selected from the citizens of more social and political importance, the classes decreasing in wealth or social importance followed, the *hastati*, the *triarii* and finally the *velati*. The *principes* were completely armed, with helmet, cuirass, round shield of bronze, called *clipeus*, sword, and a kind of pick. The *hastati* had wooden shields (*scutum*) and no cuirass, but armed like the preceding. The triarii were armed like the hastati but had no leg armour. The militia not of the legions had no defensive armour; they had picks and javelins and some slings only. From this phalanx originated the legion. The Republican Consuls for strategical and tactical purposes divided the phalanx into two, then into four, and again into more units, and finally rendered them lighter and better adapted for movements in Central and Southern Italy; and in the Gallic War we find the classical Roman legion composed of 30 tactical units (*manipoli*) organized in three lines. 1st line: 10 manipoli (each manipolo of 120 men) *hastati*. 2nd line: 10 manipoli (each manipolo of 120 men) *principes*. 3rd line: 10 manipoli (each manipolo of 60 men) *triarii*. To each manipolo there were added 40 *velites* who fought as skirmishers between the manipoli.

The manipoli were drawn up in ranks of 20 men each; each man occupied in the line about 3 ft. of space (and 6 ft. in open order); the distance between the manipoli was equal to their front, and the manipoli in rear corresponded to the space of the front ones. The arms during the Gallic War again underwent modifications. The helmet was increased in length (according to the Greek fashion), so as to defend the neck from the strokes of the long Gallic sword; the wooden shields were bordered with iron; the javelin was substituted for the *pilum*. Originally there were only four legions, but these increased in number so that at the time of Septimus Severus they amounted to XXX. (less the XVII., XVIII., and XIX. Legions—which were exterminated by Arminius at the Battle of Selva di Teutobergo and never reconstituted). The first four were held in special consideration and honour. Besides the infantry legions there were squadrons of cavalry. The Roman cavalry comprised a special class in the army (*classis equitum*) and remained under arms in peace times, while the legions were demobilized after each war. The cavalry in combat were placed on the flanks of the legions. The detachments of *socii* and *pretoriani* (Italian troops) and the *ausilarii* completed the ranks of the Roman Army. After the Punic War the Roman Army began to lose prestige. The Civil War between Marius and Sulla (about 88—82 B.C.), and internal revolutions, helped to increase the power of the more humble classes. Marius extended the right to bear arms even to the proletarii and the servi, and formed the cohort from the reunion of a manipolo of *hastati*, one of *principes*, and one of *triarii*, and this became the Roman tactical unit for the whole Empire. The legion was then composed of 10 cohorts, disposed originally in two lines at intervals; the *veliti* and the cavalry on the front and flanks, and also between the intervals of the cohorts. At the time of Julius Cæsar the cohorts were drawn up in three lines, and they were divided into hundreds commanded by centurions. The legions had for their standard a golden eagle, and were commanded by a *tribuno* or *legato*.

E. T. THACKERAY.

RECENT PUBLICATIONS OF MILITARY INTEREST.

REVIEW OF BOOKS.

[Reprinted from *The Army Review* by permission of the Controller of His Majesty's Stationery Office.]

o o o o o

FOREIGN ARMIES.

THE INFANTRY OF TO-MORROW. (L'infanterie de demain). By Monsieur Treignier. 301 pp. 8vo. Paris, 1912. Lavauzelle. 2s. 11d.

This book is a reproduction of the report made by Monsieur Treignier, in the name of the Army Committee of the French Chamber of Deputies, on the Bill for increasing the number of officers and N.C.O.'s on the cadres of infantry regiments. The Army Committee, in advising the Chamber to pass the Bill with some small modifications, points out that, as a reply to the large increases in her Army made by Germany, it is absolutely necessary for France to do something to render her military forces more formidable. An increase in the strength of the French Army is out of the question, owing to the declining birth rate and, therefore, the only way of improving the military forces of France is by making them more efficient. The Bill which forms the subject of Monsieur Treignier's report proposes to effect this improvement mainly by increasing the regimental cadres of officers and non-commissioned officers responsible for training Reservists in peace and leading them in war. It is pointed out that although the old idea was that, on the outbreak of war, reservists would be employed in garrisoning fortresses, guarding lines of communication, etc., it has now become imperatively necessary, in consequence of the decline in the French birth rate and the formidable increases in the German field armies, to employ the reserve troops of France in the first line, practically at the opening of the campaign. It is therefore of paramount importance to reduce to a minimum the period which the reserve formations require to settle down before taking the field and to keep up their efficiency during peace time. It is hoped to carry out these objects by increasing the cadres of officers and N.C.O.'s in the manner suggested by the Bill. It is not proposed to go into the details of the Bill because they are not likely to be of general interest, but the following points which are incidentally discussed in the report seem worthy of note :—

(1). The steady decline of the French birth rate is undoubtedly causing great alarm in France. The rate of this diminution may be judged from the fact that whereas in 1893, 343,651 youths reached the age for military service, in 1911 this number had dwindled down to 301,467 of whom 224,747 were passed as fit for service. It is calculated that if the same rate of decline and the same proportion of rejections are maintained there will only be 196,000 men incorporated in the contingent of 1927.

(2). In dealing with the organization of machine guns, the report remarks that in the majority of foreign armies they are organized as distinct units. In France, however, it is considered that they should form part of regiments and that machine gun detachments of various regiments should only be occasionally brought together for training and manœuvres. This arrangement is thought by the Army Committee to be a good one, not apparently for tactical reasons, but because it is thought that if machine gun detachments are made distinct and autonomous units the men are apt to become merely specialists in machine gun work and to know nothing of the

duties of infantry soldiers. This, it is said, would probably be a serious thing on mobilization, because there would be far more specialist machine gunners than required and it would be necessary to put the surplus, who would be without a knowledge of infantry work, into the ranks of infantry battalions.

(3). The development of cyclists in France is of particular interest to the British Army. At the present time there are five cyclist companies attached to five battalions of *chasseurs à pied* on the North-Eastern Frontiers of France. The great utility of cyclists as a support to cavalry has been demonstrated by a number of experiments at French manœuvres. It is now proposed to raise 10 "groups" of cyclists. Each "group" will consist of about 300 men and will be divided into three sections. The question is discussed whether these cyclist groups should be permanently attached to cavalry divisions and the conclusion is that, as they will be required to do infantry work, they should be attached to infantry battalions and should train for certain periods in the year with cavalry divisions.

(4). The increasing use made by infantry of entrenchments in modern war is pointed out, and it is thought that in the battle of the future the engineers of a division will probably be incapable of dealing with all the engineer work which will be required. It is therefore proposed that each company of infantry shall have eight pioneers specially trained in engineer work.

(5). It is interesting to note that the report considers that a company cannot be efficiently trained in peace unless it consists of at least 100 men. It is therefore considered that, in view of the smallness of the French company in peace time, double companies should be organized for training purposes.

(6). It is thought that the captain of a company has too much administrative work to do at present, and that the fact is detrimental to the proper training of the company. It is therefore proposed to make a slight increase in the battalion staff and make the battalion commander responsible for much of the administrative work which now falls to the lot of the captain.

(7). At the present time there are some 5,700 societies in France which give gymnastic and musketry training to youths preparatory to their entering the Army. These societies issue certificates to those who reach a certain standard of efficiency, and the possession of these certificates carries with it certain very distinct advantages on entering the Army. With a view to trying to ensure that all men have had a certain amount of training in gymnastics and shooting before they join the Colours it is proposed to give further encouragement to the societies in question, whilst Regular officers are to be appointed to supervise their work and see that the instruction given is thoroughly up to date. It is hoped, moreover, that the societies may be utilized for the purpose of continuing the instruction of men after they leave the Colours.

HISTORY.

THE STRATEGY OF FREDERICK THE GREAT IN THE SEVEN YEARS' WAR. (Die Strategie Friedrichs des Grossen im Siebenjährigen Kriege). By Major Schwertfeger, Professor at the Prussian Staff College. 24 pp., with map. 8vo. Berlin, 1913. Mittler.

This is a lecture given before the Berlin Military Society on January 24, 1913, the two hundred and first anniversary of Frederick II.'s birth, and, as the author reminded his audience, the fiftieth anniversary of the refusal of the representatives of the people in the Prussian Lower House to vote the supplies that William I. urgently required for Army reforms "in order to regain the Frederician power of offence (*Stosskraft*) that is the backbone of Prussian policy."

The lecture is a clever and useful summary of Frederick's methods. For thirteen years, 1745–56, the King made careful preparations for the war that he meant to undertake. He strengthened his Army, perfected its training, and made it a weapon of the first order. He did not wait until his opponents were prepared, but, relying on his greater readiness for war, struck first at the most favourable opportunity.

He fully recognized that in war, as Napoleon so often said, he who attempts to cover everything covers nothing; temporary sacrifice of territory must be made for the good of the whole. To use his own words: "Small minds want to cover everything, intelligent people look only to what is vital (*Hauptsache*); they parry the heavy blows and put up with small misfortunes in order to escape great ones. He who seeks to cover all covers nothing. The essential thing, which one must never lose sight of, is the enemy's Army; one must guess his plans and oppose them with all one's might."

Frederick insisted on his officers studying their profession. "What use is experience if it is not ripened by study? It is reflection and capacity to array his ideas that distinguish man from a beast of burden. The mule that carried Prince Eugene's pack saddle in ten campaigns was none the better tactician for it. And shame is it that many men who have grown grey in an honourable service have made no better progress than the mule."

He gave particular warning that there is no book of the rules to success in war. "My methods were only good in consequence of the faults of my adversaries. They were slow; I was active. They, through indolence, failed to take advantage of opportunities; I seized every chance. My methods must not therefore be used as patterns. Stern necessity often compelled me to trust to chance. No rules can be deduced from the ways of a pilot who depends on the humour of the winds rather than on his compass."

THE BATTLE OF THE WILDERNESS. By Morris Schaff. 8vo. 345 pp. and 5 maps. Boston and New York, 1912. Houghton Mifflin Co. 8s. 4d.

The author, a West Pointer, and well-known as the writer of a charming book on his military school, *The Spirit of Old West Point*, served on General Warren's Staff in the Wilderness campaign. His book gives a general account of the fighting, with his impressions and reminiscences, and presents a most vivid picture of the fighting, the field of battle, and the troops. He has aimed at showing what an army in deadly combat is like rather than at writing military history.

After describing a service held by a Commanding Officer at 1 a.m. before the battle, he says: "Possibly the earnest student would prefer to be told the order of march and the exact distance they had to make; but I wonder which is the more enduring and significant fact—the young Colonel pouring out his heart to God under the starlight, or whether Blank's battalion moved first right or left in front?"

The first day's fighting showed Lieut. Schaff what was the matter with the Army of the Potomac. It had no power of initiative and no elasticity; and it was very careful of itself. "Its early commanders had dissipated war's best elixir by training it to a life of caution, and the evil of that schooling it had shown on more than one occasion and unmistakably that day." Besides caution, however, it suffered from panics; whole brigades bolted after barely confronting the enemy, and skulkers drifted back to the trains at the first opportunity.

As a staff officer he came in contact with most of the prominent Generals. He describes Grant as a "medium-sized, mild, unobtrusive, inconspicuously dressed, modest and naturally silent man. He had a low, gently vibrant voice, and steady, thoughtful, softly blue eyes. Not a hint of self-consciousness, impatience or restlessness, either of mind or body; on the contrary, the centre of persuasive quiet which seemed to be conveyed to everyone round him."

For Burnside he has the greatest contempt. Of him he says he "represented a well-recognized type in all Armies, handsome, ingratiating manners, and noted for a soldierly bearing—that is square shoulders, full breast, and the capacity on duty to wear a grim countenance, while off duty all smiles and a keen eye to please—who in times of peace, not only in our country but everywhere, invariably land in high places, and almost as invariably make utter failures when they are given commands on the breaking out of war."

Of his own commander, Warren, who was one of his instructors at West Point, he says little, except that Grant neither liked nor trusted him, and that always serious, his seriousness deepened as he rose in fame and command.

The maps are excellent, and the book is thoroughly well worth reading both by soldier and civilian.

THE DIPLOMATIC ORIGIN OF THE WAR OF 1870–71. (Les origines diplomatiques de la guerre de 1870–71). Published by the French Ministry of Foreign Affairs. Vol. VI.* 491 pp. 8vo. Paris, 1912. Gustave Ficker. 6s. 3d.

This is the latest of a series of volumes containing a collection of official despatches which passed between the French Foreign Office and their ambassadors and ministers at Berlin, Vienna, Munich, Stuttgart, Stockholm, Dresden, Frankfort, Turin, Madrid, Hamburg, Hanover, Carlsruhe, Darmstadt and London, during the period March 1, 1865, to August 31, 1865. The volume will naturally be of value for purposes of reference, but will be of more interest to the diplomat than to the soldier. The long series of disputes and complications between Austria and Prussia regarding the question of the Duchies of Schleswig and Holstein which led up to the Convention of Gastein is described in great detail in the despatches contained in this volume. The probable attitude of France in the event of a rupture between Austria and Prussia is shown to have been a constant source of anxiety to Bismarck, and one is struck by the consummate skill with which that statesman endeavoured to obtain definite information on this point from Benedetti, the French Ambassador at Berlin. The latter in frequent conversations with Bismarck assured him that France fully recognized Germany's interests in the North Sea, and had no intention of interfering in the dispute regarding the Duchies, although she was most anxious that any arrangement made regarding them should be in accordance with the wishes of the people of Schleswig and Holstein. These assurances apparently did not quite satisfy Bismarck, who was afraid that France might have some idea of demanding compensation as the price of her neutrality in the event of an Austro-Prussian War. It would appear that, in order to obtain information on this point, he told Benedetti, in course of conversation, that he had heard from the German Ambassador in Paris that France had decided to assist Austria in the event of war with Prussia. This story seems to have been a pure invention, but the telling of it to Benedetti had the desired result. Benedetti, after denying that France had any intention of helping Austria, said: "I am authorized to ask you plainly what you wish us to do and what you offer us." According to Benedetti, Bismarck, on hearing this, was "obviously surprised," and, "after a moment's hesitation," replied: "What we ask of you is a benevolent neutrality both during our negotiations with Austria and afterwards, if they lead to war." Benedetti thereupon asked, "You have then no proposition to make?" To which Bismarck replied: "None at present." The skill with which Bismarck subsequently kept the French quiet is clearly brought out. The terms of the Convention of Gastein are given verbatim on pp. 463—466. The French Minister at Frankfort thus describes the results of this Convention: "It is the annexation, disguised, but none the less certain, of the Duchies of the Elbe by Prussia. The fate of Lauenburg is already decided; the rest is only a matter of time. Prussia had gained what she wanted." The French Chargé d'Affaires at Berlin writes on the same subject: "The question of money has evidently had a great deal to do with the recent success of the Berlin Cabinet; the state of Austria's finances has been a great help to Bismarck." The French Foreign Office view of the Convention is thus expressed in a circular letter to its representatives at the different European courts:

"Have the terms of former treaties been respected? Certainly not. The Treaties of Vienna have stipulated for the existence of the Danish Monarchy; the conditions

* Vol. I. of this work was reviewed in Recent Publications of Military Interest for November, 1910, and Vol. IV. in *The Army Review* for April, 1912, p. 617.

of these treaties have been disregarded. The Treaty of London was a fresh proof of the solicitude of Europe for the continuance and integrity of the Monarchy: Austria and Prussia have torn up this treaty. Have Austria and Prussia consulted the interests of Germany? The members of the Germanic Confederation only learnt the terms of the Gastein Convention from the newspapers. Germany wanted a united Schleswig-Holstein, separated from Denmark and governed by a Prince whose candidature for the position of ruler they supported. The claims of this popular candidate have been set aside, and the Duchies, instead of being united, are now separated and placed under different rulers. Have the wishes of the people of the Duchies been consulted? In no way. On what principle does the united action of the Austrian and Prussians rest? We regret that we cannot see any principle but the application of force, or any justification for this Convention but the mutual convenience of Austria and Prussia."

MEDICAL.

THE HOUSE-FLY AS A DANGER TO HEALTH. By Ernest E. Austen. 11 pp., 7 illustrations. 8vo. London, 1913. Longmans, Green & Co. 1d.

This little pamphlet, printed by order of the Trustees of the British Museum, is written in popular language and well illustrated. Its object is to educate people in the life history of the fly, its potential danger to health, and how to get rid of it. Half an hour may very profitably be spent in looking through this publication.

MISCELLANEOUS.

THE SOLDIER'S FOOT AND THE MILITARY SHOE. By Major E. L. Munson, Medical Corps, United States Army. 147 pp., 54 illustrations. 8vo. Published by the United States Cavalry Association, Fort Leavenworth, 1912. 5s.

This book contains a summary of the investigations carried out by the Army Shoe Board during a period of more than four years. The purpose of the book is to supply practical information for the guidance of those officers who have to superintend the fitting of men's boots.

The chapter on the anatomy of the foot is written in simple language and well illustrated. The illustrations of footprints showing how the foot is expanded by carrying a load are most instructive and should be borne in mind when fitting boots. The radiographs on pp. 36 and 37 showing the bones of a naked foot bearing the weight of the body and the same foot compressed by a dress shoe should be studied before purchasing Mess Wellingtons. The requirements of a good military shoe are thoroughly discussed under twenty-six headings (pp. 43 to 55). The radiographs on pp. 60 to 63 showing the bones of the same soldier's foot encased in different shoes illustrate clearly the harm done by a faulty boot. The chapter on the fitting of military shoes contains much useful information and many practical hints.

The book fulfils the purpose for which it was written and is well worth careful reading by anyone who is responsible for fitting the soldier with boots.

SERVICE CHEMISTRY. By Lewes and Brame. 576 pp., with index. 8vo. London, 1913. Edward Arnold. 15s. net.

At no time in the world's history has the need for scientific knowledge been more important than at present, while the period available for acquiring it has, in the naval and military services, tended to contract rather than to expand.

This book supplies a rational treatise on the more chemical side of the many subjects with which a large number of officers are so frequently brought into contact. The fact that a fourth edition is necessary shows that it supplies a want and has been appreciated by many. To keep it up to date, the present edition has had to be largely re-written; it includes a considerable amount of material not available in the ordinary text-books, a fact which adds to its value.

POLITICAL.

THE MEDITERRANEAN PROBLEM. (Le Problème Mediterranéen). By Charles Vellay. 85 pp. 8vo. Paris, 1913. Berger Levrault. 1s. 0½d.

This will be found an interesting little book by those who desire to read in a concise form the various aspects of a problem which is attracting so much attention at the present time. It is pointed out that Moroccan affairs, the War in Tripoli and the present Balkan War have added further importance to the Mediterranean question and have, in a way, made it the pivot of the foreign policy of the principal European Powers. Monsieur Vellay explains the different bearings of the problem as looked at from the point of view of Great Britain, Germany, Italy, Austria-Hungary, Russia and France and supports his statements by reference to official documents as to the public utterances of responsible statesmen. His conclusions regarding the general aspect of the Mediterranean question are as follows:—

"Regarded from a general point of view the Mediterranean question is becoming more and more complex and the great trade routes which are being opened up or are in course of development—as for example those from the Cape to Cairo, from Scutari (in Asia) to Bassorah, that also from Alexandria to Bassorah and Calcutta—are daily adding to its importance.

"If one looks to the root of the matter it will be found that the desire of the various nations of the world to control the trade routes passing through or near the Mediterranean is the essential point in a problem which is a vital one for each of the great nations of Europe. Those nations which do not obtain some of the spoils of victory in the great struggle which is now going on will be to some extent disarmed in the great economic battles of the future."

STRATEGY, TACTICS, AND TRAINING.

SUCCESS IN WAR—A SKETCH OF A DOCTRINE OF WAR. (Vaincre—Esquisse d'une Doctrine de la Guerre). By Lieut.-Colonel Montaigne. 3 vols. Vol. I., 253 pp., Vol. II., 253 pp., Vol. III., 157 pp. 8vo. Paris, 1913. Berger-Levrault. 13s. 4d.

This somewhat curious book has attracted a good deal of attention on the Continent. The main idea running through it is that war is a "moral science" and that mistakes committed in war are moral faults and as such should be punished. The author adds that "every defeat is a crime and everyone who is defeated is a criminal." Although the book is written in rather exaggerated language and is full of repetitions, and in spite of the fact that many of the author's ideas will not be generally accepted, there is some interesting reading in these volumes. The first volume is entitled "Preparation for the Study of War," and pp. 151 to 206, in which the writer deals with the subject of "Fear," are worth reading. The effect of fear on men and animals is discussed and various examples are quoted from the history of war to show the consequences of panic among soldiers. Colonel Montaigne then considers the measures to be taken to counteract the effects of fear, and he comes to the conclusion that the best means of instilling courage into soldiers is to make them physically fit, to teach them discipline, to fill them with patriotism and to place before them living examples of bravery in the shape of their leaders.

The second volume is entitled "The Study of War." In pp. 9—163 the author discusses the various changes which have taken place in the armament of soldiers from the time of the pike up to the present day and the effect of the changes on warfare. He comes to the conclusion that in war the fighting spirit of the victors has had much more to do with their success than the question of armament, and he supports his contention by reference to the results of the Russo-Japanese War.

Then follows an explanation of the French doctrine of war. The views of Generals de Négrier and Langlois are discussed and then the modern battle, as viewed by the French Regulations, is described. After this the German doctrine of war is explained and the so-called French and German systems are compared. This volume concludes with a description of the Napoleonic doctrine of battle.

The third volume bears the title "War" and is the least interesting of the three. The author says "the demoralization of the enemy is the first aim of war and this is done by destroying him or terrifying him. The art of war may therefore be defined as the science of destruction and of terrifying." And he adds that in war "the man himself is the principal arm." According to Colonel Montaigne's view the "work of destruction" in a modern battle is done during the frontal attack, the "terrifying" of the enemy being accomplished chiefly by means of night surprises. The remainder of this volume consists mainly in a reiteration of the views expressed in the previous volumes as to the paramount necessity for preparing the man for war. Practically the only new matter introduced is in pp. 89—101 where the author energetically attacks the pacifist theory and warmly supports the views of Von Bernhardi as to the necessity for and value of war.

Notes for Officers Proceeding to India.

By Major A. T. MOORE, R.E., 1904.

REVISED

By Major E. C. OGILVIE, R.E., 1912.

Reprinted by the Council of the Royal Engineers Institute.

Price: To Members of the R.E.I., 2/-; to others, 3/- per copy, post free.

PLEASE INSERT PLAN

241 FROM

BOOK 241