THE ROYAL ENGINEERS JOURNAL.

Vol. XXXV. No. 5. MAY, 1922.

CONTENTS.

—CHATHAM—

All Corresp... NT
Manag...

THE INSTITUTION OF ROYAL ENGINEERS.

All communications for the Institution should be addressed to :—
The Secretary,
The Institution of Royal Engineers,
Chatham.

CONTENTS.

INSTITUTION
OF
ROYAL ENGINEERS.

Work of the Royal Engineers in the European War 1914—19.

For sale in the Office of the Secretary, Institution of Royal Engineers, Chatham. The following volumes are now ready :—

WATER SUPPLY (FRANCE).
With 10 maps, 37 photographs and 41 plates. Price 25/-. (To members, 12/6).

BRIDGING.
With 3 maps, 59 photographs and 31 plates. Price 12/- (to members, 6/-).

SUPPLY OF ENGINEER STORES AND EQUIPMENT.
Price 7/- (to members, 3/6).

THE SIGNAL SERVICE IN THE EUROPEAN WAR, 1914 to 1918.
(*By special arrangement with the Signals Association*).
By R. E. PRIESTLEY, M.C., B.A. (late Major, R.E.). With 2 photos and 20 plates. Price 12/6 (to members, 10/6).

WATER SUPPLY, EGYPT AND PALESTINE.
With 7 maps, 6 photos, 10 plates and 20 sketches in the text. Price 8/- (to members, 5/-).

In Preparation.
MINING. GEOLOGY.

the automatic weapon (machine-gun and *fusil-mitrailleur*, which corresponds to the Lewis gun). All the members of the *groupe de combat* only exist in relation to the automatic weapon, according to whether their individual rôle is "to move it, serve it, feed it, or protect it."

It would appear to the writer that in this dogma there are grave dangers of a cramping of mobility and initiative. The mobility of the automatic weapon, its quickness in engaging a target, its handiness and adaptability to fire from any spot, still compare unfavourably with the rifle. Even its high rate of fire carries the drawback of a too speedy and not always so economically profitable usure of ammunition, and a consequent difficulty of supply. These defects cannot altogether compensate for its volume of fire and lessened dependence on the emotions of the firer.

The writer feels that the French have undervalued the possibilities of the rifle in the hands of well-trained infantry. Its potentialities were demonstrated to the world by the British infantry of 1914. Even while bearing in mind the difficulties imposed by the short period of training of the French infantry, one feels that their natural quickness and aptitude for movement and the use of ground would make the rifle still a formidable weapon, on its own merits, in their hands. The French section, corresponding to the British platoon, is divided into three groups, each consisting of two *équipes*, an automatic rifle *équipe* and a rifle *équipe*. The latter has the duty of protecting and covering the automatic rifle *équipe*. To tie the rifle *équipes* so closely to the vicinity of the automatic weapon, as is done by their incorporation in the same group, must surely lead at times to a lack of manœuvring power and a failure to make the fullest use of all opportunities to infiltrate between and turn the flanks of enemy posts and *points d'appui*. A rifle *équipe* charged with the duty of protecting its automatic weapon can scarcely make such full use of the possibilities of movement and outflanking as one that is free from this duty and has the full width of the frontage of the "section" in which to manœuvre. One feels that the British organization makes better use of that mobility in which rests the claim of the infantry arm to remain a decisive factor in battle. Our rifle sections retain the full advantage of their superior power of movement for infiltration and outflanking the enemy defence posts.

The report then discusses the combat group. It declares that the isolated rifleman no longer exists. The group is the cellule for training and for battle, being the largest body which can be directly controlled by the voice and hand-signal of its chief.

In the Regulations of 1875 the unit of combat was the company; later it became the section (platoon); then the half-section of about 20 men at the end of the late war.

Experience showed that even this strength was still too large

the axiom of the preponderating importance of fire as a mode of action. This axiom was the fountain-head of all the deductions of those Regulations. The subsequent Regulations down to 1914 modified and weakened this primary assertion.

The report renews the original assertion that of the two elements which, combined, form the infantry manœuvre, action by fire has the greater weight.

"It is not only 'every attack in dense formation that fire power renders impossible over exposed ground,' but every progression, even in dispersed formation, if the ground can be effectively beaten by fire. The power of infantry fire has become such that any terrain, even when it appears empty of defenders, can no longer be crossed without heavy losses so long as combat groups remain resolved to defend themselves energetically and continue to make use of the weapons." Therefore the French emphasize that the only way in which movement can be made possible is for the defender's fire to be beaten down and kept down until the attacking infantry can assault him. A sentence from the report which should be inscribed on the mind of every commander is that which declares that "a progression weakly supported by the artillery, and *a fortiori* not supported, can only be attempted against an enemy in a definite state of inferiority, moral or numerical." If we make a mental addition of the words "or tanks" after "artillery" the weight of the deduction is strengthened.

It was a lesson that cost countless thousands of wasted lives before it was taken to heart. Let it be hoped that the generals of the future will not demand further and more costly proof of its truth.

The report points out that "this lesson of the preponderant importance of fire does not detract from the other element of the infantry manœuvre—movement, which remains the only decisive factor. The two elements are inseparable. The object of fire is solely to pave the way for movement. Movement is the means by which one conquers the ground and puts the adversary out of action," which acts are the visible tokens of success. "The advance should not wait for the complete neutralization of the fire of the defence, but should be pushed at every opportunity when fire has made it possible with reduced losses." "Infantry must not fear a certain proportion of loss."

To achieve this will to advance, however, the trainers of infantry must inculcate the spirit of self-reliance, of dependence on "ourselves alone" in the last resort. Let infantry be taught to value the aid of the other arms as a boon, but not expect it as a certain buttress of its own action.

The next paragraphs in the report are ones with which many English officers will be at variance. Here the doctrine is laid down that in the new methods of combat, everything gravitates around

common to all governments and war offices. Let us consider existing organizations and conditions.

The more terrible the destructive power of weapons, the more does unprotected man seek impregnable shelter in which he can escape their missiles. No other arm, save infantry, has yet proved itself capable of going in and dislodging him from this shelter. Moreover, victory being a moral effect is the result of a conviction of inferiority, a demoralization, which is driven into the defender by a concrete proof. This proof lies in being driven back, not a few yards only—his *morale* will survive this—but being hurled back in confusion from which he feels hopeless of recovery. The break-up of organization, far more than actual losses, is the test of defeat. The dislodgment of the enemy, which is thus the decisive act of battle, still rests with the infantry, because it is the only arm which is universally mobile in any given locality. Infantry alone of the arms can move over every type of terrain, penetrate any shelter, and fire from any kind of position.

The report goes on to declare that the experience of the war has clearly proved that, in order to accomplish this mission, infantry cannot fight alone, and that the support of other arms is essential.

Few will deny that this is and will remain true of all war waged against enemies properly organized and equipped with modern mechanical weapons and resources. It might perhaps have been qualified by a reference to the need for self-reliance when opposed to ill-equipped or disorganized opponents. It is well to impress on infantry that, however valuable the support of the auxiliary arms, it should be accustomed to depend on its own powers, and not depend wholly on that outside support. France, like Britain, is a colonial power whose infantry are often called upon to face tribal levies with little extraneous aid from the more mechanical arms. Moreover, even in battle against well-equipped adversaries, there are moments when infantry may overcome local resistance or exploit the temporary disorganization of the enemy after the storming of a position, solely by its own means. Is there not some risk of cramping the self-reliance of infantry if we set down, in any place, such a dogma, as that quoted from the report, without qualification?

The report then draws attention to the Regulations of 1875, issued after the experiences of the war of 1870. It lays stress on the truth that, whilst the lessons of war are still fresh in the memories of the actual combatants, the deductions are likely to be more true to reality than those subsequently culled in the years of peace from the unreal experience of the rifle range and training ground. At the end of a war the test imposed by the bullet and the shell has displayed the weak points in the pre-war doctrines; the methods in use have been hammered out of the molten ore of battle experience.

The 1875 Regulations placed at the head of their general principles

A STUDY OF THE NEW FRENCH INFANTRY REGULATIONS.

By CAPT. B. H. LIDDELL HART.

THE provisional edition of the post-war Infantry Regulations of the French Army is well worthy of study by all British officers, both for its general tendencies and its detailed methods. For those, however, who lack the time to study it in the original, or who are not able to obtain access to copies, this brief summary may be helpful, and the comments prove of interest. The *Règlement Provisoire de Manœuvre d'Infanterie*, as it is entitled, is composed of three volumes; a first part which deals with the technical preparation or training of infantry, a second part which is concerned with infantry in battle, and an annexe which contains diagrams, ceremonial, and methods of instruction.

Obviously it is beyond the scope of an article to compress these three volumes into even a condensed version of the original. Hence it is judged best merely to outline the main points which are of interest to British readers, and to accompany them by a running fire of comments from the standpoint of an English military writer. The author has recently been asked by the *Revue Militaire Générale* to contribute a critical study of the French Infantry Regulations, and for convenience of arrangement it appears best in this article to follow out the main lines of his study for the French review, taking the subjects for comment in the order in which they appear in the manual.

THE INTRODUCTORY REPORT.

The Regulations open with a long and masterly report to the Minister of War from the authors, under the signature of the Director of Infantry at the French War Office. After declaring that the late war has proved once more that victory rests with the combatant whose moral qualities are the higher, though only on condition that these are supported by adequate material resources, the Regulation reasserts the truth that, despite all the changes in armament, the task of infantry still remains the same: to conquer and hold the ground. So long as the present organization of the arms of the service continues this rôle will hold good. The conversion of armies into pure tank forces is likely to be delayed by many causes—not least by the inertia of conservatism

and too vulnerable. Thus the group is now made the primary cellule of infantry.

The report points out that in order to avoid the increasing deadliness of firearms, infantry has been forced to become more and more dispersed; that the interval between the groups tends towards a maximum which is only limited by the double necessity of keeping touch and of covering the intervening space with fire; that the strength of the unit of combat tends towards a minimum which is limited only, on the one hand by the need for retaining control, and on the other by the obligation of ensuring the service and protection of the automatic rifle.

The report speculates on the question whether this evolution will eventually terminate in two or three men enclosed in an armoured and mobile shell. It concludes that the group, however, meets the needs of the moment.

But that "the conception of the group results from the necessity of serving and protecting the automatic weapon," is an opinion with which the writer cannot agree. He feels that the origin of the *groupe de combat* is anterior to the invention of the automatic weapon, and is to be ascribed to far more fundamental and psychological causes. The group is born of human nature. Fear is always worse when man is alone. When modern fire enforced dispersion, long extended lines were introduced. But human nature, lonely and leaderless as a single peg in an unnatural featureless line, instinctively sought companions and a leader. Thus the group formed itself, even in past wars, whenever the unnatural mechanism of unarticulated lines broke down under fire. That value of personal example which inspires the soldier and makes him forget fear is only applicable to a handful of men who can feel the direct influence of a leader. In battle man needs some rock to which to hold fast—the artilleryman has his gun, the aviator his aeroplane, the infantryman his group leader. The little group of some half-dozen, or slightly more, men is large enough to be an effective instrument of fire or assault, which the isolated skirmisher is not, while it is small enough to be easily controlled and guided by the best-covered approaches and not to attract undue attention. It is suggested that the French group of a leader and twelve men is too strong if the ideal of control, mobility, and invulnerability is to be attained. The writer feels that to overcome this defect by dividing the group as in the French Army is to break away from the ideal of the group. At the same time, he admits that the English group of a leader and six men may not possess sufficient fire-power, assaulting force or insurance against becoming ineffective owing to a few casualties. There are strong arguments in favour of a strength of a leader and eight men.

Next, the French report discusses the problem of whether normal formations should be laid down. It points out that the Regulations

of 1875 thought it wise, when introducing dispersed order, to determine normal formations for battle, applicable to all situations, and subject only to slight modifications. The later Regulations reacted strongly against this tendency, and gave entire freedom to commanders—freedom which has too often been synonymous with chaos. The report then proceeds to discuss the arguments against normal formations and distributions, above all that no two situations in battle are exactly similar. Wisely, however, the report stresses the fact that if the Regulation is written in such a wide manner as to cover every possible case, it will be so full of vague generalities and reservations as to be unintelligible to the bulk of officers; an accusation which can be levied against our own manuals, in the past at any rate.

The French point out that in any future war only a few will have had actual war experience and fewer still the ability to draw correct deductions from their experiences. In war an officer has often to take over a new command with which he is unacquainted and under difficult conditions; to act without full information and *liaison*. For these reasons, the report signifies that it was decided to illumine the text with diagrams of normal formations and distributions. All the reservations are then catalogued on the succeeding page of the report, and the pages of the actual Regulations left free of those bewildering and contradictory considerations and reservations which sap the initiative and befog the brain of the average officer. Experience of war tends to prove that more mistakes and disasters are due to ignorance and confusion than to too great definiteness. In battle it is better to adopt a formation or disposition which does not quite fit the situation of the moment and carry it out with resolution, than to hesitate, to lose direction, and fall into confusion. The writer has always pleaded for a more definite tone in the manuals, and for the introduction of a framework upon which the junior officer can develop his knowledge as his experience widens. Hence it is especially gratifying to find that the French authorities have recognized the need.

The next section deals with attack and defence. "The simple idea that all infantry fighting is conducted by a certain number of groups disposed chequerwise, beating the ground in front of them with fire and lending mutual support, frees the Regulation from all excessive discrimination between attack and defence. Besides, the combat is never offensive or defensive from beginning to end, but alternates between attack and defence. In either phase, the action of the group is practically the same.

It is the same idea which the writer emphasized in his lectures at the Royal United Service Institution and School of Military Engineering in November, 1920 and January, 1921. (See *R.E.J.*, April and May, 1921). When it has been made clear that there is no

fundamental dissimilarity between infantry attack and defence, the young leader's path to knowledge will be smoothed. So long as he thinks of the different phases of action as watertight compartments, his mind is moving in a fog. The only notable difference lies in the increased time and opportunity for selecting and preparing fire positions which is afforded to the defence.

The report next emphasizes that the Regulation uses the title "Defence of the Ground" for the part which deals with infantry in defence, because its authors wish to insist above all that the aim of the defensive attitude is to keep hold, in spite of the enemy, of a certain stretch of the ground, on which it has been previously resolved to stop him and to beat him. The Regulation is definite that for troops who have occupied a position there can be no so-called elastic defence by gradually ceding the ground to the enemy. That is retreat, not defence. It adds that the inviolability of any position rests in the quality of the defenders and their ability to form a complete network of fire rather than in the natural strength of the ground.

The report shows how the idea of the "group" as the basis of infantry tactics allows great elasticity in matters of organization. Inside the company the group is the only fixed unit. The strength of the group, thirteen combatants, remains invariable. If casualties occur, the number of the sections and groups may be reduced, but the strength of the actual group must never be appreciably reduced (*i.e.*, below ten). The Regulations are therefore framed in such a manner that they apply equally to the company with its full strength of 12 groups and to the company reduced, if necessary, to two sections, each of two groups.

The report then gives the reasons for dividing the Regulation into two distinct parts: "the technical preparation of infantry" and "infantry in battle." In this it reverses the attitude of previous Regulations; on the one hand, in order to avoid the bad results due to unimaginative officers who have tried to repeat in battle the precision and alignment of the parade ground; and on the other hand because some officers, regarding close order as mainly a method for use in the approach, have neglected its precise execution.

Some British officers would, however, be inclined to assert that we have suffered equally in recent times because our drill movements have borne no relation to those which are used in battle, during the approach in particular. Battalion commanders have been apt to concentrate on attaining perfection in the drill movements, the reason being that excellence in drill is much more easily discernible to the casual inspecting officer and thus credit is more easily gained. The better "field exercises" are carried out, the less apparent they will be to the inspector, and the less there will be for him to see. Thus, however well-intentioned the inspecting officer may be, there

is a natural tendency for him to base his comparisons to a large extent on efficiency in drill. As a result, too great a proportion of time is devoted to drill, to the detriment of field training. Moreover, a further danger lies in the retention of these antiquated drill and ceremonial exercises which were in former days applicable to battle. As they are the only parts of the soldier's training which have been repeated so often that they have become a habit, he is at a loss when he goes into battle, and is told to forget that to which he has become accustomed. As human nature in battle is apt to retain only that which has become instinctive, it happens that in moments of crisis men have been known to resurrect their parade-ground habits and advance in close-packed, strictly aligned waves.

The report emphasizes that the authors of the revised Regulation have taken particular care to do away with all connection between arms drill and firing exercises. Any attempt to insist on smartness and precision in firing exercises is forbidden. The method of executing the latter by command, and even assuming them in a regular manner, is suppressed. The sole method of fire in use is that of fire at will, individual or collective.

Collective exercises are divided into close-order drill, exercises for obtaining flexibility, *i.e.*, battle drill, and field exercises. The first two come within the scope of the first part of the Regulation, and the last within the second part. Close-order drill is regarded primarily as a means to cohesion and discipline. Precision and regularity of execution are the essentials. Its secondary purpose is by the medium of ceremonial to heighten the *morale* both of the soldier and of the nation at large which witnesses this side of the training. To achieve these aims the close order drill has been simplified and reduced to the fewest possible movements.

The *exercices d'assouplissement*, or battle drill, are for the purpose of quickening the power of manœuvre and increasing the mobility of units in field exercises and deployments. They are therefore executed on the briefest indication, or even signal, of the instructor. They are solely a form of gymnastics, and no tactical scheme is needed, nor should the regularity of close-order drill be aimed at.

Field exercises are the culmination of the training. In carrying them out, the aim must be to reconcile initiative and cohesion. A tactical hypothesis is always necessary, and one should use the ground as it is, not introduce imaginary modifications. Exercises should usually be carried out on the supposition that there are other similar units working on either flank, as will normally be the case in battle. In the writer's own experience it is a most common fault, particularly in the past, for small units when training to act as if they were isolated and had an unlimited zone of action in which to manœuvre. It is a dangerous fallacy and leads to officers attempting wide outflanking movements which would be impossible in battle,

whilst they fail to realize the problems of co-operation with the units which would be acting on their flanks.

The report then lays down that drill and field training should be taught to the recruit simultaneously and begin together. Each has its own disciplinary value. Moreover, the idea of direction is more important than the idea of alignment, which is only of use in parade movements, and should therefore be implanted primarily.

This reform is one which the writer has always advocated. It ensures that the inevitably monotonous instruction on the drill ground shall not cramp the soldier's initiative and intelligence during his most plastic period. The motive of his existence, that of combat, should be instilled into him by simple demonstrations and exercises at the earliest moment on joining, and kept before his eyes throughout all stages of his training. Again, first impressions are always the most abiding, and the dangers of an undue sense of alignment have been proved on many recent battlefields.

THE REGULATION.—FIRST PART.

Technical Preparation of Infantry.

The opening chapters of the Regulation itself deal with the general system and scheme of training. Though interesting, they contain little that calls for notice in this brief survey. They differ only in detail from our own Regulations. Chapter VIII, "Definitions and General Rules," contains one or two points of interest. It is laid down that extended points of direction beyond the allotted objective should be given in order to ensure the exploitation of unexpected successes after the rupture of the first positions. In the encounter battle particularly, it is almost impossible for commanders to fix objectives beforehand which will be proportionate to the capacity of their sub-units, for they are inevitably ignorant as to the resistance which the enemy will offer at any particular point. This measure should certainly tend to avoid the danger that unenterprising subordinate commanders may rest on easily gained objectives, and let slip opportunities for further advance.

Again one notes that definite sectors or "zones of action" are restricted to battalions or higher formations. Thus the company or "section" can manœuvre freely within the battalion zone, taking full advantage of covered approaches and gaps opened by the progression of neighbouring companies or sections.

Chapter IX deals with the composition of the regiment, which comprises several battalions, usually three. The battalion consists of a headquarter group, three ordinary companies, a machine-gun company, a section of accompanying weapons (mortar and accompanying gun).

The ordinary company at war strength is composed of a head-quarter section and four combat sections. In peace it is generally reduced to three. The section is normally composed of three groups, if there are sufficient effectives. The group consists of an *équipe* of automatic riflemen and an *équipe* of riflemen composed thus :—

Personnel.	Armament.
1 N.C.O. chief of the group	Rifle
Équipe of Automatic Riflemen.	
1 Corporal chief of the *équipe*	Carbine
1 Firer	Automatic rifle and pistol
1 *Premier pourvoyeur* (feeder)	Pistol
3 *Aides-pourvoyeurs* (carriers)	Carbines
Équipe of Riflemen.	
1 Corporal chief of the *équipe*	Rifle
1 Grenade-thrower	Carbine and pistol
1 Rifle grenadier	Rifle
3 *Voltigeurs* (Riflemen)	Rifle

A British officer will probably prefer the division into four sub-units throughout the organization of infantry. An even number of sub-divisions is more convenient for reliefs and simplifies the task of the officer in learning how to apply the principle of economy of force in the distribution of his sub-units according to the different situations of battle. Changes in command are rapid in battle, and the platoon commander of the morning may be commanding the battalion before nightfall. The uniform four sub-unit organization diminishes the points of difference in the tactical handling, and so makes it simpler for officers to fit themselves to take command of higher units when called upon. It enables us to condense our Regulations and to create a framework of principles common to all degrees of units, so smoothing the path of the average officer whose memory is apt to be indifferent and whose habit of thought is liable to become confused.

DRILL.

The new French system of drill is a model for all armies. Nothing more workable and simple could be wished for, apart from the question of organization which we have just discussed. All movements in line are abolished. They are obsolete in war and much valuable time is wasted in learning the strict alignments and changes of direction, apart from the dangers of instilling habits which have often proved disastrous in battle. Alignment is, above all, the one habit for individuals and groups to avoid in battle. Line is only used in forming up for inspection and for moving a few paces to a flank with the rifles at the trail. In order that the line can move off in

column at a simple "right turn," a new method of measuring the interval between men is introduced. The distance between two men marching in column must be a yard, and therefore the interval in line is the same. This interval is obtained by each man extending his left arm to touch the shoulder of his neighbour on the left.

The Drill of the Group.

The group assembles either in line or in column. If in line, the *équipes* are side by side, forming a single rank (*Figs.* 1 and 2), or one behind the other, forming two ranks. The automatic rifle group is normally on the right in the first case and in front in the second case.

If in column, each *équipe* is in single file. The group may be formed in *column by one* with the automatic rifle group leading (*Fig.* 3); or in *column by two* in which the two *équipes* are side by side, the automatic rifle *équipe* normally on the left. The group normally marches in *column by one* or *by two*; these formations are equivalent to file or single file respectively. As can be seen, it only requires the simplest command and movement for the group to change from one formation to another, to increase the intervals between the *équipes*, or to deploy it into *skirmishing line* at five paces interval.

The critic will note that the *équipe* marches in single file (*colonne par un*) and fights in extended line (*en tirailleurs*). Single file, however suitable for moving along any defile, has the objection that men have a tendency to follow the leader blindly without troubling to see where they are going. Thus they lose the sense of direction. Both on this score and that of vulnerability to fire, *arrowhead* formation, which was advocated by the writer in his lecture at the R.U.S.I. in 1920 and is now authoritative (*vide Infantry Training*, 1921), is surely preferable. As a fighting formation it is no more vulnerable than extended line. It is capable of fire to any direction; each man can see where he is going; whilst the leader, being at the head, can guide it to take advantage of cover or to move obliquely to outflank an enemy post.

Drill of the Section.

The section assembles normally in *line on three ranks* (*Fig.* 4), or in *column by three*. In the former case the groups are successively behind each other at a distance of a yard. This can be changed to *column by three* on the command "Right (or left) turn." The latter is the normal formation for movement. A change of direction is effected by the commander extending his arm towards the new direction and if there is an obvious mark, giving the order "Direction (such a point)."

In battle drill hand signals are used as far as possible instead of commands

It is interesting to note that the definition of the section, as the smallest unit capable of manœuvring from two directions concurrently, is identical in idea with the definition given by the writer in the lecture previously referred to, and in *Infantry Training*, 1921.

THE DRILL OF THE COMPANY.

The company is normally formed :—

(i) In *line of sections by three*, the flank of each section being six paces interval from the next (*Fig.* 6).

(ii) In *double column*, which is equivalent to our square formation. Two sections are on each flank, one behind the other, each section being in *column by three*. Intervals and distances are six paces (*Fig.* 7).

(iii) In *column by three*. The sections, each in *column by three*, are one behind the other at three paces distance. This is the normal column of route (*Fig.* 8).

The simple movements which are needed to change from one formation to another can be deduced by the reader, without the need for tedious explanation.

In battle drill the company is exercised by modifying these formations according to the ground, in deploying the sections, and in varying slightly the direction.

THE DRILL OF THE BATTALION.

In close order and battle drill the machine-gun company acts as a fourth company. The section of accompanying weapons moves with it.

The battalion is normally formed :—

(i) In *battalion column*, with the companies one behind the other, each in *line of sections by three* (*Fig.* 9).

(ii) In *column by three*, with the companies one behind the other, each in *column by three*.

(iii) In *double column*. The companies are each in *column by three*.

(iv) In *line of columns*. Each company is in *line of sections by three*.

The battalion manœuvres in drill similarly to the company. In battle drill the commander gives his orders by voice, hand-signal or message. In the latter case he can give the signal for carrying out the instructions by a long blast followed by a short blast of the horn.

SECOND PART.

Infantry in Battle.

The introduction points out that the twofold aim of infantry, reduced to its simplest element, is either (i) to advance in spite of the enemy, in order to disorganize his dispositions and destroy his power of resistance; or (ii) to prevent the enemy advancing by holding the ground that one has occupied or wishes to acquire.

The aptitude for passing instantly from the offensive to the defensive attitude, or inversely, in the course of the same combat must be developed in the troops so that it becomes instinctive. The lower one descends in the scale of units the less difference there is in the two forms of action. This is the lesson the writer stressed in his R.U.S.I. and S.M.E. lectures when he declared that the defence is only the attack halted; that every infantry unit which halts its advance is capable, on account of its open and self-contained formation, of offering an immediate resistance to hostile attack or counter attack; it is a human tank possessing both offensive power —its weapons and mobility—and protective armour—its open formation preventing surprise.

From the moment when contact is made, its maintenance becomes the vital factor in security. For every small unit, the first requirement in exploiting success is to keep contact with the enemy in the direction assigned.

The Regulation insists that though fire is preponderant, it is always necessary for infantry to "*agir par le mouvement.*" This truth cannot be too strongly insisted upon. If fire alone could win victory there would be no place in modern armies for infantry; the auxiliary arms can supply a far more potent fire. But infantry can carry its fire to close quarters and supply that tangible human threat which causes the enemy to run. Important as is fire for paving the way for the infantry advance, it is in the legs of the infantry that the decision rests. For this reason some would oppose the allotment to infantry of weapons which may induce it to rest content with firing on the enemy from more or less stationary positions. If the automatic rifle or Lewis gun is to be allotted to platoons it must surely be treated as an essentially mobile weapon which must neither be allowed to hamper the pace of the infantry groups, nor indulge solely in more or less distant covering fire. The latter tendency would appear not to be confined only to the French.

The Regulation decrees that infantry units in attack should continue to advance even though units on their flanks are checked or delayed. This is qualified by the proviso that they must use their reserves to hold the gaps which their quickness of advance creates on the flanks and must halt when they can no longer ensure this. It appears to the writer that there lurks herein a danger of hindering

the initiative of the infantry units in exploiting the soft spots which they find or make. If they are so concerned with their flanks it is probable that the speed of their advance will slow down so quickly that the advantage of the attack and surprise will be lost. Such a method of attack as the "Expanding Torrent" put forward in the lecture previously referred to should discount the danger to the flanks and reconcile speed with security.

(Compare also *Infantry Training*, 1921, Section 35, paras. 13–14.)

In discussing the question of *liaison* the Regulation decrees the use of *liaison* agents. Every infantry commander, even down to the group commander, who employs his file-closer or senior soldier, details a *liaison* agent to keep him in touch with the situation and progress of his subordinate units.

This also is an idea long advocated by the writer, though it is omitted from *Infantry Training*, 1921, as issued. Officers of far greater experience have confirmed this belief, stating that in their experience junior commanders are too busily occupied at the important moments to give their first thoughts to sending back reports. A *liaison* agent means a saving of vital minutes in exploiting a sudden success or meeting an unforeseen danger.

In the part dealing with the employment of the infantry weapons the writer notes with surprise that the rate of fire expected from the French rifle is a maximum of ten shots a minute. The possibilities of an effective rate of fifteen shots a minute has been proved so often in the British Army that one feels that the French authorities are content with too low a standard. Possibly this explains the reason for their making the rifle a mere auxiliary to the automatic rifle.

The Regulation, like *Infantry Training* 1921, as issued, treats the automatic rifle merely as a means for supplying covering fire from the front. The writer, like many others of greater experience, is of the opinion that it should be regarded as a weapon of mobility. Where covered routes exist, the greater surprise and enfilade effect of the automatic rifle may advantageously be used for outflanking. In any case, even if it is used for fixing by fire whilst the rifle *équipe* outflanks an enemy post, the former should endeavour to progress ever closer to the enemy by bounds. There must be the threat of a forward spring in order fully to fix the enemy's attention.

The writer is surprised at the almost complete disregard in the Regulation of the possibilities of the smoke grenade for blinding enemy posts, and incidentally economizing ammunition.

Titre I.—General Characteristics of Infantry.

The Regulation divides the types of terrain into three classes:—

(i) Free of artificial obstacles.

(ii) Partially covered by improvised defences.

(iii) Fully covered by field fortifications.

In each case the method of attack is to progress from objective to objective in the assigned direction. The combat really consists of moving the infantry from one *base de départ* which it has consolidated to another base, from which it will make a similar bound.

The Regulation divides the combat into four principal phases :—

(i) The approach.
(ii) The establishment of contact.
(iii) The attack, including the assault.
(iv) Consolidation or exploitation.

The French doctrine on these phases is as follows :—

1. The approach has its place either well in advance of the contact between the rival infantries or well behind the troops already in contact. In the approach, infantry does not make use of its own fire, either because it suffers little or nothing from enemy infantry fire, or because it has friendly troops in front. On the other hand it takes full precautions against artillery or aeroplane fire.

2. The phase of making contact entails the units of the advance guard deploying in order to reply to enemy fire. They reconnoitre the enemy by fighting, making progress by combining fire and movement, infiltrating between and outflanking the scattered resistances of the enemy, to break through his protective screen in order to locate definitely his main resistance. Then at last contact is truly made and a methodical attack follows in co-operation with artillery and tanks.

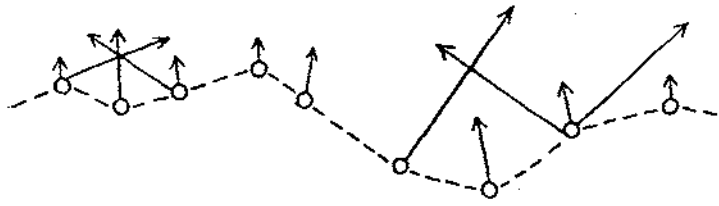
3. The attack is a combined operation aiming at the rupture of the resistance with which contact has been made. In the special case where the preceding phases have established the opposing lines at a short distance, the assault takes place at the start of the attack. It is made after thorough preparations, from a jumping-off position. The dispositions should ensure that the attacking troops debouch by surprise, in good order, and as a whole.

In the normal case the assault is a small local act constantly repeated. The centres of resistance are distributed both in breadth and depth. Thus the attack is a progression by the use of fire, intermingled with local assaults and continuing until the allotted objective is gained. The writer feels that the pre-war idea of a general assault was false to reality, and led to many costly failures. Assaults are better, because quicker, delivered by groups or sections than by battalions The opportunity for assault is momentary and must be instantly seized. A general assault allows this moment to be lost.

The French Regulation continues :—

The difference between the approach formation and the attack formation is that in the former case the aim is to avoid loss from fire, whilst in the latter the object is above all that the leading troops

should provide all the necessary fire to pave the way to their advance. The attack formation comprises firstly an *echelon of fire*, corresponding to our *forward body*. Behind the *echelon of fire* come the *reserves* distributed in one or sometimes two echelons. Even the *echelon of fire* possesses a certain depth. The groups form a very irregular line, presenting salients and re-entrants.



Thus the groups can flank and mutually support each other. In deciding how many groups to allot to the echelon of fire, the essential is that the whole frontage should be covered by fire. The groups of the *reserve* will be disposed chequerwise to cover the intervals in the *leading echelon*. As groups in this echelon are put out of action they should be replaced from the reserve. At every halt in the advance, the immediate and automatic duty of each commander is to organize a system of cross-fire to form a complete barrage in front of him. Every commander down to the company, at least, should keep in hand a portion of his force as a *reserve* and should reconstitute it as soon as possible when they have been used. The purpose of the *reserve* is to ensure continuity of effort and to maintain the combat by reinforcements and replacements; to correct mistakes of direction by filling up gaps which result; to re-establish as intended a manœuvre which has gone astray; to give to the fractions which are engaged a certainty of being backed up; to exploit success to the full. In principle every unit that is engaged ought to pursue its effort to the full limit of its offensive capacity. It is the part of the command to judge whether the momentum of advance can best be maintained by relieving a leading battalion by one from the reserve, or sometimes one company by another. Inside the company, however, the groups are not relieved. The momentum of the advance is maintained by the gradual fusion of the *reserve* into the *echelon of fire*. Reserves should be pushed in where the enemy is giving way, not by piling up an accumulation of men in front of intact defences, which causes disorder and increased casualties.

In commenting on these otherwise excellent precepts, the writer feels that there is too much insistence on the idea of reinforcement for the smaller units. In the British Army, at least, the experiences of the battlefield have been so bitter that they have inspired us with a horror of that dreadful phrase "building up the firing line." We have learnt at an awful cost the futility of crowding more men in

the echelon of fire which simply resulted in putting forward men's bodies to stop bullets, without any gain. Manœuvre, not reinforcement, is our password even in the case of platoons. Direct reinforcement does not produce so great a moral effect as a diversion from a flank, either on the enemy or the troops reinforced, whilst it allows the fresh troops to catch the infection of discouragement from those whom they reinforce.

It seems fallacious to suggest that the section (platoon) commanders do not need a reserve. Against a resistance distributed in little posts there are many opportunities for infiltration and outflanking for which a "section" reserve is needed.

The fourth purpose of the reserve is worthy of note. Infantry who are well led will forget self, will risk the sacrifice of their own lives by advancing to close with the enemy, but only so long as they feel that other troops are coming on to back them up. It is the feeling of isolation which undermines *morale*. Man, if he sinks self in forming a part of a team, wants to feel sure that the rest of the team will do their share, not leave him to bear the brunt alone; that, when he has spent himself to make an opening, the others will relieve him of the burden. Every group should be able to see near at hand another unit in support. Better still, let this body support him by diverting the enemy's attention in another direction. The sentence "every unit ought to pursue its effort to the full limit of its offensive capacity" is even more weighty. In battle the only true objective is the enemy. It is a direct violation of economy of force to limit the advance of unexhausted units which can find soft spots and can press on with little opposition. The companies and smaller units should press on to gain the battalion objective, their objective being the only true one—the enemy, wherever they find him in their path. It is no longer necessary to advocate this reform against the opposition of the limited objective, as since *Infantry Training*, 1921, has been published it is now authoritative (compare section 36, para. 25, and section 37, para. 8).

The French Regulation continues: "when the objective has been gained, the infantry clears it of the enemy, occupies it, organizes it, consolidates it and maintains contact with the enemy in the direction assigned. The exploitation of success takes the form of fresh combats of reconnaissance if the enemy retires in good order, or if he retires in disorder pursuit without respite aiming at his complete disorganization and capitulation."

The Regulation goes into little detail, however, and, in fact, rather neglects the subject. The pursuit is apparently to be carried out by the troops who have just gained the objective. The writer has always contended that, if the troops who carried out the assault have to be reorganized for pursuit, an inevitable delay will

occur, as also if a separate battalion under a different commander is used. Hence, a fresh body, but one which is under the control of the commander who has captured the objective, should be used for pursuit. For this purpose the battalion reserve should be used. It should continue to press the advance until fast-moving troops of another arm, or else another battalion, has caught up and passed through it to carry on the pursuit. In this way a relentless pressure on the yielding enemy will be maintained so that his retreat may rapidly spread and gain momentum. (Compare also *Infantry Training*, 1921, Section 35, para. 10, iii.)

TITRE II.—THE OFFENSIVE COMBAT.

The general principles are almost wholly admirable, coinciding largely with those on which *Infantry Training*, 1921, is based. In one paragraph, however, it is laid down that the assault cannot be made until superiority of fire has been gained. This smacks of the pre-war idea of a general fire fight from a definite halting-place preceding a general assault. A temporary slackening of fire from the enemy *points d'appui* may come from many causes besides the actual fire of the attacking infantry.

The artillery fire, the intervention of a tank, or the use of smoke may afford the opportunity for the small local assaults which are characteristic of modern battle. Would it not be better to say that "the enemy's fire must be temporarily subdued." In the report the correct idea was instilled.

It is to be regretted that the Regulation does not emphasize the fact that the security of the small infantry unit in battle rests in particular in a protective formation being adopted. The danger of local surprise, by fire or counter-attack, is ever present during battle. An open formation in diamond or in two echelons which ensures security is therefore as vital for the small unit during the attack as it is for the larger unit during the approach.

The new French organization of command places an officer, the *Infanterie Divisionnaire*, in charge of all the infantry of the division, responsible to the divisional commander. This idea appeals to one as being very sound. It relieves the divisional commander of the multiple responsibility which is his in the British Army. In the opinion of the writer it is too much for one commander to deal directly with three brigades of infantry as well as with the artillery and the other services.

THE BATTALION IN ATTACK.

The ordinary rifle companies carry out the attack. The duty of the other elements is to reinforce their fire and generally to support

them. The companies are rarely allotted definite zones of action. It suffices to give them points of direction and successive objectives. Then they can pass their reserves through gaps made by the neighbouring units. The formation of approach is usually *lozenge*, or as we should term it, *diamond* (compare *Infantry Training*, Section 18, para. 4, and lectures), with one company leading, reinforced by some machine-guns. The two other companies form a second echelon flanking the first. The bulk of the machine-gun company follows in rear as a third echelon. When the front to clear and cover is unduly broad, the battalion advances in *double column*. A normal frontage for the battalion in the approach is 1,000 metres, and a depth of 1,500 metres. The attack formation will normally be two companies forward and one in reserve. The machine-gun and the accompanying weapon sections will be with one or the other echelon, or behind the reserve, according to their tactical mission. The reserve company will move either in the centre of the battalion sector or on one of the flanks, if it is desired to use a covered approach, guard a flank, or be ready for manœuvre against a weak point. The frontage allotted to a battalion will vary from 300 metres, against a well organized position, to 800 metres. If the frontage is narrow, the ground flat and bare, or if the resistance is likely to be weak, only one company may be forward. The Regulation gives sound reasons for using the reserve for manœuvre instead of direct reinforcement. It is difficult to understand why these reasons should not also apply to the use of the company and section reserve.

The writer regards the frontages mentioned as too narrow, in view of the lessons of the late war. Where the enemy are strongly organized it is useless to increase the density of the attackers. Increased casualties without any compensating gain are the only result. Highly organized defences must be countered by an increase of artillery and tanks, not by reducing the frontage of the infantry units. (Compare *Infantry Training*, Section 39, para. 2, and lectures).

The Company in Attack.

As in the case of the battalion, the approach formation will normally be *diamond* (*Fig.* 10). The elements of the leading section acting as point can be pushed 300 metres ahead of the other sections. *Double column* (*Fig.* 11) is suitable for a wide frontage or ground which is difficult to explore. When the company is reduced to three sections a *triangle* formation is used. A *triangle* formation with three sections forward and one in reserve is suitable when the frontage is exceptionally wide or a great power of fire is likely to be needed at the start of the action. (Compare *Infantry Training*, Section 37, para. 2, and lectures.)

The attack formation is normally in two echelons, the *echelon of fire* and the *echelon of reserve*. The number of sections allotted to the echelon of fire will be based on whatever strength in automatic rifles the company commander judges necessary to obtain superiority of fire on the whole of his front. On a narrow front and against a weak enemy one section will be in the *echelon of fire* and three in *reserve* (*Fig.* 12). In the normal case two sections will be in the *echelon of fire* and two in *reserve* (*Fig.* 13). In the absence of tanks, when infantry ought to obtain superiority of fire without waiting for artillery support, three sections should be disposed in the *echelon of fire*. (Compare *Infantry Training*, Section 37, para. 2, and lectures.) The frontage allotted to a company will be about two hundred metres. The company commander will gradually fuse his two echelons into one as casualties increase, in order to maintain the force of the attack.

It rests with the battalion commander to judge whether he ought to reinforce the company or replace it with another unit.

The writer is of opinion that a company numbering 160 men is too strong to advance on a 200-metres frontage against modern fire from organized positions. A few groups are quite as effective in exploiting the effects of the artillery fire or tanks without suffering nearly so great losses. As infantry fire power will not suffice to capture such positions, it is best to expose as few men as possible in following up the advantage gained by other arms.

We see here again, in the case of the company, that the idea of reinforcement is put before the idea of manœuvre. Surely this is unsound doctrine. Throughout the Regulation there is scarcely any insistence on the use of penetration and outflanking, or explanations as to how it should be carried out. The formations laid down for companies in the second and third echelon are *diamond*, *double column* (*square*), *chequer* and *trapeze* (*Fig.* 14), to guard flanks, *triangle*, or *in echelon with one flank leading* in order to cover an exposed flank or connect two units which have made unequal progress (*Fig.* 15). The commander always moves at the head of his unit if it is in the rear echelons.

The Section in Attack.

The 150-metres frontage of the French section in the approach may be compared with 200–300 metres allotted even in the attack to the English platoon, which is smaller. For the approach the section commander disposes his three groups *in succession*, *abreast*, or *in triangle*, according to the frontage to be covered. The formation with groups *in succession* is the easiest to lead through woods, at night, or to take advantage of a covered approach (bottom, *Fig.* 10).

The formation by groups roughly *abreast* at 25-metre intervals is the least vulnerable to shell or distant machine-gun fire (top, *Fig.* 11). The *triangle* most nearly reconciles both needs and leaves a reserve in hand (bottom left, *Fig.* 11).

In attack the *triangle* formation with two groups forward is normal (top right, *Fig.* 13). The formation with all three groups abreast is in practice little different, because of the fluctuations of the pace caused by ground or fire (top, *Fig.* 12). It is suitable when the full fire power of the section is needed at once, or when the section is closed up to avoid the enemy's barrage in a position warfare attack.

The Group in Attack.

The rôle of fire is fulfilled in particular by the automatic rifle *équipe* and the rôle of movement and protection by the rifle *équipe*. During the approach the group advances generally by large bounds, carried out by the group as a whole. It is made in *column by one* or *by two*, or even deployed by *équipes* in *column by one* (*single file*). When the aim is to make contact with the enemy, the leading groups act as patrols, with the rifle *équipe* at the head. In the other groups the automatic rifle *équipe* leads, ready to open fire if an engagement occurs unexpectedly. In attack there is no normal formation for the group. Any disposition can be adopted or altered according to the needs of the moment. Deployment in skirmishers in either one or two ranks is recommended as most suitable in a trench attack or behind a rolling barrage. In the *équipes* themselves the disposition of the men depends on their functions; in the case of the automatic riflemen, to best serve the gun; in the case of the rifle *équipe* the men are more or less together or dispersed, with the two grenadiers acting as riflemen, unless they are told off to use their special weapons.

The sole essentials in every case are:—

(i) To rally always to the group leader.

(ii) To move at least at the intervals indicated in order to reduce the target; to avoid collecting save behind good cover.

(iii) For men who are ahead of the automatic rifle, to avoid masking its fire.

Normally the manœuvre necessary to take any centre of resistance will be carried out by several groups. On the other hand, the division of the group into two *équipes* makes it capable in some degree of itself exploiting by movement the effects of its fire. The two *équipes* co-operate at all times to the common advantage. Generally the rifle *équipe* exploits by movement the effect of the automatic

rifle's fire; though sometimes the latter *équipe* will itself exploit this effect and progress without waiting for the riflemen. At another time the rifle *équipe* can produce by a sudden concentrated fire a similar effect, to the profit of the rest of the group. In other cases this exploitation will not result from the action of the group itself, but from that of another group. Save when their personal security is at stake, or when they have every chance of knocking out one of the enemy who offers a good target, the men of the group never fight on their own, but always as a team for the attainment of the common mission.

THE DEFENCE OF THE GROUND.

The general principles of the defensive combat are wholely admirable and are expressed with the clarity of expression which is peculiar to the French genius. They are, however, so nearly similar to our own doctrine that it is unnecessary to dilate upon them.

The troops of the defence are divided into :—

(i) The troops for security, or outposts, who fight on the position of security.

(ii) The *gros* or main body, who defend to the finish the principal position of resistance.

(iii) The general reserve, placed on the barrage position and in rear.

Great importance is attached to the detailed preparation and rehearsal of all possible moves beforehand to meet an attack when it comes. It is excellent to note how the interchangeability of the rôles of attack and defence is constantly stressed.

One is struck by the omission of any reference to the use of observation posts by infantry units. Surely these are of great value in enabling commanders of rear echelons to keep watch on the situation in front. Sections or companies detailed for immediate counter-attack are thus enabled to intervene at the right moment. Turning next to the question of outposts, divided into an *echelon of surveillance*, an *echelon of combat* and an *echelon of reserve*, the writer disagrees with the idea put forth that the posts of the *echelon of surveillance* should fall back. He contends that actual experience proves that these posts cannot disentangle themselves and retire on the echelon behind without causing confusion, particularly in the dark. Troops who retire from any position which they have taken up must rally and reorganize behind another position of defence before they are in a condition to offer any effective resistance. When it is desired that the *echelon of surveillance* should fall back they should

be composed of patrols, not of fixed posts. Such an arrangement maintains the idea that infantry who have consolidated posts should not retire. Posts are likely to hold on too long and so mask the fire and confuse the resistance of the echelon in rear when they fall back.

The writer finds in the part dealing with the dispositions in defence a similar idea to his "contracting funnel" method of defence. Just as manœuvre from a flank is far superior to frontal attack in its moral effect, so manœuvre fire which enfilades the enemy is the most damaging to the attackers' morale, and also in its material effect. It represents the principle of surprise. Thus the aim should be to dispose the posts of the defence so that the attacking enemy is encouraged to penetrate into channels in which he can be raked by flanking fire. A means to this end is to place the posts of the reserve echelon on the flanks of the natural channel of approach to form gradually contracting funnels. Thus, the further the attacker penetrates the more resistance he encounters and the more confined becomes the space in which he can manœuvre. (Compare also *Infantry Training*, Section 44, para. 2.)

In the prescriptions of the French Regulation upon the use of the reserve, it is curious that they place more reliance on stationary fire and less on counter-attacks than we do.

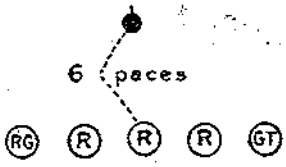
The writer regards as unsound the doctrine set forth in the Regulation that the reserves should be distributed over the ground in groups and sections and occupy posts. If a counter-attack is to be successful it must be immediate, and to collect the infantry groups from these posts will surely take too long and so allow the right moment to pass. He considers it better that they should consolidate section (platoon) posts, preferably on a flank, and then be consolidated near by. Then, if the enemy break through the forward position quickly and on a broad front, they can occupy their position and take him in flank by fire; otherwise they can deliver an immediate counter-attack to throw him out of the lodgment he has made, or manœuvre to close the flanks of the breach by fire from temporary positions. The writer advocates that the battalion should be distributed in three echelons, a *forward echelon of resistance*, a *counter-attack echelon* which can occupy its position if advisable, and lastly, a *final echelon of resistance* in case the counter-attack fails. This last will serve as a rallying place. If the forward and counter-attack echelons fail to fix and break up the enemy attack, it will be the duty of the rear echelons to fix him in order to allow the superior unit to decisively manœuvre against him. (Compare *Infantry Training*, Section 36, para. 31, and Section 48.)

In summing up his impressions, the writer would direct his main criticisms against the doctrine of the all-importance of the automatic

rifle in the fighting unit of infantry; against the retention and insistence in the idea of reinforcement; against the lack of attention paid to the subject of manœuvre; finally, against the undue repetition which tends to confuse the reader and occasionally leads to one paragraph contradicting another. The writer's special admiration is rendered to the supple and simple drill formations, to the soundness of the underlying principles, and to the crisp and easily understandable manner in which the whole Regulation is written and illustrated.

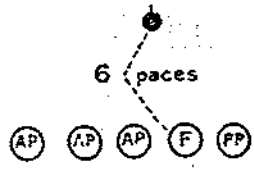
January, 1922.

FIG. 1.



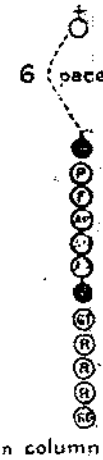
Equipe of riflemen (voltigeurs) in line of one rank.

FIG. 2.



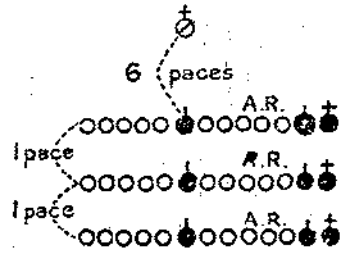
Equipe of automatic riflemen (fusiliers) in line of one rank.

FIG. 3.



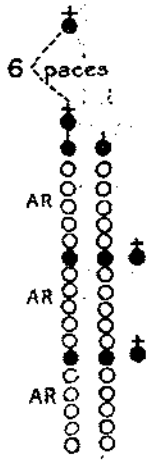
Group in column by one.

FIG. 4.



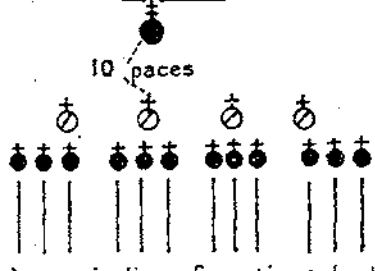
Section in line on three ranks (on command 'Right turn section' is in column by three)

FIG. 5.



Section in column by two.

FIG. 6.



Company in line of sections by three.

FIG. 7.

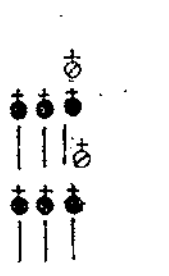
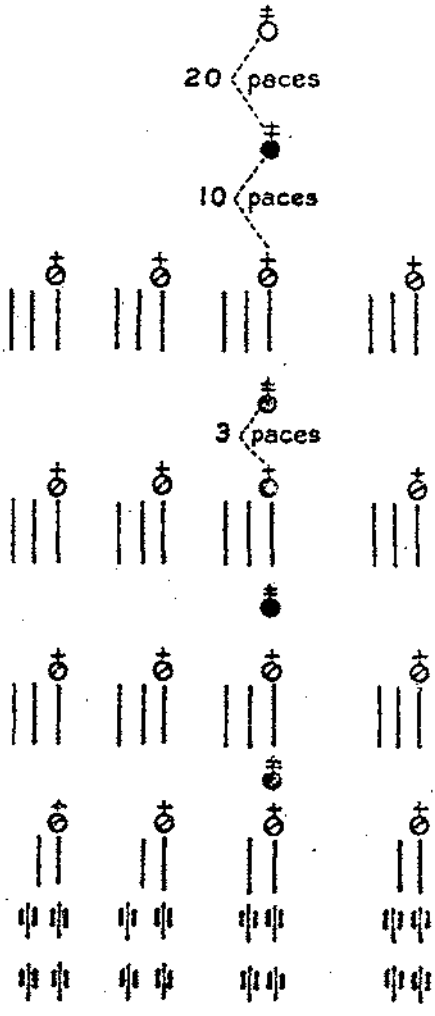


FIG. 8.

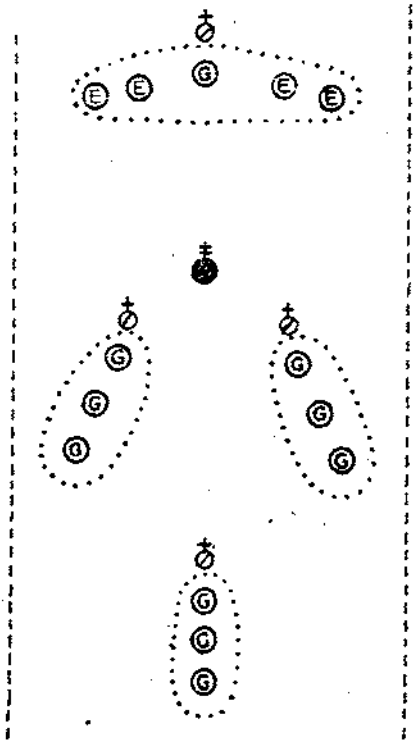
Company in column by three.

FIG. 9.



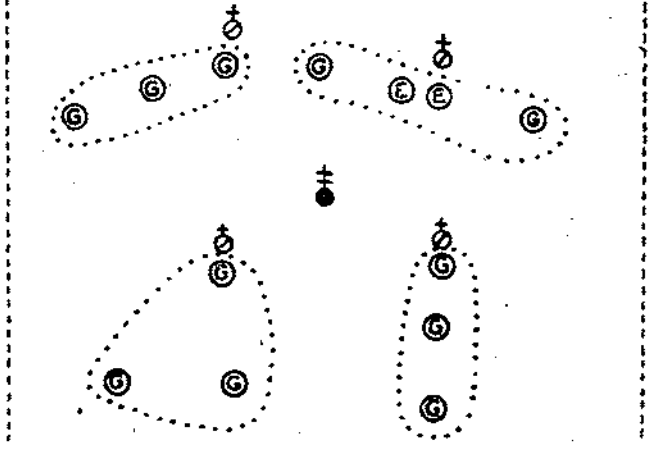
Battalion column.

FIG. 10.



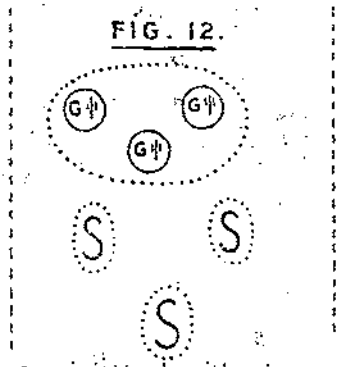
Company in Lozenge (approach)

FIG. 11.



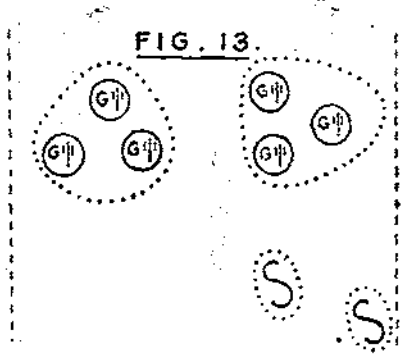
Company in double column (approach)

FIG. 12.



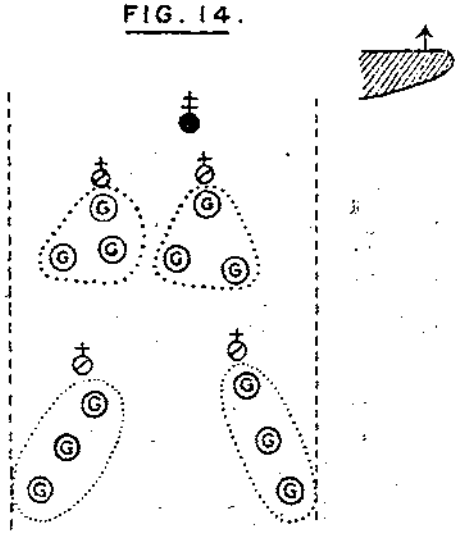
Company in attack with one section in echelon of fire and three in reserve.

FIG. 13.



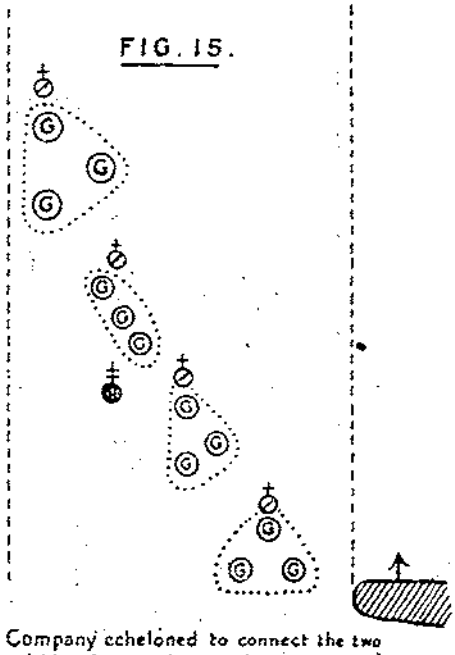
Company in attack with two sections in echelon of fire and two in reserve

FIG. 14.



Company in the 2nd or 3rd echelon in trapeze (approach formation)

FIG. 15.



Company echeloned to connect the two neighbouring who have made unequal progress.

*THE FALL OF NOVO-GEORGIEVSK.**

As in the case of Antwerp and Maubeuge, there are now accounts of the attack and defence of the old Russian fortress of N.G. from both belligerents. From the German side there is the recently published official account;† and from the Russian the book of General Basil Gourko, ex-Chief of the Russian Imperial General Staff.‡

The German account is well got up with maps and photographs, like the Antwerp volume; but, unlike it, it is a vain-glorious and popular account of little military value—at any rate, engineer military value: it is full of stories of individual acts of daring, but does not contain any description of the fortress or its defences.

The photographs, except for one view of concrete casemates under a parados, show the older inner forts, built in the 'sixties. Perhaps the reason for this is that the so-called forts were hopelessly out of date, built in the 'eighties, after the Russo-Turkish War, and at best only of the Twydale-redoubt pattern, subsequently favoured by Lord Sydenham and, even with acres of wire entanglement, not storm-proof.

N. G. stands at the junction of the Narev with the Vistula, and, with Warsaw and Zegrgie, it once composed the so-called "Polish fortified triangle." After the Manchurian War proposals were put forward to reconstruct these fortresses and bring them up to modern requirements—to form a great *Feste*, on the German model, and N. G. was to have had a new belt of forts. In a characteristic Russian fashion, operations were commenced by destroying the existing forts of Warsaw and Zegrgie; and it was in this state that the War found these two fortresses, whilst N. G. was exactly as it was in 1891. How far the story is true I do not know, but I was told in Warsaw in that year that, in the lay-out of N. G., the town of Modlin, at the junction of the rivers, was destroyed, its inhabitants removed, and the citadel built in its site. It is, however, borne out by the German map, which shows a closed enceinte, marked N. G., only about 2,000 yards across, with the citadel inside, and no town whatever. The outer line of defence, the redoubts, or forts, as the German

* The name is shortened to N.G. throughout this account.

† "Die Eroberung von N.G." Herausgegeben unter Mitwirkung des Reichsarchivs (Oldenburg, Stalling, 25 Marks).

‡ "Memoirs and Impressions of War and Revolution in Russia, 1914–1917" (London, Murray, 18s.).

account calls them, was from 5,000 to 7,000 yards from the citadel, and inside it was a belt of older forts, about 3,000 yards from the central point. The country is flat, marshy and thickly wooded.

General Gourko states that in 1914, the "greater part of the garrison consisted of militia brigades, which, at the commencement of the War, were utilized solely for the construction of field positions. It was only a short time before the surrounding of N. G. that they were used for operations in the field. The militia was made up either of older men, or of men who had not served the usual three years in the Army, having been exempt on account of family reasons." The officers were elderly men, taken from the Reserve. The brigades were organized as two infantry divisions, and the Commandant of the fortress was a cavalry officer.

The general advance of the German-Austrian Armies in the great offensive of 1915 brought them in July level with N. G. A force, under General von Beseler (lately dead, an engineer officer, in 1908 Inspector-General of Engineers and Fortresses), who had commanded at Antwerp, was detailed to invest the fortress and capture it as soon as possible. This force consisted of improvised formations, mostly *Landwehr* and *Landsturm :*

Dickhuth-Harrach's Corps : Composed of 18 battalions, 15 machine-gun companies, 4 squadrons, 19 batteries of various calibres, 2 engineer companies, etc. ;

Pfeil's Mixed Brigade : 14 battalions, 1 machine-gun company, 1 squadron, 7 batteries, 2 engineer companies, etc. ;

14*th Landwehr Division* : 9 battalions, 5 machine-gun companies, 1 squadron, 16 batteries, 1 engineer company, etc. ;

169*th Landwehr Brigade* : 6 battalions, 2 machine-gun companies, 1 squadron, 3 batteries, 3 engineer companies ;

Westernhagen's Group : 11 battalions, 5 machine-gun companies, 1 squadron, 8 batteries, 2 engineer companies, etc.

Some 80,000 fighting-men in all.

Of "heaviest artillery" there were five 16-in., nine 12-in. howitzers, and one high velocity 5·9 in. gun : of heavy artillery, 45 8-in. howitzers, eight 8-in. mortars, four 5·9-in. guns, and twelve 4·8-in. guns, besides two 9-in. trench-mortar companies. For observation, there were two balloon sections and one aeroplane squadron.

The Germans, at the very start, had an extraordinary piece of good luck : as the advanced guard approached N. G., the Chief Engineer of the fortress and his staff officer—whilst reconnoitring with all the plans of the defence—ran into a patrol in his motor-car, and was captured.

Leaving a screen only on the western side of N. G., the investing force extended first north and north-eastwards, and then south-

ward of it, thus acting as flank guard on the sides of the fortress for the advancing armies. The northern party had fighting on the 26th July with rear guards of the main Russian Army, but the southern did not make much progress until Warsaw was evacuated on the 5th August. There was also some delay in closing round the eastern side, owing to three old barrier forts near the Narev, some ten miles east of N. G. having to be captured, for which purpose heavy artillery had to be brought up; but on the 10th August the investment was complete, the garrison having made no attempt to interfere.

General von Beseler, for railway transport reasons, decided to attack from the north-east (Forts XIV–A, B and C; XV–A and B; and XVI–A and B) and to follow the same policy as at Antwerp, *viz.*, to concentrate artillery-fire on a narrow sector of the defences and destroy them, then to widen the gap, and, as soon as possible, to assault. There was, we are told, only sufficient ammunition for two and a half or three hours' preparation; and reliance was placed on the great moral effect of the 16-in. and 12-in. howitzers.

The old Russian Militia, however, had been busy, and had constructed a field position outside the line of the forts and erected a considerable amount of wire, and this position had to be dealt with first.

It was intended to commence the artillery attack on the field position at 4 a.m. on the 13th August, but heavy fog prevented the opening of fire until 9.30 a.m. After three hours' shelling, at 12.30 p.m., the assault, on a front of six miles, took place and the position was captured.

The artillery was now concentrated on Forts XV–A, XV–B, XVI–A and B, and the field-works between them. The amount of ammunition fired is not given, as it was in the case of Antwerp, but the bombardment was continued during the 14th and 15th August, and an assault was attempted on the 16th. Forts XV–A and B were eventually captured, six battalions being used against the former and seven against the latter; but the assaults made on Fort XVI–A by eleven battalions, and on Fort XVI–B by one battalion, failed. On the morning of the 17th the Russians from the woods behind are said to have made a counter-attack against XV–A; but during the night of the 17th–18th they evacuated not only the Forts on the front attacked from XIV to XVI, but all the outer ones on the north side of the rivers, and these were occupied by the Germans.

During the 18th and 19th, the Germans closed in nearer the fortress, right up to the inner forts, of which Nos. II and III were entered without opposition.

The unconditional capitulation was signed at 4 a.m. on the 20th August, thirty days after the appearance of the Germans before the

place, and ten days after the completion of the investment. Ninety thousand Russians, with thirty generals, became prisoners.

The only lesson of the siege appears to be that, as at Antwerp and Maubeuge, an obstinate defence cannot be expected from second-class troops, "bearded men, who went into action with pale faces, thinking of their wives and families." General Gourko states that the spirit of the garrison was broken by the bombardment and the men were not fit to offer any real resistance to the storming columns. No attempt was made to delay the process of investment, or to make retrenchments at the place attacked.

J. E. E.

SOME ASPECTS OF THE LEAGUE OF NATIONS.

A Lecture delivered at the S.M.E., Chatham, on 27th October, 1921, *by* LIEUT.-COLONEL H. O. MANCE, C.B., C.M.G., D.S.O.

THE object of this lecture is not propaganda. I propose rather to try and put before you certain aspects of the League of Nations in such a way that you can think it out for yourselves and arrive at your own conclusions. The subject is obviously too wide to be covered in one lecture. I might begin by recounting the activities of the League and deduce from these what the League really means. I propose, however, to begin with a general consideration of what the League is and how it will work, after which, I hope, you will have no difficulty in following its achievements for yourselves.

What is the League of Nations? Let us take a hurried glance through the Covenant. The Preamble is most important, as it enunciates the object of the League, which is "to promote international co-operation and to achieve international peace and security by the acceptance of obligations not to resort to war, by the prescription of open, just and honourable relations between nations, by the firm establishment of the understandings of international law as the actual rule of conduct among Governments, and by the maintenance of justice and a scrupulous respect for all treaty obligations in the dealings of organized peoples with one another."

Articles 1 to 7 describe the organization of the League, consisting of the Assembly, the Council and the Secretariat, and its general constitution.

Articles 8 and 9 deal with the question of disarmament.

Article 10 is the famous article which primarily caused America to stand out of the League. In it the members of the League undertake to respect and preserve as against external aggression, the territorial integrity and existing political independence of all the Members of the League.

Articles 11 to 15 deal with the avoidance of war and procedure for disputes.

Article 16 refers to the action of the League against defaulters.

Article 17 deals with disputes with non-members.

Article 18 prescribes the registration of Treaties before they become binding.

Article 19 deserves more consideration than is generally given to it. It provides for the reconsideration of obsolete Treaties and international conditions likely to endanger peace.

Article 20 cancels all existing obligations contrary to the Covenant
Article 21 permits of regional understandings.
Article 22 deals with Mandates.

Articles 23 to 25 deal with the technical and humanitarian objects of the League, and Article 26 lays down the procedure for amendments.

Supposing, however, that the Covenant has been carefully studied, is this sufficient to indicate the nature of the League of Nations? If you wanted to study medicine you would not be satisfied with studying the Rules of the British Medical Association. If you want to understand what is the League of Nations you will be liable to get a superficial idea by studying only its Articles of Association.

Who then is to say what the League of Nations really is? Even the experts on the subject present widely different conceptions, depending upon their personal outlook and antecedents. Some talk of idealism. This is the easiest, as it usually goes down well and does not require much hard thinking. Some regard it as an organization for settling political disputes; others concentrate on the juridical aspect with special reference to the Permanent Court of International Justice. Others regard it as an organ for effecting disarmament; others as a machinery for international relations; others as a new form of military alliance; others from an economic standpoint, each neglecting other aspects to a greater or lesser extent. In the absence of an orthodox interpretation of the Covenant, let us work out for ourselves some idea of what the League might be. In doing so, we must try to avoid the tendency to present one side of the League to the exclusion of its other aspects, thereby offering an easy target for criticism. There are several sides to any solid structure, so we must be careful not to condemn those who describe the League from a different point of view until we are certain they are not presenting another elevation of the same building. We shall not be able to make even an outline plan until we have had a careful look round, and we must all discard any notion of infallibility and be prepared to modify our design as we gain further experience. I will try to approach the subject primarily from the point of view of the man in the street.

It is quite possible for anyone to examine this question to a considerable degree without any exclusive information. I hope, in addition, to suggest a few ideas based on an inside knowledge of the League which may help you to assimilate the quite reliable information regarding the League which appears in certain sections of the Press.

In dealing with so complex a question it is indispensable to start with principles and tendencies; principles to make clear the goal aimed at and tendencies in order to ascertain whether world forces are operating in favour of or against the prospects of the League.

We shall be helped also in this way to keep in touch with realities. The Covenant owes its origin to world reaction against war. When attending the first Assembly of the League of Nations, I was very much struck with the general anxiety to arrive at an agreement and to achieve something, and I formed the impression that the driving force at this Assembly was the general fear of another war. It is important to consider whether the conditions are favourable for the League to survive the disruptive forces of national interests and sentiment once the initial impulse is exhausted. First let us consider what driving forces may operate when the immediate fear of another war recedes into the background. I suppose one might generalize these forces into the alternatives of idealism and self-interest. No big thing is done in this world without an element of idealism, and the League of Nations is no exception to the rule. But we may suppose that our man in the street maintains that the strongest incentive to action in the present state of human nature is self-interest, and that no League will succeed which does not take account of that fact. Very well, let us deal with the subject from the point of view of self-interest.

What is the object of the League? To stop war? Too late. To prevent war? Yes, but how? By arbitration? This implies disputes. Surely it would be better to prevent disputes. Thus we are led to the chief object of the League being the regulation of international affairs. What is the nature of the League organization? Certainly not a super-state. No Power, great or small, is prepared to delegate any of its sovereign powers to the League. It follows, therefore, that the organization must work through free co-operation between sovereign states, and this, in its turn, implies unanimity for any decision which is to be obligatory on all the members. In such questions large and small powers may be said to be on a basis of equality, but it is evident that where the League is to take executive action—for example, in solving a dangerous political situation—the assent of the powers on whom would fall the chief responsibility for ensuring the execution of the decisions of the League must be arranged for. Hence, the principal powers would occupy a position corresponding to the senior partners of a business. It is important to note that the League of Nations is a League of States and not of individuals.

The first question which will probably be asked is: In what way does the above organization operate differently from pre-war methods of international relations? Perhaps the most important difference is that the League is intended to be guided by principles common to all its members, whereas, before the war, international questions were settled directly between pairs or groups of nations directly interested, without any reference to the solutions adopted elsewhere in similar matters. Is it possible, however, to arrive at common principles,

having regard to the different ethical traditions prevailing in different countries, or even to different religions? I think it must be admitted that common principles are, to a certain extent, implied by the very fact of international relations. They certainly existed in certain directions before the war, and experience has shown that they can be expanded by frank discussion and closer contact. During such discussions between a sufficiently large number of independent representatives, a sort of public opinion gradually develops and helps in the formation of these common principles. Such public opinion was distinctly noticeable at the two Assemblies of the League of Nations at Geneva, and at the Communications General Conference held at Barcelona in March, 1921. The collective handling of these questions encourages a tendency to crystallize common principles into international law through such instruments as general conventions. It is important to recognize that these conventions are not an idealistic conception of abstract principles, but are the simplest common expression of the interests of each of the contracting parties.

Now the codification of these common principles facilitates arbitration or international jurisdiction. Without such a code States hesitate to entrust to arbitration questions which might have some unexpected bearing on their sovereign powers, but it is quite a different matter when the dispute is simplified to the interpretation of a convention to which the parties to a difference are signatories. Conversely, an interpretative organization, whether for conciliation, arbitration or jurisdiction, gets over the necessity for drawing up a code which tries to deal with every possible case, and which is, for that reason, unworkable. It is evidently much easier to draw up a code indicating clearly what is the general intention of the framers, if there is an organization to which the signatories are prepared to confide the interpretation of the code in any particular case which may not be explicitly referred to.

Now let us see if we can get any hints from methods of inter-Allied co-operation during the war, more particularly in the economic sphere. Here we note a very important development, namely the practice of discussions between the respective experts of different nations before the national policy of any one of them is fixed. During the war these discussions, on such questions as the allocation of allied shipping, raw materials, etc., were informal and non-binding, but it is significant to note that the agreements arrived at were invariably confirmed at the Plenary Conferences. It is true that direct contact and personal touch have played an important part in the past in arriving at international agreements, but the significant fact has been that after this touch was lost the force of the agreements tended correspondingly to diminish. Not the least important of the functions of the League of Nations is the maintenance of the continuity of touch between representatives of the various nations. It is

surprising how long it takes a freshly convened international conference to arrive at a common understanding of the many different points of view involved, and at a sufficiently intimate knowledge of the personalities of the representatives, to enable the basis of a general agreement to be discovered. Unless the different points of view are thoroughly understood, there is danger that any agreement arrived at may be unstable. This difficulty is virtually eliminated by the institution of a permanent organization, the members of which change gradually. Before the war, negotiations affecting technical departments in two states had to travel from the head of the technical department in one state, through the Foreign Office, to the Ambassador in the capital of the other state, through him to the Foreign Office of the other state, who communicated with the head of the technical department in that state, the original communication having been redrafted two or three times in the process. It is hardly necessary to draw attention to the relative advantage of direct personal intercourse between the respective heads of departments of the different states. Finally, the League of Nations possesses the means of convening Conferences for dealing with any particular question at comparatively short notice, as compared with the years that were usually necessary under pre-war conditions. So far, we have envisaged a League of Nations which is a partnership of states for the regulation of international affairs, each state retaining its full independence. An important feature of the organization is the continuity of personal touch between the representatives of the different states, this continuity being maintained both by the permanent organizations and by periodical conferences. The resulting tendency is to codify common principles, thus leading to an increased recourse to arbitration and international jurisdiction, the whole being assisted by the gradual development of a world public opinion. At this stage we can perhaps mark, as one of the essential common principles, that secret understandings between individual nations or groups of nations are bad form. There may be expected an increasing tendency to publicity in dealing with international questions.

I have already referred to the influence of world public opinion in bringing about general agreement in the codifying of common principles affecting international relations. The existence of the League depends on the formation of a world opinion on international questions. The very fact of propaganda in neutral countries during the war is a tribute to the increasing power of world public opinion and recent instances will occur to you when big, as well as small powers, have been influenced by world public opinion in their action, not only in international but in national questions. Incidentally, parties to a dispute are more likely to give way to the decisions of an impartial body representing world public

opinion than to arguments between each other where their *amour propre* is at stake. World opinion in the League of Nations is shaped by the representatives of its Members. It must, however, ultimately reflect the public opinion of each country. National opinion was previously based on purely national sources of information. Now, however, many questions which were previously national are becoming international, and there is a corresponding demand for information on a wider basis. The improvement of communications, especially as regards wireless telegraphy and telephony, has resulted in the opinions held in other countries being published at first hand, instead of almost invariably through national correspondents, and it seems obvious that this tendency will increase.

During the war the common danger of the Allies led to the subordination of national interests to the common cause. Since the Armistice this subordination of national interests has depended on the degree to which the common interest has been recognized in different emergencies. The question is, will the other extreme ever occur, and the disappearance of common interests lead to exclusively national policies? In spite of the recent outbursts of national Jingoism in various countries it is difficult to imagine a return to pre-war national exclusiveness. On the contrary, the gradual realization of the danger of common economic collapse will speed up the business of thinking internationally and give an impetus to the codification of principles essential to the safety and well-being of different peoples. If, ultimately, aggression, wherever it may take place, against these principles is recognized as a common menace, then automatically states will combine to bring the pressure of public opinion, and, if necessary, of force, against such aggression, which is as they have bound themselves to act in the Covenant.

Similarly, in the case of disarmament, I would suggest that the stipulations of the Covenant are more likely to eventuate as a symptom of a successful League of Nations rather than as the means of obtaining such success, though, doubtless, progress will be achieved from both directions. Armament is still necessary in the present conditions as an insurance of national security and interests, but for some years to come we shall have to choose between gradual economic recovery with moderate insurance or increasing armaments and nothing left to protect. This may result in a tendency for a united front against any power which creates a menace of aggression by aiming at military preponderance, and thus, as was the case with individual armament, will national armaments automatically be reduced in proportion to confidence in the League to resist aggression. It may be asked what will happen to the Balance of Power in which we have hitherto placed confidence for the maintenance of peace. In this connection I would refer you to an interesting article by Sir Frederick Maurice, who points out that, while the Balance of Power

was a working proposition in the days of limited armies, it has become an impossible burden now-a-days when the whole resources of a nation would have to be organized for the conflict. Personally I am not quite sure that the military side of the League of Nations is not the modern development of the Balance of Power, in that it seeks to avoid this crushing burden of armament by establishing an overwhelming preponderance against any disturbers of the peace.

As time goes on, some nations will inevitably grow in power and influence and others gradually become less important, and it may be asked how the League of Nations would deal with the adjustment of political power necessary to correspond with such changes. Under the old regime, the transfer of power took place as a result of war. The problem is a fundamental one for any organization for the maintenance of peace. If these adjustments are to be made on the old basis of the transfer of territory, the prospects of a peaceful adjustment would seem to be very unpromising. It is evident, however, that the magnitude of the problem would be considerably reduced if security, freedom and economic policy could be to a large extent divorced from territorial sovereignty, and this idea is one of the underlying motives of certain important aspects of the Peace Treaties, such as the Mandatory system, the clauses for the protection of minorities and the stipulations regarding the freedom of transit and communications and the equitable treatment of commerce. The transfer of sovereign powers or special privileges as regards territories disposed of at the Peace Conference was, as a general rule, made subject to the acceptance of certain international obligations to conform with generally accepted standards on questions of communications, the equitable treatment of commerce and the protection of minorities. The extension of this principle in the future is a desirable development and one not unlikely to be adopted as it would seem to be supported by the whole gamut of motives, from the highest idealism to the rankest jealousy. The net result, however, would be to facilitate the general adoption of recognized standards of equality of opportunity and to reduce the possible causes of friction due to the continued existence of frontiers. But what if the homeland is threatened by the penetration of a more virile or more favoured nation? There is no justification for assuming that the collectivity of nations will not continue to recognize the fundamental right of self-preservation by reasonable local measures. Ultimately, the growing recognition of the common interest in maintaining peace will be the principal force tending to prevent the inevitable adjustment taking place through war. I have already drawn your attention to Article 19 of the Covenant under which the Assembly of the League may from time to time advise the reconsideration by members of the League of treaties which have become inapplicable and the con-

sideration of international conditions whose continuance might endanger the peace of the world.

Now there is another aspect of the question. Out of deference to a hypothetical man in the street I have hitherto dealt with the League on the basis of self-interest, leaving aside the influence of idealism. It may now be confessed that this was the easiest way to handle the question, for, in other words, I have appealed to reason instead of to sentiment, and with reason one knows more or less where one stands and can build up on generally agreed facts. Unfortunately, however, there are occasions on which the actions of nations are governed less by reason than by sentiment, and in some countries it is to be feared that this is the rule rather than the exception. At the end of 1919 the cynic might have been tempted to divide European civilization into two categories—those states who were bent on furthering their own interests, and those states who were completely indifferent to their own interests, provided they dished the interests of their neighbours. On closer inspection the optimist would detect the elements of progress between these two categories. The question is obviously one of outlook and length of vision. One of the principal factors of progress will be the gradual education of peoples in international questions. What will be of even more importance in the immediate future will be the influence of a few big men of character, especially in the new countries. In this connection, it is hoped that the different states will recognize the undoubted fact that, while every member of the League theoretically participates at the annual Assembly on the basis of equality, those states, big or small, whose delegations are comprised of men of character and vision have had and will have an outstanding influence on the deliberations of that body.

I have ventured to outline above a tentative sketch plan for the gradual building up of a Partnership of nations for the

Regulation of international affairs based on the
Recognition of general principles vital to the security, freedom and well-being of all nations;
Operating through world opinion,
Favoured by personal contact and frank discussion before the crystallization of national policies,
Tending towards the fixation of principles into international law,
Rendering possible international jurisdiction,
Backed by the increasing assurance of international solidarity against aggression, and
Whose success will be measured by the growth of confidence and gradual reduction of armaments.

Thus one of the principal points to remember would seem to be that any conception of a League of Nations must be of a living organism

and not of a finished product. All the developments foreshadowed above are bound to take time to mature. The machinery and initial impetus of the League has made a start possible. It is necessary for its success to develop the power behind the machine and to avoid an overload.

I should like to emphasize the fact that nothing I have said implies the destruction of the individuality of nations or races. It is essential that precautions should be taken to prevent the deterioration of national qualities which would result from the indiscriminate mixture of races. Champagne and beer are both excellent beverages, but by mixing them you would lose the good qualities of both, and if you can imagine the addition of bovril and tea you will understand my point.

I trust that the ideas which I have put before you, modified or expanded as the result of your own reflection, will be of assistance in following the development of the League and in interpreting foreign news from a wider standpoint, so that you will be able to recognize where solid progress has been achieved and to appreciate the inherent difficulties of certain situations and the necessity sometimes for going slow.

It may be suggested that the present situation, with at least a dozen separate crises of the first magnitude, is hardly one to inspire undue optimism. I am not sure, however, that this is not a question of diagnosis. A sick man, suffering from undefined pains all over his body, may quite well be passing through a necessary phase towards recovery when the poison in his constitution comes to a head, and the optimist will derive satisfaction from the tendency, which has undoubtedly developed, of calling in the League of Nations to effect a cure. The optimist will further remember that any external application at a particular outbreak may alleviate, but cannot be expected to cure, the patient, and will therefore attach greater importance to the more general remedies directed to curing the sources of the trouble, reinforced by the up-to-date method of suggestion through the force of public opinion. You will recognize, from my previous remarks, that there is always some danger of the patient losing his reason, thereby increasing the difficulty of rational treatment.

I will conclude, as I began this lecture, with a reference to the Covenant of the League. It seems to me that the Covenant may be likened to a roof supported on scaffolding. Under the shelter of this roof nations, spurred to a greater or less degree by the lessons of the great war, are striving to lay the foundations and build the walls of a structure of international co-operation. It behoves reasonable critics to ponder whether they are more likely to help by tinkering with the roof at the present juncture rather than by contributing to the construction of the edifice on which the security of the whole

depends, trusting to make any necessary alterations to the roof at a more suitable season when this can be done with less risk of interfering with the progress of the work. Whatever conclusions one may arrive at regarding the League of Nations, it must be remembered that no one has hitherto proposed an effective alternative protection from the recurrence of a world war, and, therefore, if our roof, through lack of solid support, should collapse under some great strain, there is every probability that this civilization will be overwhelmed in the ruins.

ANTI-AIRCRAFT DEFENCE BY NIGHT.

"EVERY commander is, therefore, at all times responsible for protection of his command from surprise in every direction from which attack is possible (both by land and air), and for preventing the enemy from ascertaining his strength and dispositions."—(*Field Service Regulations*, Volume II, Chapter VIII, Section 79, para. 4.)

This article endeavours to state generally the means of defence that are available to the commander of a force for the protection of his command from aerial attack by night.

The defence can be arranged to employ one or all of the undermentioned methods.

1. Anti-aircraft guns firing a barrage.

This can only be effective over a comparatively small area and could not cover at one time all heights from 6,000 ft. to 20,000 ft. In any case, daring pilots will fly through a barrage. For fixed defences it might be adopted in certain cases, such as ground mists, where the supply of ammunition is unlimited.

2. Anti-aircraft guns firing when the hostile aircraft has been illuminated by searchlights.

It can be generally stated that anti-aircraft guns are only really effective in so far as they drive aircraft to a height and affect the pilot's nerves, thus causing the machine to fly on varying courses, and thereby hindering observation and bombing.

3. Machine-guns operating with or without searchlights for low-flying aeroplanes.

Against low-flying aircraft the appropriate weapon is the machine-gun, which is very effective up to heights of 3,000 ft. It has been found that the best position for these guns, which should be two in number, is at the searchlight. One gun should be arranged so as to fire up the beam, and the other reserved for use in case of attack on the searchlight by low-flying aeroplanes not in the beam.

4. Night-flying aeroplane co-operating with searchlights.

Of the above methods the last is undoubtedly the most effective.

The pilot of an aeroplane illuminated by searchlights is blinded by the glare and cannot observe ground objects. Bombing under these conditions is indiscriminate. In addition a hostile aeroplane illuminated by searchlight beams becomes an easy target for a night-fighting aeroplane, which can see the enemy without being seen, and can manœuvre unmolested until a suitable position in

relation to the hostile machine has been obtained. The hostile machine can then be brought down by machine-gun fire at the pilot's leisure.

The efficiency of the above method of dealing with hostile aeroplanes was proved by the operations of 151 Squadron, R.A.F., co-operating with the 1st, 3rd and 4th Army's Searchlights, France, during the period July—November, 1918. During the first five weeks of this period over 20 hostile machines were brought down and the enemy's night-flying activities were brought to a standstill.

In the article published in the March *R.E. Journal* on "Anti-Aircraft Searchlight Defences," the problem of the anti-aircraft defence appears to have been based on the old-established principles of fighting fixed coast defences, which were not tested at night in action during the late war. The anti-aircraft defence problem is infinitely more complicated, in view of the fact that—

(*a*) The operations take place in three dimensions, as opposed to two in coast defences and over the whole area of the sky, as compared with a limited sector of water.

(*b*) There will be numerous aircraft, both friendly and hostile, engaged and moving at ground speeds up to 200 miles per hour, as against the comparatively slow speed of sea-going craft.

(*c*) The difficulty imposed on the defence in distinguishing between friendly and hostile aircraft, in order to co-operate with the former and interfere with the activities of the latter.

It will be seen from the above points that in anti-aircraft action, by the time the detachment are able to form an opinion as to whether the aircraft is hostile or friendly, immediate action has to be taken.

Aircraft travelling at 200 miles per hour at 10,000 ft. will only be within the effective range of a searchlight for at most 1¼ minutes. This allows no time for the transmission of reports, or for the reception of orders from a superior authority.

The difficulty of locating aeroplanes by searchlights is very largely due to the time taken by the sound to reach the observer, since this interval gives the hostile aircraft an opportunity of altering its course.

It is most desirable to have several beams searching for the suspected aeroplane. It is found that one beam may temporarily illuminate the target in such a manner that the latter can be seen by an observer at another light, although not visible to its own detachment. Under these circumstances it is necessary for the neighbouring detachments to act instantaneously and to direct their searchlights on to the target; any delay caused by awaiting orders from a central control would prevent advantage being taken of such opportunities.

It was found possible on certain occasions to locate aeroplanes by means of prismatic glasses, and then, having directed the searchlight on to the machine, to expose the beam without previous searching, but this is only possible if immediate action is taken by the detachment, who should not have their attention diverted by telephone instructions.

Normally the group commander would be situated at a distance of some miles from the most advanced light; he would, therefore, be quite unable to appreciate the situation at the point of action, and, should he give orders to search in the direction from which he thought the aeroplane was approaching, considerable errors would undoubtedly arise.

In addition, unless the detachments are trained to independent action, any breakdown in the telephone communications would result in confusion; and it has been found that telephone communications are frequently interrupted during air attacks.

Central control entails in fixed defences considerable expenditure on telephone communications, and in addition a large maintenance and operations staff is required. Although this system may be of great value for intelligence purposes, it would not be advantageous to the personnel operating the light.

In mobile warfare it is difficult to see how any form of central control would be practicable.

The keynote of anti-aircraft searchlight defence lies in the independent action of the lights consequent on a general policy laid down by the group commander.

"EXPERTO CREDE."

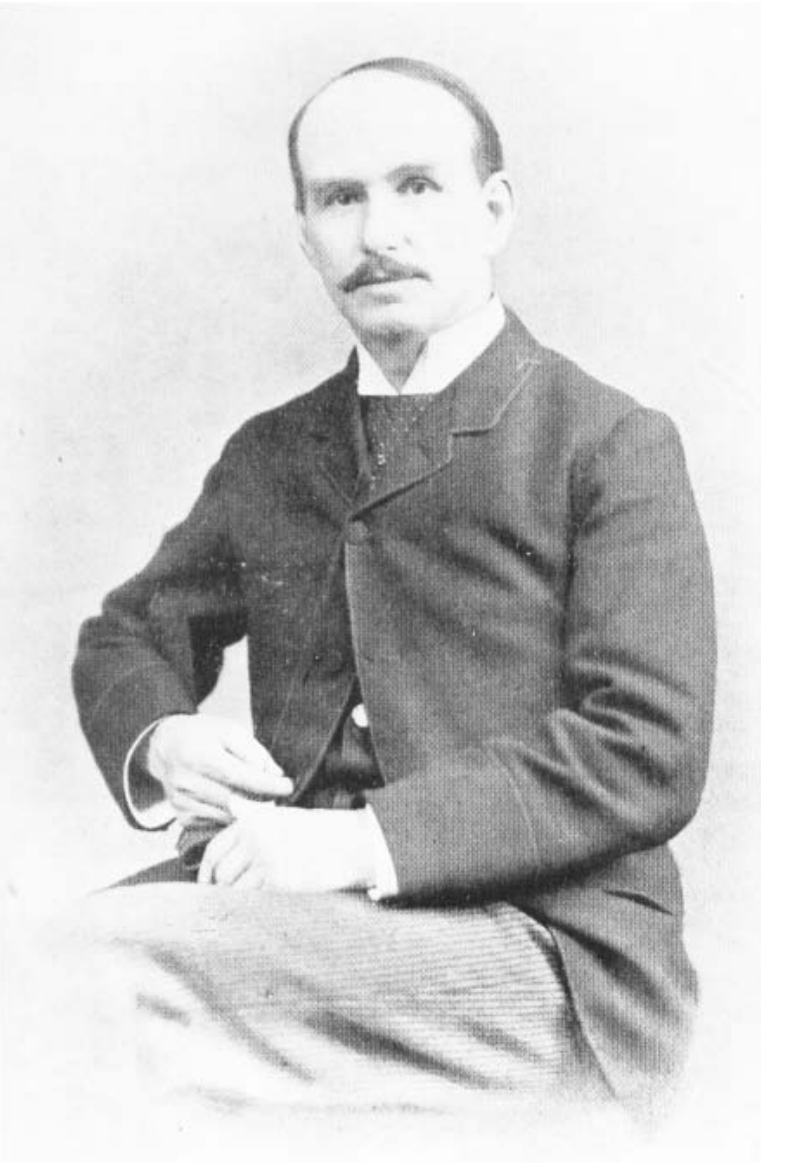
MEMOIR.

COLONEL E. M. LLOYD.

BY the death of Colonel Ernest Marsh Lloyd on the 11th January, 1922, at the ripe age of 81, the Corps has lost one of its best-read and most able writers on military and other subjects. Inheriting from his father a taste for literature, he began early to read extensively, and while yet at school had digested Napier's *History of the Peninsular War*, on which subject he even wrote to Sir W. Napier and received a reply quoting a work of Lucien Bonaparte. His thoughts now turned towards the army as a career, and in June, 1859, he obtained his commission in the R.E. His first station was Dover, where he met his wife, and was married in 1862. In 1863 he contributed a paper to the *R.E. Corps Papers* on "View Sketches of Ground Adjacent to a Fortress." In the following year he sailed for Hobart, Tasmania, where he was chiefly employed on fortification work, and sent home a proposal for a disappearing gun-carriage before the Moncrieff counterpoise system was known. At this time he read widely in mental and moral philosophy, and wrote a pamphlet entitled "The Freedom of the Will Stated Afresh," becoming greatly influenced by the works of J. S. Mill and Herbert Spencer.

In 1872 Capt. Lloyd was appointed an Instructor in Fortification at the R.M. Academy, and became Professor in 1877. During this period he attended the fortress manœuvres at Coblentz. He also edited the new *Text Book of Fortification and Military Engineering* for the R.M.A., the first comprehensive book on the subject which had been used there. Much of this work came from his own pen, notably the very able chapters on "The Attack and Defence of Fortresses" and on the "Historical Development of Permanent Fortification."

In 1882 Major Lloyd was ordered to Hong Kong, where he was employed on Admiralty and Defence works, and for some months undertook the duties of Assist. Military Secretary, in which capacity he was most favourably reported on by the G.O.C. In 1886, when on the Tyne Defences, he published a book under the title, *Vauban, Montalembert, Carnot—Engineer Studies*. In 1887 Lieut.-Colonel Lloyd was appointed Assist. Director of Works (Fortification) at the War Office, and retired in 1892. He also undertook examinations



COLONEL E M LLOYD RE

in Fortification for the D.G. of Military Education. Lieut.-Colonel Lloyd's active mind, however, sought other work. After election to the Athenæum Club in 1893 he became a contributor to the *Dictionary of National Biography*, for which, during the succeeding five years, he wrote 123 articles, including that upon Wellington. In 1893–5 also appeared essays in the *English Historical Review* on "Catinat," "Marlborough and the Brest Expedition," "The Herse of Archers at Crecy." To the *Journal of the Royal United Service Institution* he contributed "The Campaigns of Saxe" and "The Battle of Albuera"; for the *United Service Magazine* he wrote "Mr. Spencer and Militarism" and "Letters of a Staff Officer in 1794." From '97 to '99 he contributed 35 reviews, mostly of military books, to *The Speaker*. In 1900, after writing short articles on the French and Austrian Armies for the *Encyclopædia Britannica (Supplement)*, he was invited to join the Military Intelligence Staff as an extra D.A.A.G. In 1900 also he contributed "The Last French Charge at Waterloo" to the *United Service Magazine*.

In 1902 he was given the rank of Colonel in recognition of his "meritorious" services, and was invited to become a member of the Royal Historical Society, on the Council of which he sat in the following year and read a paper on "Canning and Spanish America." Two years later he wrote an article on "The History of the British Army" for the *Quarterly Review*, and began work for the *Cambridge Modern History*. To this he contributed chapters on "The Third Coalition (Napoleon) and, in conjunction with Dr. Prothero, "The English Civil War."

In 1908 Colonel Lloyd published *A Review of the History of British Infantry*.

After this he turned his attention to municipal and other affairs, and was on the Epsom Board of Guardians, of which he became Vice-Chairman in 1913. He was also Hon. Secretary of the Sutton Division of the National Service League, and was on the Committee of the Sutton Boy Scouts' Association, besides being Treasurer of the Sutton branch of the Anti-Suffrage League.

In 1911 he contributed 12 articles to the *Supplement* of the *Dictionary of National Biography*, and wrote reviews for *The Nation in Arms*. In 1913 he became a member of the "Board of Studies in History" (University of London), and in the following year Vice-President of the Royal Historical Society.

When the Great War broke out Colonel Lloyd became Treasurer of the Sutton Division of the S.S.F.A. and helped to form the Volunteer Training Corps. He also became, in 1915, Chairman of the Surrey Committee of the National Service League. In this year he delivered a lecture on "Waterloo" to the Royal Historical Society on the occasion of the centenary of the battle. He also served on a local Tribunal under the Derby Scheme. His last articles were: a review

of Arthur's *Life of Lord Kitchener* (*R.E. Journal*, 1920), and a review of Lord Esher's *The Tragedy of Lord Kitchener* (*R.E. Journal*, 1921).

So ended the career of this remarkably able officer. His great literary ability, mental power, and energy are amply shown by the number and variety of his writings. The easy and fluent style, the fine choice of language and logical accuracy of everything which Colonel Lloyd wrote made it all pleasant and profitable reading. The position he occupied in the Royal Historical Society alone showed the high estimation in which his abilities were held. It may safely be said that he made a great mark in the literary world. Personally he was a man of a modest and retiring disposition, of unruffled temper in argument, and a charming companion—in fact, a man worth knowing.

It will interest his brother officers to know that the Royal Historical Society has accepted from his family a gift of all his Napoleon books, which fill a separate bookcase in the library of the Society, and constitute a lasting memorial of his work.

J.W.S.

CORRESPONDENCE.

THE TECHNICAL TRAINING OF ENGINEER OFFICERS.

(*To the* COMMANDANT, S.M.E., CHATHAM).

SIR,

I have read with much interest the article entitled "The Technical Training of Engineer Officers," in the January, 1922, number of the *Royal Engineers Journal*. This article, it is stated, was communicated by you, and I desire to express my satisfaction with the presentation of the case as you have made it.

I agree with you most thoroughly in everything which is stated in the article, and it may be interesting to you to know that we have adopted exactly the same methods which are advocated, in the education of our officers. Ever since I have been at the head of the Engineer Corps, officers have been sent to some of our principal engineering institutions for the purpose of completing their civil engineering studies. I find that this method works out, as was anticipated, in a most satisfactory manner to all concerned. The young men obtain a point of view which they could not get if they were to receive their training or instruction along these lines from other officers, and the mingling with civilians is most beneficial.

There is only one difference between your method and ours, and that is, that our officers are not detailed to these institutions until they have been two or three years in the service as commissioned officers. They are then allowed to live in town lodgings. The senior officer present is in command of the detachment and is responsible for its discipline and is required to submit reports concerning the other officers. These men being older than those which you contemplate sending to such institutions, we find there is no trouble about their engaging in boyish pranks or indulging in actions unbecoming the dignity of officers and gentlemen.

I am in most hearty accord with the statements in the article concerning the character and extent of the training which an engineer officer should receive. It is my opinion that an engineer officer should be so educated and trained that he can take up any work to which he may be assigned. He may not be able to handle it with the same degree of technical skill as a specialist would give it, but he should possess that training and self-confidence which will enable him to exercise administrative functions in any line of duty to which he may be called.

Again expressing my appreciation of the article,

I remain,

Very truly yours,

LANSING H. BEACH, *Major-General,*
Chief of Engineers.

Washington, February 17th, 1922.

To the Editor of R.E JOURNAL.

SIR,

It is stated in the "Professional Note" which appeared in your January issue that the former was published partly with a view to drawing criticisms on the new system of training R.E. officers.

While I am unable to offer any adverse criticism on the scheme, the advantages of which have been so plainly set forth in the Professional Note referred to, yet there appear to me to be several resultant questions which merit attention. These have no doubt been well considered by the authorities, but it is possible that the views of a junior officer may comprise some point of view which has not hitherto been perfectly appreciated.

The natural corollary to the existence of an Engineer Officer Corps which has been trained on broad scientific lines, which has been taught to think in an engineering manner, which has, in short, been "educated" rather than "instructed" in engineering, is the existence of a very highly trained and expert body of artificers, capable of interpreting and putting into action the necessarily somewhat general instructions of their leaders. This idea I endeavoured to develop in the article published side by side with the Professional Note under discussion.

The next point I wish to suggest has reference to engineering experience. The finest training is useless unless followed by adequate experience, and it must be admitted that no real engineering experience can be obtained in the course of the work ordinarily performed by the R.E. in peace time.

Constructional engineering is limited by paucity of funds and scant demand for large works. The mechanical work of the Army is now chiefly undertaken by the R.A.O.D., R.A.S.C. and Tank Corps.

The electrical engineering of the Army is largely in the hands of the Royal Corps of Signals, and even where useful electric plants are run, such as the Aldershot Power Station, the work is generally carried out by civilians.

The operation of Coast Defence oil engines and minor pumping plants, etc., petty barrack repairs and an annual Fieldwork Course do not afford sufficient engineering experience. This applies not only to officers, but with much worse and more far-reaching results to the rank and file. You cannot keep a man, originally a skilled engine-fitter, employed for five years wiping down a couple of Hornsby Ackroyds in some out-of-the-way station and expect him to remain a competent and up-to-date mechanic. Here it may be remarked that the establishment of a Mechanist Branch, comprising not only supervisory staff-sergeants but also lower grades who would always be employed at their trades and never on cook-house duty, would in some measure ease the situation in creating a demand for work.

If work, and work of real engineering value, cannot be found within the Army, then the only remedy is to transfer, for periods alternating with periods of military service, our personnel to other Government departments or to civilian firms who do carry out engineering work.

The last point I wish to bring forward refers to the Specialist Officers,

of whom mention is made in the Professional Note. If the right sort of boys are given adequate training for a long enough period as artificers, the best of these would form excellent candidates for specialist commissions. These young men, having had five years' educational and practical training in a R.E. Trade School, and having undergone the normal University Course in company with Woolwich trained officers, would be thoroughly well equipped as junior Specialist Officers. A similar scheme is in force in the Navy, and is being adopted in the R.A.F.

I am, sir,
Yours faithfully,
H. S. BRIGGS, *Bt.-Major, R.E.*

REVIEWS.

MANUAL OF FIELD WORKS (ALL ARMS), 1921.

THE *Manual of Field Works* (*All Arms*), 1921 (*Provisional*) has now been issued, and takes the place of the *Manual of Field Engineering*, 1914. The change in the name of the Manual emphasizes the fact that field works concern all arms, and not the Sappers alone; the Manual will therefore be used by all arms, who are now expected to construct their own field works, thereby releasing the Sappers for technical work. It is divided into five parts, with six appendices and 175 plates, the increased number of plates making the new Manual more bulky than the old, and, being only a provisional edition, the volume is not well bound.

The new Manual develops, by the light of military experience gained during the European War 1914–18, the whole subject of field engineering; it shows that the power of modern artillery has profoundly modified the design of field fortifications; new weapons, such as gas, smoke, mines, tanks, and aeroplanes have necessitated a corresponding development in defensive organizations.

Part I, which deals with Field Fortification, includes a chapter on "The Siting of Trenches," a subject which was dealt with very generally in the old Manual. The importance of machine-guns both in attack and defence has necessitated the clear definition, in a separate chapter, of general principles for rendering emplacements difficult to locate, without at the same time limiting their field of fire or unduly jeopardizing the protection required for the gun and its personnel.

The chapter on "Trenches, Fire Positions and Trench Accessories" corresponds to the chapter on "Earthworks" in the old Manual, the very change of title indicating the advance in such matters as field defences for and against artillery and defence against tanks and gas.

In the chapter on "A Defensive System" the organizations of an outpost zone, a battle position, and rear systems are clearly set forth, being based on the experience gained in trench warfare, but equally applicable to defensive warfare of a less rigid nature.

The subject of Camouflage is dealt with in a chapter which has been compiled before the appearance of the *Manual of Camouflage*, and it will eventually, no doubt, require a certain amount of revision. The necessity of skill in reading air photographs is emphasized and special reference is made to the measures which gunners should adopt for camouflaging their battery positions.

The chapter on "The Organization of Working Parties and their Tasks" is an important one, for it clearly defines the responsibilities of the infantry officer and gives him valuable instruction as to how to organize his men.

Part II deals with Bridging. Infantry foot-bridges, an artillery trench-bridge and a crib causeway for tanks form subjects of new plates in a Part which otherwise follows much on the lines of the bridging chapters in the old Manual.

Part III deals with Accommodation. Under "Camping Arrangements" the methods of purifying water includes chlorination, but further reference is made to *M.E.*, Vol. VI, *Water Supply*, which is not yet in print.

Part IV deals with Communications, and there is much that is comparatively new in the construction for military purposes of "communications," *i.e.*, cross-country tracks, roads, and tramways.

Part V deals with Demolitions. The properties and method of employment of ammonal and dynamite have been described in detail, for these explosives have been found superior to gun-cotton for special purposes, such as the use of ammonal for heavy deliberate demolitions and of dynamite for boring and blasting work.

It will be found that the work carried out by the Germans during their retreat in 1918 has provided lessons and principles which are enunciated in the section of the Manual under the title of "Demolition of Railways."

The detection of land mines and traps is important and the section on this subject will be of interest to all.

C.R.J.

THE ENGINEER STAFF OF A FRENCH ARMY, 1914-1918.

THE following details are taken from a most valuable encyclopædia of French Staff work, entitled *La Vie d'une Armée pendant la Grande Guerre*, by Colonel Pellegrin,* which describes the organization and working of a French Army Staff.

As in the British Army, the French War Establishments for 1914 did not provide a commander of the Army Artillery or a Chief Engineer. Directly the front became stabilized after the Battle of the Marne, 1914, a General commanding the Engineers of the Army was appointed, with

* Paris: Flammerion, 8.50 francs.

a Staff consisting of a *Chef de Bataillon* as Chief of the Staff, two Captains and an Administrative Officer, and a Lieut.-Colonel, Director of Engineer Services, to take charge of work carried out by the Army Engineer troops and special working parties, and of the refilling of the Engineer Park. The General of Engineers was made specially responsible for the supply of engineer material, except stores for hutting, cantonments and camouflage, which were under a special director; for the selection and gradual construction of second positions; for the establishment of roads in case of an advance; and for the destruction of communications in case of a retreat.

Attached to the Engineer Service, under the G.O.C., Army Engineers, were representatives of what we should call the Roads Directorate, Water Directorate, Electrical Directorate, and Camps and Cantonments Directorate, with special units, including even a "Company of Hutters" (*Baraqueurs*), and also Local Forestry Units, Sanitary Squads and Anti-Aircraft Searchlight Sections. Further, the following units, which were attached to Armies as required for the following purposes, came under the G.O.C., Army Engineers: Flame Projectors, Gas (*Compagnies Z*) and Mechanical Dug-outs (*Compagnies Mascart-Dessoliers*).

Thus, the position of the G.O.C., Army Engineers, was definitely one of command, and he controlled all the Engineer operations in an Army, except those connected with railways (but including the destruction, if required, of bridges and tunnels), Signals and Camouflage.

J. E. E.

LE HAUT COMMANDEMENT ALLEMAND EN 1914.

By General Dupont (Librairie Chapelot, 136, Boulevard St.-Germain, Paris. Price 5 *fr.*)

This book, written by the Officer who, at the beginning of the War, was Chief of the French Intelligence, is especially interesting as it gives the opinions of the French General Staff on many disputed points. Marshal Joffre, in a Preface, recommends it to all impartial readers as a means of forming a comparison of the work of the General Staffs in the German and French Armies, which he claims will be entirely to the advantage of the latter. The author shows that in the Spring of 1914 the French Staff gave a correct estimate of the number of German active and reserve divisions. He confirms the opinion of General Lanzerac that, although the French Officers expected that the Germans would violate the neutrality of Belgium, they did not expect them to cross the Meuse and Sambre, as this action would too certainly provoke the intervention of England, and General Dupont admits the error and the surprise which resulted from it. He does not allow that the defence of Liége caused any delay in the German programme. Kluck could not move without his convoys, and these would not be ready before the 14th August, but he actually did advance on the 13th. In the second part we follow the wanderings of the German Third Army, which were almost as reminiscent of d'Erlon as the journey of Eleventh and Guard

Reserve Corps between Belgium and East Prussia. The third part gives the Battle of the Marne, in which the First, Second and Third German Armies all claimed victories, which, with the notable exception of Bülow's right wing, our author is ready to admit, and laid the blame of the retreat on one another. The retreat of the Second Army was forced upon them, but the question of the opportuneness of Hentsch's decision to retire the First Army must be left to history.

LA CONDUITE DE LA GUERRE JUSQU'A LA BATAILLE DE LA MARNE.

By LIEUT.-COLONEL GROUARD. (Librairie Chapelot, 8 *fr.*)

IN this book we read a great deal about the author's previous writings, especially *La Guerre Eventuelle*, published in 1913, and articles in the *République Française*, in which he foretold that the German right flank in an attack on France would extend beyond the Meuse. Needless to say, there is no recommendation of this book by Marshal Joffre, in fact, our author states that the French General Staff made every possible error, and the Commander-in-Chief was not equal to his task. In the operations of the British Army we read of its *lenteur habituelle*, and *extrême prudence*, and yet the writer gives the impression, in describing the Battle of the Marne, that the German retreat began in the First Army, from the threat to its left flank caused by the British advance, and very little credit is given to the French Fifth Army. The author claims to show how the victory could have been made more overwhelming, but he does not give sufficient credit to the successes which had been gained up to this moment of retreat by the German First and Third Armies. He has no doubt as to necessity of preparing against a new German aggression, and this, he says, will have to be met by the French unaided by the British, who have obtained all they require in the destruction of the German Fleet.

F.E.G.S.

NOTICES OF MAGAZINES.

MILITÄR WOCHENBLATT.

No. 31. *Recent Events in Eastern Siberia.* The *M.W.B.* is always interested in the Far Eastern situation and gives in this issue an account of the factions which are struggling for supremacy.

After the Japanese left Semenoff in the lurch in the autumn of 1921, they took up the democrat Mierkuloff, who became nominally President of the Vladivostock Whites, but really an advance agent of the great powers, for the exploitation of Siberia. Wirbitzky and two more of Semenoff's lieutenants lent him their support, but this is stated to be of doubtful value. For troops he has the remainder of Kappel's corps, which on the death of the latter amounted to about 8,000, and whose trustworthiness and discipline are not above suspicion. Mierkuloff is, however, just able to hold his frontier posts with them. Semenoff has sent a message to his old troops, who appear to be the best of a bad lot, urging them to adhere to Mierkuloff. These troops have recently obtained the mastery of Kamschatka and Okhotsk and succeeded also in capturing Blagouestchensk. When Kappel's 8,000 came up to hold the latter town, difficulties at once arose, and Gleboff, the commander of Semenoff's men, was arrested by order of Mierkuloff.

Semenoff's men promptly mutinied and demanded the return of Semenoff, who, however, while not out of the game, prefers to watch events from Shanghai. He will, however, probably do nothing to embarrass Mierkuloff, so long as the latter is fighting the Bolsheviks.

The Republic of the Far East has been promised help by Moscow, who asked the Irkutsk government to send all its best communist troops to the East. This it accordingly did, and thereby provided a strong reinforcement to the weak nine brigades which constitute the army of the Republic of the Far East. On their arrival in Chita, the seat of Government of the Republic, the troops of one division promptly mutinied, but the remainder seem to have been moved successfully to the front, and will presumably now attack Mierkuloff.

Complaints by Soldiers.—Regulations have been drawn up to show how complaints should be made. A period of seven days is allowed, after which no complaint may be made, and any man making a complaint is allowed to choose a representative to conduct his case. This latter is approved of by the *M.W.B.*, because it tends to eliminate personal animus. In the old army, complaints were always a difficult subject, though the Regulations were good enough. General von Pape used to

say, " An officer who makes a complaint is either justified or mad." In either case the consequences were unpleasant.

Socialists and Universal Military Service.—It is pointed out how in France and Belgium universal military service is supported by Socialists, though only a few of their German fellows do so. Among the latter the most important is Kautsky, who writes in his book on Social Democracy : " A free people must know how to fight ; its readiness for war is the safeguard of its existence. From childhood it should be taught that no one has the right to call himself a free man, unless he knows how to shed his blood for freedom." The *M.W.B.* hopes that this idea will again be universally accepted, though even when it is, it will only be one step on the long road of preparedness for war which Germany must some day travel if she is to survive.

No. 32. *The Moral Effect of Position Warfare.*—German military writers all agree that, if only it had been possible to keep the war in France open and mobile, the victory would have been theirs in a very short time. Falkenhayn has declared that trench warfare could not be avoided, though its disadvantages were not overlooked, and the present writer goes on to examine what these disadvantages were. The Manchurian war led to exaggeration of the value of entrenched positions, and the fact that passive resistance, like that offered by the Russians, implies the surrender of all claim to skill in the art of war, was overlooked. Victory must be sought in the destruction of the enemy, not in nibbling at him, and capturing nothing but ground. Tannenberg was, and will remain, a brilliant example of the sort of battle that Schlieffen's teaching visualized, for only great stakes can bring great winnings. Goethe's saying : " Who never risks his life will never have a life worth risking " being as true for nations and armies as for individuals.

The better trained an army is, the greater the loss it suffers through stagnation. This is especially true when the training has been based, as it was in the German army, on individual initiative. The old spirit of personal sacrifice gets changed round to one of self-preservation. Officers lose the opportunities they should have, of showing their superiority in all soldierly virtues and N.C.O.'s, through living too much with their men, lose some of their power of maintaining discipline. In the war, the influx of comparatively wealthy men into the ranks was a further strain on the N.C.O.'s, who were not always able, when off duty, to maintain their position as they should have done, and would have been able to do in the more difficult game of open war. In addition, there was the continual increase in technical armaments, in which Germany, owing to lack of materials, was at a disadvantage.

When Rome was at her height she fought out her battles with sword and spear ; only when her soldiers began to lose their stomach for fighting did she use engines and machines. Similarly, in Frederick the Great's letters, we find the complaint that, whereas formerly victory was won by the courage of the soldiers, now it was gained by skill in avoiding the hostile artillery. But just as, after this, courage once more came into its own, so will it again, and the good and well-trained army will in the next war strive for a war of movement, while the inferior one will aim at stagnation.

The Officer-hater.—The pacifist Dr. Steiner is said to be a good example of this species; he is also apparently a communist. In a recent article he recommends that all officers who have acted, or even might act in a reactionary way, should be arrested, and rendered harmless. The means by which this is to be done are curious. Their previous service is to be examined and a sufficient number of their comrades and soldiers collected to give evidence on oath of their atrocities and crimes against the laws of war. The evidence need not, of course, bear any relation to the facts, but must be such as is likely to be believed, or, at any rate, difficult to disprove.

The dossier will then be prepared for dispatch to the Entente, should the future action of the officer show the slightest cause for dissatisfaction!

Discipline in the Austrian Army.—A Memorial Service was recently held in Innsbruck for those fallen in the war, and orders were issued for a party of twenty men of the Defence Force to attend. The regimental delegates said that they had no objection to a memorial service in itself, but that it was not lawful to order men to attend, and in consequence most of the men refused to appear. The case has been referred to the War Minister, but no ruling has been given. As the *M.W.B.* says, the state of Austria can hardly be considered satisfactory so long as such things can happen.

No. 33. *Destruction Carried Out by the Germans in France.*—General Ludendorff replies to statements from the Entente side, that the German General Staff, instigated by German manufacturers, deliberately destroyed French and Belgian factories so as to put possible rivals out of action. He says that though no amount of repetition can make a lie into a truth, yet, unless Germany defends herself more actively than she has done hitherto, the lie will be believed. The Entente considers the destruction, without taking any account of the circumstances. It must first of all be remembered that the Entente willed the war, encouraged thereto by the pacifism of Germany and her unskilful politicians. Next, the barbaric action of England, in carrying on a blockade, forced Germany to the decision that necessity knows no law, a decision which even Prince Max of Baden will not quarrel with. If these circumstances are borne in mind, it becomes clear that the responsibility for the destruction lies chiefly with the Entente.

The destruction was of two kinds—that caused by the direct acts of war and that carried out behind the armies and on the L. of C. It is of the latter that the Allies chiefly complain, when they say that it was instigated by German manufacturers. This fairy tale was often heard during the war and, like everything else that came from the Allies, found wide belief in Germany. Ludendorff declares categorically that it is absolutely untrue. When he went to G.H.Q. he heard the tale and tried to find its foundation, without any success. In his Russian campaigns he built more than he destroyed and in the West the same was often true. On the other hand, German industry had to be placed in a position to fulfil the demands made upon it. It needed help all the more because it had to compete against the whole world. Consequently,

whenever a factory in the occupied territory could not be worked, the machinery was sent to Germany. It was only occasionally possible to work a factory where it stood, because industry must not be imperilled by the chances of war, and German workmen often refused to leave their own country.

Every German knows how short of raw material the country was, and no one can be surprised that everything possible was taken out of the occupied territory; nevertheless, the enemy was protected more than he deserved, for, while German church bells were melted down, those in Belgium were not touched.

The French have complained about the removal of furniture. Owing to the situation it was necessary to build many hutments, and in these the soldier, after his exertions in the trenches, had to be refreshed, consequently the barracks had to be furnished. Similarly, dug-outs required furniture, particularly those used for offices. It is not astonishing that the nearest furniture was taken for these purposes, particularly when much of it came from unoccupied houses. Much of the plundering of unoccupied houses was done by the civil population, as was noticed during the first advance of the German armies in 1914, and much of the destruction that was then carried out was in consequence of the action of the Belgian civic guard and population, contrary to the laws of war. In 1914, and when the trench war began, both sides destroyed equally; or did the Allies never bombard French and Belgian towns? On the contrary, they did so far more than the Germans, because they had more ammunition, and did far more damage by entrenchments, because they had more men. St. Quentin, Cambrai, and many other towns were never touched by German shells.

The battle line from Nieuport to Switzerland, and the devastation that it shows, made a deep impression on all who saw it, but much of the damage was due to the spade, and to the fact that cultivation was impossible for a wide area on each side of the line; wind and weather did the rest.

The destruction by shelling was chiefly due to the allied attacks of 1915, 1916 and 1917 with their enormous munition resources, which were far greater than anything Germany could dispose of. Only at Verdun, on a restricted front, did Germany do any original damage. The rest of her attacks were over ground already devastated.

The destruction carried out during the withdrawal of March, 1917, can, it is true, be charged to the Germans, but even this was to a great extent over ground already destroyed during the Somme battles. In this case it was necessary to take such measures as would enable a weak force to hold a strong one. For this reason 12 to 15 kilometres had to be cleared in front of the Siegfried position, and if it be said that this was far more than was usual even with regular fortresses, the necessity must be attributed to the greater effective range of all sorts of weapons. The law of nations was in no way infringed. Aeroplanes, and not German lust for destruction, necessitated the cutting down of the fruit trees; every front-line soldier knows the value of trees as shelter against hostile planes.

Apart from tactical considerations, the strategical situation was such that it was essential to have a piece of front which should be moderately safe from attack on a large scale, where tired divisions could rest. Only by this means was it possible to find the reserves with which to meet the British and French attacks of 1917.

In fact, if it had not been for the withdrawal of 1917 to the Siegfried line, the Germans would not have lasted out the year, and from that fact alone the demolitions which were entailed are fully justified.

When in 1914 the 9th Army retreated from the Vistula to the borders of Silesia, only the railways were destroyed, because the situation demanded nothing more.

In the autumn of 1918 German demolitions were on a larger scale; they only barely corresponded, however, to the situation and in many respects fell far short of requirements. Coal mines are in a category by themselves, as will be admitted, and it was necessary to put them out of action thoroughly and for as long as possible; it could not be foreseen in August, September and October that the revolution of 9th November, 1918, would break the armies, and a much longer resistance was counted on. In any case, the destruction was no more than was carried out in the Roumanian oil-fields by the English "Engineer or Colonel" Thomson. Germans would have themselves done exactly the same to their own Upper-Silesian coal mines, if, in 1914, they had had to leave them to the Russians.

General Ludendorff says he will not continue the subject. As time goes on, the circumstances which compelled action are forgotten, while the results of the action remain. This fact is used by the allies in making their case for the oppression of Germany. But it was iron necessity, and not wilful lust that led to the measures which G.H.Q. had to take to counter the lawless actions of the enemy. War is at all times a rough business, and seems mad and wilful to those who do not know it. For this reason the allied statesmen ought to stop their attacks on the German soldier's honour. They ought to have the courage to speak out openly and say "might is right."

The use of Poisonous Gas in the War.—The writer admits that Germany was the first nation to employ gas in war, when she used it with partial success on the Yser in 1915. The cry raised by her enemies at this so-called barbarous weapon was not justified because, he says, it is well known that the French, for long before the war, had been carrying out experiments with gas, and it was only the skill of German chemists which enabled Germany to get a temporary start in its use.

Whether the French actually fired gas shells before the Germans did, is, he declares, an open question, for many heavy shells cause death without visible wounds. The writer then proceeds to compare the Washington resolution on the subject of the use of gas, with the opinions that have appeared in the press, and concludes that no one, least of all England, is likely to be bound by any pious resolutions if national safety is in question.

No. 34. *The Comparative Strengths of Modern Armies.*—General von Altrock gives a table showing the peace strengths of armies

as percentages of the total populations. By giving England an army of 341,000, her percentage is 0·72. Some others are :—

Russia	1·23	per cent.
Germany	0·17	,,
France	2·19	,,
Italy	0·57	,,
Poland	1·10	,,
Roumania	1·25	,,
Jugo-Slavia	1·53	,,
Checho-Slovakia	1·47	,,

The remainder are mostly under 1 per cent. The writer points out how hopeless Germany's position is shown by these figures to be, particularly because she cannot form any reserve. The right of self-defence should not, he says, be taken from any nation.

L. CHENEVIX-TRENCH, *Major, R.E.*

April, 1922.

REVUE DU GÉNIE MILITAIRE.

November, 1921.

Roads and Tracks, by Colonel Normand. (Notes issued to the 12th Engineer Regiment). The construction of a new road requires, say, 1·20 cubic metres, per metre run, of material, for a single-way road, and 2·20 cubic metres for a double-way road. A new road should never be undertaken unless time and transport are available. A wagon carries ·75 cubic metres ; a lorry 3·00 cubic metres ; a train, 350 cubic metres. The maximum rate of construction is 100 metres per day for a road five metres wide, per 100 skilled men. This is reduced to 60 metres if the men are unskilled.

2. It is always better to improve an existing road than to build a new one, as, with the latter, settlement continues for a long time.

3. The soling must be hand-packed ; and laid preferably on excavated ground, cut to camber, and not on made ground.

4. The trace is fixed by the places to be connected, and by bridges, railways, streams, etc. Curves must not exceed 10 m. for horse transport or 40 m. for motor transport, and gradients 1 in 20 for flat country or 1 in 10 for hilly country. If possible, roads should pass near quarries.

5. Camber must be slight ; say, 1 in 50.

6. The foundation must be firmly supported on both sides by a solid edging of large stones, sometimes by a pavement, or by carrying the foundation to the edge of the excavation, to trees, etc. Vehicles running over the edge cause much damage. This must be prevented. An earth bank is only allowable to prevent vehicles upsetting into large ditches, as it tends to bring mud on the road. Pickets and large stones at 5m. intervals are very effective. Longitudinal baulks kept in place by pickets are effective, but expensive.

7. The disposal of water is essential for the preservation of roads. Longitudinal ditches should be 1·50 m. clear on either side or, failing

space, should be revetted with hurdle work. The road should be connected to these ditches by drainage channels every 5 m. at least in cuttings. Storm water drains should be dug above roads. Allowance of 50 cm. width of ditch for every 1,000 *hectares* of surface collecting rain-water.

8. Mud holds moisture, destroys the binding, and causes dust. It should be got rid of, or prevented, by sweeping in wet weather or by shovelling. Watering places by a roadside should be forbidden. Corduroy roads leading to camps and watering places, if kept clear of mud for 50 m., prevent mud being brought on to the road. Mud removed from a road should be taken well away, so that it does not get back to the road again.

9. When roads have to be widened this should be done equally on both sides, but one side should be completed throughout before the other is begun.

10. *Upkeep of Roads*: (*a*) Above all else, drain; (*b*) keep free of mud; (*c*) never fill up holes with earth, but use stone, and ram or roll; (*d*) if a repair has to be made, loosen the old metal if possible by machinery, and roll the new metal with the old, binding it into the old surface; (*e*) do not interrupt traffic, do one side of the road at a time; (*f*) replace wastage caused by use and the removal of mud and dust, and cover with marl or chalk if very dry.

A small maintenance party is essential. During a thaw the pace of light motor traffic should be reduced to 35 km. an hour, and no heavy axle-loads should be allowed until the road is dry.

11. *The Re-establishment of Battle Roads.*—First ensure the passage of field-guns and then try to restore the road on its old site. In trench warfare roads are apt to be buried 30 cm. or more in mud. Where the road crosses trenches repair by filling and not by bridging. Where craters occur make deviations of corduroy road. Temporary bridges should be sited clear of the sites of the permanent bridges. Work should be done only on the roads selected by commanders. As much use as possible should be made of materials from ruined villages, etc., metalling being reserved for the surface. Seek out mines and booby-traps, and, lastly, leave a maintenance party.

12. *Traffic Regulations.*—Place numerous sign-posts, with transparency lamps for night, and make motor traffic move slowly. The different pace of horse and motor traffic can be arranged for by having different roads, cross connections between roads, or fixed hours for horse and motor traffic respectively. Intervals of 50 m. should be maintained between groups of vehicles to facilitate the movement of faster traffic.

13. *Organization of the Road Service in the Army.*—Soon after the outbreak of war, in each Army a Road Service was organized under the general commanding the engineers, commanded by an engineer of the *Ponts et Chaussées*, and composed of companies of workmen, officers and administrative officers who commanded sectors, companies of reservists of the territorial engineers, civilians, men undergoing punishment, occasionally of foreigners and colonials, and prisoners. In 1916 the Fourth Army were employing from 2,400 to 4,000 men. The Verdun Army had 92 companies. In addition, for transport, etc., sections were

organized each of 25 carts or 18 motor vehicles ; steam, petrol and horse-rollers, watering carts, sweepers and stone-crushers.

14. *Tracks.*—These should avoid all important works. Usually sign-posts only are required, vehicles then make the track. Sufficient width must be allowed for the track to be moved when it becomes bad. . Fill up holes with anything but earth (this does not apply to footpaths). Only use sweepers in very bad places. Insure the run-off of water, put in culverts of fascines, pickets, etc., where required. Only build bridges when deviations cannot be made more quickly. . In sand, fascines can be used at right-angles to the line, or, more economically, longitudinal ones kept in place by pickets ; the ends should be firmly bedded.

Tracks are very useful for caterpillars.

C. LA T. T. JONES, *Capt.*

REVUE MILITAIRE GENÉRALE.

December, 1921.

The Revision of the Regulations. Continuation of the article by "Lucius," dealing with the end of the fourth period. The Instructions issued at the end of 1916 were a first effort towards reconciling order and method with rapidity in execution, with a view to reaping the full advantages of success. A Provisional Note of 27. 9. 16 on the subject of attack by small units fixed the new organization of the infantry battalion at three companies and a M.G. company, and determined the establishment of specialists. It announced that infantry could now hold their ground more firmly in defence, and in attack had recovered the power and ability to manœuvre which had been diminished by trench warfare. The way having been opened by the artillery, it should now be possible for infantry to exploit a success with its own resources, and each body should have a plan prepared for doing so ; the first success must be completed by the capture of those supporting points the conquest of which might have to be dearly bought next day, and points abandoned by the enemy should be occupied at once. However, as a check to rashness the battalion commander was warned that the following up of a success is achieved, not by infantry alone, but in combination with the artillery. The note also reduced the density and increased the depth of infantry formations, the interval between rifles is raised to four or five paces, which appears to be a maximum if continuity in the line is to be preserved. The Instruction of 8. 12. 16 on the employment of cavalry sums up previous instructions in one document, and points clearly towards the infantry model and action on foot. The missions to be fulfilled will be the immediate exploitation of a success in combination with the other arms, or distant exploitation in the execution of which the larger cavalry formations will have to depend on their own resources. The cavalry of the division or corps is the true co-partner of the infantry, and ought to come into action directly the latter finds it has no continuous obstacle in front of it. The larger formations must have a "pursuit plan" and put it into operation, directly the enemy's

defence is breached or he retires on a wide front. An Instruction of 12. 12. 16 deals with inter-communication and regulates the employment of aircraft in the battle.

The Instruction of 16. 12. 16 deals with the combined offensive and marks a distinct advance. It commences by pointing out that recent tendencies, to reduce the width of front attacked, to select objectives which are too close, and to increase the interval of time between two successive operations, cannot assure the best results, but limit the success and give opportunities to the enemy to recover. Limited objectives lead to a narrow conception of the battle, and an easily achieved success is then liable to come as a surprise and to find no definite plan ready for exploiting it. On the contrary, attacks must be conceived of as wide in extent, involving the capture of the enemy artillery, and must be executed as rapidly as possible one after the other. Method is above all applicable to the period of preparation, and is extended to the period of execution only as far as plans of action can be arranged beforehand; rapidity and continuity of purpose are then paramount. The greatest attention should be paid to places where the advance is expected to be easy; the artillery preparation will be carried out not only on the first position, but on any others within range, and infantry will advance with no delay beyond that necessary for restoring order or the destruction of fresh obstacles. In consequence the objectives assigned to an attack will be a minimum which is bound to be reached, but beyond which progress can and ought to be made, thus realizing the *tactical exploitation* of the success. Once the organized positions have been carried, commences the *strategical exploitation* carried out by the larger formations held in reserve for that purpose. It is nothing less than the pursuit, but a pursuit in which the infantry will be husbanded by the support of artillery. The time taken in changing position of the guns will be reduced by detailed change of position plans prepared to ensure that there are batteries always ready to fulfil their different rôles, whatever the infantry progress may be. Attacks will be by successive stages, each limited only by the resistance met with. Arrangements for the attack will be directed more and more to the preparation of numerous plans to ensure rapidity of execution, and as far as possible eliminate the chance of being surprised by success. In the execution, a large measure of initiative must be left to the officers on the spot, to ensure energy and boldness. It is, however, pointed out that good order, rapidity, continuity and constant artillery support for infantry are necessary conditions, and that for infantry good order is more important than rapidity. Artillery is constantly enjoined to destroy the enemy's guns (neutralization is only allowable in default of anything better) and obstacles (but now confined to essential elements of the defence) to the march of the infantry. The commencement of the infantry attack depends entirely on the progress made by the artillery preparation. Tactical surprise is always to be attempted by simplification of the earthworks undertaken, by the general use of camouflage, by strict control of conversations and correspondence to ensure secrecy, and by less complete destruction by the artillery; but even now the preparation must extend to five or six days, although

neutralization of the enemy's artillery would allow of its being considerably shortened.

At the end of 1916 the resources of the offensive may be considered adequate to the requirements of position warfare, and, although there was a deficiency of heavy Q.F. guns, a judicious employment of those existing permitted of the rupture of the enemy's fortified front being confidentially anticipated. At this time the enemy was much exhausted, and for the first time had made overtures for peace, while the numbers of the Allies nearly attained their maximum. The year 1917 appeared to dawn happily for the Allies, but new defensive tactics and alteration in the French High Command played them an ill turn.

(*6th.*) *The Combined Offensive in Artois and on the Aisne* (*9th April to 15th May*, 1917): (*a*) *The Preliminaries.*—General Nivelle now replaced General Joffre and for political, economic and moral reasons it was desirable that the war should be ended as quickly as possible. Joffre's plan had been two attacks, the principal one between Oise and Arras, commencing on 1st February, the other, less important, between Soissons and Rheims about 20th February. This plan was remodelled by Nivelle, who wished the principal effort to be made on the Aisne, although the attack on the Somme was still to be first in order, and destined more to attract the enemy's reserves than to effect a breach; the changes entailed postponed the attack till April. It will be seen that the plans were based on a system of multiple attacks intended progressively to absorb the adversary's reserves; not on a system of successive attacks on a single wide front. Each attack was to be on such a wide front, however, that dangerously narrow salients would be avoided and manœuvre would be possible, and it was hoped that the later attacks would effect a breach owing to the enemy's reserves having been drawn away by the earlier attacks. Success would be more probable if the separate attacks followed each other closely in point of time, but this supposes sufficient material and personnel to be able to maintain the later attacks without starving the earlier ones. General Nivelle's plan was about to be executed when the enemy forestalled events by retiring on the Hindenburg line with the object of gaining the time he required for the development of his submarine campaign, and to collect reserves of men and munitions. The retreat reduced the length of his line by 40 km., got rid of the vulnerable salient at Noyon, and placed the Allies on a devastated zone unsuited to the offensive.

(*b*) *The General-in-Chief's Plan, Based on Rapidity.*—General Nivelle was impressed by the necessity for an early termination of the war, and was a wholehearted advocate of the Instruction of 16. 12. 16. Unfortunately he emphasized the principles of rapidity and boldness to the neglect of good order and method, and aimed at a dashing attack, breaking through the enemy position in 24 to 48 hours, forgetting that the defence was now so deep that the attacking guns must change position to bombard the whole of it, and that successive preparations were necessary and took time. In fact, the General's plan was a return to the already discredited Instruction of 16. 4. 15, but meanwhile, fortification had developed and the Allies had not sufficient heavy Q.F.

guns to prepare for attack in one operation the whole of a deep position of defence.

(*c*) *Resumption of the Offensive in April*, 1917.—The Allied offensive began on 9th April according to plan, but except on the British front produced meagre results.

(*d*) *The Results.*—The anticipated breach was not effected, and from 21st April all idea of breaking through was abandoned, and attacks on limited objectives were reverted to, with a view to wearing down the enemy, until operations were suspended on 15th May. Shortly afterwards General Nivelle was replaced by General Pétain.

(*7th.*) *Conclusion.*—It is unfortunate that the Instruction of 16. 12. 16 should hardly have seen the light before it was modified, the order and method it inculcated neglected, and its boldness exaggerated. All the operations show that surprise is still an important factor of success. In the earlier days of the offensive, especially if surprise can be obtained, it is certain that the assailant suffers fewer casualties than the defenders, but once equilibrium is established the losses on each side tend to become equal, and that side will then be favoured which can obtain for itself the ability to manœuvre. Mastery of the air is now a powerful factor of success.

(*To be continued.*)

A. R. REYNOLDS, *Colonel.*

REVUE MILITAIRE SUISSE.

No. 12.—*December*, 1921.

The Reichswehr—Major de Vallière's article on this subject, begun in the number of the *Revue* for July, 1921, is continued. The successive stages through which the Imperial German Army was, after the Armistice of 1918, transformed into the Reichswehr is dealt with. Major de Vallière points out that the Great General Staff was, in 1917, still confident that the Central Powers would emerge victorious from the trial of strength on the hard-fought fields of the Western Front, and arrangements were consequently made gradually to begin the liberation of men with the colours, so that the economic reconstruction of Germany might be taken in hand the moment the "Cease fire" sounded on the battle-fields. The defeat of German plans in 1917 caused the original demobilization scheme to be cancelled. The critical situation through which Germany passed during the final stages of the Great War is dwelt upon in the original article, and it is made clear that it was largely due to the firm hand with which Noske, the Socialist War Minister, restored discipline in the ranks of Germany's new levies that his country escaped the unhappy fate of Mighty Russia. The return to the Fatherland of the Field Army at the end of 1918 also seems to have had a sobering effect upon the German people. Officially, the old German Army was demobilized in November, 1918, but there were still 300,000 unmobilized soldiers in April, 1919; it was not till October, 1920, that the late Kaiser's Army can be said to have been finally dispersed. In the meantime, General Mærker, Commanding the 214th Infantry Brigade,

raised a Volunteer Corps, the members of which were liberally treated in the matter of pay and rations by Noske. This Corps, the forerunner of the Reichswehr, maintained order in the interior, and came in useful when the communist gathering, numbering some 150,000, in Westphalia had to be taken in hand and dispersed by force. The Reichswehr was brought into existence in March, 1919, by a law passed at Weimar by the National Assembly: its strength increased from 300,000 men (28 brigades) on May 1st, to 450,000 men (43 brigades) on October, 1919; however, by the end of 1919 the strength of the force had been reduced to about 100,000 men, organized in 20 "mixed" brigades. This brigade organization was in violation of the provisions of the Versailles Treaty: each "mixed" brigade really constituted the nucleus of an Army Corps. Warned by the measures adopted by Prussia to evade the conditions imposed by Napoleon after Jena, France has kept strict watch on her eastern neighbour: she does not desire to have a surprise sprung on her. The possibility of secret measures being adopted in the Fatherland with a view to enabling Germany to escape from the consequences of the defeat experienced by the late Kaiser's hosts on the fields of Flanders and Northern France during the recent struggle cannot be put on one side as something too remote to be guarded against.

Rapidity of Attack in the Great War and After.—M. Fleurier's article on this subject, begun in the number of the *Revue* for November, 1921, is continued; the campaigns which have been in progress since the Armistice of November, 1918, was signed, are discussed. It is pointed out in the original article that the causes which led to the stabilization of fronts in the Western theatre during the Great War have been absent in the theatres in which operations have continued since November, 1918. M. Fleurier examines the causes which were chiefly responsible for the stabilization of the fronts in France and Flanders, and compares the conditions prevailing there with those under which the subsequent campaigns have been conducted in other theatres. He sums up his conclusions under two main heads (*a*) observations on strategy, and (*b*) observations on tactics. He points out that the war of movement has returned, and that the *strategic manœuvre* has once more a place in plans of campaign, whilst in the case of the tactical field, a great variety of conditions have had to be faced, indeed, from police action against insurgents to pitched battles. The article affords interesting reading.—(*To be continued.*)

NOTES AND NEWS.—*Switzerland.*—In normal circumstances, the annual contingents for the Swiss Army amount, under the Military Service Law, to 30,000 men. In 1917, 27,350 recruits were actually called up; in 1921, owing to the sum voted in the Budget not being sufficient to call up the whole of the class reaching military age in that year, the annual levy was reduced to 22,900 men; this number has been further cut down by 2,800 men in the current year's levy. The young Swiss is exceedingly keen to put in his military service, and considers it a stigma to be rejected for the Army. To meet the exigencies of the moment, the medical examination of recruits has been stiffened, and men quite fit for service are being rejected; much dissatisfaction has

been caused by a resort to this expedient to cut down the numbers called up.

France.—An appreciative note is contributed by a special correspondent on General Humbert, Governor of Strasburg, who died on November 9th, 1921, at the age of 59. At the beginning of the Great War he was commanding a Brigade, and rapidly rose to the command of an Army (July, 1915).

Portugal.—A special correspondent calls attention to the main features of the proposed new Army organisation: they consist in (1) the creation of two new Directorates in the Ministry of War, *viz.*, (*a*) Directorate of the General Staff, and (*b*) Directorate of Army Services; (2) the creation of an Air Force; and (3) the creation of five military territorial districts in place of the eight military divisions. Among the other proposals which have been made is one for the fusion of the Field and the Garrison Artillery into a single regiment. Considerable controversy has arisen on the question, and apparently the leading experts in Portugal are opposed to this part of the New Army Organization Scheme.

No. 1.—*January*, 1922.

Rapidity of Attack in the Great War and After.—M. Fleurier's article on this subject, begun in the number of the *Revue* for November, 1921, is continued. The part of the article under notice contains further observations on tactics. The important question of the employment of cavalry is dealt with; it is pointed out that since the termination of the fighting on the Western Front many opportunities have been afforded to cavalry for playing its old rôle in war; the experience thus gained has necessitated a revision of the death sentence passed on the mounted arm. Aviation, tanks and field fortification each receive mention in the original article, and technical observations sum up the author's conclusions on such subjects as the rifle, automatic guns, grenades, trench mortars, artillery and ammunition. Finally, M. Fleurier points out that, as was the case in former ages, so in the last war, technical improvements in the armament and equipment of troops appeared at first to tell most in favour of those resorting to the defensive, but, as the campaign continued, it was those on the offensive who derived the greatest gain from the advances made in the technical field. The extended use of automatic weapons, for instance, provided the attacking infantry with support and protection up to the latest stages of an advance, owing to the continuity of the fire-action. M. Fleurier recognizes, and emphasizes, the fact that the offensive manœuvre can alone succeed, however, where adequate measures are adopted for promptly providing all that is necessary for rendering an attack swift and for maintaining the rapidity of the advance.

Search for a New Discipline.—Captain Cingria's article on this subject, begun in the number of the *Revue* for November, 1921, is continued. Reference is made to a new system of discipline (the Montesori system) introduced in certain Government schools in the Canton of Ticino; a system which appears to have proved eminently successful with school

children. Captain Cingria recognizes that reforms which have proved successful in school discipline will not necessarily meet the requirements of military discipline; he, however, inclines to the view that something in the nature of the Montesori system might be introduced into some phases of military life, but makes no definite recommendations—a search for the solution which will satisfy his ideals being still continued. In a pamphlet entitled "L'organisation et l'instruction de l'armée," published in Switzerland in 1920, General Léo Keresselidgé, its author, holds up the organization of the Swiss Army as a model worthy of universal imitation. Captain Cingria takes exception and expresses the opinion that in the matter of discipline the Swiss militia lags behind the monarchial armies of the present day.—(*To be continued.*)

NOTES AND NEWS.—*Switzerland.*—Attention is called to the controversy which has been taking place on the subject of the "neutralization" of Savoy: General Wille and Colonel Sprecher, of the Swiss Army, have contributed their views on the subject in recent numbers of the *Allgemeine Schweizerische Militärzeitung* in reply to views which have been expressed in the *Revue* on the subject of the League of Nations. Colonel Sprecher is strongly of opinion that Switzerland should continue to maintain an adequate Army, and, having regard to the unsettled state of Europe, the preparation of schemes of defence to meet all possible contingencies likely to arise should be taken in hand.

France.—A special correspondent calls attention to the functions of the *Conseil supérieur de la défense nationale* and the *Commission d'études*; the provinces of the two bodies are now regulated by a Decree of November 17th, 1921, and certain Decrees of earlier date. He pleads that the scope of the responsibilities of the *Conseil supérieur* should include that of co-ordinating the activities of all Government Departments, so far as they affect matters of military interest, in order that the part these Departments may be called upon to play in a time of war may be duly considered and planned out in advance with foresight. He further urges that the *Conseil supérieur* should not have its time taken up exclusively in dealing merely with matters affecting rifles, catapults, etc., as has been customary in the past, but should now survey a much wider horizon: instead of considering the matter of mobilization as being the sole domain with which preparation for war is concerned, the *Conseil supérieur* should extend its oversight to all questions which are connected with the provisions and arrangements which have to be made for the conduct of a modern war. Some pertinent remarks are made concerning the respective rôles which the *Conseil supérieur* and the *Commission d'études* should each be called upon to play in the State organization.

W. A. J. O'MEARA.

ERRATA.

In *R.E.J.*, April, 1922, page 199, line 4, for *Seres* read *Sedes*.
Page 202, line 31, for *Piers* read *Piles*. Line 39, for 8 *in.* read 8 *feet*.