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EDITED BY
ARTHUR F. CASSELS
LIEUTENANT-COLONEL (FIELD ARTILLERY), UNITED STATES ARMY, RETIRED

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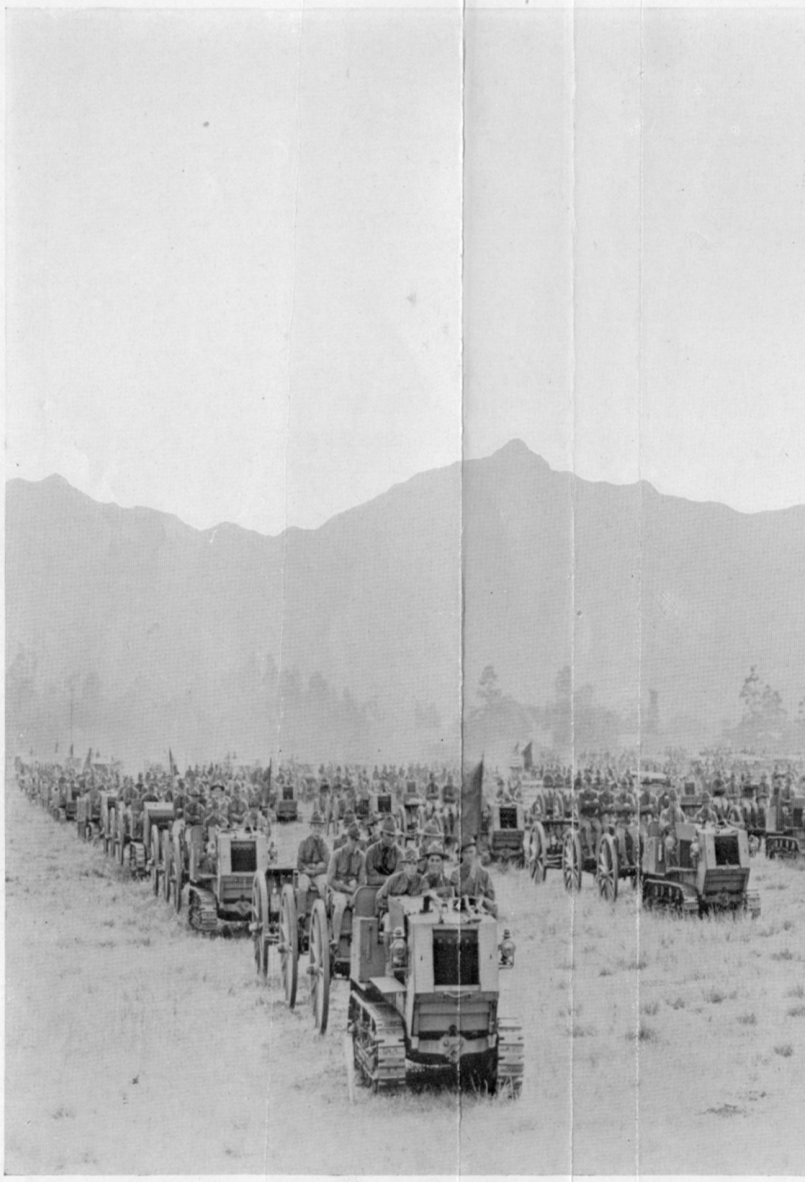
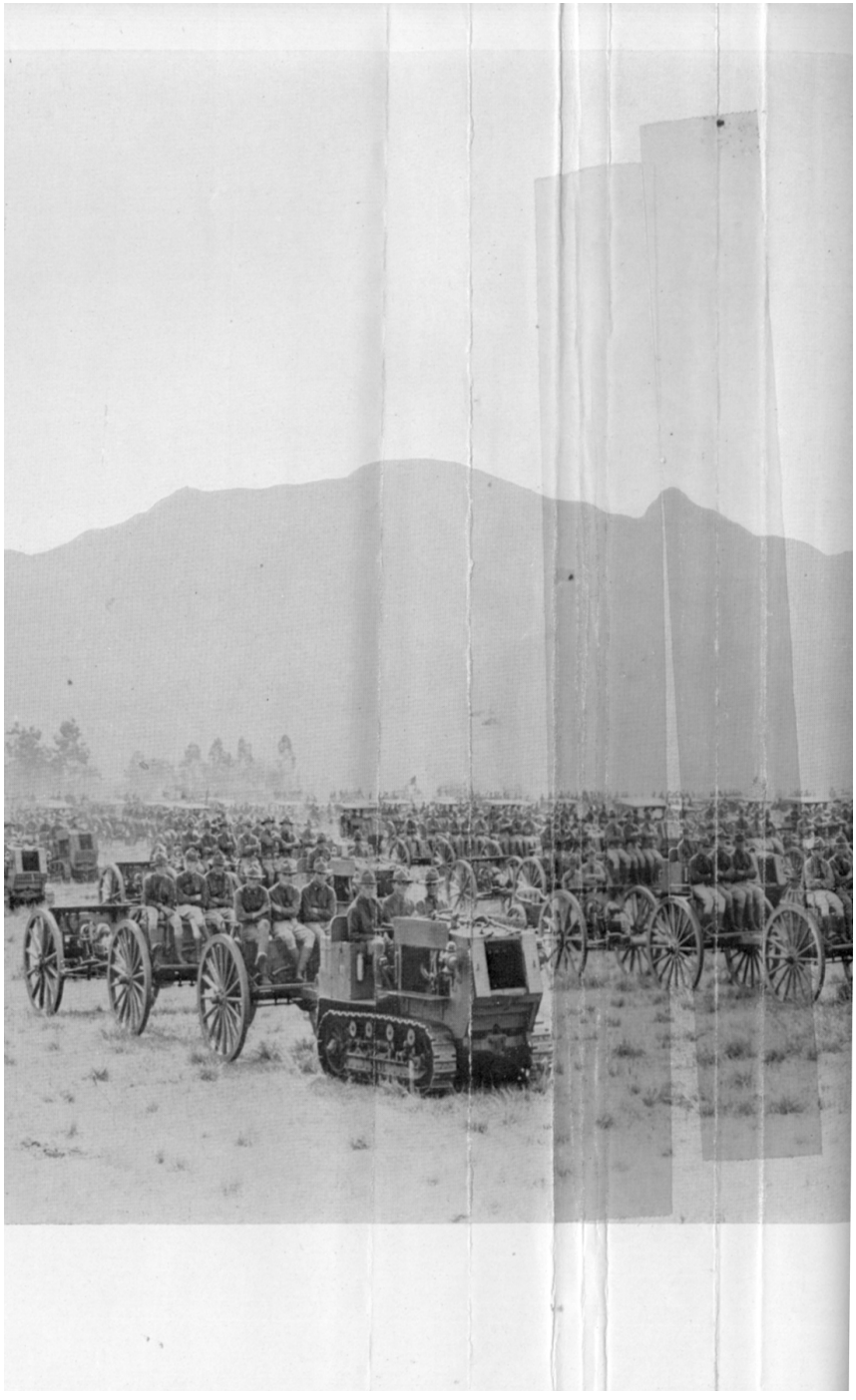
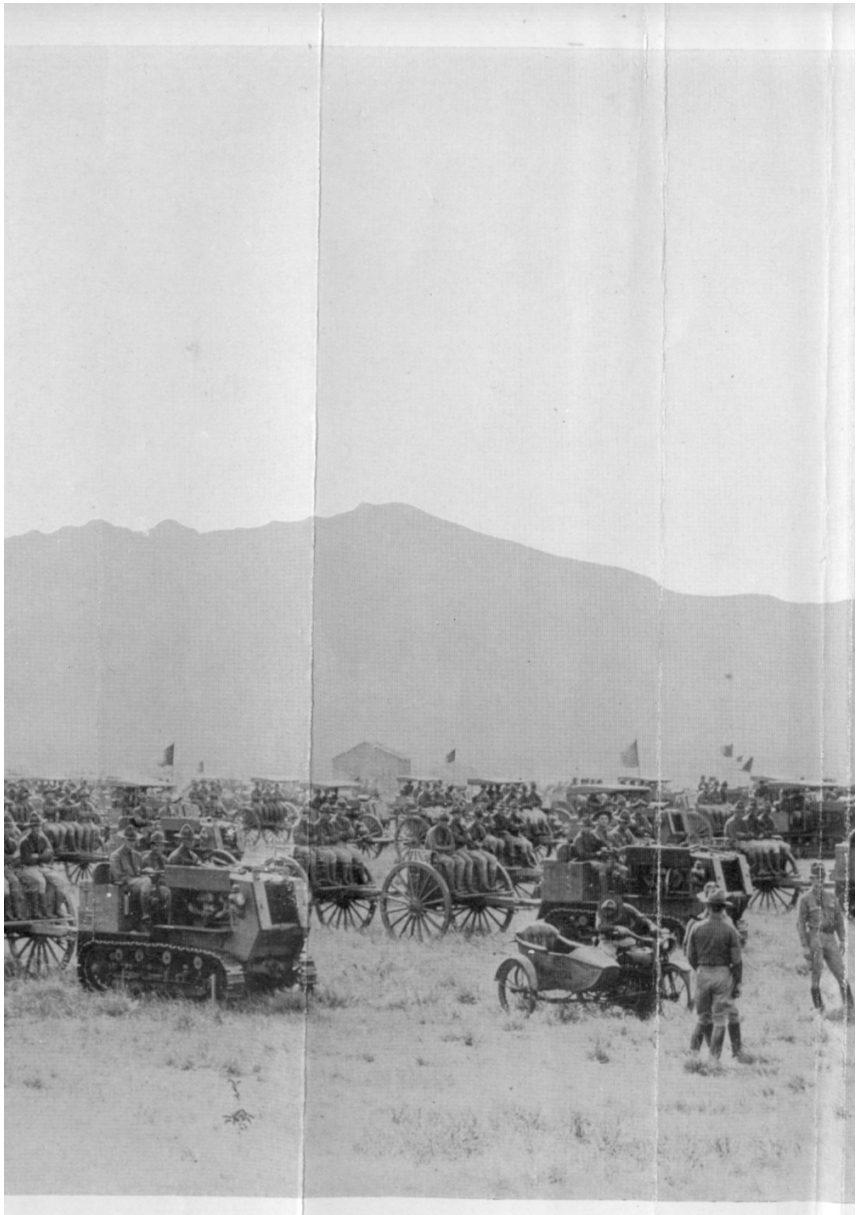
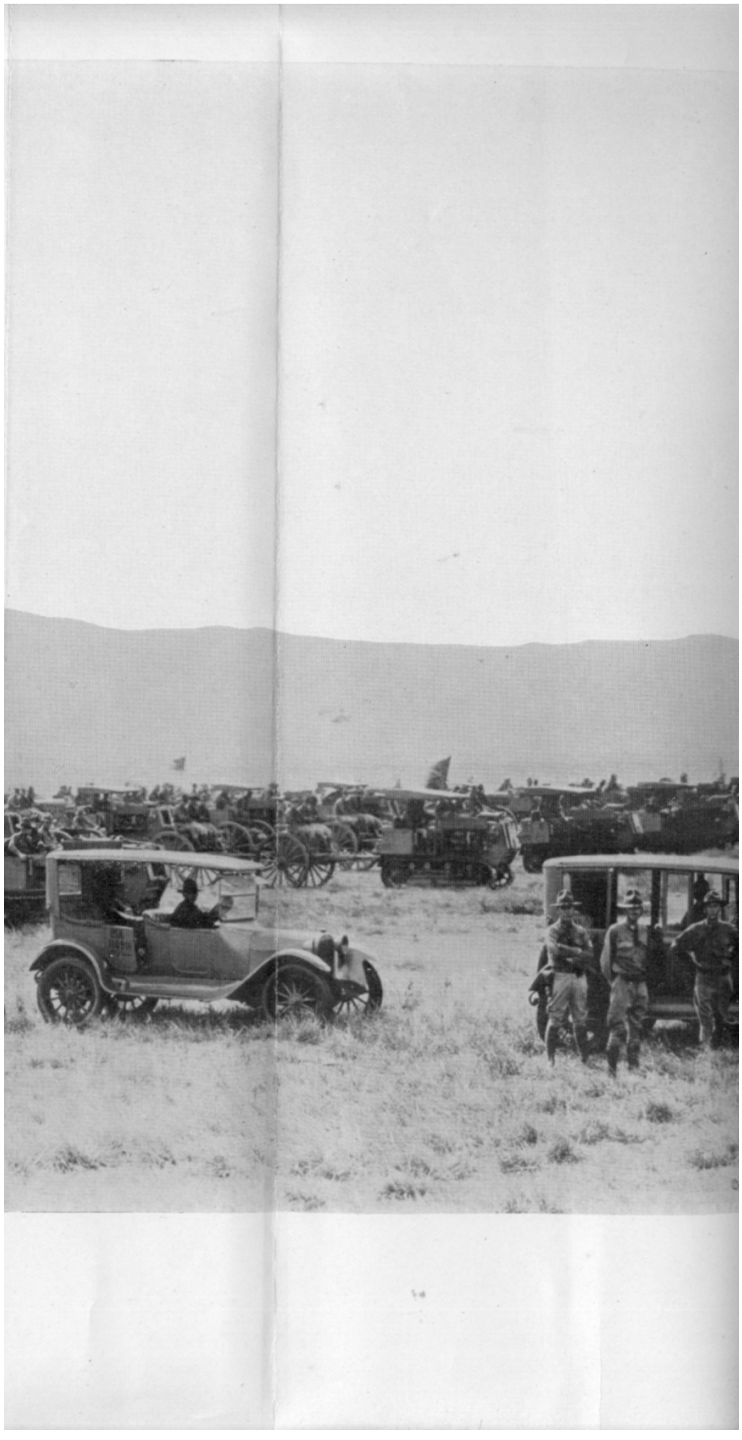






ELEVENTH FIELD ARTILLERY BRIGADE—MOTORIZED

8TH AND 13TH (75 MM.), 11TH (155 MM. S.) FIELD ARTILLERY REGIMENTS
SCHOFIELD BARRACKS, HAWAII




11th Field Artillery Brigade
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THE FIELD ARTILLERY JOURNAL

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EVOLUTION OF IDEAS IN THE EMPLOYMENT OF ARTILLERY DURING THE WAR

COMBAT

LECTURE DELIVERED BY COLONEL MAITRE, COMMANDING THE 13TH LIGHT ARTILLERY, BEFORE THE CENTRE D'STUDES TACTIQUES D'ARTILLERIE AT METZ

Authorized translation furnished through courtesy of the Director, Military Intelligence Division, General Staff, United States Army

GENERAL MOUCHEN and Gentlemen, I have come to speak to you on the evolution of ideas in the use of artillery during the great war.

I have frequently heard it said that there has been a veritable revolution in the principles of the use of artillery over what they had been before 1914. We are now going to see how much truth there is in this great word "Revolution" and with that in view we are going to follow, step by step, an evolution as shown up by:

The experience in battle during different phases of the war.

The increase in matériel.

The improvement in technic.

The organization of command.

For this purpose I will follow to a great extent, even to quoting them literally, the reports made by the Commission Centrale d'Artillerie on the lessons drawn from the war.

If it had been possible to put these very interesting reports in your hands, my little talk would be useless, but unhappily only a few of these reports are in existence, although I hope that the 3rd Direction will have enough copies printed to give you an opportunity to study them.

DOCTRINE BEFORE THE WAR

Our regulations before the war made clear that the mission of the artillery was to work for the benefit of the infantry. In the offensive it was to open the way, taking under its fire everything that could hinder the progress of the infantry. In the defensive it was to support its own infantry and stop the advance of the enemy. The means of executing this task, as indicated by the regulations,

were based on the supposed great destructive power of the rapid-fire field-piece against personnel in the open, and even against personnel sheltered behind gun shields, breast works, or trenches.

The picture of a battle as foreseen in those days was something like this:

The batteries being in position of readiness or observation, a certain number would be put into action, dependent on the length of front and the importance of the objective. The purpose was to induce the enemy to uncover his infantry and artillery, and to put these objectives immediately under fire with the remaining available batteries, always using, however, the minimum necessary for the task. The end to be sought was to have at all times more batteries than the enemy, available to concentrate a fire on any part of the field.

This scheme is not to be accepted without discussion and many authorities teach that it is better to be two or three against one, than one against two, even with a better weapon than that of the enemy, for already great concentrations of fire were foreseen.

With regard to the conduct of fire, the regulations foresaw that the enemy would seek to escape the murderous effect of our artillery. Visible objectives would be usually scattered or sheltered behind gun shields or entrenchments. Such objectives would not justify a great expenditure of ammunition. As for objectives with defilade they could only be attacked, in general, by zone fire since aerial observation had just come into existence and its possibilities were very modest and little known.

Under these conditions the regulations called for destructive fire when possible, but they foresaw that frequently it would be necessary to limit oneself to neutralization, with a relatively small number of projectiles. The editors of the regulations had been influenced by our weakness in ammunition, as compared to our strength in matériel, and as a matter of fact our supply of ammunition only allowed from 1200 to 1300 rounds per piece, or about four days actual fire.

Our heavy field artillery was almost non-existent and the regulations hardly mentioned its properties; its powerful effect and its high trajectory, a quality which we wished to give to the light artillery by use of plaquettes.* On the employment of heavy artillery the regulations were silent.

Our high command underestimated the power of the German infantry fire, and in particular that of the machine guns. It did not foresee sufficiently the need of an artillery preparation. The field service regulations of 1913 prescribed that the artillery support the attacks but did not require it to prepare them.

* These "plaquettes" were disks put on the projectiles to give them high trajectory.

Our very large divisions of four regiments of infantry had only three groups of 75's commanded by a colonel who acted as chief of the divisional artillery, but did not have a place of sufficient importance in the division.

In short, the ideas of before the war were characterized by an almost exclusive use of the 75, working so as to give a feeble density of fire. There was little heavy field artillery, its importance was not considered, and many people did not wish to believe in it, for reasons of economy.

With this as the state of mind of our officers, our artillery at mobilization was composed of 3840 pieces of 75 with an ammunition supply of 1300 rounds per piece, and 308 pieces of mobile heavy artillery of which 104 were of rapid fire, but of short range (155 C, Model 1904).

Nevertheless, many authorities foresaw the concentration of fire, coördination of artillery in the Army Corps, and the capital importance of heavy field artillery. Certain of these ideas had been timidly admitted in the artillery regulations and beginning with 1910 studies had been undertaken leading to the creation of a heavy artillery. It was these studies, begun in 1910, which facilitated the evolution of our ideas and the construction of new matériel.

LESSONS FROM THE FIRST PART OF THE WAR, AUGUST TO OCTOBER, 1914

At the outbreak our infantry, full of enthusiasm, attacked without preparation and in too dense a formation, with the result that our losses from the fire of the German infantry, and above all from their machine guns, were considerable. From the month of August, 1914, the Commander-in-Chief directed that the recklessness of our infantry be moderated, and that it should only attack in thin formations, and after an artillery preparation.

The German army in its advance was preceded by an advance guard of shells of large calibre which disagreeably impressed our infantry. The hidden German batteries often fired at their extreme range and our 75 was unable to reach them, a fact which drew attention to the importance of artillery and to the effects obtained by shells containing a heavy charge of explosive, and also the need of long-range guns. This led to the decision of November 27, 1914, by which a group of heavy artillery (155 L, 120 L or 105) became an organic part of each army corps.

In fact, our artillery using densities of fire greater than had been foreseen, only obtained real success at the moment of the counter-offensive, when the enemy offered objectives near enough to be visible from terrestrial observatories. In some particular cases,

concentrations on nests of enemy batteries located by aeroplanes resulted in their destruction, and in spite of our inferiority in heavy artillery, our counter-offensive succeeded both in Lorraine and on the Marne. Unfortunately, in some weeks our ammunition supply was exhausted and this phase of the war was interrupted by the lack of artillery ammunition.

This first campaign taught, however, two ideas: the real power of fire, and the importance of the heavy artillery.

STABILIZATION

At the end of 1914 the front became fixed. In one way or another the manufacture of the matériel recognized as necessary, was begun, and our factories organized.

On the German side, ammunition above all was lacking, but not heavy artillery, for the Germans had from the outbreak of the war more than 6000 pieces of heavy artillery—they had not been hypnotized by their 77. On the French side, ammunition was needed, much ammunition, for the 75 is a great eater. Our first effort was in the direction of ammunition. All the mills began to turn out shells sometimes to the detriment of gun making. It was also necessary to create a heavy field artillery since at the beginning we had only 308 pieces of such matériel. We began by pushing the manufacture of the 105's ordered at Creusot before the war, and of which a part were delivered towards the end of 1914, but principally we altered the old De Bange matériel, found in the fortresses, so that it could be used in the field, with very happy results. From the end of 1914 we replaced in part our lack of heavy artillery by trench artillery which could be rapidly manufactured.

In the matter of employment we began to use the methods of siege warfare. We organized telephone systems and networks of terrestrial observatories, using any means at hand. Certain artillerymen remembered that before the war they had foreseen the necessity of directing their batteries from a distance, and the idea became general. Officers with 75's began to make a careful preparation of fire, using maps, etc.

Confidence was lost in the figures, regarding the shells needed to perform certain tasks, as given in the regulations of before the war. These figures were considerably increased but in a haphazard manner, and it is only at the end of 1916, after costly experiences, that they were fixed with any definiteness.

Beginning with the spring of 1915 we studied methodical preparations for attacks—preparations a bit weak, it is true, but the idea was developing all the same.

The idea of the counter-battery work began to make headway,

although for some time it was necessary to fight the opposition of the high command and of the infantry.

The offensives of September, 1915, in Artois and Champagne put in use the new organization and the knowledge deduced from our experiences. For the first time we have complete plans for the employment of the artillery, plans for the destruction of the enemy's works, and plans for neutralization during the attack. They are not yet perhaps the complicated plan that we will see in 1916 and later, but the idea of a careful preparation by artillery has taken root and the infantry has become exacting.

The lessons drawn from these offensives served as a basis for the instructions of the 20th November, 1915, on the use of heavy artillery, and of the 16th January, 1916, setting forth the end and the conditions of combined offensives.

The instruction of the 20th November, 1915, codified the dispositions already made for the organization of counter-battery work; direction of the artillery by the army corps; and the organization of groupments, from a tactical point of view. They pointed out the destructive effect of accurate fire (we were very poor still in ammunition above all for heavy artillery), and with this in view prescribed aerial observation. Terrestrial observation was to be developed, and at the same time the creation of the S.R.S., F.R.S., and artillery information service was begun. The technic of firing was improved by the application of topographical methods and the extension of the functions of the "Groupes de Canevas de Tir."

The centres of instruction, Chalons, Toul, Amiens, turned out battery commanders for the heavy and light artillery. They simplified the lessons drawn from the attacks of September, 1915, and made known to all the possibility of improving the methods of fire, such as atmospheric corrections, separating powder by lots, calibrating guns, etc. Finally, an annex of the 27th June, 1916, promulgated the principle of zones of normal and eventual action for the artillery, which had already been set forth in the secret annex of the 8th December, 1915.

The instructions of the 16th January, 1916, are characterized by the importance given to a proper artillery preparation along the following lines:

Combined operations on large fronts, successive attacks of limited objectives, and the results obtained from artillery preparation. Employment of a dense artillery fire, advance of the artillery in echelons, and the importance of the ability to manœuvre which had been lost during the period of stabilization. It should be said, however, that many batteries of heavy artillery had never had the chance to manœuvre since they came to the front and remained there as soon as they had been formed. Importance was also given to the need of

the most intimate liaison with the infantry and the creation of liaison detachments.

In the matter of matériel the increase made since the end of 1914 was considerable. Beginning with 50 batteries of heavy artillery in 1914, we increased our strength, so that on the 1st August, 1915, we had 246 horse-drawn heavy batteries, and 26 tractor-drawn batteries, total of 272, and the Commander-in-Chief at this moment requested that these be increased to 400 horse-drawn batteries and 100 tractor-drawn batteries, or a total of 500.

The delivery of the 105's was speeded up and the construction of the 155 Schneider howitzer, tried out in 1913, was begun. To secure greater production two models were adopted with the result that the following deliveries of 55 howitzers were promised.

1916	March	April	May	June	July
Creusot	10	30	30	50	30 etc.
St. Chamond	—	—	4	12	20 etc.

Hence we expected to have in the Spring of 1916:

4500 pieces of 75;

2500 pieces of heavy mobile artillery, horse and tractor-drawn, of 105 mm. and above;

2400 pieces manned by the foot artillery;

190 long-range heavy guns;

60 navy guns;

1200 small trench mortars (58 to 150);

350 large trench mortars (240).

These figures were never realized, for there was always a delay in deliveries and the battle of Verdun used up some matériel. The defensive of Verdun in the Spring of 1916 showed up in a brutal way, the power of artillery fire which closed for always any discussion on the matter.

Barrage fire was at its height, but a happy idea was brought forth and disseminated broadcast. It was the counter-offensive preparation which disorganized more attacks and cost the enemy greater losses than have ever resulted from the defensive barrage.

The battle also showed the importance of interdiction and long-range fire. The most characteristic of the lessons taught were: the great density of fire which is necessary to be really efficacious; the crushing force of concentration; the use of destructive fire in counter-battery work (the number of officers who did not believe in counter-battery diminished); and on the other hand, the insignificant effects of minor reprisal shelling which, if not abandoned, was at least changed.

From the month of April, 1916, the amount of artillery at Verdun was as follows:

744 pieces of 75;

570 pieces of heavy artillery divided into 144 batteries, and later increased by the arrival of new mobile batteries.

In July, 1916, we had 800 heavy guns. Two documents were published to set forth the lessons of Verdun, instructions of the 27th May, on the use of artillery in the defensive and the program of manufacture of the 30th May for 4000 heavy rapid-fire guns. At this moment we adopted the idea of assigning heavy howitzers to the divisional artillery. The idea could not be completely realized, however, before the end of the war on account of delays in manufacture and the necessity of equipping the new American Army. This program called for the manufacture of:

960 pieces of 105 mm.;
2160 pieces of 155-mm. howitzers (720 being for the division);
1440 pieces of 155-mm. long's (480 being for the army corps);
320 pieces of 220-mm. R.F. howitzers;
80 pieces of 280-mm. R.F. howitzers;
Total, 4960.

The following general principles of artillery organization were considered:

(1) To constitute a reserve of artillery in the hands of the Commander-in-Chief, and lesser Reserves in the hands of the commanders of groups of armies, in order to provide the necessary matériel in attack sectors.

It was a repetition of the principle already admitted in August, 1915, that all the mobile artillery should participate in all attacks and that the artillery of position should alone form a permanent framework on the defensive fronts.

(2) Only when surplus matériel was available should it be assigned permanently to the army corps and divisions, but before beginning this repartition, we were obliged to be very rich in matériel, for once having permanently assigned a unit to a division or corps, it is impossible to take it away without injuring the morale. We will return later to this question of the assignment of organic artillery to large units.

The offensive of 1916 was executed in accordance with the principles deduced from our experience in Champagne (1915) and at Verdun. It is still the system of force more and more brutal, where the preparation of an attack by a methodical destruction lasting several days was carefully organized. The effect of continued heavy fire was sought to the detriment of surprise tactics.

After each attack the demands of the infantry, who now advanced behind formidable masses of projectiles, were always increased. During the preparation the destruction of batteries and trenches became the general rule, sometimes rendering the terrain impassable. During the attack the barrages became more and more dense and the rolling barrage made its appearance. Between attacks, defensive barrage and counter-offensive preparations were required. The use of gas shells gave an effective means of neutralization in counter-battery work. For the first time we were able to support our infantry with the density of fire that was necessary. On the first of July we had 700 mobile heavy guns on the Somme, and 800 at Verdun. The 15th of August we had on the Somme 1074 guns from 95 mm. to 220 mm., and 126 of 240 mm. and above. At this moment the total of heavy guns in the army was 4000, of which close to 2000 were of a mobile type. The following table gives the densities realized in two of the principal attacks:

Attack of the 6th Army 1st July, 1916, front of 15 kms.	Attack of the 10th Army 4th Sept., 1916, front of 21 kms.
LIGHT ARTILLERY	
111 batteries—444 pieces 1 battery per 144 m.	159 batteries—636 pieces 1 battery per 132 m.
HEAVY ARTILLERY	
228 howitzers 300 longs —— 528	244 howitzers 364 longs —— 608
This gives	This gives
1 howitzer per 65 m. 1 rifle per 50 m.	1 howitzer per 61 m. 1 rifle per 58 m.
Average of 1 heavy gun per 28 m.	Average of 1 heavy gun per 29 m.
LONG-RANGE HEAVY ARTILLERY	
56 howitzers 61 longs	56 howitzers 64 longs
TRENCH ARTILLERY	
1 battery of 58 mm. per 300 m. 1 battery of 240 mm. per 1000 m.	1 battery of 58 mm. per 360 m. 1 battery of 240 mm. per 1100 m.

During the numerous attacks which took place on the Somme between the 1st July and end of October, the divisions attacked with a mean strength per unit of 6 groups of 75's and 6 to 8 batteries of howitzers. Sometimes there were as many as 8 groups of 75's per division, and 14 heavy batteries. This artillery was always under the command of the colonel or lieutenant-colonel commanding the regiment of 75's assigned to the division, who had, at least officially, only two assistants.

The artillery of the attacking army corps had a mean strength of 18 batteries, but this number sometimes exceeded 25. These were all under the orders of the lieutenant-colonel commanding the two groups of organic corps artillery. The handling of such masses of artillery showed up the defects of the organization of the artillery command, and gave us the chance to overcome the opposition of the staff, formerly shown to the artillery. The notes of the 9th December, 1916, which were a timid attempt to organize the artillery command, gave larger staffs to the artillery commanders. It was at once recognized that we had not yet gone far enough and that we had not given to the artillery commanders the place they should hold, considering the importance of their command in relation with the other arms.

The phrase, technical advisor, is not a happy one, but we gave to it more importance than had been intended. The delays in appointing temporary officers in the artillery did not permit us to find the necessary officers for our organizations, and prevented the commander of the heavy artillery of the corps from properly absorbing any reinforcing artillery that he might receive. In addition, the Chief of Artillery in the corps did not have the position that he should have held, since he was too often considered primarily as a supply officer, with the result that the divisional artilleries suffered from lack of coördination.

Although this first attempt at organization in the artillery command contained many defects, it still exercised an influence on the use of the artillery. The divisional artillerymen better equipped, became somebody, but the heavy artillerymen remained unhappily a little in the shade.

The year 1916 was marked by another great step forward, the organization of the Centre d'Etudes d'Artillerie at Chalons, by General Petain, and later transformed into the Centre d'Etudes for all the armies of the North East. Though no sensational things were discovered, a very useful work was accomplished in the way of disseminating information already known, but only by a few. In a word, the artillery command received instructions in all phases of their arm, tactical, employment, and technical, which our pre-war

methods had only made known to a very few. This was perhaps the revolution.

The attacks of 1917 were executed in accordance with principles deduced from our experiences in the Somme, as set forth in the instructions of 16th December, 1916. The attack of the 16th April, 1917, has already been much discussed, and I will not re-open the question, but will limit myself to remark that the densities of artillery were considerable. In the following table a comparison is made with the attacks of September 25, 1915, and July 1, 1916:

ARTILLERY DENSITIES

Operation	Front	Total of Heavy Guns	One Long Gun per	1 How, per	1 Long Range Gun per	Average for Heavy Matériel
25th Sept., 1915.....	35 km.	872	60 m.	120 m.	. . .	40 m.
1st July, 1916.....	15 m.	702	46 m.	62 m.	110 m.	21 m.
16th April, 1917.....	40 km.	1930	40 m.	53 m.	230 m.	21 m.

ONE 75-MM. GUN PER

25th Sept., 1915	33 m.
1st July, 1916	33 m.
16th April, 1917	20 m.

Moreover, in the attack of April 16, 1917, the modern mobile guns, non-existent in 1915 and rather rare in 1916, assumed the following proportions:

25 per cent, for the long rifles
55 per cent, for the howitzers.

CONSUMPTION OF AMMUNITION

	220 to 270 mm.	95 to 155 mm.	75 mm.
22nd to 27th Sept., 1915.....	30,317	265,483	1,387,370
24th June to 10th July, 1916.....	66,132	453,033	2,013,484
1st to 17th April, 1917	61,543	1,199,954	3,991,000

You will see that in the amount of artillery and the consumption of ammunition everything had been foreseen up to that time, but the weather had been bad during the artillery preparation, the ground was difficult, preparation to a great depth had been desired and the attack had nothing in it in the nature of a surprise. I will not insist on the result which was and could have been even better than that of the preceding attack. However some of our officers did not believe in this method, and at the end of 1917 we returned to attacks of limited depths.

The attacks in Flanders, Verdun and Malmaison were a triumph for brutal force, combined with limited objectives.

The following table gives the artillery densities in these attacks:

	Front	Field Pieces	Heavy Guns
Flanders:			
31st July, 1917	4 km.	240 (1 per 16.6 m.)	373 (1 per 10.7 m.)
Verdun:	Jump-off: 17½ km.	984 (1 per 17.78 m.)	1318 (1 per 13.20 m.)
2nd August, 1917	Objective: 23 km.	984 (1 per 23.37 m.)	1318 (1 per 17.45 m.)
Malmaison:	Jump-off:		
23rd October, 1917.....	10 km.	624 (1 per 16.02 m.)	986 (1 per 10.14 m.)

This density of artillery was such that in spite of the industrial effort of the country and the increase in our matériel, still the means available was not sufficient to attack on fronts as large as it was desired—nevertheless, we were beginning to be really equipped. You will remember the 308 pieces of heavy mobile artillery which were divided in the 50 batteries in 1914. At the beginning of 1917 and at the end of the same year our situation on the Western front was as follows:

1st January, 1917	1st January, 1918
Horse-drawn: 332 batteries, 105 to 155 long	516 batteries
Tractor-drawn: 143 batteries, 75 to 155 long	266 batteries
Total, 475 batteries	782 batteries

1918

During the execution of these attacks of 1917, brutal, methodical and slow, our ideas were changing. From the month of May, 1917, the Commander-in-Chief pointed out the advantages of surprise in attacks. This as brought to the attention of every one in the Note du Commandment published at the end of 1917. It had also been applied by the Germans at Riga in the month of August, and at Caporetto in October, as well as by the English at Cambrai in November. All the operations of 1918 were based on this form of attack.

Many factors have brought this evolution. Without insisting on the tactical rôle of the tanks which swept away the terror of barbed-wire and diminished the work of the artillery, there were also developments in the artillery. We had a great number of mobile heavy batteries (782 on the 1st January, 1918, and 1320 on the 11th November without counting 306 batteries of 75 portée) which could be transported from one point to another rapidly and placed in action, thus affording an element of surprise.

Great technical progress had been made, and this knowledge was given to the troops through the instructions of the 19th November, 1917 (Firing Regulations).

The new methods of topography, the use of meteorological data, the separating of powder and ammunition by lots, had become common knowledge, and the batteries were thus on all parts of the front able to go rapidly into action after having made an accurate preparation of fire, without revealing their presence. It was thus that the artillery was able to acquire an element of surprise.

The number of rapid-fire guns had been so increased that in a few hours we were able to fire as many rounds as formerly we used to fire in the same number of days, permitting us to reduce considerably the length of the artillery preparation, recognized as necessary.

Ammunition was abundant and we could almost fire without counting the rounds. The only difficulty was the question of transporting the ammunition to the batteries; nevertheless great progress was made in our methods of supply. The more general use of gas shells allowed us to make a rapid and effective neutralization of the enemy artillery.

Perhaps you will ask why this was not all done sooner, to which I will reply, that up to then we lacked the necessary means; the question of barbed-wire was frightful; we did not have enough heavy mobile batteries; our methods of fire forbade us opening for effect without adjustment; our matériel of the type De Bange was very slow; we lacked ammunition and were obliged to count our shots; and last of all, gentlemen, the Bochs of 1918 was not the same we knew in 1914 to 1917. One must not forget this change in the situation without being guilty of grave mistakes.

All this being understood, it will be seen that the form of battle of 1918 brought numerous changes in the employment of artillery.

In the offensive the methodical destruction by artillery passed away forever. Sometimes there was no preparation at all, and at others a preparation as brief and as violent as possible by which it was hoped to destroy all the defenses of the enemy. During the execution of the attack, we see a powerful neutralization of both the enemy artillery and infantry; the blinding of his observatories; smashing of his counter-attacks; and interdiction fire on his reserves, and the lanes of approach, as well as on the routes of supply. To exploit the victory, the advance of the artillery by echelons was minutely planned so as to assure the infantry a support as continuous and as powerful as possible. A decentralization in the system of command, at the same time keeping the artillery in hand, so that the higher command can direct the concentration, should the enemy's resistance stiffen.

In the defensive we had learned to echelon our artillery in depth; hide the batteries, and to require a suppleness in manœuvring power and in fire.

In brief, the general mission of the artillery which was before the war to open the way for the infantry in the offensive and in the defensive to cover it and stop the advance of the enemy, was not different from what we find it in 1918. However, certain principles which had only made a timid appearance in the drill regulations and which had not been accepted by our minds, were made very clear; while at the same time our ideas regarding the matériel necessary had undergone a considerable evolution.

During the first part of the campaign we corrected our errors in the matter of overestimating the fire power of the 75 and underestimating that of the heavy artillery and machine guns.

While our ideas were crystallizing, we equipped ourselves in one way or another, our ideas became clear on the importance of liaison between infantry and artillery and the necessity of a dense artillery fire if a real effect is to be produced. At the same time that our matériel was increasing, our methods were brought up to date and became rational—destruction during the artillery preparation, neutralization during the attack. Our technic had improved in the direction of accurate and supple fire which could be brought to bear rapidly on sensitive points.

During this period, although the power of the infantry weapons was increased, the infantry became more and more exacting in the matter of artillery support.

This period is marked by destructive fire in the course of a long and methodical preparation which was incompatible with a surprise attack and necessitated more and more artillery and ammunition until its demands exceeded our means of manufacture.

During the last part of the campaign we came to surprise attacks, as a result of the improvement in our matériel and in our technic. These attacks rapidly succeeding each other broke the enemy's front and permitted an exploitation which gave the final victory to the Allies. (It is the predominance of neutralization—fire of great density.)

In concluding, I want to say that there has been no revolution in artillery, but only a gradual evolution following our experience in battle, the increase in our matériel, the improvement of our technic, and the organization of the artillery command. This evolution has been due above all to the knowledge more and more general, in all echelons, of what could and should be demanded of the artillery.

I am firmly convinced that many artillerymen, had they thoroughly digested our pre-war regulations, would have done in 1914 what they did in 1918, supposing they had had the matériel, and I

remember certain powerful concentrations which I was ordered to make the 8th, 9th and 10th of September, 1914, at ranges then thought extraordinary with the 75 (5000 to 7000 metres) and with aerial observation of the mean point of impact.

DISTRIBUTION OF ARTILLERY

Organic Assignments

I now wish to speak to you of a matter which has been the subject of much criticism, and if there are any critics in your midst, I am convinced that they will be lenient when they understand the question in all its phases.

I wish to speak of the assignment of heavy artillery as an organic part of large units.

In August, 1914, we had three groups of 75 in each division. The corps artillery consisted of four groups of 75 in each corps and the few heavy mobile batteries then in existence were divided in a more or less regular manner among the armies.

It was decided at the end of November, 1914, to assign a group of long guns (105–120 or 155 mm.) to each corps. The batteries of 75 in the corps artillery began to diminish, being used to form new divisions and from now on the 75's in the Corps Artillery became fewer and fewer. The 27th July, 1915, the heavy artillery of the Army Corps was organized with two groups of long guns, usually by the addition of a group of 95's to the existing group.

At the end of May, 1916, it was decided to give 155-mm. howitzers to the divisions and to reinforce considerably the heavy artillery of the corps, whenever this became possible.

Was it possible to do anything else? Would another course have been preferable? These are the questions which we are now going to study.

The following table will show our means on the Western front. Cannon are not manufactured and artillery not created by magic. It is necessary to have time to make cannon and also to find personnel. This is especially true considering the state of mind at the beginning, which took away from us recruits of the class of 14, and which in 1915 obliged the artillery to transfer good N.C.O.'s as machine gunners in the infantry. Such a policy did not facilitate the training of officers for the future.

EFFECTIVES ON THE WESTERN FRONT

	Aug. 1914	Aug. 1915	Aug. 1916	Jan. 1917	Jan. 1918	Nov. 1918
Officers	11,000			16,000	18,000	21,000
N.C.O.'s and men	420,000			620,000	670,000	730,000
Horse-drawn artillery:						
75 batteries	990	1,000		1,050	1,056	966
120 L batteries	21	68		59	68	17

	Aug. 1914	Aug. 1915	Aug. 1916	Jan. 1917	Jan. 1918	Nov. 1918
155 H batteries	26	57		140	267	441
155 L batteries		40		68	79	175
95 batteries		60		24	0	0
105 batteries		21		41	102	153
Motorized artillery:						
75 batteries				6	72	306
120 batteries	3	22		30	0	11
155 H batteries				18	20	4
155 L batteries		2		38	78	92
14-inch batteries				7	32	17
Various matériel		2		44	64	104
Total of heavy batteries, horse and tractor-drawn.	50	272	410	469	710	1,014
Heavy guns and howitzers.		1,088	1,640	1,876	2,840	4,056

The above figures do not include the personnel and matériel on the other fronts, nor do they include the men under instruction. The table shows very well that we were not rich at the beginning and that our means increased gradually in spite of the difficulties met in the creation of this arm. However, we must recognize that during the greatest part of the war we had on the sectors of attack a density of heavy artillery fire only slightly less than what was asked for. The requests for artillery fire continually grew larger, and it seemed as if at the last moment the infantry always tried to broaden their front of attack. The table below gives the amount of heavy artillery in use during the principal offensives.

	Dates	Pront	
Champagne.....	25th March, 1915	16th Div.	109 pieces: 95, 105, 120, 155, 220 mm.
Woevre	April, 1915	15th Div.	361
Arras.....	May 9, 1915 June 16, 1915	18th Div.	340
Arras.....	Sept. 25, 1915	15th Div.	400
Champagne.....	Sept. 25, 1915	35 km.	872
Verdun.....	1916		800
Somme.....	July, 1916	15 km.	702
Somme.....	August, 1916		1200, of which 116 were modern
Aisne	April 16, 1917	40 km.	1930, 40 per cent. modern
Flanders.....	July 31, 1917	4 km.	373, almost all modern
Verdun.....	August, 1917	18 km.	1318, almost all modern
Malmaison.....	October 23, 1917	10 km.	986, almost all modern

The great majority of the artillery used in these operations was made up of mobile batteries. Comparing with the preceding table, you will see that almost all of the mobile heavy batteries were in the battle, and I can state that on the 5th August, 1916, outside of the heavy batteries organically a part of the Army Corps, there were

only 10 mobile batteries which were not engaged at either Verdun or on the Somme. The officers of the heavy mobile batteries remember very well that they were in every show. This utilization of all the means at hand is a direct result of the directions of the Commander-in-Chief, who, while recognizing the utility of mobile heavy artillery permanently assigned to the large units, felt the absolute necessity of having a reserve of heavy artillery for attacks. The only means of having this heavy artillery take part in an attack was to not distribute it among the divisions and Army Corps.

At the moment when it was decided to build up the heavy artillery, the Commander-in-Chief set forth the principle that all the mobile heavy artillery, save one and later two groups assigned to the corps, should be in every battle, and that he must therefore have the heavy artillery at his disposition, in order to place it with the units destined to make the attacks. On calm defensive fronts the frame-work of the heavy artillery must be formed by the artillery of position and the organic groups of the Army Corps occupying these fronts.

According to the great program of the 30th May, 1916, it was planned, as I have previously said, to reinforce the heavy artillery of the corps and to assign a group of howitzers to each division, but out of the 4960 pieces which were to be manufactured the first 3600 were to go to make up the reserve at the disposition of the Commander-in-Chief and only after that were two new groups of 155 longs and one group of 155 howitzers to be given to the corps and divisions. These wise measures allowed us to appear better armed than we were in reality and to use our artillery to the best advantage in our attacks, and this to such an extent that from 1916 on, each division in an attack counted 6 to 8 heavy howitzer batteries and frequently more, while the Army Corps had an average of 18 heavy batteries. Towards the end of 1917, as a result of numerous requests, the Commander-in-Chief gave orders to assign one group of 155 howitzers to each division. We had at this moment 100 divisions. If you will refer to the table showing our resources on the 1st January, 1918, you will see that we were not able to carry out this new organization in every division since we would not have had any more 155 howitzers to reinforce our attack divisions whose organic group was not sufficient for a real battle. After the Armistice a circular letter gave us the different opinions on the permanent assignment of artillery to the large units. The requests called for a large amount of artillery and it does not seem possible to satisfy them unless we reduce the infantry.

The question has been studied by G.H.Q. and La Commission Centrale d'Artillerie. G.H.Q. proposes a divisional artillery organization of four groups of 75's, total 12 batteries, and two groups of

155 howitzers, total 6 batteries, at the same time preserving a huge reserve of 155 howitzer regiments at the disposition of the Commander-in-Chief.

You have seen that at the Armistice we had 444 batteries of 155 howitzers which did not permit us to give 6 batteries to each of the 80 divisions while forming a reserve, unless the output of our factories was to be greatly increased.

The commission Centrale d'Artillerie has presented the question in the following words:

"It is impossible to equip the great combat units with all the artillery which would be necessary in large offensives. No practicable assignment would be sufficient; instead we must give it the matériel indispensable to meet the ordinary missions of the divisional artillery on the battlefield, while on the other hand, we must build up a reserve for the use of the high command in critical periods (offensive or defensive). In consequence the general artillery reserve, unassigned to any unit, should contain all the different types of matériel found in the divisional and Corps Artillery, and in addition such special matériel as would be needed for any unusual particular mission asked of the artillery."

The sub-commission has therefore proposed a divisional artillery organization comprising four groups of 75's, total of 12 batteries, two groups of two batteries each of 155 howitzers, total of four batteries. This leaves 120 batteries of the latter gun for the general reserve. The Corps Artillery would comprise two groups of 105's and two groups of 155 longs. This is also the proposal of G.H.Q. Some authorities find that the 155 howitzer is a little heavy, or at least that the ammunition is too heavy for use in a division, and have proposed that the heavy artillery of the division comprise one group of 105 howitzer and one group of 105 longs.

Personally, I agree with this solution as soon as a good 105 howitzer can be perfected, in which case the Corps Artillery would comprise 4 groups of 155 howitzers and two groups of 155 longs. This solution seems preferable from the point of view of counter-battery work and would also increase the number of 155 howitzers available for the reserve.

The army should not have any organic artillery, and all the artillery not permanently assigned to the divisions or corps should form a part of the general reserve.

I beg of you to excuse this exposition already too long, but I hope that I have shown you that there has been no revolution in the principles of employment of artillery during the war, but only a progressive evolution of the methods keeping step with the development of our means and the progress in our technic. In a word, we have had an evolution which has followed the possibilities of the

moment—an evolution which will continue. There has, however, been a change, and this change has been a more profound knowledge of the artillery by many artillerymen, and above all by the High Command.

The artillery is an old arm which was tested in the wars of Napoleon. It was rather neglected before 1914 and was perhaps a little forgotten at the outbreak of the campaign. The exigencies of the battlefield have given it a special situation and have led to its development.

The command in all echelons has understood the role which the artillery should play and has taken an interest in this arm once called special. I hope that the lessons will not be forgotten too quickly, and that the artillerymen will not be put back into their corner under the pretext that they are a special arm.

In the army there are different arms as in a mill there are different machines. The good engineer forgetting the specialty of his youth, employs all his machines to obtain the maximum production and in the same way the higher commanders who no more belong to any one arm, must use infantry, cavalry, artillery, engineers, aviation and the rest, avoiding all favoritism and those questions of subordination which have made us lose so much time.

With this in view, Army Commanders must study these arms, understand them, which I hope will be the result of the work at this school, as it has been in the past on the front during the war.

Under these conditions the High Command will be able to follow the evolution which I am convinced will continue, and to adapt its methods to the possibilities of the battlefield.

OPERATIONS OF THE HORSE BATTALION, 15 TH (GERMAN) FIELD ARTILLERY WITH THE 7TH CAVALRY DIVISION IN NORTHERN FRANCE, AUGUST, 1914*

BY LIEUTENANT-COLONEL A. SEEGER. GERMAN ARMY

ON October 9th our 7th Cavalry Division was marching north in three columns toward the obsolete fortress of Lille, with orders to invest it from the west so as to enable the troops approaching from the east to take it readily. In the "race to the sea" it was important to be quicker than the enemy, and get possession of the great industrial centres, with their stores of supplies. Our cavalry under General von der Marwitz, with the divisions in the west, had the task of screening, of seizing and holding ground, and of working in the enemy's flanks and rear. All this it did successfully, and justified its existence even in these days of automobiles, tanks and airplanes. The long marches and the serious fighting, sometimes with and sometimes without infantry, reached their height with us in these days just before the taking of Lille. Without this work it would have been impossible to prevent the enemy from reaching the German exposed right flank before the lines became stabilized.

Lille had been abandoned in August by its garrison of some 25,000 men, because it was realized that it could not stand against modern heavy artillery, even less than the strong fortress of Antwerp, which fell on October 9th. However, several thousand territorial troops had entered the city in September, in anticipation of reinforcement by both French and English; their orders seem to have been to hold the vicinity of the city by field entrenchments, but to avoid bringing on a bombardment of the city itself. Wahnschaffe's small detachment was approaching from the east to attack the place, and our cavalry was to operate from the west. Six cavalry divisions in all were engaged along the line Bailleul-Bethune; one of them even got as far as Hazebrouck, where it had a mounted engagement with English cavalry.

Our division had learned that the French were trying to get as many able-bodied men as possible out of Lille, for service in their army. Our patrols reported that long columns of inhabitants, with transportation of every kind, were making their way westward escorted by territorials.

One such party we intercepted on October 10th. We had crossed

* Translated from *Artilleristische Monatsheftc*, March-April, 1921, by Colonel O. L. Spaulding, General Staff, U. S. Army.

the Deule Canal south of Lille on a broad front, meeting little opposition. As we approached the villages of Ligny and Beaucamps, our patrols came galloping back and reported a railway train full of infantry just entering the station at Bac de Wavrin. We were ordered to fire a few shots to drive off the territorials, who seemed to be a covering detachment. The leading piece of my 3rd Battery went into position at once, only 500 metres from the station, and opened fire upon the train, which was still moving very slowly, and whose crew and passengers seemed utterly astonished at meeting the enemy so soon. We had never had an opportunity to use a railway train for a target, at least at so short range; so, in spite of all the familiar "movies" on the long ridge at Jüterbog, which generally moved much faster than this train, our first shots at the locomotive went wide, although the cannoneers worked feverishly to get on the fine target, and the young officer in command of the piece ran up and down in excitement, shouting "Fire! Fire!" to urge them on. Finally he got something like a bracket, and was about to fire a volley at his enormous target, when he had to stop to avoid hitting our own dragoons, who by this time had reached the train. The passengers scattered in every direction.

We then went on to Ligny and Beaucamps. Our Strassburg Hussars now encountered a column of perhaps a thousand men, mostly civilians, moving from Lille toward Fromelles, with two companies of territorials and a few curiassiers ahead and a long wagon train behind. The commanding officer of the Hussars, who had held the command only a few days and so was full of energy and enthusiasm, decided to attack and capture the whole party; but first my guns were called upon to speak a word to the escort. Lieutenant von Chappuis, who was in the lead, put two pieces in position, and fired several effective shots at the head of the column, which at once scattered. The cavalry then closed in on the mass and surrounded them. Here, unfortunately, some of our own men were hit by shrapnel, and there were many complaints; it was entirely unavoidable, however, in this close country, unless one wished to give up the idea of artillery support altogether, which would have certainly caused us to suffer considerable loss from infantry fire. As it was, the success was instant. The prisoners were taken to Beaucamps, checked and examined. The losses among the escort were light; among the civilians, zero. The column was on the way to Dunkirk and Gravelines; it included a large number of vigorous men between 40 and 50, who had not yet been called to the colors, but who were now needed to replace the large French losses. Many of them were well pleased, so simply to avoid dying for their country, and did not hesitate to say so. There were also many foreigners and neutrals, and many who claimed to be such—Belgians,

Danes, Spaniards, and even a few Germans, who now decided that it was their duty to reveal their true nationality. In the wagons were many women, who had preferred to accompany their husbands or who had taken this opportunity to get out of the danger zone—a very sensible decision, in view of later events at Lille.

The Maire of Lille, very wisely, had issued a proclamation, warning the people against any hostile acts toward the enemy's armed forces. Everyone was advised to give quarters and subsistence without resistance, and avoid any act calculated to bring retaliation upon the city. This proclamation, posted at all the road crossings, contrasted sharply with those of the Belgian cities at the beginning of the war. How much bloodshed would have been avoided if the civil population everywhere had taken the attitude prescribed by the Geneva Convention!

The garrison, however, made a useless resistance with weak forces under the walls of the old fortress, which caused a bombardment of the city. Here also, a little cooperation between civil and military authorities would have avoided a loss running into millions, which we now have to pay, the enemy charging their own faults to our account.

About this time—I believe on the 10th—a young officer was sent from the Division Intelligence section, without escort, to Lille, with instructions to take possession of the telephone and telegraph offices. As a matter of fact, Lille was still occupied by the French; and as his car drove peacefully through the suburb of Haubourdin it was fired upon by French soldiers. Seeking to escape, he drove at random through the streets, and finally got into a blind alley. The driver was killed; the officer sprang from the car and placed himself under the protection of a French officer, explaining his mission and his ignorance of the true situation. A crowd of soldiers and civilians collected, shouting *"à la mort"* and *"à la lanterne."* But in this case, in contrast to many other cases, the French officer did his full duty, and brought his prisoner safely to the citadel, where he was held for a few days, until the city was fully taken over by the Germans. When the citadel finally surrendered, with its garrison of 3500 men, this officer was able to repay the kindness of his hosts, especially the chivalrous commandant, by rendering various services. In recognition of this, when the commandant was sent away as a prisoner of war, he gave his two very good horses to the German officer, who later made a full report of his experiences.

On the 10th our division rested at Fromelles and Fournes, between Lille, La Bassée and Béthune. In front, we were in contact with new forces of the enemy; in rear, strong reinforcements were coming up to relieve the cavalry, and to construct a new fortified position under the old walls, where an attack in force could be

sustained. On the main road between Armentières and Béthune, we met regular English infantry which prevented any further advance. Our cavalry was not equipped for small operations against infantry; our dismounted skirmishers had little fire power, no bayonets, few entrenching tools, no grenades and no wire. Under fire, they could only take cover and try to hold the ground they had gained. Our opponents were good shots, made skilful use of cover, and could hardly be found even by my artillery observers. We were very glad, therefore, to be relieved by infantry—two battalions of the 112th Baden Infantry, from the Aisne front. As already remarked, the presence of infantry always gave strong backing to our operations; we artillerymen were always pleased to have them with us. The infantry does not begin to think of the led horses when things get hot; but is always mindful of the duty of the foot soldier, to attack or hold his ground.

The fighting at Richebourg and Neuve Chapelle brought us many anxious hours and many losses, but also many successes against the English Royal Fusiliers. The work was especially difficult for my batteries on account of the difficulty of getting observation in this Flemish country, so that my guns, only twelve at best, could get little effect. It was impossible to work the battalion as a unit; from the advanced observation stations, only limited areas could be seen, and it was rarely possible to bring a cross-fire upon neighboring areas. The attacks of the enemy often brought partial successes, endangering even the adjoining parts of the line which were not attacked. Our higher commanders gradually came to the conclusion that it was necessary to work the guns closer and closer to the line, even into it, a measure which was not popular. The cavalry and infantry complained that the guns drew hostile fire upon them. But the higher cavalry commanders ordered peremptorily that the artillery should share in the dangers of the close combat; so, between the two opposite views, it was hard to find the right tactics. One of the highest cavalry commanders went so far as to say that he would not be satisfied until the last gun was put into the skirmish line. As artillery commander, it was my duty to point out that in the face of an energetic enemy, as was the case here, in case of a counter-attack the guns would certainly fall into his hands, while infantry or cavalry could fall back quickly. In spite of the contradictory demands upon them, the scattered platoons and sections were skilfully handled, and helped out in many close combats—making a virtue of necessity, for the guns could not be gotten away, either with the limbers or by hand.

Such changes in tactical conceptions we should never have believed possible. I think we should all have been stoned if we had taken such risks with our guns in manœuvres or service practice.

But fortunately the enemy could not get up his courage to make a determined effort to break through our thin lines. Evidently he did not know how weak we were; and then of course his own artillery was working under the same disadvantages as ours. It was soon evident that his fire was chiefly at random, or only by the map. Our losses, consequently, were slight; we had only one gun destroyed by fire, although a few were temporarily put out of action. The numerous scattered buildings, however, drew heavy fire, the enemy of course assuming that we were using them for shelter or observation.

On Sunday, October 11th, we were cautiously approaching the Estaires-La Bassée road, to reconnoitre and take up position. Our cavalry was halted at a cross-road, near an inn with the striking name "Estaminet de la Bombe." I was sitting by the road, with the commander of the advance guard brigade, Duke R——; the sun being warm, he was dozing, while waiting for a report from the front. At that moment an automobile came dashing up, and out stepped the cavalry commander of the whole west front, like Jupiter Tonans, looking upon the peaceful scene so sharply that I felt impelled to give the duke a more or less disrespectful nudge to bring him to attention. His Excellency von M. —— was pleased to make ungracious comments upon the apparent inactivity, to which it was hard to make satisfactory replies; the brigade adjutant was absent, and His Grace was still a trifle bewildered with sleep. The cavalry commander finally wound up his little speech by saying, "Here we are lying about the road, with enough cavalry assembled to get clear into the enemy's rear, as His Majesty positively ordered yesterday. So, gentlemen, get to business at once!" Just then an English "Sugarloaf" struck with a terrible explosion fifty paces from us. The moral effect was surprising. Someone of our guests shouted, "Thunder, there's something doing here! Chauffeur, turn around." In an instant the whole cavalry corps had disappeared, leaving it to us to decide how to "get to business."

The next five days were hard ones for us. Never before had we had so difficult and important tasks. Only a realization of their importance, and an iron sense of duty, enabled our officers and men to hold out, when the situation often seemed desperate, and especially when one day the division next us thought its flank was turned and fell back. The cavalry commanders of every grade on this occasion set a fine example of devotion to duty, as did also the commander of my right flank battery, Lieutenant von Chappuis. Although the right flank at Rouge Croix was evidently exposed, he did not obey the order, erroneously sent him from the right, to fall back, but when he saw his guns limbering up put them back into position and kept up the fire upon the enemy who was working around the flank until night. With his guns stood the skirmish-line of Queen Olga's

Dragoons, under Captain Schmetzer, and held the line of the Estaires—La Bassée road. Several observers were wounded in the little red house on the road, upon which the enemy fired repeatedly, including finally Captain Schmetzer himself. As he was being carried away on a ladder, under fire, he called out to the men to save their cartridges and wait for close range. A final attempt by the enemy to reach the road, just at nightfall, was repulsed by the fire of the guns and the few remaining carbines.

On this evening, the 14th, the situation was so strained that it was evident that a decision must come the next day; before long the enemy would envelop our right. But our orders were positive, to hold the line. The enemy saw that we were not merely making a demonstration, intending to fall back, but that we meant to fight for it. It was essential to hold this line until the one in rear was ready.

During the night there was some little firing, probably of no importance, in the outpost lines at Richebourg and Neuve Chapelle. The nerves of our men were overstrained from lying so long under fire with little cover, and so the firing spread all along the lines and continued until midnight, costing us an immense amount of ammunition to no purpose, for the enemy did not attack. This is a very common experience, and a thing against which all subordinate commanders must always be on the watch. This fighting on foot and at night was then a new thing to us, although in the east the cavalry was already expert in it.

Finally, early in the morning of the 15th, we were relieved. We were too weak and too inexperienced in such fighting to stand against regular infantry, which daily astonished us by their skilful use of the ground and by their accurate shooting. Thus we noticed that the English would creep close up to us through the tobacco fields, by winding their bodies with the long half-dried leaves. We at once imitated this trick; we were learning something every day that was not in the books. One such English trick cost some of our scouts dearly; cattle were still numerous in the fields, and the enemy had been making use of them as a mask, like Odysseus in the cave of the Cyclops, and thus reaching desirable points. When our men tried it, however, three of them were killed; as the proverb says, everyone looks behind the bush where he has hidden himself, and the English were evidently watching for us.

We captured few prisoners during these October days; but those that we did take impressed us as more reserved and less worried about their own fate than the French. They showed much more confidence in ultimate victory than their allies, too. One of them, when asked about his capture and his ideas of the prospects, said, "No matter. If I am captured today, there will be ten more in my

place tomorrow. It's hard luck for me, but King George has plenty more Tommies." One sergeant made an especially good impression. He was every inch a soldier, full of national pride. His invariable answer was, "One has to fight, sir." His chief worry was that he could not present himself smart and clean when called in for examination; he would give no information.

We withdrew from our positions on the morning of the 15th. There was many a sigh of relief from our men when they got out of the fire-swept zone and, after their long fight on foot, mounted once more, even to move to their next quarters. The next day the English found us gone, but when they tried to follow they met infantry fire from a strongly organized and occupied new position, under the walls of the old forts of Lille. The 13th Army Corps had come with one division from the Argonne, and gave the English a warm reception.

Our division was given three days rest in the outskirts of Lille. The city had fallen into our hands on the 12th, and we utilized this opportunity to visit it, and to make needed purchases. The city was full of German troops of all arms, chiefly cavalry. Except for a few burned areas in the heart of town, everything was much as in peace time, especially on the outer boulevards.

The city had to pay a contribution, which, however, was moderate in view of the wealth of the town. Paper money was hastily printed for this purpose, and passed freely. The people preferred it to German silver or even gold, for they believed our occupation would be brief. Neither the French nor ourselves would have believed that we should remain there four years, establish a German newspaper, and have German theatrical troupes play long engagements in the City Theatre.

There was little to be purchased in the clothing and provision stores. So many German soldiers had passed through that field glasses, boots and warm underclothing had been bought or seized. There was plenty of women's clothing, as the shop girls assured us. An experience of my own indicates the care taken by the German authorities in northern France. I had lost my raincoat, and got a civilian coat here, signing a receipt for it with my full name, a formality which unfortunately was not always observed. Two years afterward in Galicia my receipt came to me for redemption. I paid the specified sum, 100 francs, equivalent to 81 marks, at the existing rate of exchange. Three months after, on the Rumanian border, I received five marks back, on account of change in the rate!

About October 20th we left our quarters here, marched through the city by brigades, and went north by way of Quesnoy to Comines on the Lys. Here we went into line opposite Zandvoorde, to learn the ways of position warfare, and to prepare for the great battles of the new reserve troops on the Yser.

NOTES ON THE DUTIES OF AN ARTILLERY BRIGADE STAFF IN A GENERAL ATTACK

BY MAJOR W. E. BURR, FIELD ARTILLERY, U. S. ARMY

As a rule attacks are always preceded by some warning or hint regarding the same. When a division commander receives such notice, he should consult his artillery commander. It is necessary that the artillery be informed as to what is to take place in sufficient time so as to allow for the systematic formation of the artillery details, and also to allow the division commander to inform himself as to how the artillery can support the attack proper. In addition, the artillery commander should be regarded as one of the division commander's staff officers and his advice and assistance, in that capacity, should be sought on such occasions.

Just as the chief of staff of the division is the right-hand man of the division commander, so the adjutant of the artillery brigade is the main assistant of the artillery brigade commander. He should be present at all such meetings. Rarely are verbal reports of affairs strictly correct, and for this reason it is necessary that for the artillery adjutant to have a clear conception of what is to take place, he must be allowed to share in these councils of war. This custom also provides the artillery brigade commander with a check on himself.

At these meetings, all information available must be imparted. Arrangements should be made to do as much in advance of the actual receipt of the orders as possible. The principle point for the artillery though, is to secure all information that will be of the least value for the preparation of the artillery plans. Definite facts are necessary.

When the actual orders for the attack are received, the council of war is repeated, only this time, definite conclusions are reached, as well as definite facts imparted. The artillery commander should insist particularly on being informed accurately on the following:

a. Jump off line.
b. Width of sector.
c. Depth of attack, and phases thereof.
d. Rate of advance of infantry.
e. Additional artillery available.

Without the above information it is absolutely impossible for him to prepare an artillery support plan.

Having secured the necessary data, the artillery adjutant should be informed by his brigade commander as to the general scheme desired. This should be a combination of the best ideas of the whole

staff of the brigade commander. The general scheme adopted, the brigade commander should give his adjutant free play in the drawing up of the detailed orders. The specific details to be completed have been noted in the "Log." The brigade commander will have plenty to do without burdening himself with the actual drawing up of the orders. Such matters as reconnaissance with his regimental commanders, consultations with the added artillery, the ammunition supply, and answering his adjutant's questions will more than keep him busy. His adjutant of course should consult his commander freely during the drawing up of the plans, and should make no vital decisions regarding the same without the brigade commander's O. K.

Specifically, the adjutant allots the operation, information (or intelligence), ammunition and communication details, respectively, to the operation, information, ammunition and communication officers of the brigade staff. He superintends their work, makes the necessary decisions, and usually prepares the written orders. He is absolutely responsible for the accuracy of all the plans made, and nothing must be issued unless he has checked same.

The completed plans are consolidated by the adjutant and submitted to the brigade commander for approval. As soon as approved copies must be furnished the regiments without delay. It is extremely important that the subordinate commanders be allowed all the time possible for the forming and issuing of their own orders. If possible the battery commanders should receive their orders at least twenty-four hours in advance. Of course, the necessary steps can be taken in much less time, but to carelessly force battery commanders to such a course is inexcusable.

With regard to some of the details of the actual orders, the proper distribution of artillery comes first. A decision regarding any artillery preparation should be secured as soon as possible. This is important, for the amount of interdiction and destruction planned often depends upon the amount of preparation ordered. This decided, the logical distribution as laid down in the "Log" can be proceeded with. No rules regarding the manner in which the distribution should be made can be fixed. Each problem will have its own solution. Some principles, however, can be enunciated.

1. If possible, for the barrage have a battery for every 100 yards of the front.
2. Use only 75-mm. guns in the barrage proper.
3. Concentrate on the enemy's strong points just ahead of the barrage.
4. Provide for fire on all known enemy assembly points at the commencement of and during the attack.
5. Neutralize all hostile artillery possible.

6. Use gas for destruction and neutralization only where there is absolutely no danger from same to our own troops.

7. Blind all o.ps., command posts, etc., as well as strong points with smoke if possible.

8. Assign batteries or battalions for fugitive target fire under aerial control.

9. Make sure that the wire in the immediate front will be attended to either by artillery fire or other means.

A good manner in which to arrange a barrage is to superimpose the fire of two or more batteries. It is often disastrous if, through one reason or another, "holes" occur in a barrage. If such a scheme is used, even though whole batteries may fall out of barrage, a thin curtain may remain and the infantry will have something at least to guide and regulate their advance on. It is well known that the regulation furnished by a barrage for an advance is not the least of its value to the infantry.

If the attack is to proceed beyond the initial range of the light guns, the greatest care must be taken regarding the echeloning forward of the artillery. For such movements, time-tables have been prepared in advance, but the incidents arising during an attack are so varied and problematical, that their application is thought to be more dangerous than advantageous. If the amount of artillery will allow it, the units to move forward should not take part in the initial barrage, but should be hitched and prepared to move shortly after the jump off of the attack itself. Their assemblage and location are therefore matters of great importance. Their ammunition supply must be accurately figured, and provided for, including enough for emergency measures in addition to their barrage needs. It is usually necessary to detail sections of the ammunition train caisson companies to accompany them. The general location of their forward positions must be carefully studied. Other factors are, the available routes forward, the formations to be adopted, provisions for crossing trenches, ditches, etc.

It is the general rule to require a standing barrage to be put down in front of the infantry for a short while, upon the attainment of intermediate and final objectives, the object being to protect from counter-attacks. The limits and duration of this should be generally specified in the initial orders.

The orders must specify the rates and duration of the various fires. This provision, with the information regarding the kind, automatically allots the ammunition. Of course the amount available regulates. The density of the barrage is of the first importance.

These questions as a rule should be decided by the adjutant as he draws up the orders. The brigade commander should be keeping

in touch with his regiments, the division commander, and the Corps Artillery if there is any.

The information officer must keep close to G-2 of the division. The intelligence with which the operation plans are drawn up depends to a large extent upon the amount and correctness of the information of the enemy furnished by the information section. The best source is usually G-2. He must not neglect the artillery regimental information officers, however. Often, upon investigation valuable information can be extracted from them if they are kept upon the alert. As noted in the "Log," the supply, care, and use of the maps and codes devolves upon this officer. It is seldom that the supply of maps is ample. The subordinate information officers must be impressed with the value of any information to be secured from prisoners.

The work of the brigade signal officer is mostly practical. He should keep in constant contact with the division signal officer. The artillery lines of communication, while independent from those of the division, must be coördinated with the general scheme. It has been the custom for this section of the brigade staff to concern itself with supply of signal material for the regiments. The assignment of codes and wireless calls is usually made for the whole division by an annex to the division operation order. Advance information is often required and is secured by the brigade signal officer. Lastly, he must plan how he will use his own equipment to secure the maximum efficiency during the entire operation. He secures information from the adjutant regarding the probable position of the advanced headquarters, routes of advance, and developments to be expected.

The ammunition officer is told how much ammunition is available. He then plans the procurement and distribution of the same. The principle should be to deliver as much to the positions as possible, and establish dumps for the rest. His difficulties are usually enormous, but he must never say die. His directions to the ammunition train regarding its participation in the attack must be imparted after careful consultation with the brigade adjutant. In fact, this officer must always be in close touch with the adjutant. The details regarding the supply of ammunition and the movements of the train are usually embodied in the artillery brigade order.

The supply of the infantry ammunition usually does not cause severe difficulties. The prime requisite, after the initial supply has been furnished, being to cause the infantry combat trains to function properly. It was the custom for a long while for the infantry to leave them in their rear echelons at the commencement of an attack. The salvage of abandoned ammunition, and the information regarding refilling stations, are important points to be noted. The information

for the infantry regarding their ammunition supply is furnished in the division operation order.

It must be evident that the adjutant requires a keen grasp of the whole situation. Like the brigade commander he must not burden himself with the undertaking of trifles. He must detail such to his assistants, but he must supervise and check most carefully. He must be ready to make decisions and accept responsibility. His post should, except under exceptional circumstances, be always at his headquarters. While his brigade commander is attending to the general questions, he is arranging the specific details, and coördinating the various agencies of the brigade.

While the adjutant is preparing the artillery plan, he should consult the division chief of staff frequently. Attack plans rarely proceed without minor changes. Often these changes are made in the division headquarters and the artillery not informed. The importance of many minor details to the artillery is not generally recognized at a division headquarters. For instance, it was the writer's experience in a division which had taken part in many combats to discover that the G-3 of the division invariably thought that the artillery commander's post for an advance into hostile territory was in command of the reserve column. For such reasons, the artillery headquarters must constantly keep up to date.

The artillery orders completed, approval by division headquarters is then necessary. This should include a thorough explanation as to what the artillery contemplates, in order to prevent any possible misunderstanding in the future. If possible, the infantry brigade commanders should be present in order that they may have a clear conception of the artillery support planned. At any rate, it is wise for the artillery commander, on his own initiative, to see that these infantry commanders are informed of his plans. In this manner an exchange of views always results, a proceeding which invariably brings harmony and results of great value. The closer the relation between the artillery and infantry is, the more efficient is their combined fighting ability.

One subject not heretofore mentioned is liaison. No other single matter is of more importance to the success of an action. Its efficiency depends primarily upon training and organization. For this reason, when an attack is imminently impending, the artillery commander can do no more than require his general liaison scheme to be followed. This matter as a rule has been woefully neglected in the combined training of infantry and artillery.

Once the artillery orders have been issued, the brigade staff is principally concerned in regulating the orderly occupation of the battle positions if such an occupation has to take place. If the units are in position, the chief difficulties which arise are those concerning

the ammunition supply. For artillery occupying new positions, an important question to decide is whether adjustments by the batteries should be allowed. The chief factor governing such should be the amount of fire which has taken place ordinarily previous to the occupation. Naturally if the adjustments will cause a noticeable increase in the usual amount of fire delivered, the enemy will suspect something. If adjustments are not to be made, it is believed wiser not to occupy the battle positions much before twenty-four hours before the attack; this to prevent the enemy receiving a too timely warning through increased circulation. The element of surprise cannot be underestimated. The surprise occasioned by the attack of July 18, 1918, is believed to be the principle cause of its success. The Germans being warned by this primary attack held the allies to small gains on the attacks during the succeeding days.

Regarding the actual occupation of the positions, the artillery commander must assure himself as to the exactness of the details thereof. He is responsible for the arrangement of the details between the relieving and the relieved artillery, as regards his own artillery. Nothing must be left to chance. A battery losing its way might easily cause a disaster. It is believed that an alert enemy might have prevented several attacks by the writer's division, if it had been properly guided by all the suspicious signs available to it.

Before the actual occupation, all artillery signal officers concerned should install and test out all the lines of communication possible. Upon the occupation, all units should be organized to function at maximum efficiency without delay. The brigade adjutant should concern himself with this matter as a routine duty.

The occupation having been completed, the next steps are, reports from the units as to their preparedness, check of communications, and the imparting of the official time and zero hour. The proper dispatching of all liaison personnel must be assured. One of the brigade commander's most important functions at this time is the arrangement with the corps artillery for their maximum assistance. He should endeavor to learn the complete corps artillery plan, including such details as their targets, what guns will be moved forward, who will command them, and whether he will be allowed to assume control of any. If possible, when the advance is to be considerable, he should request that he be allowed to command any guns moving into his area during the progress of the fight. The reason for this being that he will be better informed on the local situation than the corps artillery commander. The French were particularly generous and efficient in this matter. Their corps artillery moving forward in an advance always reported automatically to the nearest division artillery commander for duty and

information. Ignorance of conditions often rendered our corps artillery not only useless, but dangerous to the infantry.

The adjutant checks the time and sends out the zero hour. It was customary to require officers from the units to report in person to the adjutant for this check and information.

Once the attack has commenced, for a short period, practically nothing can be done by the brigade staff, until reports come in regarding the progress of the advance. Usually the adjutant secures a final report from the ammunition officer on ammunition. Also, he may send forward an officer to watch the progress and to report directly to the brigade. The information officer must be especially alert to report any news from any sources whatsoever.

If guns are to be echelonned forward to cover the later stages of the attack, the brigade commander must concern himself immediately with this matter. Whether the units to advance should have instructions to advance automatically at a certain time or whether the brigade commander should reserve that order for himself to determine, is a question to be debated. The writer has seen both used with success, and some disaster. The grave danger lies in the liability of the advance being precipitously driven back through this advancing artillery by a severe counter-attack. The writer has had this happen in his own brigade when it was supporting a French division. It is believed that the best practice is only to provide for the automatic advance, when the attack is believed to be unquestionably overwhelming; otherwise, the brigade commander should give the word when he considers the time appropriate. Of course the questions of distance to be covered may require orders of an automatic nature. With respect to the time for the brigade commander to order the advance, it must be understood that it is not necessary at all for him to await any reports from the front. Lack of news at the beginning of an advance can usually be interpreted to mean that the attack is progressing favorably.

During the whole attack the adjutant must keep an accurate record of all messages sent and received. This is most important for all kinds of references later on. In no other way can a check on what takes place be kept.

Units ordered to advance must be required to report their departure, and their arrival at their new positions, or failure to reach same. Of course units taking up new positions must include in their report of occupation, the definite location of their headquarters and units. The reason for this is apparent.

If conditions permit, the air forces should be active in furnishing information for fugitive target fire during this and the later stages of the attack. It is the adjutant's duty to see that the maximum fire available is delivered on these targets. Units should have been

designated in advance to receive and act upon such information directly, but the adjutant should not take the operation of this plan for granted, but should assure himself that it is working, if possible.

If the nature of the advance requires it, division headquarters will move forward during the advance in order to keep in close touch with the attack itself. The artillery headquarters should move at the precise time that the division moves. In fact, it is best if the artillery commander accompanies the division commander, leaving the adjutant to follow closely on his heels with the necessary emergency personnel and equipment. Never should the division and artillery headquarters be separated. If the move forward is made known in advance and the new position definitely located, the adjutant should send the signal officer forward in advance to make a preliminary installation of communications if such is thought necessary. He should also notify the regiments that it is contemplated moving brigade headquarters, the approximate new position, and probable time of arrival thereat.

The decision relative to the move is usually made by the division commander, though it is not inappropriate for the artillery commander to urge same, if he considers that the division commander is neglecting opportunities by remaining far in rear of his advance.

The brigade adjutant assigns the personnel for the brigade move, the principle being to leave the old headquarters in operation until the new one is occupied and functioning. As a rule, the move is made as quickly as possible, and hence only emergency equipment can be taken. Upon the new headquarters being occupied, the rear echelon is dismantled and moved forward. As soon as the new headquarters commences to operate its first duty is to inform all concerned where it is. This is sometimes done by courier, and at other times it is delayed until telephone communication is established. Whether telephone communication is to be made to the lesser units depends entirely upon the circumstances. If it seems that the occupation is only a matter of a few hours, only the adjacent units should be connected in, and perhaps not even then. No rule can be laid down, because the factors controlling such matters change too quickly during the operation itself.

Inside of the first hour of the attack, at the latest, reports should be coming in regarding the progress of the advance. Of course the nature of these reports lay the foundation for any steps taken. If the advance is progressing per schedule and the plan well conceived, it should not be necessary to make any change in the operation orders of the artillery. Changes in the midst of an operation are extremely dangerous, due to the difficulties of making the changes effective, and informing the infantry regarding the same. Due

to poor communications, etc., changes sometimes result in nothing being done at all. Such changes as might occur in a successful operation, as a rule, are made by the individual units themselves acting on requests from the infantry they are directly supporting, and for whose benefit they are. These changes usually are passed back through the artillery liaison system, which is designed for just such a purpose. Of course, changes can be attempted by the brigade headquarters, but under the above conditions their operative effect is problematical. The necessity for them must be of the strongest before they should be attempted. The writer, during a successful advance, can remember no changes made which effected the original orders issued for the attack.

However, if the attack does not develop successfully, changes must be made. Such a condition will provide much confusion in both the artillery and infantry, and the brigade commander must size up the situation quickly, and issue the most simple and effective orders within his power. The occasion will demand the most direct action. Complexed orders of any kind must be absolutely avoided. The prime factor must be the safety of the infantry, and the maximum power of the artillery must be brought to bear without delay on the enemy. Ordinarily, in case of a sudden check by the enemy, the initial measures will be taken by the artillery units themselves, acting through their liaison system. This information should be quickly sent to brigade headquarters where additional steps with a view to increasing the artillery power will immediately be taken. This whole question is a most difficult one for which to lay down a proper solution. Experience and quick action are the essential needs.

Upon the report of the attainment of the final objective by the infantry, the brigade commander takes steps to arrange for the maximum protection of the infantry. This is done by consolidating all his available artillery by definite sectors and missions. The resupply of ammunition, organization of headquarters, communications, and forward movement of artillery left in rear are all matters which the adjutant attends to without delay. The brigade commander as a rule is concerned with what he can determine from the division as to further action.

If a further attack is decided upon, the same steps as outlined in the beginning must be undertaken. The artillery commander must insist upon time for the careful preparation of his plans if serious resistance is expected. The fighting following the 25th of September, 1918, in the Meuse-Argonne region proved the inadvisability of attacking without time being allowed for systematic artillery support being planned.

At this stage, care regarding the circulation must be enforced, and judgment as to what is allowed to come into the zone of advance exercised.

The permanent or semi-permanent consolidation of the sector after an advance, and the police of the battlefield are matters beyond the scope of these notes. One factor alone may be dwelt upon, the collection of abandoned ammunition. If this is done systematically, perhaps the difficulty of ammunition supply may be lessened. Captured artillery may be put to use during an attack, but its use must not detract from the primary importance of the maximum efficiency of our own guns. The proper time for their use is after the advance has ceased.

To sum up, the writer would say that there is no distinct line between the duties of the brigade commander and those of his adjutant. Generally speaking, the brigade commander is concerned with general matters and decisions as affecting the brigade from the outside, while the adjutant busies himself with the internal specific matters, and is responsible for the putting into effect within the brigade of his commander's desires.

It is a large subject, and capable of no definite or approved solution. Such things as the ability of the officers, their personal relations, and their experience in action all bear on the subject.

Unity of thought and action is the keynote.

LOG OF ARTILLERY BRIGADE COMMANDER

(*During typical attack*)

1. Receipt of information re probability of attack.
2. Visit to division headquarters with adjutant for discussion of same.
   Includes:
   a. Nature and date of attack.
   b. Troops to be used.
   c. Probable methods to be employed.
   d. Sector of attack.
3. Receipt from division headquarters of specific orders for attack.
   a. Visit repeated for determination of specific details.
4. Reconnaissance of sector by brigade commander and regimental commanders and indication of regimental sectors and maximum ranges desired.
   (Only required when occupying new sector.)
5. Preparation of artillery orders.
   a. General plan directed by brigade commander after discussion.
   b. Allotment of duties for preparation of orders.
      1. Operation details.

2. Information details.
3. Ammunition details.
4. Communication details.
5. Issuance of orders.

6. Operation details.
    a. Distribution of artillery.
        1. For preparation.
        2. For barrage.
        3. For interdiction, destruction, etc.
        4. For counter-battery.
        5. For special missions such as smoke screens, gas, etc.
    b. Echeloning of units forward if needed to cover entire depth of attack.
        1. Designation of units to be echeloned forward.
        2. General location of forward positions assigned.
        3. Assignment of section of ammunition train to accompany advance.
    c. Protection of infantry upon attainment of objective.
        1. General assignment of regimental sectors.
        2. Contact with, and support to and from, adjoining units.
    d. Allotment of ammunition for various missions.
7. Information details.
    a. Enemy information.
        1. Maps of works.
        2. Location of hostile troops.
    b. Battle maps.
        1. Barrage.
        2. Circulation.
    c. General maps.
        1. To cover general theatre of specific operation.
    d. Instruction subordinate information officers.
        1. Information re prisoners.
        2. Information re espionage.
        3. Codes.
8. Communication details.
    a. Assignment of call letters, etc.
    b. Telephone net.
        1. For attack.
        2. In the event of an advance.
    c. Wireless net.
        1. Plan of.
        2. Arrangements for control of aerial fire control on fugitive targets.

d. Message centre system.

9. Ammunition details.
   - A. For the artillery.
     - a. Procural of amount designated.
       1. Distribution to units.
       2. Establishment of dumps.
     - b. Duties of ammunition train during the attack.
       1. Assignment of units.
       2. Filling stations.
       3. Establishment of forward dumps.
       4. Amount to be retained in train.
     - c. Duties in the event of an advance.
       1. Probable forward dumps.
       2. Amount to be transported forward, etc.
   - B. For the infantry.

     Same procedure as for the artillery.

10. Issuance of orders.
    - a. Combining of various above details into formal order.
    - b. Tentative order drawn up.
    - c. Approval by brigade commander.
    - d. Submitted to division headquarters for comment and approval.
    - e. Necessary copies for infantry supplied by division headquarters.
    - f. Copies by Field Artillery Brigade to Field Artillery Regiments.
11. Occupation of positions and headquarters.
    - a. March orders by division.
    - b. Preliminary reconnaissance.
    - c. Arrangement for occupation of positions by brigade commander.
    - d. Instructions readjustments.
    - e. Preliminary installation of communications.
    - f. Actual occupation.
12. Immediately before the attack.
    - a. Report on receipt of, and preparation of, plans for the attack by the regiments.
    - b. Check of communications.
    - c. Communication of zero hour.
    - d. Check of official time.
13. During first phase of attack. (No movement contemplated.)
    - a. Report from ammunition officer on situation.
    - b. Officer sent forward for information.
    - c. Await reports re infantry.

14. During further phases of attack. (Forward movement included.)
    a. Orders for designated units to advance.
        1. Depend upon information re progress of infantry.
        2. Report of commencement of movement and arrival at new headquarters required.
    b. Fire on fugitive targets reported.
15. Forward movement of division and brigade headquarters.
    a. Move together.
    b. Decision re appropriate time.
    c. Assignment of personnel for move.
    d. Designation of contemplated new headquarters.
    e. Information re same sent to units.
    f. Method of move.
16. Occupation of new headquarters.
    a. Installation of communication with division headquarters.
    b. Installation of communication with available regiments.
    c. Report to all concerned of occupation.
17. Completion of attack.
    a. Await reports from infantry.
    b. Preparation of plans for consolidation and protection.
    c. Assignment of duties to available units.
    d. Secural of ammunition of ammunition supply.
    e. Further movements of artillery.
18. Preparations for renewal of attack. (If contemplated.)
    a. Same as 5 above per time available.
    b. Importance of ammunition supply.
    c. Information re circulation.
19. Consolidation of sector.
    a. Specified and detailed assignment to duties of regiments.
    b. Detailed missions arranged.
    c. Resupply of ammunition.
    d. Protection of positions.
20. Police of battlefield.
    a. Collection of unused ammunition.
    b. Collection of hostile artillery and use of.
    c. Destruction of duds.

DECORATION OF THE COLORS OF THE FIFTH AND SEVENTEENTH REGIMENTS OF FIELD ARTILLERY

A DESCRIPTION OF AN IMPRESSIVE CEREMONY

BY MAJOR F. W. BOWLEY, 5TH FIELD ARTILLERY

ON the evening of December 9, 1921, at Monroe, N. C., the colors of the 5th and 17th Regiments of Field Artillery were decorated by Marshal Foch, the Supreme Allied Commander during the Great War, with the Fourragere in the colors of the Croix de Guerre. The right to wear the Fourragere is based upon having obtained two citations by army orders for gallantry in action. It was not uncommon during the war for individual artillerymen to receive personal decoration, but the fact that these two regiments, equipped with heavy howitzers, so conducted themselves that they should receive recognition as units should be a matter of pride to our entire service. These regiments were the only ones so honored by Marshal Foch during his visit in the United States.

It is unfortunate that the total strength of the regiments was unable to be present, but transportation difficulties prevented this. The regimental commanders and their staffs, the colors and color guards, and the guidons of all organizations, and a saluting battery composed of a platoon from the 5th and a platoon from the 17th, together with the combined band composed the representatives of the two regiments. Marshal Foch's time in Monroe was limited to 45 minutes. As he stepped from his train the first round of a marshal's salute from the firing battery was fired. He was driven from the railroad station to the court-house in the centre of the city where a platform had been erected. In front of the court-house the ceremony of decoration took place. The brigade commander, the two regimental commanders and their staffs, the colors and the guidons were formed in the order named, the Fifth, the senior regiment in point of age and "grandmother" of the Seventeenth, being on the right. As the Marshal looked down from the platform and his eye caught the colors and guidons he appeared transfigured. His address seemed to be directed at the handful of soldiers rather than to the great mass of civilians. As he descended from the platform the band played the general's march and the trumpeters sounded the flourishes. He went first to the colors of the 5th Artillery, where he read the citations of that regiment and the order conferring the Fourragere, after which he fastened the decoration to the regimental standard. As the standard

was raised "To the Colors" was sounded. He then went to the colors of the 17th, and repeated this ceremony. Then the Marshal evidenced his kindly, courteous nature. Calling the two regimental commanders to him, he gave a hand to each of them and, in profound eloquent tones, congratulated the regiments, expressed his appreciation of their services while under his command, and transmitted a message to those of the regiments who were unable to be present, speaking as an artilleryman to others of his own profession. The brigade commander, General Bowley, responded to the Marshal's address in a few crisp sentences and the Marshal then boarded his car and returned to his train.

Members of his party stated that the Marshal had been extremely sick and very much fatigued for the preceding few days, but that the smell of powder, the noise of the salute, and the presence of soldier men invigorated him. To describe the graciousness and the depth of feeling which the Marshal put into this simple ceremony is a difficult task. Suffice to say that the personality of the man was firmly impressed upon all who were present, and it is not difficult to understand why he is the greatest of our military leaders.

The following is a condensed account of the histories of the two regiments, containing the citations for which the Fourragere was awarded:

BRIEF HISTORY OF THE FIFTH FIELD ARTILLERY

The history of the Fifth Field Artillery is in effect a history of the Regular Army. From 1798 to the present time there has always been at least one battery of the regiment in active existence, and the regiment has been represented by at least one battery in every war in which our country has been engaged.

The senior battery of the regiment, Battery "D," was organized in 1798 as Meninger's Company of the Corps of Artillerists and Engineers. From 1799 to 1802 it formed a part of the 2nd Regiment of Artillerists and Engineers. From 1802 to 1812 it was part of the "Regiment of Artillerists," being known as Wollestonecraft's Company. This officer remained in command until his death in 1817, during which time the name of the battery was again changed to Battery "A," Southern Division. In 1821 four regiments of artillery were organized, this battery becoming Battery "F," Fourth Artillery. In 1901 this was changed to the Eighth Battery, Field Artillery, and in 1907 became Battery "D," Fifth Field Artillery, its present designation.

In the 119 years of its existence previous to the war with Germany, Battery "D," Fifth Field Artillery, participated in the following wars and campaigns: War of 1812, Blackhawk War,

Creek Indian War, Seminole Indian War and Cherokee Indian War. In the Mexican War it fought at Vera Cruz, Cerro Gordo, Pueblo, Contreras and Mexico City. It entered the City of Mexico by the San Cosmo Gate on September 14, 1847.

In the Civil War this battery distinguished itself at Antietam, Chancellorsville, Gettysburg and numerous other campaigns and engagements. It fought in the Nez Perces Indian War, Bannock Indian War, and the Sioux Indian War. During the War with Spain it was at El Caney and Santiago. It went to the Philippines in 1899 and fought at La Loma, Cavite, Calbayog, Catbalogan, and Northern Samar.

The history of this battery has been traced for the reason that it is the senior battery of the Fifth Field Artillery. The record of the remaining five batteries is no less glorious, if not so long, they having been organized at various times between 1861 and 1899. Battery "A," then Battery "K," Fifth Artillery, distinguished itself in the Civil War and since in the Indian Wars and War with Spain. Battery "E" was in numerous engagements in the Visayas from 1899 through 1901, making a unique record of having its guns drawn by trotting bullocks, horses not being available.

The Fifth Field Artillery made a record in the World War equal to any artillery regiment in the Army. It was chosen by General Pershing as one of the three artillery regiments to accompany the First Division in July, 1917. It was the first American artillery to ever fire a shot on European soil, and Battery "C" fired the first *aimed* shot of the American Army against the Germans in October, 1917. From that time on the regiment was practically continuously in action until the Armistice.

After preliminary occupation of the Sommerville and Ansauville sectors it supported the infantry of the First American Division and 60th French Division in the Montdidier Sector from April to July, 1918. During this period the Fifth Field Artillery was the main reliance of these divisions for counter-battery work, enemy batteries firing from 5000 to 15,000 shells daily into our lines. The ammunition supply permitted a heavy firing schedule and the howitzers of the Fifth were especially valuable in interrupting enemy traffic and paralyzing his movements, in addition to keeping down the fire of his batteries. The crowning achievement of the regiment in Picardy was the part that it took in the capture and defense of Cantigny by the First Division. The task of the Fifth Field Artillery was to fire concentrations upon the enemy's organized positions, his machine guns, his command posts and his batteries. The threatened German offensive on the Marne resulted in the withdrawal of the French Artillery, causing the entire task of

counter-battery to devolve upon the Fifth. For three days the guns scarcely cooled, members of the gun squads dropping from exhaustion in the gun pits. When, on July the 5th, orders for relief were received, the regiment marched out of the sector and bivouaced in the rear area. It had received as well as given blows and had borne its full share of the losses.

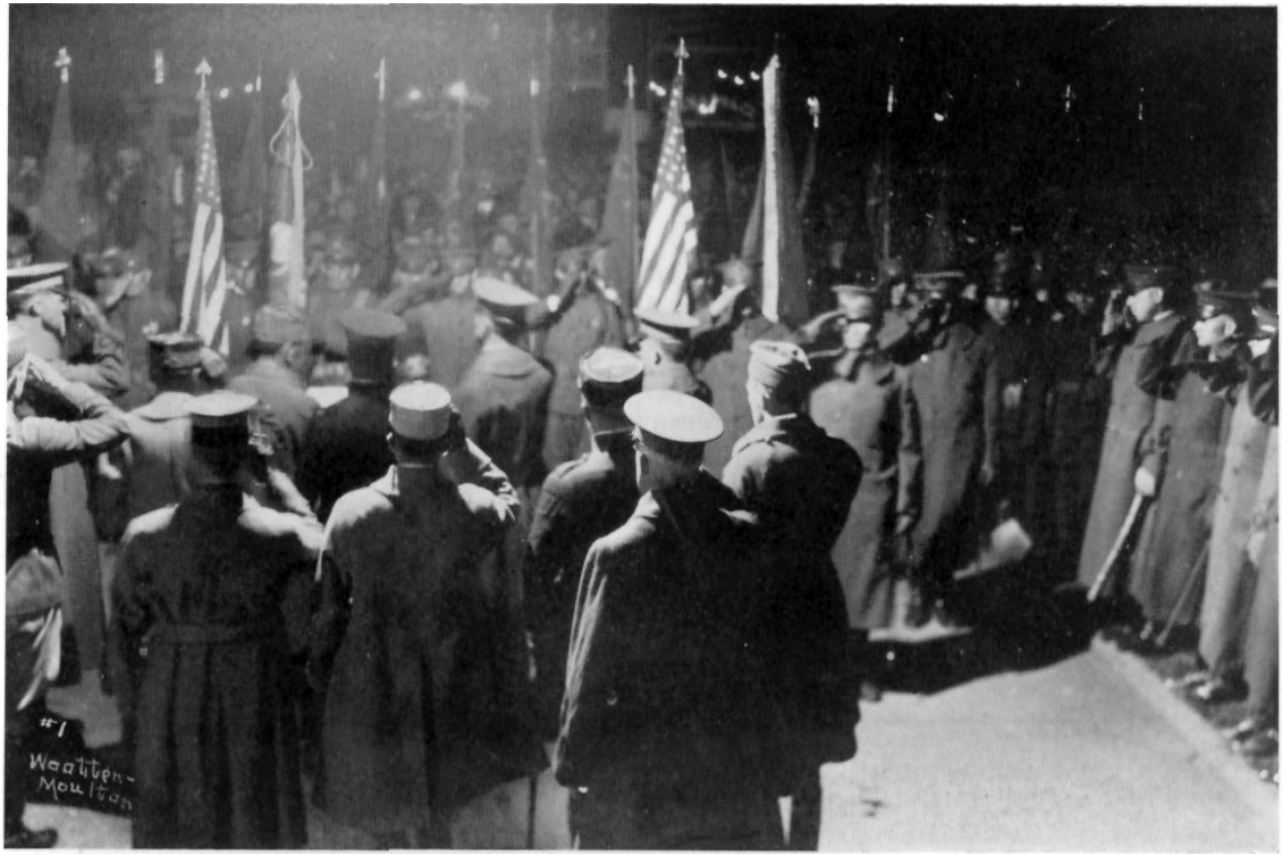
If the previous experiences seemed hard, they were only a prelude to the succession of great events that followed. Scarcely had the regiment cleared the Montdidier sector when orders came to move with all speed and secrecy towards Soissons. The truth dawned that the regiment was to participate in a great offensive. After six days of forced marches, under cover of darkness, the batteries of the Fifth reached their positions at the hour of the assault, July 18th. It would be a long story to tell of the manner in which the powerful fire of the regiment covered and protected the advance of our infantry through six historic days. Its concentrations on the enemies' organized positions, notably in the Missy and Ploisy Ravines and at Berzey-le-Sec, as well as its never-ending mission of counter-battery were conspicuous features of the battle. Upon the relief of the American Infantry, the Fifth continued in support of a British Division, the 15th Scottish.

During the St. Mihiel offensive, September 12th, the regiment took a conspicuous part in its missions of both corps and divisional artillery. Its counter-battery was a powerful factor in silencing the enemy's guns and in blinding the enemy's observation from the Heights of the Woeuvre.

The great ordeal, however, came with the Meuse-Argonne Offensive, when from September 30th to November 1st the regiment stayed in line and supported successively the First Division, the Forty-second Division and the Second Division. Throughout the greater part of this period its batteries were compelled to occupy exposed areas and at times were subjected to intense flanking fire. Again the varying missions of counter-battery, of concentrations, of interdiction and of harassing fire occupied its guns continuously. In the assault of November 1st, the regiment took part in the advance barrage and had the satisfaction of seeing the infantry, covered by its fire, take all objectives as per schedule. The end found the officers and men worn out, triumphant, and their losses, which had been serious, were borne cheerfully as the price of victory.

Despite losses of horses the regiment managed to move with the First Division into Germany and across the Rhine, where it remained until August, 1919, returning to the United States at that time with the Division, to participate in the great parades in New York and Washington. Later it was signally honored by the French Government

MARSHAL FOCH AT MONROE, N. C., 9 P.M. DEC. 9, 1921



PRESENTATION OF FOURRAGERE TO 5TH AND 17TH REGIMENTS OF FIELD ARTILLERY BY MARSHAL FOCH, AT MONROE, N. C., 9 P.M., DEC.9, 1921

by the presentation of the decoration of the Fourragere. The citations on which the award was made are as follows:

"A Regiment of Artillery of the 1st American Division which under all circumstances gave proof of the highest order and of the greatest tactical value; it showed itself a worthy auxiliary of the infantry regiments of the Division, not only at Menil-la-Tour and at Cantigny, but also during the counter-offensive of July 18, 1918, south of Soissons where, during six consecutive days, it accompanied and supported the attack of the infantry and aided it to triumph brilliantly over the enemy resistance and to conquer all its objectives.

"A famous regiment which has maintained undiminished the reputation it acquired on its first arrival in the line. During the counter-attack to the south of Soissons launched on July 18, 1918, it accompanied and supported its infantry for six consecutive days and powerfully assisted that army in overcoming the enemy resistance and in conquering all its objectives. Again distinguished between the Argonne and Meuse in October and November, 1918."

HISTORY OF THE 17TH FIELD ARTILLERY

On May 11, 1917, the Secretary of War issued the order directing that the 17th Field Artillery be organized. The 1st Battalion of the 8th Field Artillery, which was to form the nucleus of the new regiment, was accordingly ordered from Fort Bliss, Texas, to Camp Robinson, Sparta, Wisconsin, the first home of the 17th Field Artillery. On June 1st the actual transfer of men took place and the organization of the new regiment began.

On June 17th, 1917, Brigadier General, then Colonel, A. J. Bowley took command of the 17th Field Artillery and faced the task of organization. From June to December the days were entirely devoted to instructions and drills in preparation of the anticipated movement overseas. On December 5, 1917, the orders arrived and on Sunday, December 9, 1917, the regiment started for the port of embarkation.

Upon arriving at New York the regiment immediately boarded a large ferry boat and was placed aboard the U. S. S. *Covington*, formerly the *Cincinnati*, a Hamburg-American liner. Early on the morning of the 14th the *Covington* with several other transports, convoyed by the U. S. S. *North Carolina*, sailed. The voyage was uneventful and the convoy arrived at Brest on December 27, 1917. The troops disembarked on December 31st, marched to the railroad station and boarded the train in which the long trip across northern France nearly to the Swiss border was made.

On January 2, 1918, the regiment arrived at Camp du Valdahon, near the historical old town of Besancon. Here under the instruction of French and American officers intensive training was carried on, equipment drawn and the regiment made ready for its first appearance on the front.

On March 17th the batteries entrained at Besancon and on March 19th the regiment was in line at Rupt, as was the rest of the 2nd Division of which the 17th was a part. Here the first shelling and gas was experienced and several of the officers and men were decorated for gallantry in action. After its stay in this so-called quiet sector the division was taken out and a few field problems were worked out. On June 1st, 1918, the regiment moved by train, and marching to the vicinity of Château Thierry where on June 4th the batteries went into position and aided materially in stopping the German drive on Paris. After a month of severe fighting in this sector during which the 17th Field Artillery participated in the successful assaults on the Bois de Belleau, Bouresches, Vaux, and Hill Number 204, the regiment marched to the vicinity of Villers Cotterets where on July 18, 1918, it participated in the great Soissons offensive, the turning point of the war. For this action the regiment was cited by Marshal Petain, Commanding the Armies of the East, as follows:

"With untiring energy and the highest bravery, this regiment valiantly supported the attack of the 2nd Division on the 18th of July, to the South-West of Soissons. Always eager to move their guns forward, in spite of the bombardment, they continually submerged the enemy under a most violent and destructive fire of 155-millimetre shells. After the relief of the 2nd Division, the 20th of July, they remained in line and fought valiantly in support of the 58th and 12th French Infantry Divisions.

"Officers and men have given proof of a superb energy in courageously completing all the tasks entrusted to them during the course of the attacks continuously made upon the French divisions, inflicting heavy losses on the enemy. Among the dangers and privations of all sorts, they have always shown a high valour and a remarkable tenacity."

After a short rest in a quiet sector the regiment again took its place in the line for the St. Mihiel drive. This action was quickly followed by the attack against the Blanc Mont Ridge which the Germans had held with a tremendous tenacity and fortified with a wonderful system of barbed wire and trenches. Here the division was with the French under General Gouraud. The batteries occupied this position on October the 1st and 2nd and the attack began at 6:00 A.M. on the 3rd. The American barrage was effective and the infantry advanced to its objective, but it was soon clear

that the Germans had no intention of leaving the vicinity without a fight. Their artillery constantly shelled the American Infantry, and their machine gunners made a desperate resistance; moreover, the German guns kept up a harassing fire on the American artillery and on the roads. After two fierce attacks Blanc Mont was cleared of the enemy and the 17th Field Artillery following close on the heels of the infantry was, on October 5th, in position on Blanc Mont. The regiment suffered the loss of a great many horses but the loss in officers and men was not as large as would be expected from the great amount of shelling that the battalions underwent. The 2nd Field Artillery Brigade remained in line and supported the 36th Division Infantry, which relieved the 2nd Division Infantry, until October 27th when, by forced marches, it rejoined the 2nd Division in the line in the Meuse Argonne.

The attack in the Argonne commenced on November 1st, 1918, and on Armistice Day the regiment was in the town of Beaumont. On November 17th, the regiment commenced its long march to Germany through France, Belgium, and Luxemburg. The Rhine was crossed at Engers, Germany, on December 13, 1918, exactly one year after sailing from the United States.

In February, 1919, the 17th Field Artillery was billeted in the great German Fortress of Ehrenbreitstein directly opposite the city of Coblentz on the Rhine. Here the organization had the distinction of raising the first American flag to be flown over a German fortress. At this place the regiment was inspected and reviewed by Marshal Foch, Marshal Petain, General Robertson, the Secretary of War, the Secretary of the Navy and many other high ranking officers of the Allied Armies. General Pershing, Lieutenant-General Liggett, Major-General Hines and Admiral Benson also honored the regiment by informal visits.

On July 18th the regiment started homeward where it arrived on August 4th. After parading with the 2nd Division in New York the emergency men were discharged and the remaining men sent to Camp Travis, Texas, where the organization remained until January 5th, 1921, when it was ordered to Camp Bragg, N. C., arriving there on January 9, 1921.

During the war four (4) Distinguished Service Crosses and one hundred and six (106) Croix de Guerre were awarded to the officers and men and a great many others were cited in orders.

The Second Army Citation, which entitles the regiment to wear the Fourragere of the Croix de Guerre, covers the action at Blanc Mont.

The citation reads as follows:

"Has taken a glorious part in operations and engagements in Champagne in October, 1918, by supporting with remarkable energy

the infantry attacks of the Division. Has powerfully aided the infantry to carry on October 3rd the very strongly fortified German positions at Blanc-Mont, the farm Medeah, and St. Etienne-a Arnes, and has thereby attained during the day an advance of about six kilometres. During these attacks, and in all other missions which were entrusted to it, officers and men of rank and file have rivalled in energy and courage."

F. W. BOWLEY,
Major, 5th Field Artillery.

THE SCAPEGOAT OF THE BATTLE OF THE MARNE, 1914. LIEUTENANT-COLONEL HENTSCH, AND THE ORDER FOR THE GERMAN RETREAT.*

BY BRIGADIER-GENERAL J. E. EDMONDS, C. B., C. M. G. (RETIRED R. E.)

ACCORDING to Princess Blücher ("An English Wife in Berlin") it was not until the 23rd of September, 1914, that it began to leak out in Germany that there had been a disaster on the Marne. All that the official bulletin of the 10th of September, 1914, had to tell about the battle had been:

"The portions of the Army which had pursued up to and over the Marne east of Paris were attacked between Meaux and Montmirail by superior forces. They have held the enemy during two days' heavy fighting and have even made progress. As the approach of strong enemy columns was reported, the right wing was drawn back. The enemy nowhere followed. As victory-booty in these actions, fifty guns and several thousand prisoners have up to now been taken."

No further news about the Western front was given to the German public until the 13th of September: it was kept amused with "a new victory of General Hindenburg" and "successes at Lemberg." It was then told:

"The operations in the Western theatre of war, with regard to which details cannot yet be published, have led to a new battle that stands favourably for us. The unfavourable information with regard to our Armies that the enemy is spreading by all possible means is false."

After that there was silence as to the events of the 6th to the 13th of September. Even in the long list of monographs on battles of the war that the Great General Staff has advertised, though Le Cateau is included (the monograph on it has not yet appeared), there is no mention of the Marne. An anonymous pamphlet, "Die Schlachten an der Marne," issued as late as 1916, in defence of von Moltke, was at once suppressed.[1]

Gradually, however, the magnitude of the disaster became public property. Rumors were therefore set in circulation from Berlin that the reverse that had occurred had been the fault of the Saxons. Their four army corps served together in the Third Army under

* Reprint from *The Army Quarterly*, London, England.

[1] At the time it was thought to have been written by one of his staff, but in 1920 it was announced that the author was a Herr Kircheisen.

a Saxon general, von Hausen. It was said its front had been broken and he had been removed from command. This was so far the case that von Hausen was unemployed; but it was on account of severe illness. The rest of the story was not true. Far from it, a wing of the Saxon Army had assisted to drive back Foch, and otherwise it had been entirely successful though it did fight in two parts with a gap between them. The Berlin story never obtained much credence, though it is still persisted in.[2]

Then succeeded rumors that a Saxon General Staff Officer was the guilty party: he had given a wrong order, an order to retire he had no right to give to Prussian troops, and that he had given it in the name of the Supreme Command. There had been an awful mistake, for the Germans, even the Saxons, and particularly von Kluck, were everywhere victorious. The officer had been tried by court martial and shot. His name was Lieutenant-Colonel Hentsch, head of a section of the Great General Staff in the Field.

So much for rumor. It was not until June, 1919, when the Saxon General-Major Baumgarten-Crusius published his book "Die Marneschlacht, 1914," "compiled from war records," in order to destroy forever the absurd legend about the Third Army and its leader, that some of the facts began to be known. It is to the quarrel between the Saxons and the Prussians that we owe it. Since then other books on the Marne have appeared, among them those of the commanders of the German First and Second Armies, and there have been numerous magazine articles and letters on the subject of Colonel Hentsch. Finally, the result of the Court of Enquiry on him in 1917 has just been published in the *Militär Wochenblatt*, and we have practically the whole story. Lieutenant-Colonel Hentsch actually did have a great say in the orders for the retreat from the Marne, and his name will doubtless be connected with the battle for all time.

At the outbreak of war he was one of the two officers in charge of the Foreign Armies section of the German Intelligence, one-half of which dealt with the French Army and those of Western States: and the other with Russia and the rest of the world. On mobilization he became head of both parts, and in this capacity accompanied Supreme Headquarters into the Field. He appears, however, to have been principally employed in liaison work in August-September, 1914, and was therefore well known to the Army Staffs.[3] It is certain that he took out to the First Army the Supreme Command operation orders of the 5th of September (which ordered von Kluck

[2] *E.g.*, by General-Major Tappen in his pamphlet *Bis zur Marneschlacht*, published this year. He was head of the Operations section of the Supreme Command in 1914, and bears some of the blame for the defeat at the Marne.

[3] Von François, "Marneschlacht und Tannenberg," pp. 102, 108.

to face towards Paris). His arrival is mentioned by General-Major von Kuhl, von Kluck's Chief of the General Staff, who further accepted his covering authority for von Kluck doing something quite different to what was ordered, and pressing on southward.

"The taking of a new front towards Paris," Hentsch said, when asked, "need not be hurried, but can be carried out at complete leisure (volle Ruhe)."

The custom that obtained in the German Army in 1870–1871 as regards the power of General Staff liaison officers of Great Headquarters, is well known;[4] they were not mere messengers and carriers; they were expected to explain orders, and even to give orders if necessary, in the name of the Chief of the General Staff; being supposed to be fully conversant with his wishes and intentions. There was nothing unusual, therefore, in Hentsch taking upon himself to approve von Kluck's delay in carrying out his orders. No one probably knew this better than von Kuhl, for he had served twenty-two years on the Great General Staff. Hentsch was well known to him and had served under him.

During the battle of the Marne, Supreme Headquarters were back at Luxembourg, more than 150 miles from the First Army. Their only means of communication with the armies was by wireless, which worked very slowly, messages taking eight—even twelve—hours to get through, and by officers in motor cars. The great machine had been started and by the 6th of September, if not earlier, had escaped control. By the 8th von Moltke had no clear conception of what was happening in the great battle. What he did to obtain news and coördinate action, and what happened in consequence, can hardly be better described than in the words of the Memorandum[5] signed by Ludendorff on the 24th of May, 1917, numbered "Chief of the Staff of the Field Army, No. 2229." This paper embodies the results of the enquiry which Lieutenant-Colonel Hentsch asked for in 1914, but which was not held until Hindenburg-Ludendorff were in power. It will be given in full. Further information elucidating its plain official statement will then be given.

"Colonel Hentsch, then Lieutenant-Colonel and Head of a Section on the Staff of the Chief of the Staff of the Field Army, on the 8th of September, 1914, at Great Headquarters, received verbal instructions from the Chief of the General Staff of the Field Army (Generaloberst von Moltke), to motor to the Fifth, Fourth, Third, Second and First Armies (a round trip of some 400 miles) and bring back a clear idea of the situation. In the case that rearward movements had already been initiated (eingeleitet) on the right wing, he

[4] See Rousset's "Le haut commandement Allemand en 1870–1."

[5] Given in the *Militär Wochenblatt* of the 18th of September, 1920.

was instructed so to direct them that the gap between the First and Second Armies would be again closed, the First Army going, if possible, in the direction of Soissons.

"Lieutenant-Colonel Hentsch was therefore authorized, in the specified circumstances, to give binding instructions in the name of the Supreme Command.

"He motored on the 8th of September, 1914, to the Headquarters of the Fifth, Fourth and Third Armies, and spent the night of the 8th–9th September at Second Army Headquarters. The commander of the Second Army made the decision to retire behind the Marne early on the 9th of September, independently (selbstständig).

"Lieutenant-Colonel Hentsch agreed with this conclusion and motored on to the First Army. There, after discussion of the situation with the Chief of the Staff on the afternoon of the 9th of September, he gave the order for the retreat in the name of the Supreme Command, quoting the powers conferred on him. He was justified in this, for the case provided for in his instructions—the initiation of rearward movements—had arisen.

"Whether the decision of the Second Army Headquarters and the order of Lieutenant-Colonel Hentsch to the First Army Headquarters to retreat were actually necessary from the situation must be decided by historical research in later years.

"Colonel Hentsch incurs no personal reproach that he went beyond what he was entitled to do. He acted solely in accordance with the instructions given to him by the then Chief of the General Staff of the Field Army.

"I request that this decision may be circulated down to divisional staffs.

"By order (signed) LUDENDORFF."

It seems strange that a comparatively junior officer should be given so fateful a task. It has been suggested that General von Stein, the Deputy Chief of the General Staff, was available. The device of one lieutenant colonel motoring behind the front of five armies to coördinate a retreat, if necessary, is, to say the least of it, hardly suggestive of expedition. However, it was all that the "Brain" of the German Army could evolve. General von Kuhl, writing after events,[6] suggests that there should have been a special commander for the three armies of the right wing, or that there should have been an advanced Great Headquarters nearer the armies, for the collection of reports and forwarding of orders. But no one thought of this at the time, for such an arrangement had of course not been found necessary at Staff Tours and War Games; and the

[6] "Der deutsche Generalstab," p. 194.

German Signal Service, in any case, was far behind the British in efficiency and equipment.

It would appear obvious, from Lieutenant-Colonel Hentsch being sent on his important mission on the 8th of September after his decision at First Army Headquarters on the 5th of September, that he did correctly interpret the intentions of the Supreme Command (O.H.L.) on this occasion, and still enjoyed their entire confidence.

It further appears, from the nature of von Moltke's instructions, which only contemplated a retreat, that the Chief of the General Staff considered the German Armies on the right beaten, or, at any rate, not likely to be victorious.

The situation into which the Germans had blundered on the 5th of September might well make him think. For half a century German military writers had preached envelopment, and tried to make our flesh creep with bogies of Sedan, and, after von Schlieffen's celebrated magazine article of "Cannae." There is hardly a German book or pamphlet on war since 1911 that does not allude to Hannibal's double envelopment, to sabre-rattling accompaniment.

One cannot restrain a smile at the value of "Doctrine": for when the "Brain of the German Army" went to war—instead of manœuvres—this brain, which had so long posed as a super-brain until the world nearly believed it was, not only failed, even with the help of a stolen start, to envelop its less ready foe, but the army it controlled was enveloped—and doubly enveloped. Unfortunately, the French cavalry was too worn out by senseless *randonnées* in Belgium to be in a position to complete the "Cannae," but General de Cornoulier Luciniere's provisional division of cavalry, all that Sordet's Cavalry Corps could send into action, did get in rear of the Germans, and was within an ace of capturing von Kluck, as that Commander himself relates. To complete the proof of their incapacity to handle large armies, the Germans provided a lightly held gap of thirty miles in their front to assist the enemy in breaking it. Of this General Franchet d'Esperey's Fifth Army and the B.E.F. took some advantage, so that that French Commander could truthfully tell his army on the 9th of September, "turned on both flanks, his centre broken, the enemy is retreating."

The Germans unfortunately fell short of the complete military bankruptcy of encirclement, from the sheer fatigue of the Allies.

Is the military art a fraud? Far from it; there were good and definite reasons for the failure of the "Brain." It had been poorly nourished.

The writer, who has known the German Army fairly intimately since, as a child, he saw it in occupation of northern France in June, 1871, often advanced the opinion before the war that from the

moment the Kaiser Wilhelm II. came to the throne in 1888 the Army began to go downhill, except as a parade army. The ex-Kaiser could not tolerate a soldier of real independence of character; good men were thrust aside and passed over, and courtiers and sycophants promoted. The most notorious case is that of Lieutenant-General von Kretschmar, who was uncourtierly enough to defeat him at divisional manœuvres shortly before he came to the throne; in 1889 the General was informed that he would not be promoted. There were good men in the German Army, but they were not on the Great Headquarters Staff when the war commenced. Hindenburg was unemployed and Ludendorff in a subordinate staff appointment, whilst von Prittwitz and von Waldersee were selected to defend East Prussia.[7]

To resume: General-Major Tappen, who, as already mentioned, was head of the Operations section, states that before Hentsch was dispatched "there was a thorough discussion of the situation (at Supreme Headquarters) at which it was emphasized that it was important to hold out (ausharren) and avoid any rearward movement."[8] Considerable doubt has been thrown on the value of Tappen's statements by von Hausen, von Kuhl, and others in the public Press. Even he, however, does not assert that anything about holding on was included in Hentsch's instructions: he was merely to coördinate the movements of the armies if a retreat had been initiated.

Lieutenant-Colonel Hentsch died as a colonel in Rumania in 1916; von Moltke is also dead; so neither can defend himself personally. Both of them left written statements with regard to the incidents of the 8th–9th of September. When arrangements, however, were made in 1916, after von Moltke's death, to publish his apologia, they were officially stopped, and nothing more has been heard about it. Part of Hentsch's statement has been printed in the *Militär Wochenblatt*, and the published extracts of the First Army War Diary, with von Bulow's and von Kluck's statements, practically cover the important period of his mission.

What Hentsch reported of the situation in the Fifth, Fourth, and Third Armies, we have not yet been told in full. Tappen states that "in general," as regards the two first, he said, "the Fifth and

[7] Gross Admiral von Tirpitz in his "Erinncrungen," p. 139, "a lack of men of strong character ruled in Berlin—the forceful men, who in 1866 and 1870, and even 1848, came to the top, were in our days of trial not available in the same number, or were not put in the right places."

[8] "Bis sur Marne," p. 24. We need not go in this paper into a criticism of the fatal mistake made by Tappen of sending two corps to Russia on the 26th of August from the striking wing, instead of from the left. This adds another item to the blunders of the "Brain."

Fourth Armies can practically stay where they are." Von Hausen, the Commander of the Third Army, in his book describes its position on the 9th of September as hoffnungsvoll, which is a stronger expression than our "hopeful."

"The eastern wing of the Third Army," he says, "had successfully withstood an enemy superior in numbers, the centre and western wing had beaten the enemy (Foch) at Mailly and forced him back." This is substantially correct.

Hentsch's report of what occurred at Second Army Headquarters is as follows:

"I discussed the situation thoroughly with Generalfeldmarschall v. Bülow, General von Lauenstein (his Chief of Staff), and Oberstleutnant Matthes (Operations) on the evening of the 8th of September in the Château of Montmort. We weighed every possibility for avoiding a retreat; the tone of the Army Staff was calm and confident. At 5:30 A.M. on the 9th of September, I examined the situation once again with General von Lauenstein on the basis of the reports that had come in during the night. After the First Army had withdrawn the III. and IX. Corps from the Marne to its right wing, there was no other possibility but to go back at once across the Marne."

The right flank of the German Second Army was, in fact, more than turned. Part of Franchet d'Esperey's infantry was actually behind it, not to mention Conneau's Cavalry Corps, which was on the early morning of the 9th approaching Château Thierry.

It may be recalled here that von Kluck on the 6th of September, when he took the II. and IV. Corps back to assist the IV. Reserve Corps against General Maunoury's enveloping attack, had left the III. and IX. Corps with von Bülow, covering the right flank of the Second Army. Early on the 7th, however, he had urgently recalled them to his own army. Kluck's message to the Second Army asking them was significant:

"Assistance of the III. and IX. Corps on the Ourcq is urgently required. Enemy considerably reinforced. Please start corps in direction La Ferté Milon and Crouy."

To return to Hentsch's report, it continues:

"There behind the Marne the Army could and would stop. The basic condition for this was, however, that the First Army should take over the protection of the right flank of the Second Army and prevent the British from crossing the Marne west of the Second Army."

We know that the First Army was not in a position to accomplish this, and that by the evening of the 9th the greater part of the B.E.F. was across the Marne.

Von Bülow's own account of Hentsch's visit is a little disingenuous.[9] He says:

"When early on the 9th of September numerous enemy columns crossed the Marne between La Ferté Jouarre and Château Thierry, there remained no doubt that the retreat of the First Army was, for both tactical and strategical reasons, unavoidable, and that the Second Army must also go back, in order not to have its right flank completely enveloped. In agreement (Ubereinstimmung) with the representative of O.H.L. (Lieutenant-Colonel Hentsch), I was convinced that the most important task of the Second Army was to support the First Army north of the Marne and offer it again the possibility to connect with the right wing of the Second Army in the direction of Fismes."

As no part of the B.E.F. (except the 11th Hussars) had crossed the Marne by 5:30 A.M. (British time 4:30 A.M.) on the 9th of September, when Hentsch left Second Army Headquarters, and no French troops had crossed at that hour, von Bülow had other reasons for retirement than those he gives; and Hentsch knew them and, in these words, told the First Army:

"The right wing of the Second Army has been driven back (zurückgeworfen), not drawn back."

That this was the case is fully confirmed by a statement made by the Commander of the 13th Division, VII. Corps,[10] which stood on the extreme right of the Second Army. After the French had attacked him all day on the 8th, they broke through his front, and his whole division went back. His own words are:

"A weak enemy detachment[11] succeeded in the darkness in breaking through where two companies of the 57th Infantry Regiment were interpolated between the 1st and 3rd Battalions of the 158th Infantry Regiment. As the strength of the enemy could not be ascertained (he has said it was weak!), I gave the order to go back to the Montmirail-Artonges railway."[12]

One might quote dozens of instances where German commanders have argued that they were not driven back, because they gave an order to retire. We need not, however, quibble over the words, and Hentsch no doubt interpreted them correctly as "thrown back." A German division of 1914, and that a flank division, was hardly likely to be ordered back except for very strong reasons: the compulsion

[9] "Mein Bericht zur Marneschlacht," p. 60.

[10] General v. François, pp. 104 *et seq*. The other division of the VII. Corps, the 14th, was farther down the line and not alongside the 13th.

[11] The German is "eine schwächere feindliche Abtheilung."

[12] The enemy was the 18th Infantry Regiment of the French XVIII. Corps; the place Marchais. The Germans fled, leaving dead and wounded behind. (J. Maze in "Les Champs de Bataille de l'Eopée. La Marne," p. 159.)

of the enemy. But the full significance of the retirement of the German 13th Division is not grasped until one looks at the 1/80,000 map, and finds that the southern half of the Montmirail-Artonges railway faces (for the Germans) west, and the northern half, where the 13th Division stood, northwest.

The diagram provided by von Bülow is more illuminating on the subject than his text. It shows half the French Fifth Army and the whole of the B.E.F. at 10 A.M. on the 9th as having broken through the Germans on a thirty-mile front, and in the act of turning outward to envelop his right and von Kluck's left. To show them in this position at that hour is a little premature; von Bülow had evidently taken counsel with his fears, and, as we have so often heard lately, "a general is beaten who thinks himself beaten." Ludendorff's conclusion that von Bülow made the decision to retire seems completely justified. The particular effect of such a decision by von Bülow on Lieutenant-Colonel Hentsch should be considered. It was expected by the whole General Staff when von Schlieffen retired in January, 1906, that von Bülow would succeed him.

"With Generals von Bock, von Eichhorn, von Haeseler, and von der Goltz he was reckoned among the best corps commanders that the German Army had possessed. His intellectual gifts and capacity were generally recognized. The Kaiser and the Supreme Command had a high consideration for his judgment.[13] One may well imagine that von Moltke, in sending Hentsch off, said to him, "You had better be guided by von Bülow"; for he, poor man, the humble bearer of an historic name, "had never expected to be Chief of the General Staff, had never prepared for it."[14] and had spent the greater part of his life first as A.D.C. to his uncle and then to the Kaiser. In any case, von Bülow's decision would weigh much with a lieutenant-colonel of the General Staff.

It may be of interest to note here that von Bülow when commanding the III. Corps in peace time had been celebrated for "shoulder-to-shoulder" tactics, and his operation orders always allotted very definite boundaries even to small units. In August, 1914, he was constantly clamoring for the First and Third Armies to keep near him. He was, therefore, more likely to be disturbed by the knowledge of gaps in the line than a less precise and more up-to-date commander; and he was sixty-eight years of age.

We now come to what happened at von Kluck's headquarters when Hentsch arrived there with von Bülow's decision in his mind. One extraordinary feature of the visit is that he did not see von Kluck, but did his business with the General Staff. Von Kluck

[13] Von François, p. 102, writing of 1914.

[14] Von Stein (Deputy Chief) in his "Erlebnisse," p. 37.

complains of this; it is certainly curious that his Chief of Staff, von Kuhl, did not inform him of the presence of the representative of O.H.L., and detain the bearer of such an important decision. The explanation seems to be that, as Hentsch took seven hours to travel between the two Army Headquarters, the Second had already sent information by wireless that it was going back, and the First Army had already decided that it must retreat before Hentsch arrived. This will be referred to again later. The entry in the First Army Operations War Diary with regard to his visit is:

"Lieutenant-Colonel Hentsch brought the following information: The situation is not favourable. The Fifth Army is held up before Verdun; the Sixth and Seventh before Nancy-Epinal; the Second Army is simply exhausted. The retreat behind the Marne is irrevocable. The right wing of the Second Army has been driven, not drawn, back. It is, therefore, necessary for all the armies to be off together: the Third Army north of Chalons, the Fourth and Fifth, in coöperation via Clermont in the Argonne on Verdun. The First Army must also go back, direction Soissons-Fére en Tardenois; possibly farther, even to Laon-La Fére.

"He then drew the lines to be reached by the armies on the map of the Chief of the Staff of the First Army, General Kuhl, with charcoal.

"A new army would be collected at St. Quentin. Thus new operations could be commenced.

"General Kuhl remarked that the First Army was in the midst of an attack; a retreat was a very ticklish matter, as the troops were thoroughly mixed up and thoroughly exhausted.

"Lieutenant-Colonel Hentsch stated that, nevertheless, nothing else was possible. He admitted that a retreat out of the fight in progress in the direction ordered was not feasible, only perpendicularly to the front, not farther east than Soissons, with the left wing behind the Aisne. He emphasized that these instructions would hold good whatever further information might come in. He had full powers.

"The Deputy Chief of Staff of the First Army, Colonel von Bergmann, was present at this conversation."

Thus ends the First Army account. Colonel Hentsch's statement traverses it in several particulars, and adds that Colonel Bergmann came in "much later," after the discussion with von Kuhl, and that the account of his visit was entered up by the First Army not at once, but on the 10th. Those who know how and when War Diaries during a retreat are written will probably believe Hentsch; more especially as we are told that there is nothing about his visit in the Second Army War Diary.

Hentsch's account is that "on account of the panics behind the front," it was not until about midday that he reached First Army Headquarters at Mareuil (sixty miles as the crow flies from Montmort, so he did not make more than ten miles an hour).

"I do not know what interchange of information and intentions had taken place between First and Second Armies meanwhile. In any case, General von Kuhl received me in the village street with the words, 'Well, when the Second Army goes back, we can't remain here.' The intentions of the Second Army must, therefore, have become known to the First Army by this time—about 12:30 P.M." He then discussed every possibility thoroughly with General von Kuhl, who was alone.

"The situation of the First Army about midday was such that the left wing had already received the order to go back to the line Crouy-Coulombs.[15] The possibility of the Second Army holding the line of the Marne was, therefore, out of the question; it must go farther back if its flank and rear were not to be enveloped by the British on the 10th.

"General von Kuhl then said that 'the position of the right wing was favourable; the IV. and IX. Corps were attacking and had prospect of a success. More was not yet known.'"

But Hentsch adds:

"I know, however, for certain, that just at this time a report from the IV. Corps came in that it could not carry out the attack, as it was itself attacked by strong forces. I also knew for certain that I asked General von Kuhl if the First Army would not be in a position to support the Second with its whole force next day (10th of September), if it succeeded in defeating its own immediate enemy on the 9th. This was negatived on account of the state of the Army.[16]

After discussing every possibility, Hentsch used the powers given him and gave the order for the First Army to retreat. He further states:

"I am firmly convinced that on my return to Supreme Headquarters on the 10th, they thoroughly concurred in my arrangements."

This seems confirmed by the fact that O.H.L. issued no orders until 1:15 P.M. on the 10th, after Hentsch's return, and then

[15] That is, across the Ourcq and to face south against the British. Crouy is on the Ourcq about ten miles north of La Ferté-sous-Jouarre, where the British 4th Division, the left of the B.E.F., crossed the Marne, and Coulombs is three miles east of Crouy.

[16] Von Kluck, p. 123, says that Hentsch gave the reasons: "Shaking clear of Maunoury, reorganization of the Corps (divisions and brigades were mixed up), replacing ammunition and supplies, sending off the Train, arranging for security of communications: all measures taking up much time."

merely *put von Kluck until further notice under von Bülow*. The next orders, timed 5:45 P.M., directed von Bülow to go back behind the Vesle.

Von Kluck's hints that, but for the orders given him to retreat, he would have been able "to exploit the success already commenced against Maunoury" and then turn against the British Army, "if, after the fight at Montbertoin, it ventured to push forward,"[17] seem to have little to justify them. We have seen that there were panics behind the front where the B.E.F. was attacking;[18] that the left wing of the First Army had been ordered back before Hentsch's arrival, and that part at least of its right wing was unable to get forward. No reinforcements from the East, from Antwerp or elsewhere, reached the Germans on the Aisne until the 13th, when the VII. Reserve Corps from Maulbeuge, followed by the IV. Corps from Alsace appeared. They could not have reached the Marne so soon even as the 13th.

No one can say with certainty what would have happened in a battle of 1914 if something that was not done had been done; but it would appear that the decision made by von Bülow and acted on by Lieutenant-Colonel Hentsch saved the German Army from a greater disaster than it actually suffered. Fighting with both flanks enveloped, its front broken, enemy cavalry in its rear, its supply of ammunition nearly exhausted, without organized lines of communications, in a hostile country, and with no reinforcements in sight, it was, to say the least of it, in such an unfavorable strategical situation that there was only one course: retreat.

Germans are now consoling themselves by arguing that if they had won the battle of the Marne, it would have made no difference in the result of the war. Professor Delbrück has said that the peace terms that the German Government would have offered in September, 1914, would have been so fantastic that France must have gone on fighting. We can leave the Germans with this consolation for the failure of their General Staff to handle in war time larger bodies of troops than they were permitted to practice with in peace—and take warning to ourselves.[19]

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[17] "Der Marsch aur Paris," p. 123.

[18] It was covered by four German cavalry divisions with 9 Jäger battalions, the 5th Division, and Kraewel's Composite Brigade.

[19] Since the above article was put in print the following additional information has been published in Germany:

(1) "At Second Army Headquarters the order for the retreat was given without consultation with the two neighbouring Armies, and only after an aeroplane report had come in of the advance of five long columns against the Marne between La Ferté-sous-Jouarre and Château Thierry. (Five British divisional columns and a French cavalry column, directed on Azy, were moving against this section

of the front on the morning of the 9th of September, 1914.) Generaloberst von Bülow then sent a wireless message to the First Army that he was beginning to retreat behind the Marne between Damery and Epernay. Before this happened Lieut. Colonel Hentsch had left to arrange the retirement of the First Army to the northeast." (See Suevicus in Wissen und Wehr, p. 449, 1920.)

(2) "Hentsch, in the portion of his report that had not yet been published, has expressly written: 'I was charged in case of necessity to order the retreat of the whole army to the line St. Menehould-Rheims-Fismes-Soissons. I was expressly given full powers to issue orders in the name of the Supreme Command. . . . In the case of the First Army I drew attention to the full powers conferred on me, and ordered the retreat in the name of the Supreme Command.'" (See Lieutenant-Colonel Müller-Lobnitz, formerly of the Great General Staff, in the *Militär Wochenblatt* of the 25th of September, 1920.)

THE RELATION OF THE FIELD ARTILLERY BRIGADE TO THE DIVISION

BY MAJOR J. N. GREELY, GENERAL STAFF, U. S. ARMY

"THE exact method of employing field artillery depends, as for the other arms, upon the particular tactical situation and upon the plan decided upon by the commander of the troops."

This is the first principle for the employment of field artillery as laid down in the essentially sound, if incomplete, Provisional Drill and Service Regulations for Field Artillery, 1916.

Nothing is more basic. Nothing can be more important to every artilleryman than the plan decided upon by the commander of the troops. This is no new thought, and yet it is one that has been little elaborated upon in the artillery literature of the late war. You will thumb thousands of pages, instruction pamphlets, histories, magazine articles, without finding a hint of it. Much of this artillery literature has concerned itself with map firing, one of the simplest problems which faces the field artilleryman, which has been given enormous prominence of late only because it was given none in America before the great war. It therefore has the fascination of novelty for the American public. Additional acres of wood pulp have been devoted to descriptions of new ordnance, which should of course interest every field artilleryman, but which is after all essentially the business of ordnance officers. Another subject which has been stressed is that of liaison with the infantry. Here for the first time we approach, even if obliquely, the matter of the concern of the artillery with the plan of the commander. For it is merely to supply the deficiencies in the plan of the commander that direct liaison between artillery and infantry becomes necessary.

Now and then in the military literature of today there is found a statement in general terms of the necessity for voluntary coördination. Field Marshal Haig in his "Features of the War," says: "An intelligent understanding of 'the other man's job' is the first essential of successful coöperation." What other man is most important to the artillery brigadier in an infantry division? Manifestly it is the division commander.

An artillery commander may have a complete understanding with the commander of the infantry he normally supports. This profits him nothing if division orders assign him to the support of some stranger regiment. He may have painfully worked out a barrage reinforced by machine guns. This is instructive, but hardly valuable if division orders put half the machine guns in the front line and the other half into a division reserve miles to the rear. He

can plan nothing, do nothing, that is not dependent on the division commander and the way in which he handles his job.

The artillery brigade commander must be first grounded in artillery work. But once so grounded, his most important study should be that of the job of the division commander. He will find it to be the whole of a job. The division commander must at the same time justify his cause to the enemy and justify his course to his friends. The whole military hierarchy sits in judgment on him, from his corps commander up to the chief of staff, from his brigade commanders down to the muddiest doughboy, from the enemy's Military Information Division up and down. He is responsible for his division sector, everything that lies in front of it, much that lies behind it; and in the last analysis he, and he alone, is responsible for the protection of his flanks. He has the finest job in the world for a strong man, the worst for a weak one. It follows that most division commanders will be strong men.

No division commander, however, can stand entirely by himself. Napoleon has denied that he ever did. "I marched in time with four million men." The strength of the division commander is part and parcel of the strength of his command; a part of the brain to coördinate that strength is his general and technical staff. In his staff he must find means to round out the personality of an efficient division commander. If he lacks suavity, his G-2, say, must supply it. If he thinks slowly, his G-3 must think fast. If by any chance he vacillates, his Chief of Staff must not. If his idea of communication is to roar out commands in a bull voice, his D.S.O. must lay the telephone lines in his name. This is the merest sketch of the job of a division commander, a job that the artillery brigade commander must study throughout his official life.

For the study of this job the artillery brigade commander is ideally situated. He is:

A. One of the three principal subordinate commanders.

B. The principal technical staff officer.

C. An unlisted general staff officer whose importance and influence depends directly on himself. He may have greater influence than the Chief of Staff or less than the commander of the Mobile Ordnance Repair Shop.

These three different capacities offer to the artillery commander three different methods of approaching the division commander, for the study of his job and for the exercise of influence for the common good.

As a general officer commanding a brigade he has the prestige that opens doors. As a man of something like equal rank and age the division commander will want him as a friend to share his burdens. For just this reason buck privates associate with buck

privates, old maids with old maids, and emperors with emperors. He has one great advantage, physical contact, which the infantry brigadiers have not. To them the heart of the division commander would normally go out did he not see with his own eyes, hourly, the burdens under which the artilleryman has to struggle. At all costs, the artilleryman must maintain the fortuitous advantage which places him always at the left hand of the division commander. He must cut his own staff to the bone, sleep on the ground, go hungry, rather than lose close contact with his chief. His primary duty is, of course, to command the artillery, but he must manage to do this from wherever the division commander happens to be.

As the principal member of the technical staff the authority of the good artilleryman will not be questioned. The essential is that he be a good artilleryman. He must know just what his command can do and what it cannot do. He is on the same plane as the D.E.O. or the attached tank officer. The D.E.O. must not say that his wire cutters can not cut the wire when any front line doughboy knows that they can. A tank officer must not guarantee that his tanks can attack with the infantry when their carburettors and gizzards are missing and they cannot get out of park. Nor must the artilleryman.

If, however, the artilleryman is technically efficient he can without interference write the orders that concern his own arm alone. No efficient artillery brigade in the war with Germany ever had insuperable difficulty in prescribing the proper technical use of artillery. As a rule the higher command asked only accurate knowledge and efficient service of technical arms. Here the method of approach is easy, although strictly limited to the matter of the employment of artillery as artillery.

The third method of approach to the division commander is as an unlisted general staff officer. It is the most difficult, but it leads past the ramparts that bar out common folk and into the innermost keep of the citadel. A good division commander in quiet times can listen to everyone, weigh their opinions and thereafter make his decisions. In battle he cannot. "In battle," says Ardant du Picq, "the fighting man from general to private is not the calm, settled, unfatigued soldier, but a nervous, easily swayed, moved, troubled, distrait, excited, restless being, not under self-control." At this crucial time a division commander cannot listen to everyone, bear everybody's troubles; but he is always willing to listen to those whose sole excuse for being is to help him—his general staff officers. It is in such a capacity and at such a time that the immediate duty of the artillery brigade commander is to approach his chief to help him, and to help himself thereby.

The first two methods of approach are open to the artillery commander by virtue of his position. The third method, as has been indicated, is dependent on his personality. He may have to depend, as does the division commander, on his staff to round out his personality. It must smooth out his faults, remedy his deficiencies. If the artillery general congenitally froths at the mouth at the sight of the Chief of Staff, he should approach him only through one of his own staff. The instant that the two personalities of the two commanders, each with his staff, can be brought into sympathetic understanding, prospects are bright for the success of the artillery brigade within the division. It remains only for the brigade to maintain this understanding and to maintain its own efficiency to make a brigade and a division that corps commanders strive to get and enemy divisions strive to get away from. This maintenance of relations is not automatic, however, it is dependent on the continuous effort of the artillery command.

The specific things that an artillery brigade commander should do to maintain the desired status cannot be listed. They will depend on attendant circumstances. In general it can be said that they will be the sort of things not laid down as anybody's job, or the sort of things that are vaguely described as functions of command, but which everybody realizes will be too big for the commander to attend to personally in a crisis.

Perhaps the first crisis that can be expected in the future for a division is an entrainment. Nothing is simpler for a mobile division than a move; but nothing is more overwhelming than an immediate entrainment order to a division that has sat down for years and accumulated superfluous junk. Those lobes in the brain of a division commander which can militarily be designated as G-1 and G-3 will be jellied with apprehension. Nobody will be more welcome at division headquarters than an artillery commander with his part in the entrainment properly prepared and mimeographed. He can leave a copy on the G-3 desk and get back to the details of handling his brigade, secure in the knowledge that his plan will be followed to the letter if the grateful division commander can put it across. If he cannot—tant pis; but he will follow it as nearly as possible, merely to economize work at a time when he cannot think out everything himself. In such a case a personable young officer of the artillery staff can make himself useful by slipping carbons and an extra sheet or two under the successive sheets on which the harried G-3 writes his rough draft of the division entrainment order, and hurrying one carbon copy to artillery headquarters. The division G-3 will not only tolerate him, but in the future welcome him when he finds at his disposal two copies of the draft instead of one.

Much the same procedure can be followed in influencing the preparation of a march table, the most intricate and annoying problem that confronts a division commander and his staff. Thorough reconnaissance of roads, promptly and modestly communicated to the division, may so modify contemplated division orders as to save the artillery brigade hours of waiting in the rain, miles of detours, and oceans of grief in general. A case in point is that of an infantry division which moved out of the St. Mihiel operation into the Meuse Argonne. Army orders, prepared in advance, had not been able to foresee the complete collapse of the German salient and had routed the whole division around it. Prompt reconnaissance, followed by some small repair of roads through the captured salient, made it possible to make to the Army a concrete project for moving the artillery brigade and other horsed elements straight across the salient under cover of night. The project as approved not only freed to the Army for other purposes valuable road space, but saved the artillery brigade kilometres of travel over fantastically congested roads.

But procedures such as entrainment and marches, important as they are, are only preliminary to the all-important procedure of battle. Success in battle is the one excuse for the upkeep of a military establishment, the one aim of that establishment. On it the whole wealth, the very life of a nation is wagered. In this great gamble, all the accumulated resources of a people are put into the hands of the commander to play them as skilfully as he may. On the decision of the commander the whole conduct of his command will depend. Once the battle is loosed he will hold in his hand only his reserves, until he can gather the scattered combatants up again; but in the preparation for battle he is supreme. On one man will rest all responsibility, and he will need all the help he can get.

In preparation for battle the average division commander will be harassed by the complexity of the machinery provided him. In an effort to simplify and to distribute over his whole command the weight that is placed on his shoulders, he may be driven to "pass the buck." It is simple to divide between the infantry brigadiers all means at his disposal and give each of them half of his task; but in so doing the division commander wastes all the machinery for coördination available at his headquarters. Here the artillery commander may exercise great influence. If his artillery orders are prepared, and the brief excerpts made for inclusion in division orders, the primary essential, coördination between artillery and infantry, is thereby solved for the division commander. The plan informally submitted by the artilleryman may even serve as a model in requiring plans from and insuring the coördination of the tanks, the machine guns, the air service, and other special arms. If

this is done the division may fight as it is supposed to fight, as a unit.

But it is in the heat of battle that the artillery brigade commander will find the greatest opportunities to exercise any influence he may have gained as an unlisted general staff officer. In the case of a check there is the matter of the resumption of the rolling barrage which must be decided. An artillery commander may sit down and wait for orders on the subject. Inevitably they will come late, and he will be rushed in his technical artillery preparations. On the other hand, the artillery commander may swiftly reach a tentative understanding with flanking artillerymen, and submit it for integral inclusion in division orders. And the division which first prepares a mimeographed attack order may force its will on its neighbors, insinuate its decisions into the orders of corps and of armies.

In battle everything is fluid. The supreme command may have made the completest plans, with zones, objectives, phase lines, and exploitation areas for attack; with lines of surveillance, areas of combat, and barrage positions for defence. It is possible that the battle will develop as planned. It is also possible that some crop-headed enemy machine gunner with courage to continue doing what he has been told to do, may shoot such plans into nothingness. In this case a division commander must improvise new ones. It is in such a case that the good artillery brigade commander will prove invaluable to his chief. Less burdened with responsibility, disposing of his own staff and communications, he must have ready a solution for every problem. Here, his artillery must sit tight and cover its front with its own fire, to replace infantry battalions which have been wiped out of existence. Then his batteries must be on the heels of the advancing infantry battalions to hearten them, to protect them and to hold ground gained. The artillery brigade with its great fire mobility will often constitute the last reserve of the division and it must play its part as such. Pitched battle offers the greatest opportunity to the artilleryman who has plans to meet every emergency and who knows how to get the division commander to accept them. In a crucial hour he can make a division for all time.

The importance of one fact cannot be overemphasized. This gratuitous interference of the artillery commander in the affairs of the division commander must be carried out tactfully, or there must be no such interference. The value of the help that an artilleryman can give has been made evident, but if it is proffered in such a manner that it irritates the division commander, it will not be accepted. Furthermore, the artillery in common with the rest of the division will suffer from the irritation of the individual on whose coolness and ability the lives and fortunes of the whole command depend.

Under many circumstances, and always in battle, the artillery commander will be racked by apparently conflicting responsibilities. As a commander he must do everything to save his men. As a staff officer he may have to initiate action that will sacrifice a battery or battalion for the common good. His refuge is in wide vision. If necessary to break a great attack he must send his whole brigade forward into the open. He may foresee that such action will cost 25 per cent. casualties during the preliminary bombardment. But if he looks further he may visualize friendly infantry, insufficiently supported by artillery which is sheltered far to the rear, breaking before the enemy attack. He may visualize the enemy infantry, mad with victorious battle, sweeping with red bayonets into his battery positions. In a flash he may see his own overtenderness costing his own artillery 75 per cent. casualties.

The artillery brigade commander is better placed than his peers in the infantry to maintain the coolness and equanimity which are essential to breadth of vision. He is further removed from the madness of modern battle. But he, too, may find himself in some hot corner of battle when the shattering effect of high-explosive shell, the groans of the wounded, the perturbation of others, will tend to destroy his mental balance. Under such conditions he must fight himself, and the result will be the measure of the man.

History is full of fine examples. Turenne said: "You tremble body, but you would tremble more if you knew where I am going to take you today."

Here is another example, from our war with Germany:

In the early morning of October 4th, 1918, an infantry division had just jumped off in one of the four general attacks of the Meuse-Argonne operation.

The division post of command was in some captured German dugouts which were in consequence unfortunately faced. To the rear they were protected by cubic yards of concrete, stone and earth; toward the enemy the only artificial protection was of bristol board which had been converted into a sieve by previous artillery fire. An enemy flat trajectory 150-mm. gun had been reaching for these dugouts for days. Happily there was a crest which caught most of the shells and detonated them in a cloud of dust, two hundred yards in front. The overs passed through the hair of division headquarters personnel with a very disagreeable sound, to burst harmlessly thirty or forty yards up the hill.

This particular gun resumed its mission as the infantry jumped off. The Division Chief of Staff was a nervous soul; he had developed a habit of ducking ostrich-like behind the bristol board sieve when he heard an over sing. This interfered with his work

at the desk. He said fretfully, "I wish they'd stop that and let me work."

The Division Commander was standing by the door. As each over passed his chin jerked up a little and that was all. He said, "Don't say that. Every shot they fire here is one less on our devoted infantry in front."

A fine artilleryman spoke there.

NEW "FOUR-POINT-SEVEN" GUNS*

A COMPARATIVE STUDY OF PRE-WAR AND POST-WAR CORPS ARTILLERY GUNS

BY B. P. JOYCE

MEMBER A.O.A.

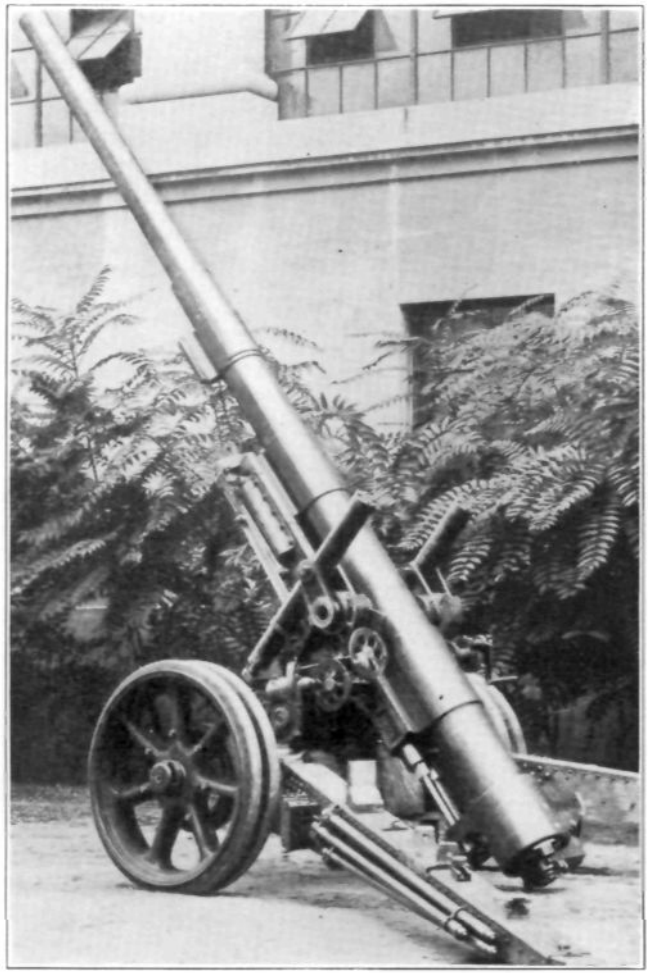
SHORTLY after the Armistice was signed, there was convened by War Department order a Board of Officers representing the Artillery and the Ordnance Department, for the purpose of making a study of the armament, calibres and types of matériel; kinds and proportion of ammunition, and methods of transportation of the artillery to be assigned to a Field Army. After much study of existing and proposed armament of the armies of all nations, the Board drew up definite specifications from the user's standpoint of all types of ordnance required for the various units of a Field Army.

For Corps Artillery, they specified as the *ideal* armament a gun of calibre between 4.7 inches and 5 inches, to be mounted on a carriage permitting a vertical are of fire of at least 80 degrees, and a horizontal are of fire of 360 degrees; to fire a projectile weighing not over 60 pounds at least 18,000 yards. To serve as a companion piece to the gun and have at least its mobility and yet provide a heavier projectile, the Board specified an *ideal* howitzer of about 155-mm. calibre to be mounted on a carriage permitting a vertical are of fire of at least 65 degrees and a horizontal are of fire of 360 degrees; to fire a projectile weighing not over 100 pounds at least 16,000 yards.

The Board deemed it particularly desirable that both the Corps gun and the Corps howitzer just described should be so constructed as to permit their being assembled to the same recuperator system, carriage and running gear.

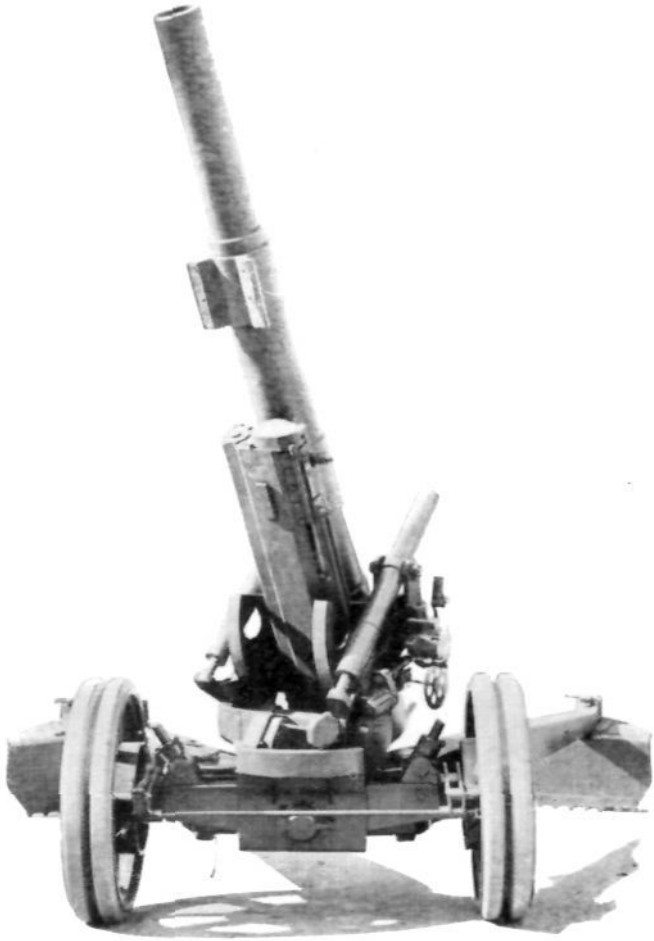
While the Board did not attempt to indicate how these *ideal* requirements should be met, nor even to intimate that they could be met in all cases, the Ordnance Department proceeded to design pieces of ordnance to meet the approved requirements insofar as possible. The requirements as to interchangeability of mounting cither the 4.7 gun or the 155-mm. howitzer on the same identical carriage necessitated compromises which of course, yielded a combination carriage not as satisfactory for either the gun or the howitzer as if individual carriages had been designed for each weapon. To determine exactly what had been gained and what had been lost in seeking this interchangeability a carriage designed for

* Reprint from *Army Ordnance*, January-February, 1922.



4.7-IN. GUN AND 155-MM. HOWITZER CARRIAGE, MODEL OF 1920

4.7-in. gun mounted on combination gun-howitzer carriage. Left rear view. Zero traverse. Fifty-two degrees elevation.



4.7-IN. GUN AND 155-MM. HOWITZER CARRIAGE, MODEL 1920

155-mm. howitzer mounted on combination gun-howitzer carriage

mounting the 4.7-inch gun only is now under manufacture and a carriage designed to mount the 155-mm. howitzer only may later be manufactured if found desirable and funds are available. Both of the post-war types are vastly superior to the original 4.7-inch gun model of 1906, which was standard equipment in our Army at the outbreak of the World War.

The 4.7-inch Gun Carriage, Model of 1906, was designed to be horse-drawn and therefore its weight was strictly limited. In view of these limitations, the carriage was restricted to a total traverse of 8 degrees and a maximum elevation of 15 degrees, these movements being about the same as in other contemporary types. The new experimental carriages of this type purpose to use if possible a somewhat better grade of gun steel, which permits a reduction in the total weight as compared with that for a gun of the same power, but of lower grade steel. The new guns being of much greater power, the weight of the new matériel is considerably greater than that of the old, but this is permissible since it will be motor-drawn. The accompanying diagram will clearly illustrate the greater range and field of fire of the new matériel. The comparative muzzle energies of the old and new matériel are also indicated.

The combination 4.7-inch Gun—155-mm. howitzer carriage, Model of 1920, was designed and built to meet as far as possible all of the *ideal* requirements set forth above. The howitzer specified, being the more powerful weapon, controlled the design of the carriage. The non-interchangeable carriage for the gun only (4.7-inch Gun Carriage, Model of 1921 E), seeks to meet all *ideal* requirements excepting that it shall be capable of mounting a 155-mm. howitzer without alteration, thus permitting reduction of weight to correspond with the less powerful weapon it is designed especially to mount.

As the combination carriage, Model of 1920, is motor-drawn, it is spring supported and rubber tired, and a transport wagon is provided to carry either gun or howitzer so that the load may be split for long hauls. This transport vehicle is known as the Medium Transport Wagon, Model of 1920. The carriage is provided with a band brake so arranged that it can be set when firing, or operated from the trail seat when traveling. The carriage is of the split-trail type, permitting a total traverse of 60 degrees, and equalization is obtained by means of an axle pivot. Owing to the high elevation of 65 degrees at which this piece can be operated, it is provided with a quick-return mechanism, the function of which is to return the gun from the firing position to the loading position (horizontal) more promptly than would be possible by using the regular elevating mechanism, thus materially increasing the rate of fire.

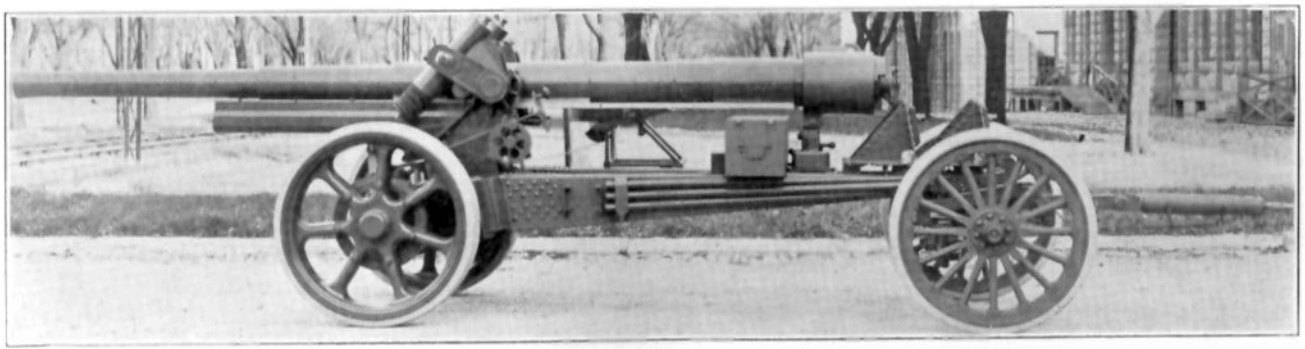
The recoil mechanism is hydropneumatic. The tipping parts are balanced at the trunnions by means of pneumatic equilibrators. The trunnions are fitted with roller bearings. The gun is of high-grade steel built-up and has a screw block. The sight and the traversing and elevating hand-wheels are located upon the left side of the carriage. The quick-return lock and the quick-return crank are located upon the right side of the carriage.

A removable winch of 25 pounds weight is provided with the carriage to pull the piece on and off the carriage and to retract the piece into its traveling lock for short hauls. The limber (Medium Carriage Limber, Model of 1920) is a two-wheeled spring supported platform to receive the trail ends. The detachable spades, the traveling lock, the lighting equipment and tool chests are carried upon the trails.

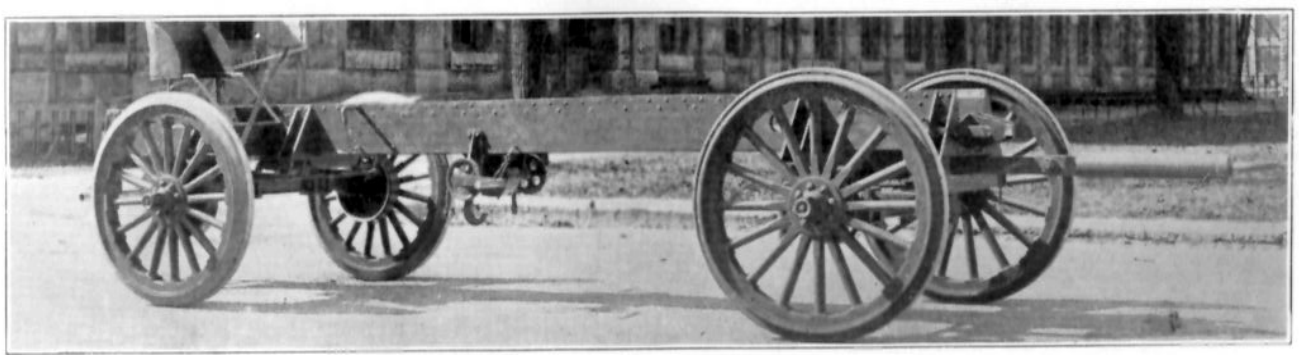
The advantages of the Model of 1920 carriage over the Model of 1906 are increased range and increased field of fire without disturbing the wheels and trail. It fires a 50-pound projectile 20,500 yards as compared with a 45-pound projectile ranging 8860 yards—an increase in range of almost two and one-half times with a heavier projectile. Incidentally, this range exceeds the *ideal* requirements of the Westervelt Board by 2500 yards. The Model of 1920 carriage has a total traverse of 60 degrees without shifting wheels or trail as compared with a total traverse of 8 degrees for the Model of 1906 carriage, covering a field of fire of 70 square miles as compared with a field of fire of one and two-thirds square miles for the earlier carriage and with a heavier projectile. The Model of 1920 carriage has a modern hydropneumatic recuperator in lieu of the hydrospring recuperator of the earlier carriage, which insures stability and so assures greater accuracy of fire. The later carriage being motor-drawn, spring supported and rubber tired is capable of much greater speed than the earlier horse-drawn vehicle.

The Model of 1906 carriage is, however, capable of getting into action quicker than the later carriage as it does not have to be mounted from a transport wagon and jacked to a solid firing position from spring supports. Also, the Model of 1920 carriage requires two tractors, one for the carriage and its limber, and one for the gun and its transport wagon—an elaborate outfit as compared to the Model of 1906 gun carriage and limber drawn by horses.

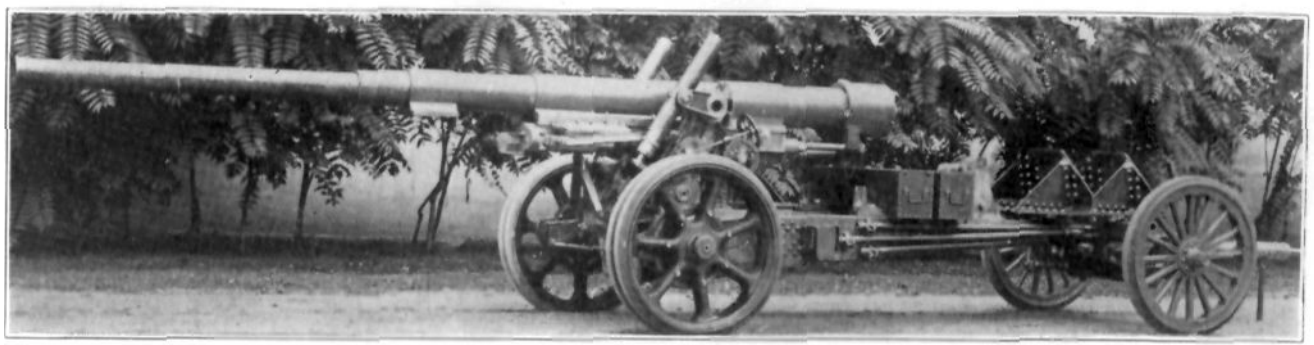
The object of mounting both gun and howitzer upon the one carriage was to facilitate production, but as a transport wagon is necessary to bring the loads within 12,000 pounds, it was found expedient to design the 4.7-inch Gun Carriage, Model 1921. As plunging fire is not a function of a gun carriage, 45 degrees elevation was specified for this carriage, which permitted a gun, carriage and



4.7-IN. GUN CARRIAGE, MODEL OF 1921E. LEFT SIDE TRAVELING POSITION



MEDIUM TRANSPORT WAGON, MODEL 1920
The gun is loaded on this wagon for traveling long distances



4.7-IN. GUN AND 155-MM. HOWITZER CARRIAGE, MODEL 1920
Gun mounted on carriage and limbered for traveling short distances

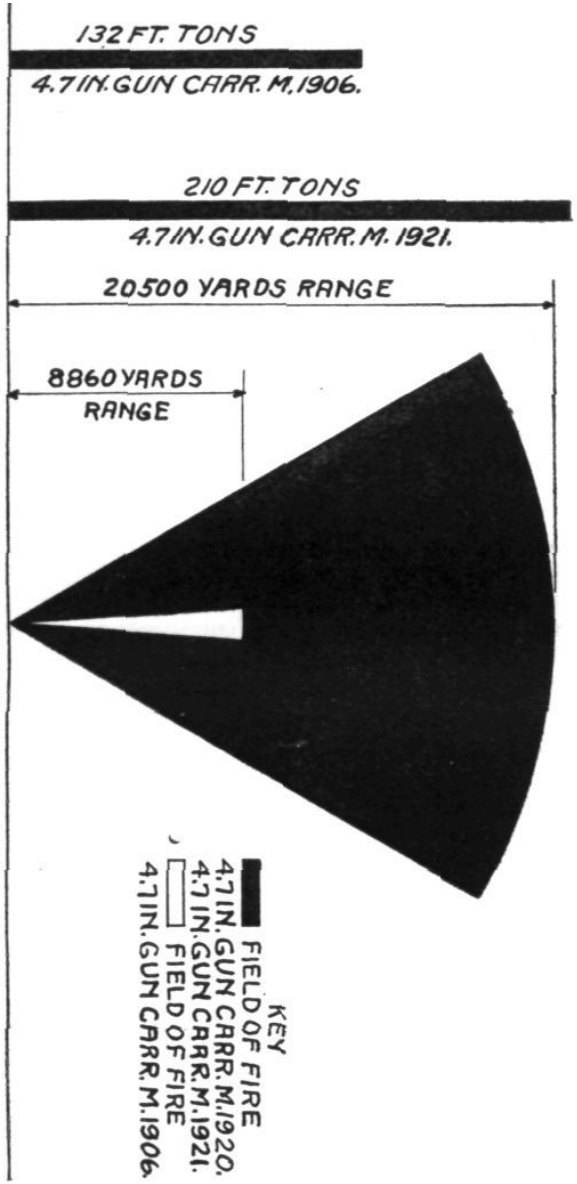


DIAGRAM OF COMPARATIVE FIELDS OF FIRE AND MUZZLE ENERGIES IN FOOT TONS

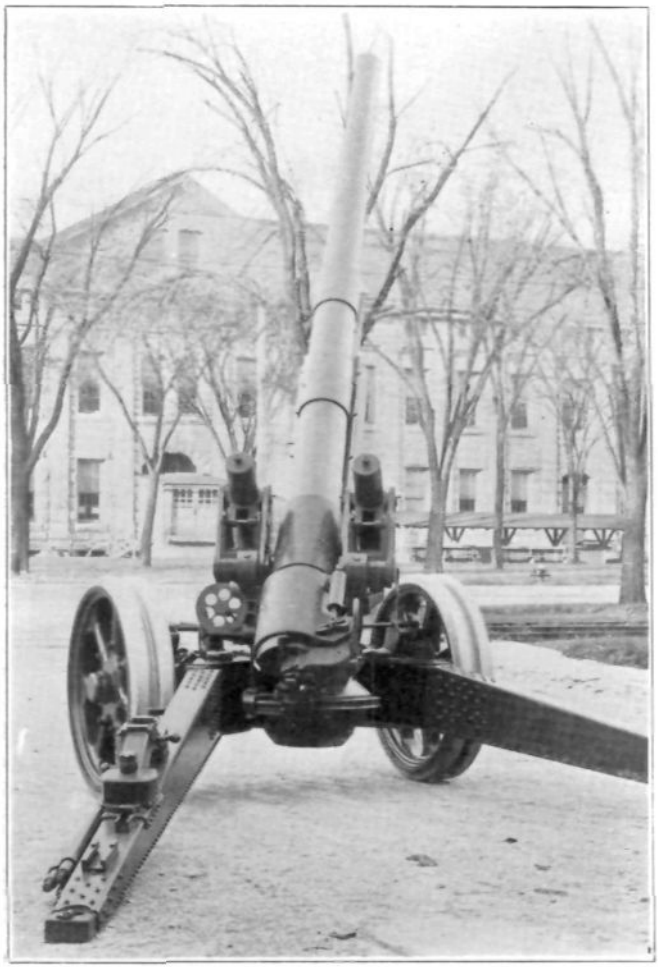
limber to be designed within the weight of 12,000 pounds, thereby obviating the necessity of a transport wagon.

The gun for this carriage is of high-grade steel built-up. It weighs but 3700 pounds as compared with 4200 pounds, the weight

of the gun for the Model 1920 carriage. It is provided with a screw block of the swing type equipped with an equilibrator so that the piece may be loaded at all elevations. The recoil mechanism is hydropneumatic. A rack underneath the gun to mesh with a cranked pinion, supported by bearings on the rear end of the cradle, provides a simple retracting mechanism. A quick-acting connection is provided between the gun lug and the piston rod by means of a sliding key. The tipping parts are balanced at the trunnions by means of pneumatic equilibrators. The sight and the elevating and traversing handwheels are located upon the left side of the carriage. The elevating and traversing parts are entirely supported upon ball and roller bearings, thereby insuring minimum handwheel loads. Improved spring supports on this carriage obviate the necessity of jacking up the carriage when limbering, which should greatly facilitate this manœuvre. The other features of this carriage and its limber are similar to the Model of 1920 carriage and its limber.

The advantages of the Model of 1921 carriage over the Model of 1920 carriage are principally in shortened time to get into action and lessened road-space en route. It can get into action much more quickly owing to the fact that its gun is never withdrawn from its cradle when traveling and only needs to be moved into battery by means of a rack and pinion, whereas, the transport wagon of the Model of 1920 matériel must be aligned with the carriage, the gun slides aligned with the cradle ways by hoisting the trails, and the gun then pulled into battery by means of a winch; also, no jacking of the carriage from spring supports is required, they being so designed as to swing in and out of engagement. The Model of 1921 carriage requires but one tractor and may not require a transport wagon, thereby saving one tractor and a transport wagon as compared with the Model of 1920 matériel. However, the maximum traveling load of the Model of 1921 matériel exclusive of tractor is 12,000 pounds transport wagon not being used. The Model of 1920 matériel exclusive of tractors consists of two traveling loads, one of 10,300 pounds, and one of 7400 pounds, a total traveling load of 17,700 pounds. The load of 12,000 pounds of the Model of 1921 matériel is, of course, not as mobile as the maximum 10,300 pound load of the Model of 1920 matériel.

From the accompanying table it is seen that the relative value of the Model of 1920 carriage using a 45-pound projectile is 1.09 as compared with 1.23 of the Model of 1921 carriage. The difference between these values is due to the fact that no depression was required on the Model of 1921 carriage and that its elevation was reduced from 65 to 45 degrees. The Model of 1920 gun and carriage was designed for a 45-pound projectile, and when later a 50-pound



4.7-IN. GUN CARRIAGE, MODEL OF 1921E
Left rear view, 45 degrees elevation, 30 degrees traverse, firing position

projectile was determined upon, certain sacrifices had to be made as indicated by the values 1.00 and 1.09. In connection with the 1.02 value of the Model 1906 carriage, it must be borne in mind that the carriage has a very moderate traverse and elevation and its real value is considerably less, as indicated by comparative fields of fire.

RELATIVE VALUES

Based on muzzle energy of projectile per pound of gun and carriage.

	4.7 In. Gun Carr. Model 1906	4.7 In. Gun Carr. Model 1920	4.7 In. Gun Carr. Model 1920	4.7 In. Gun Carr. Model 1921
Weight of projectile—lbs.	45	45	50	50
Muzzle velocity—ft.-seconds	2,050	2,700	2,450	2,450
Energy of projectile—ft.-lb.	2,950,000	5,120,000	4,700,000	4,700,000
Weight gun and carriage—lbs.	8,068	13,000	13,000	10,600
Elevation—degrees	—5+15	—5+65	—5+65	0+45
Traverse—degrees	8	60	60	60
Energy projectile per lb.				
Gun and carriage—ft.-lb.	367	393	362	443
Relative value	1.02	1.09	1.00	1.23

As to mobility, both the combination gun-howitzer carriage (4.7-inch Gun and 155-mm. Howitzer Carriage, Model of 1920), and the carriage which is designed especially for mounting the gun and is not intended to mount the howitzer also (4.7-inch Gun Carriage, Model of 1921 E), can be drawn by tractors at speeds sufficiently high to enable them to keep well up with all other tactical elements of an Army Corps. True their weights are considerably greater than the pre-war 4.7-inch Gun Carriage, Model of 1906, but the substitution of the gasoline engine for draft horses has produced not only ample power to move the much heavier weights of the new matériel, but to move these heavier loads at much greater speeds than ever could have been possible even for the lighter pre-war matériel under the animal-drawn transport system. The mobility problem may, then, be considered as satisfactorily solved.

In one respect alone do the post-war guns fall below the *ideal* requirements of the Westervelt Board, namely, in not providing 360 degrees traverse of the gun upon the carriage, or all-around fire. This requirement was not specifically emphasized by the Board, and there is some doubt as to whether the sacrifices that would have to be made in order to obtain it would not adversely affect other requirements concerning which there is no division of opinion as to desirability. All around fire would probably require the adoption of a pedestal mount, which would in turn need a wide, stable platform under-slung from two axles, as has been found necessary in the anti-aircraft types of gun carriages. All ordnance design is a

compromise, or, rather, a series of compromises, and the best that can be said of a given design is that it has utilized the most recent development of science and engineering to yield the most effective weapon within a given limit of weight. Judged from this standpoint, both of the new 4.7-inch guns described in this article are eminently satisfactory. Metallurgy has contributed stronger steel for a given weight—a more powerful weapon per pound of gun. Compressed air in the hydropneumatic recuperator has displaced the heavy spring columns of earlier recoil and counter-recoil systems—a more efficient mechanism per pound of carriage. Researches in aerodynamics point out the best form of ogive, location and profile of rotating band, and degree of boat-tailing—a more effective missile per pound of projectile. Auto-motive engineering has contributed increased tractive power, thus permitting increased maximum weight of the complete unit, and correspondingly increased power over and above that attributable to perfection of design. It only remains to determine whether or not the principle of interchangeability between gun and howitzer is worth adhering to, in the light of some of the advantages already demonstrated for the principle of designing each weapon to fulfill its own particular requirements, and this is a question for the using services to answer after extensive tests under severe field service conditions.

CHARACTERISTICS

	4.7 In. Gun Carr. Model of 1906	4.7 In. Gun Carr. Model of 1920	4.7 In. Gun Carr. Model of 1921
Length of gun in calibres	27.5	47.5	42.
Muzzle velocity, shell, normal f.s.	2,050	1,850	1,850
Muzzle velocity, shell, super f.s.		2,450	2,450
Muzzle velocity, shrapnel	1,700	not determined	
Maximum range at elevations obtainable on carriage—yards	8,860	20,500	20,500
Maximum elevation possible degrees	—5+15	—5+65	0+45
Traverse—total degrees	8	60	60
Weight of shell lbs.	45	50	50
Weight of shrapnel lbs.	60	50	50
Normal length of recoil in.	70	48.21	48
Weight of gun and breech mech. lbs.	2,688	4,200	3,700
Weight of gun, carr. and limber lbs.	9,818	14,500	12,000
Weight of gun and carr. lbs.	8,068	13,000	10,600
Weight of carr. and limber lbs.		10,300	
Weight of gun and transport wagon lbs.		7,400	

IN CONNECTION WITH A FIRING MANUAL. THE DREAM OF THE GENERAL COMMANDING THE ARTILLERY OF THE NTH ARMY

BY E. MUSSEL, LIEUTENANT-COLONEL OF ARTILLERY

TRANSLATED FROM AN ARTICLE APPEARING IN THE REVUE D'ARTILLERIE FOR DECEMBER, 1921, BY CAPTAIN PAUL C. HARPER, 18TH FIELD ARTILLERY

ON the sixteenth of July, 1918, after his evening conference with the general commanding the Nth army, the general commanding the artillery was worried. The attack planned to the east of Villers-Cotterets was fixed for July 18th at 3:45 A.M. In order to get the greatest effect of surprise the artillery preparation had been suppressed. Also the preliminary tell-tale registration had been done away with.

This putting aside of the established methods disturbed the general commanding the artillery. At dinner he was irritable. In the night his sleep was troubled by bad dreams; at times his heavy concentrations would fall in unoccupied places and his heart was torn at the thought of the precious 155 O.A. shells thus wasted; at times barrages would fall short and mow down whole waves of horizon blue infantry, and, though he was sorry for the victims he suffered also in his pride as an artilleryman. * * *

Suddenly there was a call on the telephone.

"Hello, hello, this is the school of fire at Pontoise. General, we are sending you on a rush order the lot of artillerymen you requested. They are the best we have. They will be there in five minutes."

A knock at the door. "Come in."

The artillerymen file in. Nothing in their pockets, nothing in their hands; a few have field glasses slung over their shoulders.

"Ah! Here are my artillerymen! You know what is in the wind. I hope that you have been taught everything necessary at the school of fire. Let's see, you, the tall blonde officer. You are from the 75s. Your rolling barrage should be ready at H hour without observed adjustment."

"Oh, General, without adjustment? That is impossible! I expected to go to the observatory in the Reaumont tower, and, with a few rounds obtain——"

"Not at all! Your adjustment would warn the Boche. Without adjustment I tell you. And you, the 105s?"

"General, I assume that I will be ordered to fire a good ways beyond the infantry. With the compass I am sure of my direction. Then from the Reaumont tower I can see my bursts perfectly."

"Oh, you think so! Very well, you shall see nothing at all, nor will there be any airplanes. After one minute there would be so much smoke that you could no longer recognize your bursts. As for the compass, this is what I experienced at Verdun. There was so much old iron in the vicinity of a battalion of 120s that their compasses were affected and they were shooting 60 mils too far to the right. When one of our rare airplanes was able to observe the fire, 4000 shells had already been sent some 500 metres off the target. Look out that the same thing does not happen to you. As for adjustment, there will be none."

"And you, the G.P.F.s? You people are usually pretty well oriented. You are doubtless going to get your direction by astronomical laying?"

"Oh, General, one of our instructors told us that we would need watches that keep time to the very second. On account of the bumping of the automobile we cannot use those methods."

"Well, I once had a battalion of 83s in which we told time by the stars and also it is a clear night. Well now, how are you going to proceed?"

"General, we have been taught methods much less complicated, very simple methods within reach of everybody. Also we believe in direct observation and, from the Reaumont tower, we are going to adjust——"

"Adjust! The Reaumont tower! Very well, not one of you is going to the Reaumont tower. You are not artillerymen because you ignore the fundamental principles of surprise attack. Simplicity, simplicity! That is all they talk about. I like simple things myself, but since when can you take the first cow-herd that comes along and make him a captain of artillery?" * * *

The telephone rings. "Hello, hello General, this is the school of fire at Provins. There has been a mistake. It is we who should have furnished you that lot of artillerymen. Those which you received should have gone to the XIXth Army. We are sending yours by airplane. You will have them in three minutes."

There is a knock at the door. "Come in."

The artillerymen enter. Some carry large boxes from which they draw theodolites of the latest model with eight verniers. Others hold under their right arms tables of logarithms to seven decimals, under the left arm two nautical almanacs, one for reserve. Others have hung around their necks by universal joints barometers, thermometers, psychrometres, elasticimetres, while the noncommissioned

officers are pushing Pagezy mechanical calculaters mounted on wheels, etc.

"General," they said with the greatest assurance, "we are informed as to your intentions. Our pieces have been laid in the rear, our powder and shells are perfectly arranged in lots, we know all our dVo's. As you know, we use nothing but astronomical laying. We leave the observatories entirely alone, except to admire the scenery. Surprise attacks without adjustment are our specialty. Complete ballistic preparation, triangulation, astronomical laying; these are the fundamental methods that we have been taught, doing away with the old regulations.

"In that case you will not need to adjust."

"Oh, General, nobody adjusts any more: they prepare."

* * * * * * *

This was the lot of artillerymen who had the great honor of operating on the glorious day. From the height of the Reaumont tower, an elevated point from which the eye takes in the wide horizon of the old Soissons sector, the general commanding the artillery admired the perfection of the rolling barrage, the accuracy and precision of the interdiction fire, the power of the concentrations crushing the enemy artillery by reason of their suddenness at once capricious and calculated. Everything went well, everything went very well; then, at nine o'clock the general was surprised by several telephone calls; the infantry was stopped in front of Chaudun by German machine guns and batteries set up with impunity in the open. The French artillery, except for a few big guns, had ceased firing. Soon he heard on the telephone a chorus of angry abuse: What is the artillery doing?

Much disturbed, the general commanding the artillery called for his car and went at top speed to the farm of Cravencon to the commander of a battery which had gone forward at five o'clock.

"For God's sake, why don't you fire?"

"General, the one over 50,000 map is not very accurate and I have not quite finished calculating the coördinates of my directing piece. I have only gotten the "x." As for the traverse from the geodetic point, the battalion orienting officer had to do it all over again. He is not sure of his fourth decimal. We are also waiting for the ballistic wind."

"But you can see the Boche with the naked eye! Haven't you been taught fire by direct laying, adjustment by simple observation, correcting your direction after the first salvo? These are still the fundamental methods and at the Marne your superiors knew no others. Fire! For God's sake fire! I needed artillerymen and they sent me astronomers!"

* * * * * * *

Sequel

Instructions of the general commanding the artillery of the Nth army in view of the impending attack.

Headquarters, July 17, 1918.

*An artillery officer to function properly should be able to adapt himself rapidly to the changing circumstances of war, whether it is stabilized or a war of movement. Through his thorough knowledge of the new methods as well as of the old regulations, using his judgment, he should always be able to * * **

The rest has never reached us.

CURRENT FIELD ARTILLERY NOTES

New Ballistic Tables

THE Ordnance Department proposes to publish in the near future a set of ballistic tables which has been in course of construction the past three years. The amount of study which has been devoted to the subject of ballistics by the Ordnance Department during and since the War is perhaps not generally recognized. The use, during the war, of high velocity guns at angles of elevation up to 85 degrees made inadequate the old ballistic methods which were applicable only to elevation not exceeding about 20 degrees. This was especially so in the case of anti-aircraft guns where a knowledge was necessary not only of the range on the level of the ground but especially of the range to the point of burst. The ballistic tables when completed will fill a number of volumes aggregating about three thousand pages. They are based upon the latest information as to the law of air resistance and density of the air aloft.

It was found necessary during the War to have much more complete information than given by range tables for artillery that had been furnished in our service previous to the War. The modern range table must contain the answer to practically any question that can be asked concerning the artillery material to which it is applicable. Range tables in this form are being gradually prepared by the Ordnance Department for the service material. Where necessary, range firings are being conducted at the Aberdeen Proving Ground to obtain additional data. In all cases the tables are being prepared according to the latest ballistic methods.

Test of Short-Base Range-Finders

The results obtained from the recent test of short-base range-finders emphasize the need of further research work upon these instruments. Accordingly an extensive program for the study of range-finders at Frankford Arsenal has been inaugurated and special testing instruments are now being built at the Frankford Arsenal for this purpose.

However, the result of most immediate application shown by the test is the striking difference in the ability of different range-finder observers and the splendid improvement which can be obtained by special training of the personnel. Seventeen observers were employed, all of whom were enlisted men. Ten of the men were given a week's special training in using the range-finder before the test was begun and the poorest of the ten was better than the best of the

seven without the special training. This result is the more remarkable when it is added that the ten men who had the special training were new recruits in the army, and had had no previous experience with range-finders, whereas the other seven had considerable experience in the use of range-finders during their service in the army, and several of them were noncommissioned officers. The difference between the ability of the various observers was much wider than that between the best and poorest instrument. In fact, this difference was so great that the poorest observer would require a two-metre base instrument in order to equal the performance of the best with a one-metre base range-finder.

New 105-mm. Howitzer Carriage

Rock Island Arsenal has recently completed a new type of 105-mm. howitzer carriage, which has been shipped to the Aberdeen Proving Ground where it will be put under test soon. The 75-mm. gun is commonly recognized as the backbone of the artillery, but the experience of the World War emphasizes the fact that this gun must be supplemented by a howitzer of equal mobility. The Germans used large numbers of 105-mm. howitzers, and this calibre has been taken as most suitable for pairing with the 75-mm. gun. The Ordnance Department has also put under test at the Proving Ground a howitzer of this size on a carriage of the split-trail type, and one mounted on a vehicle of the caterpillar type. The carriage just completed is of the so-called box trail construction which does not permit a wide traverse, but this limitation is offset by a decrease in weight and increased simplicity of construction. The howitzers being tested are more powerful than those used during the World War.

Artillery Ammunition

During the past year the Artillery Ammunition Department at Frankford Arsenal has been particularly active in the manufacture of Demolition Bombs and Bomb Fuzes for the Army Aircraft Service. The Department modified bombs of the 100-pound, 300-pound, and 600-pound types, and also manufactured all fuzes and adapter boosters required for the same. The initial lot of 2000-pound Demolition Bombs which were used in extensive tests conducted off Chesapeake Bay, and which were remarkably successful against captured enemy vessels, were manufactured at this Arsenal. The latest achievement in Demolition Bomb work is the 4000-pound type, which was also manufactured here. The recent tests conducted at Aberdeen Proving Ground also proved this type to be a perfect success in so far as the proper functioning of all mechanism and explosive action is concerned. Further tests are contemplated against vessels at sea. There

are also being manufactured in the Artillery Department various experimental types of shells and proof slugs from 1.8-inch to 8-inch calibre. Among these shell are various innovations that are being tried for their greater efficiency and less cost over the standard or recognized types of shell previously used. Several types of Point Detonating Fuzes new to the service are also being manufactured for use in the above-mentioned shell. Preparations are being made for the manufacture of a large quantity of base detonating fuzes for use in seacoast ammunition.

Experimental Fuzes.—The following development work has been undertaken by the Artillery Experimental Department:

A major calibre armor-piercing base-detonating fuze for major calibre projection. This fuze has proven entirely satisfactory in extensive firing tests which have been conducted with it. This fuze is "bore-safe" and has been accepted by the department for use in all major calibre armor-piercing seacoast projectiles.

A superquick and automatic selective mechanical delay point-detonating fuze for all calibres from 75-mm. to 12-inch inclusive. This fuze is so designed that it will explode the projectile just after it emerges from its resistance, regardless of what the thickness of the resistance may be, but if the projectile cannot penetrate the resistance which it hits, as will be the case when fired directly into the side of a hill, the fuze will explode the projectile when it is finally stopped. In addition to this selective action the fuze can be made superquick at the option of the gunner. This fuze is also entirely "bore-safe."

A superquick point-detonating fuze for all calibres from 75-mm. to 12-inch inclusive. This fuze is "bore-safe" and will give extremely quick action as the projectile will be in front of its resistance when detonated.

A superquick and non-delay point-detonating fuze. This fuze is "bore-safe" and will give either superquick or what is known as non-delay action at the will of the gunner. By non-delay action is meant a very slight delay sufficient to permit the projectile to just get through a four-inch wood plank before it detonates.

A superquick and short delay or superquick and long delay point-detonating fuze. This fuze can be assembled with either a short delay or long delay. The gunner can obtain either a superquick and short delay action or superquick and long delay action depending upon how the fuze is loaded. This fuze is for use for mining action at long range and for richochet action at short range against personnel.

A non-delay action base-detonating fuze for 2.24-inch armorpiercing projectile has been developed and is practically perfected.

This fuze is "bore-safe" and gives just sufficient delay to enable the projectile to pass through light armor.

A time detonating fuze for anti-aircraft artillery has been developing and is practically perfected. This fuze is "bore-safe" and is designed to give superquick detonation upon impact or time detonation in flight.

A detonating element for use with mechanical time fuzes. In combination with the mechanical or powder time fuze, this element makes it possible to obtain either a non-delay action upon impact or time detonation in flight. This element is "bore-safe."

A supersensitive superquick point-detonating fuze for 37-mm. high-explosive ammunition. This fuze is bore-safe and is extremely sensitive. It will explode the shell upon impact with aeroplane linen. It will be used against aeroplanes, balloons and dirigibles.

During the past year considerable development work on 37-mm., 1.8-inch and 2.24-inch armor-piercing projectile has been carried out. Satisfactory results have been obtained with all three calibres. A satisfactory 37-mm. canister has also been perfected.

EDITORIAL

Field Artillery Journal Prize Essay Competition, 1922

By January 31, 1922, the following essays had been received:

Training Field Artillery Reserve Officers.

The Development and Employment of Weapons in the Late War and the Effect Upon the Employment of the Artillery in the Attack.

Handling a Battery—Field Artillery.

Artillery Ammunition Supply.

New Methods in Exterior Ballistics.

Fire Control of Long-range Mobile Artillery.

Impressions of a Corps Munition Officer.

Some Notes on Liaison.

Accompanying Artillery.

Field Artillery in Coast Defense.

Some Aspects of American Field Artillery.

The Effect of Unobserved Shots Upon the Accuracy of an Adjustment.

Target Practice of a Light Artillery Regiment of a Division.

The Accompanying Gun as a Practical Weapon.

Lateral Observation.

The number of papers received is encouraging, being an increase of fifty percentum over that of the preceding year.

The Committee of Award, nominated by the Chief of Field Artillery, is now engaged in its work of marking the papers and a notice of its award will appear in our next issue.

BOOK NOTICES

WITH THE RUSSIAN ARMY, 1914–1917. Being Chiefly Extracts from the Diary of a Military Attaché. By Major-General Sir Alfred Knox, K.C.B., C.M.G. Two vols. With 58 illustrations, chiefly from photographs taken by the Author, and 19 maps.

The first book to deal in detail with the War on the Eastern Front, the most interesting of all its theatres to the student of military science.

The author enjoyed greater opportunities for observation of the Russian Army than any foreign observer—previous to the War as Military Attaché at Petrograd, and during the War and Revolution at the front for three and a half years. Starting from the Headquarters of the Grand Duke Nicholas, the author visited the Third Army before the invasion of Galacia, and the Second Army during the battle of Tannenberg. He then accompanied a cavalry division to Southwest Poland, and retired with it before Hindenburg's first attack on Warsaw. In the following months he was with the Guard Corps at the battle of Ivangorod, and in the subsequent Russian offensive towards Cracow. The operation of Lodz is described, as well as the disaster to the Russian Tenth Army in February, 1915, and the operations on the Narev in the winter of that year.

In the great Russian retreat from Poland in 1915, the author saw service with the Guard Corps and the Staff of the First Army. He describes the German cavalry raid on Sventsyani and the adventures of the Russian Delegation sent to England and France to obtain munitions.

The fighting in 1916 is covered in full, with many hitherto unpublished details of Brusiloff's offensive. The author describes the political unrest preceding the Revolution and gives an eyewitness's account of the Revolution of March 12, 1917. The decline of the Russian Army follows, culminating in the Bolshevik *coup d'etat* of November 7th.

Published by E. P. Dutton and Company, 681 Fifth Ave., New York.

THE MARINES HAVE ADVANCED. By Lieutenant-Colonel Giles Bishop, Jr., U. S. Marine Corps, Author of The Marines Have Landed. The Penn Publishing Co., Philadelphia, Pa., 1922.

THE QUARTERMASTER CORPS IN THE YEAR 1917 IN THE WORLD WAR. By Henry G. Sharpe, Major-General, U. S. Army, formerly Quartermaster-General. The Century Co., New York, 1921.