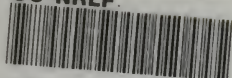


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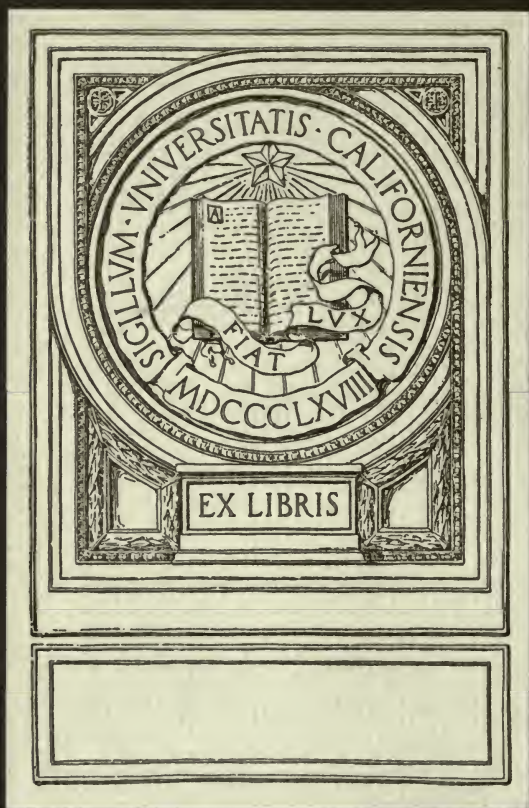
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GERMAN NOTES ON MINOR TACTICS

1918

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TO THE
ADJUTANT GENERAL

WAR DEPARTMENT.

Document No. 713.

Office of The Adjutant General.

WAR DEPARTMENT,
WASHINGTON, *December 10, 1917.*

The following pamphlet, entitled "German Notes on Minor Tactics," is published for the information of all concerned.

[062.1, A. G. O.]

BY ORDER OF THE SECRETARY OF WAR:

JOHN BIDDLE,
Major General, Acting Chief of Staff.

OFFICIAL:

H. P. McCAIN,
The Adjutant General.



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GERMAN NOTES ON MINOR TACTICS.

BARRAGE FIRE AGAINST AIRPLANES.

The appended translation of an order, dated February 7, 1917, found at the front of the army shows that the Germans then considered special antiaircraft pieces insufficient for combat against enemy airplanes in case of important operations, and had considered using barrage batteries for repulsing low-flying infantry airplanes.

This order prescribed the initial training for "aerial barrage." The result of the experiment is unknown.

[Ypres Army Group. Artillery 263/17.]

ARMY CORPS HEADQUARTERS,

February 7, 1917.

ORDER FOR THE ARMY GROUP.

It is not impossible that during the next offensive the enemy will attack our infantry in their trenches with so large a number of aircraft that it will be necessary to combat them not only with the special antiaircraft batteries but also with a part of the barrage batteries.

In general, buried or casemated batteries will be used against enemy airplanes flying above their respective barrage areas. In short, momentarily they will have to project aerial barrages.

Fire against airplanes should be conducted in the simplest possible fashion. The distance separating the battery from the most advanced trench should be taken as range, always supposing the direction of flight to be perpendicular to the direction of the barrage fire. Direct laying should be used when possible. If not, the laying-in direction should be that of the barrage fire and should sweep the zone of the barrage fire.

Laying-in elevation should be made by means of the gun level or an ordinary level.

The range table appended¹ has been established for field pieces for an average altitude of 1,000 meters.

The enemy airplanes can not fly at very high altitudes, as the effect of their machine guns would then be too reduced.

If the airplane flies lower than 1,000 meters, the combined use of this range table and direct laying would result in placing the point of burst at too great a distance—that is, beyond our first-line trenches.

The second column on the table gives the deflection to be employed, assuming that the speed of the airplane is 35 meters per second.

Trials will be made by each division with a battery of light howitzers and a battery of field guns to find out if barrage fire at an altitude of 600 meters, 800 and 1,000 meters necessitates any change in the construction of gun emplacements.

For these experiments the firing will be directed at least 100 meters beyond our most-advanced trenches; and the first rounds still further, to prevent accidents.

The range table gives a sufficient approximation.

The fire will be conducted by locating sections. They will indicate to the batteries the elements for the adjustment of the height of burst and will be charged with placing the point of burst at the proper height.

The result of the experiments will be reported, and the locating sections will add their own observations. The most practicable methods will be proposed. Batteries will indicate particularly whether barrage is to be made simultaneously at two different heights (600 and 800 meters, for example) or at a single average height.

The locating sections will next make out range tables, placing the point of burst above our first-line trench.

VON THAER,

Lieutenant Colonel, Chief of Staff.

¹ This document missing.

NOTE FOR THE ARTILLERY OF THE REGION OF YPRES.

In order to assure, in case of relief, continuity in the methods of combat and of construction of positions, the following regulations shall be strictly observed :

I. ACTIVITY OF FIRE.

(a) The principal objective is the destruction of the enemy batteries. Insufficient expenditure of ammunition is equivalent to waste. From 400 to 500 rounds are necessary. In general, the number of rounds of 15 cm. fired should not exceed one-half the total number of rounds, as the supply of 15-cm. shells is at present limited. The balance shall be field artillery fire. To destroy especially important batteries, the above figure may be exceeded.

Never lose a single opportunity of counter battering the enemy artillery ; call on the drachens, the aviation service, the locating sections. The latter use here a very sure procedure. Batteries located at night should immediately be counter battered, with the aid of the locating sections, by batteries equipped with anti-flash bags or by other batteries firing from especially chosen emplacements. Fire for effect can immediately follow the fire for adjustment even if observation has become impossible.

When the fire for demolition has ended, execute on several successive days, at irregular intervals, short harassing fires with single time-fuse shells to hit the detachments clearing up the débris.

(b) Bracket as many battery emplacements as possible in order to have the data for fire with gas shells or to be prepared if necessary to execute surprise concentrations of fire.

(c) Fire on trenches only in case of absolute necessity, and then deliver only observed fire (except in case of fire for annihilation). Avoid incessant regulation of barrage and registration fire. Do not fire on trenches without endeavoring to destroy

trench mortars, machine guns, or shelters. The first trench generally is not occupied. In this region, shelters for personnel or for kitchens are generally in the trenches farther to the rear (most often far to the rear). If fire on the trenches is necessary, it is on these constantly occupied parts that it should principally be directed. It is advisable to prepare occasional "mass fire," i. e., concentrated fire by several batteries on especially important targets. Launch this fire by a short order, such as "Mass fire for three minutes on point 723."

(d) Before or after adjustment of fire by airplane, balloon, or locating section, it is generally advisable to choose a clearly visible auxiliary target and adjust in range and, if possible, also in height of burst (for example, when there is a steeple or a chimney available); by means of this auxiliary target it will be possible at any time to determine the corrections of the day and make corresponding changes in the data for fire on the target itself. Auxiliary targets situated very close to the target are the best. This applies also to barrage fires.

(e) When our airplanes are in the air, they should always dispose of one or two batteries, in order that they may be able immediately to have fire delivered on important targets, such as trains or assemblies of troops.

(f) For barrage fire, use the reduced charge as far as possible, in order to save wear on the tubes.

Batteries of heavy guns and mortars should not take part in barrage except by order of the general commanding the group or in cases of absolute necessity. Regulate barrage fire with all the guns and not merely with the directing gun. For barrage fire make the adjustments in range for each piece. For fire on trenches and for control of barrage fire, always come to an understanding with the infantry officers interested.

(g) In case of enemy aerial activity, a careful decision must be made in each instance under the actual circumstances whether it is not more profitable to avoid disclosing the emplacement of the gun than to execute the fire under contemplation.

(h) When enemy fire for adjustment on one of our batteries has been observed, the battery should as far as possible before the fire for effect, which often is not delivered until a day later, avoid danger by removing to an alternative emplacement.

II. EMPLACEMENTS.

(a) Echelon the artillery in depth, arrange the battery emplacements checkerwise, in order that if the enemy penetrates

the lines, all batteries shall not be put out of action at the same time.

In order to have a reserve ready in case of enemy penetration to support the counter attack immediately, it is advisable to establish from the first, for each divisional sector, one or two batteries about 5,000 meters back of the first lines.

For these reserve batteries it is often advantageous to have elevated emplacements (to secure the advantage of direct fire on enemy elements which may have penetrated our lines, on tanks, etc.); build strongly of concrete; do not fire the guns often.

(b) The thickness of reinforced and compressed concrete should whenever possible be as much as 1.50 meters. Only concrete which has been prepared according to rule withstands bombardment. Concrete blocks will not do this. Organize the principal emplacement strongly. At the same time construct at the alternative emplacement very strong isolated shelters for the men and also some ammunition shelters. For protection against direct hits penetrating under the shelter, it is necessary to give it a strong concrete floor. Also organize strong observation posts, first establishing isolated posts with very wide fields, then complete the system according to needs. It is the province of the artillery commander to regulate the order of urgency of these works. Observation posts are equally necessary in the zone of the rear, and one should therefore be organized near each battery to provide for the case of the enemy penetrating the lines. An observation post should also be prepared for each group commander. As far as possible, the field of fire of these pieces should be 120°.

(c) At a distance of from 100 to 400 meters from each battery, establish a firing emplacement for a section or piece. The latter should be of strong concrete and well masked; it will serve to satisfy the daily requirements for fire in order to conceal the principal position from enemy aerial observation. It is often advantageous to use for this purpose the best gun emplacements of abandoned battery positions.

Construct isolated shelters, principally ammunition shelters, at the sides of the battery and outside it.

(d) *Simulated emplacements.*—In general it is necessary by all possible means to throw the enemy on false scents. Mobile sections must constantly fire, especially at night, with frequent changes of position. Simulated emplacements must be given, even in the most minute details, the appearance of occupied

emplacements. Fires will be lighted to produce smoke; trails and Decauville roads will be built, actual fire delivered from the emplacement, etc.

In all simulated emplacements particular care must be given to imitating the stain on the ground produced under the muzzle of a gun by the flame and blast of its discharge. This is the detail which makes it possible to recognize a well-masked battery on photographs. The absence of this stain reveals that the battery is not occupied.

To deceive the enemy some pieces should be made to continue fire from emplacements which have been abandoned by reason of the enemy fire. Flashes of discharge can be imitated by the electric process and at the same instant fire can be delivered by a battery equipped with antflash devices. This is an excellent means of deceiving the enemy.

(e) Too little attention is generally paid to protection against view from aircraft. Our camouflage must constantly be improved by study of our own aerial photographs. There is a very special advantage in camouflaging our positions to conceal them from aerial photography. All sharp edges, clearly outlined shadows, regular lines and figures must be avoided. Prolong roads, Decauville lines and trails up to false batteries or harrow up the trails every day. Conceal the stain under the muzzle by a camouflaged trellis or similar device.

(f) As far as possible all real fire should be masked by that of a false battery or by exploding flash devices.

(g) Be prudent in the use of smoke, lighting several smoke boxes simultaneously on a wide front not too close to the batteries, the distance varying between 100 and 200 meters, according to the wind, in order not to reveal the battery. Isolated use of smoke boxes at different points of the ground gives a perfect imitation of explosions and of battery emplacements. This process can be used to advantage in many cases.

(h) The declination here is $13^{\circ} 15'$, which is equivalent to the reading of 212 for the fortress artillery and 235 for the field artillery.

(i) If the battery emplacements have no cemented shelters for the ammunition, the following arrangement for depots will be exclusively used: Arrange the ammunition on planks in small heaps surrounded by small dikes of earth and protected against rain by a light roof, preferably of corrugated iron. Leave sufficient intervals between the heaps.

(Signed)

KUHNE.

The above instruction suggests the following remarks:

1. PROCESS OF FIRE.

The first point to note is the instructions in regard to the number of rounds to fire for the demolition of a battery position. This number is given as 500, but with the recommendation that not more than one-half of the fire be with 15-cm. shells, the other half being with smaller caliber shells. It is evident that the effectiveness of the fire will be considerably reduced by this practice. It is interesting to note that the reason for it is need for economy.

Immediate fire for demolition on batteries located at night is highly recommended, and in this connection allusion is made to the very sure processes used for adjustment of fire by the locating sections. This tendency of the enemy to adjust fire by night by means of the locating sections is interesting to note.

It is also to be noted that when the German airplanes are in the air they should always dispose of one or two batteries in order to be able to fire immediately on important targets, such as trains, columns, etc.

2. BATTERY POSITION.

(a) In practice it was not found in the course of the attacks of July 31 and August 16 that the enemy disclosed any distant batteries constructed on the principle here contemplated, 5,000 meters behind the lines for barrage fire.

In general, no unknown batteries were noted during the development of the attacks, except about August 16 in the region to the east of Houthulst Forest, where the photographs had not revealed battery positions organized in advance and where the pieces concerned were no doubt long-range pieces which had been obliged to retire to the rear.

(b) *Construction.*—Concrete, the use of which was recommended in the note, was largely used in accordance with the principles prescribed, and the recent test well demonstrates that "concrete prepared according to rule withstands bombardment." Batteries 47-80 and 47-83 (Bois de la Ferme) may be cited. The first apparently corresponded to four unsheltered or weakly casemated pieces, the emplacements of which, now completely overturned, were separated by concrete shelters; the second was constructed for two pieces, the emplacements for which were

prepared in a cast concrete work, which now appears as a single concrete block about 15 meters long.

Against the first fire of 250 rounds of 220-mm. shells was delivered on three different occasions; against the second, one fire of 300 rounds of 220-mm. shells was delivered. Now, of the six cement shelters of 47-80, only one was slightly broken into, while the block of 47-83 remains almost intact. (The positions had, nevertheless, become untenable for the artillery.) Experience has also shown that constructions of concrete in slabs or blocks prepared in advance and separated do not withstand fire for demolition delivered by heavy artillery.

(c) The precaution taken of installing at from 100 to 400 meters from each battery a firing emplacement for a section or a piece has not prevented the battery emplacements from being demolished or rendered useless by our fire, as our artillery took for targets all concrete shelters which had been located on photographs and shown on maps.

In conformity with the above instructions the ammunition shelters had been installed at the sides of the batteries and outside them.

(d) The precautions suggested for false batteries are very judicious. It seems impossible, however, to take such precautions except in a quiet sector and the enemy seems not, in fact, to have had either leisure or means for them since July 1. He has, however, on several occasions endeavored to make us believe that he was continuing to occupy a position, either by simulating activity of a piece on the day following a fire for demolition, or by actually keeping a piece there when the ground was so torn up that the piece could not be removed.

(e) The precautions for camouflage can be taken only during a period of inactivity. In fact, the enemy has done little in the way of such precautions during the course of the operations. He did, indeed, try to conceal trails by harrowing, but the work was not cleverly done.

(g) The enemy used smoke at the commencement of our offensive, but abandoned the practice rather early.

In a general way our counter-battery work was not seriously embarrassed by it.

MEANS OF LIAISON ON THE SOMME FRONT AND THEIR UTILIZATION FOR ARTILLERY.

I. ARTILLERY LIAISONS.

1. Regardless of the number of liaisons installed by the infantry with the rear, the artillery must, as a matter of principle, itself organize the liaisons which it needs in order to receive the reports of its liaison officers and first-line observation officers and in order to direct its fire.

2. The means of liaison of which the artillery can dispose are:

(a) *The telephone*.—See "Composition of telephone material equipment" (supplement to the Ministerial Circular of Sept. 17, 1915).

(b) *Signal material*.—Allotment (see Ministerial Circular of Oct. 9, 1916).

Brigade staff: Two medium signal lamps, model 16.

Regimental staff: Four medium signal lamps.

Battalion staff: Four medium signal lamps and six small signal lamps, model 16.

(c) *Signal pistols*.—Allotment (see order of the Fifty-sixth Division, dated Oct. 28, 1916).

Battalion staff: Two pistols.

Battery: Three pistols.

(d) *Signalwerfer*.¹—Allotment (see order of the Fifty-sixth Division, dated Nov. 30, 1916).

Regimental and battalion staff: One apiece.

Each battery: Two.

(e) *Runners—Couriers*.—Relays for runners and couriers.

3. Before these various means of liaison are used the ground must be very thoroughly reconnoitered by officers. On the basis of these reconnaissances the staffs will prepare the plan for their liaison network.

¹ Note by French translator of the German document: "The Signalwerfer is an apparatus for throwing illuminating signals (signal bombs) more powerful than those used with signal pistols and thrown to a greater height."

4. Rules for the reconnaissance of the ground preparatory to organizing liaison:

(a) *Telephonic liaison along the line of relays.*—Install intermediate telephone stations; use the relay posts of runners not only for the transmission of messages but also as crews for hunting telephone-line trouble.

(b) *Place the visual signal stations* near the telephone stations and the lines of relays; if they are not so placed, provide the visual signal stations with liaison by means of telephone and runners.

(c) Utilize the natural shelters of the ground; avoid dwellings and exposed sites.

5. Inspect from this point of view all liaisons already installed and improve them where possible.

6. *Make a sketch showing the whole liaison network*; reproduce this sketch in numerous copies; distribute copies to all batteries directly interested in knowing the network, to adjoining battalions of artillery, to the infantry of the same unit, to the various liaison organs (observation and liaison officers and the personnel assisting them, runners, couriers, visual signal posts); report the installation of the liaison network to the superior authorities.

7. Practice transmitting messages along a liaison line of a certain length, only part of which has a telephone line, using visual signals and relay posts.

8. Perfect operation of any liaison service is possible only when it is permanently supervised by energetic officers or non-commissioned officers.

II. LIAISON OF THE OTHER ARMS.

1. Staffs are under obligation to make sure, as soon as they are in line, that all liaisons taken over from the force they relieve are *in working order*; they will constantly test them to see if the liaison still exists. Distribution will be made to all batteries and all interested organs of sketches of the liaisons available for their service.

2. The means of liaison at the disposal of the infantry are—

(a) The telephone.

(b) The visual-signal material.

(c) The signal pistols and signalwerfer.

(d) The Ahrend posts for earth-conduction telegraphy.

(e) Liaison by signal lamps with infantry airplanes; then liaison between infantry airplanes and wireless stations of divisions, artillery commanders and infantry sector commanders. Each staff, each battery, must know the emplacement of the nearest wireless and must get in communication with it immediately; this communication will be maintained as permanently as possible and will exist when all other means of liaison toward the front fail.

These wireless stations will also intercept all radiograms transmitted by the wireless stations of the advanced lines and will thus continue to receive messages even when there are no infantry airplanes in the air.

(f) The relay posts.

(g) Report centralization posts; officers will be detailed to these posts to exploit immediately all messages of value to the artillery.

(h) Carrier pigeons and courier dogs.

3. When the artillery wishes to utilize a liaison line, it will connect itself with this line by telephone or will detail liaison agents to it.

4. Each observation and liaison officer must know and be able to utilize all the means of liaison which are available for him. He will inform the authority which sent him of the means of liaison at his disposal, in order that they may establish communication with his receiving station.

(Signed)

VON HORN.

INFORMATION DRAWN FROM THE USE OF THE LIGHT MACHINE GUN, MODEL 1908-15, IN THE SIXTH ARMY.

[Extract.]

The 1908-15 machine gun is capable of giving very good results in the hands of men who have perfect knowledge of the arm and its handling, commanded by officers who have a very exact understanding of the conditions under which it should be used in battle.

As the 1908-15 machine guns were distributed to the troops rather tardily, sufficient use has heretofore not been made of this weapon, for the men have not received the thorough technical instruction which is absolutely necessary for the use of the guns.

It is extremely urgent that the infantry regiments of the divisions which have been withdrawn from the front be provided with 1908-15 machine guns for instruction purposes. It is also advisable that not only the gunner but the other two men serving the 1908-15 machine gun should be armed with carbines in order that these three men should not be completely lost for combat in case the machine gun should not work.

I. TACTICAL EMPLOYMENT.

Use in the trench.—The 1908-15 machine gun should always be used near the platoon commander, who assigns the machine gunners the post which they must occupy. The battalion commander should keep a reserve of these guns near him for possible counter attacks. The troops should not forget that the use of the 1908-15 machine gun should be entirely independent of that of the 1908 machine gun of the machine-gun companies. It is on this principle that the emplacements of the 1908-15 machine guns must be determined.

They should be posted in the first line, in shell craters, or in other available places which have been reconnoitered in advance. It is not necessary to arrange them in platoons, but very special importance should be attached to flanking fire, which should

be practiced in such a way that two machine guns posted at different points can both sweep the same ground. This model of machine gun should not fire over the heads of infantry and therefore should be installed between the first and second line only in very exceptional cases. Their emplacement should be changed frequently in order to deceive the enemy about their position and to keep them as long as possible sheltered from artillery fire and from view by airplanes. This is the only means of securing full advantage of their great mobility on ground full of shell craters, of the facility with which they can be concealed from terrestrial and aerial observation, of their ease of operation. The end of the small communication trenches in front of the first trench also offers a favorable emplacement for isolated machine guns of this model, free from risk of surprise fire.

Good results can be obtained by fire on momentary targets (men working on auxiliary defenses, detachments of carriers, at night, in front of our lines); this is true of fire on offensive patrols and on troops marching to the assault.

Bursts of harassing fire executed by surprise in short volleys have also had very good results. It should not be forgotten, however, that the precision of the 1908-15 machine gun is limited and that this fact must be taken into account in regulating its utilization. This gun must never completely take the place of infantry, but, on the contrary, the infantry must have clearly in mind that for them the 1908-15 machine gun is only a means of increasing their firing capacity. By reason of *imperfections of a technical order* the 1908-15 model does not serve entirely to replace the 1908 machine gun.

In mobile defense the 1908-15 machine gun is indispensable. In this case it is posted either in the advanced first line or in front of the first line proper, in machine-gun nests, shell craters, etc. Its high capacity for fire will bring a certain moral support to the first-line infantry.

On the attack the 1908-15 machine gun, well handled and judiciously posted, brings a very valuable increase in the volume of fire. In this case it can be carried forward with the first line and used to fire on the parts of the enemy trench before which our attack is stopped. This requires a certain spirit of initiative. An effort should also be made always to use the 1908-15 machine gun near the platoon commander in order that the latter may be able to throw it rapidly during the battle to the most favorable place.

In small enterprises the gun can be used very effectively to protect the flanks of the infantry attack and to support the attack in case of need. The gun should not be carried prematurely into a newly conquered position, but should be brought up only when the bomb fighting has ended. While waiting, the gun remains in front of the enemy trench and observes the ground toward the enemy, looking for important targets. When it has once been installed in the conquered trench, its task is to protect the flanks or to stop enemy counter attacks if any are delivered. It is absolutely indispensable in this case to protect the gun by special details of bomb throwers. By reason of its extremely light weight, the 1908-15 machine gun is perfectly capable, with some dragging, of following the infantry. *It is not at all too heavy for this* (with water reservoir, drum, and belt it weighs 22 kilos.) The 1908 machine gun (which weighs 25 kilos with water reservoir and assault carriage) has already frequently been used in assaults.

If the 1908-15 machine gun is used judiciously, the consumption of ammunition is not excessive, from 1,200 to 1,500 cartridges should be enough. *It should not deliver continuous fire*, but should be used only for precise fire on targets which are offered under particularly favorable conditions. The highest consumption of ammunition which has heretofore been reported is 5,000 cartridges. This was an exceptional case where the targets were extraordinarily advantageous. The longest continuous fire was 250 cartridges.

The 1908-15 machine gun should regularly be placed under the orders of the infantry company commander, both for its tactical use and for ammunition supply. The machine-gun officer of the regimental staff is responsible only for the care of the gun after battle. For this reason the replenishment of ammunition for this model gun should be completely independent of that of the machine-gun companies. The latter, moreover, will generally be between the lines or in rear of the first trench.

For all men of the infantry carriers' detachment detailed to supply the 1908-15 machine guns with ammunition, it should be a duty of honor to bring back to the ammunition depot near the battalion commander all empty cartridge boxes and belts. They must be carefully trained in this practice.

II. DIRECTIONS FOR INSTRUCTION.

The 1908-15 machine gun can be used with profit only by a well-trained machine-gun man thoroughly familiar with the technique

of this model of machine gun. *Jams should not embarrass him.* He should, first of all, learn the following points: How to put the machine gun rapidly into position in a shell crater without letting the barrel touch the edge of the crater; to change breech-blocks and tubes at the bottom of a shell hole; to load under the most unfavorable conditions, even if his body is very cramped in its movements; to carry the machine gun while crawling; to spring from one shell crater to another carrying the machine gun slung over the shoulder. *It is necessary thoroughly to convince* the machine-gun man that his weapon yields nothing to the infantry for mobility, and this conviction can be developed in him by exercising him energetically and incessantly in jumping.

His training must also habituate the machine-gun man to act promptly and on his own initiative, and must also endeavor to develop in him a certain tactical sense in view of the different situations he may encounter during the course of an action. For this purpose drills in detail, executed in concert with the infantry, are absolutely necessary.

It is only by satisfying these conditions that this *fine weapon* can be made to give its maximum results.

CHICANES CONSTRUCTED IN THE AUXILIARY DEFENSES TO ALLOW AN OFFENSIVE.

The auxiliary defenses set up in front of positions, obstacles, and dense wire entanglements, distributed over the ground, cause great difficulty in carrying out an offensive movement and putting the troops forward to an engagement.

Chicanes have been introduced into the lines of auxiliary defenses and main obstacles of the Wilhelm position; these chicanes are marked on the terrain so that they can be recognized. A map is now being drawn up showing the chicanes; these maps will be distributed to the troops.

The chicanes will be methodically multiplied in the Albrecht position. It is advisable to include chicanes in all the new lines of defense.

The constant improvement in the obstacles and wire entanglements on the intervening ground and the need of watching them prevent all the chicanes from being shown on a map of a sector for an entire division.

Because of this it is necessary for all the security detachments who occupy the positions and works defending the intervening ground (machine-gun nests) to know exactly the positions of the near-by chicanes in order to be able to provide guides when necessary. It is the duty of the commanders of the machine-gun companies to give detailed information to the personnel of the machine-gun nests. The passages will be indicated on a diagram. The reconnaissance of chicanes is part of the instruction of machine gunners.

This diagram will be handed over at each relief, together with the other instructions to the men coming into the position. The machine-gun officer of the division will be responsible for the execution of this order. Also each detachment, on coming into the position, will send out scouts to reconnoiter the position of the chicanes and afterwards be responsible for them.

The scouts will carry wire cutters; for signaling they will carry flash lights.

With their periodic report the commander of the pioneers will hand in diagrams of the chicanes in the obstacles of the

Wieltje and Furtuin position and the engineer officers of sectors II and VI will hand in diagrams for the Albrecht position.

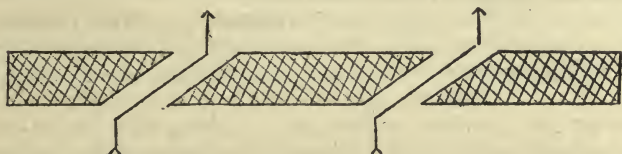
They will indicate the width of each chicane. The orders for making new chicanes will be given according to the necessity.

When installing auxiliary defenses on the intervening ground, one generally uses only very short entanglements and does not extend them parallel to the positions; this very often does away with the making of chicanes. If the entanglement is more than 150 meters in length and runs parallel to the position, chicanes are necessary. The engineer officers will show the chicanes in their periodic reports.

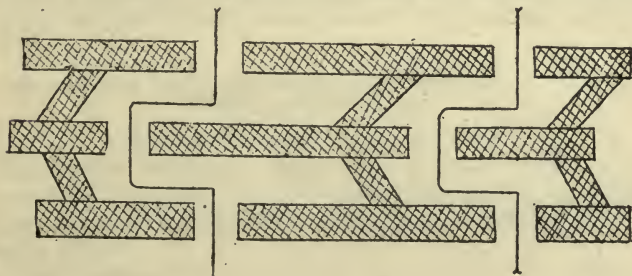
GENERAL PRINCIPLES FOR CONSTRUCTING CHICANES.

Each passage should have a width of 4 to 5 meters; the passages will always be in groups; for example, there will be four passages in 80 to 100 meters of entanglement. A subsequent order will indicate the number of groups of passages that it is necessary to have.

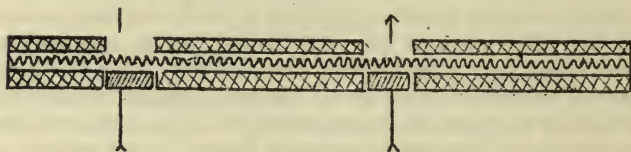
On a single line of entanglements placed in the open the passages will run obliquely, so that they are not visible from the direction of the enemy.



In entanglements of two or three rows of wire the gaps in the lines will be staggered; the passages will run parallel to the lines and the men will follow them from one chicane to the other.



When the entanglements are made up of wire hedges, the chicanes will be left open on the side of the enemy and closed on our side with chevaux de frise.



In chicanes intended exclusively for infantry the stakes are left standing and wire is placed near them for closing the chicanes. In chicanes intended for use by both infantry and artillery the stakes are taken out and chevaux de frise are placed near the chicanes.

It is useless to attempt chicanes for artillery in the Albrecht position and in wire-hedge entanglements.

To prevent the grass near the chicanes from becoming trampled down, which would render the passages visible and allow them to be recognized in the enemy's photographs, it is forbidden to use them for ordinary passage. The old passages near the paths and roads will have to be used.

(Signed)

VON DEWITZ.

GERMAN ARTILLERY.

ORGANIZATION OF THE COMMAND—DENSITY IN DEFENSIVE SECTORS—DISTRIBUTION ON THE GROUND.

The following investigation of the organization of the command of the artillery in the German Army is published for its value as information. It brings out the two following principal points:

1. All artillery in position in a sector, with the exception of the railway heavy artillery, is put under the orders of the commander of the divisional artillery. For the Germans, therefore, counter battery is a divisional work, the application of which is strictly limited to the narrow front of the division.

This organization is very inferior to the French system, which concentrates counter-battery work in the hands of the army and the army corps and thus permits elastic use of the great range of the guns by lateral actions.

2. As the result of prolonged artillery preparation, the German infantry leaves its trenches and the reserves abandon their assembling places. This procedure, which destroys the cohesion of the first-line and counter-attacking units, will not even succeed in forcing the German troops from the French artillery fire if our artillery executes zone fire with time-fuse shells (see note 28,610, of August 25, and note 1,606, of September 2, of the general commanding in chief) and with gas shells.

To escape destruction by the French batteries, the German artillery takes positions in the open. The artillery intelligence service must give the greatest care to making sure where the German battery emplacements are and when they are not actually occupied, and must regulate counter-battery fire accordingly. If this is neglected, the French artillery will waste its fire on a great number of empty emplacements and will thus play into the enemy's hand.

THE GERMAN ARTILLERY IN LINE ON BOTH BANKS OF THE MEUSE, AUGUST 20, 1917.

[Investigation made by the Second Army.]

Information collected confirms in a general way the facts already known relative to the organization of the command, the density and the disposition of the enemy artillery in a defensive sector.

I. ORGANIZATION OF THE COMMAND.

(a) All artillery in position, with the apparent exception of the railway heavy artillery,¹ is at the disposal of the infantry division, and is placed under the orders of the commander of the divisional artillery.²

In the "Maasswestgruppe" (group west of the Maass) at the beginning of August *there were directly dependent on the army corps staff only* some units of artillery not yet in battery; a foot artillery staff (apparently as reserve command); a staff "for special employment" (the foot artillery regimental staff for special employment No. 1).

(b) Within the divisions the distribution is variable.

In the "Maasswestgruppe" the artillery was divided within each division into two great groups—the long-range group ("Fernkampfgruppe"), under the orders of a foot artillery regimental staff, and the short-range group ("Nahkampfgruppe"), under the orders of the commander of the regiment attached to the division.

The "Fernkampfgruppe" comprised the larger part of the foot artillery guns and howitzers. Its essential mission is counter-battery and long-range harassing fire, and it also participates in fire for annihilation.

The "Nahkampfgruppe" was formed by all the field artillery at the disposal of the divisional artillery (the attached regiment and reinforcing battalions), and also included some batteries of heavy artillery (a large proportion of sector batteries).

ESSENTIAL MISSION—BARRAGE AND "ANNIHILATING" FIRE.

These two groups in turn were divided into subgroups, of which the "Fernkampfgruppe" comprised two and the "Nahkampfgruppe" comprised two or three, all placed under the orders of a field artillery group commander or of a foot artillery

¹Seven or eight railway batteries had been located by the artillery intelligence service of the army. None of these batteries figures in the tables of divisional artillery which have fallen into our hands.

²Numbers of the "divisional artillery commands" noted: 25th Reserve Division, 228th Division, 206th Reserve Division, 213th Division, 6th Reserve Division, 127th Divisional Artillery Command, 228th Divisional Artillery Command, 206th Divisional Artillery Command, 213th Divisional Artillery Command, 94th Divisional Artillery Command.

battalion commander and comprising a variable number of batteries.¹

In the "Maasstosstgruppe" (group east of the Maass) the field artillery seems to have been placed entirely under the orders of the commander of the regiment attached to the division, the heavy artillery forming a "foot artillery regiment."

II. DENSITY OF THE ENEMY ARTILLERY IN LINE.

(a) It has been possible to ascertain the whole composition of the enemy artillery at the disposal of the three infantry divisions of the left bank and of one of the infantry divisions of the right bank (Two hundred and twenty-eighth Division, Beaumont sector, Bois des Fosses), as it was at the end of July and beginning of August.

Division.	Number of batteries.											Front held by divisions.	Number of batteries per kilo- meter.	
	Field Artillery.		Heavy Artillery.								Total.			
			Guns.					Heavy howitzers.	Mortars.	Very large caliber.				Unknown caliber.
			7.7 cm.	10.5 cm.	9 cm.	10 cm.	12-13 cm.								15 cm.
Two hundred and sixth Division.....	14	5	.....	5	.....	.....	6	4	1	.....	35	<i>Km.</i> 3	11.7
Two hundred and thirteenth Division.....	12	.....	.....	2	.....	2	4	2	.....	6	28	2	14
Sixth Reserve Division..	8	6	1	4	1	2	6	3	.....	.....	31	3.5	9
Two hundred and Twenty-eighth Divi- sion.....	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	15	.....	1	4	1	.....	8	.....	.....	.....	29	2.8	10

¹(In the Sixth Reserve Division the distribution was as follows:

(a) SHORT-RANGE GROUP:

West subgroup.—One 77-mm. battery; one 9-cm. battery; two 105-mm. howitzer batteries; one 15-cm. howitzer battery; one 12-cm. battery.

Center subgroup.—Three 77-mm. batteries; two 105-mm. howitzer batteries; one battery of 15-cm. Russian guns.

East subgroup.—Four 77-mm. batteries; two 105-mm. howitzer batteries; one 15-cm. howitzer battery.

(b) LONG-RANGE GROUP:

Subgroup A.—Two 15-cm. howitzer batteries; two 21-cm. mortar batteries; one 10-cm. battery; one battery of Krupp 15-cm. guns.

Subgroup B.—Two 15-cm. howitzer batteries; one 21-cm. mortar battery; three 10-cm. batteries.)

²No account is taken of the passive sector included between the railroad and the Meuse.

For the four divisions investigated, therefore, the average density about August 1 would be a little less than *11 batteries per kilometer*.

The proportion of guns to howitzers and mortars was much higher than normal—21 heavy-artillery-gun batteries against 33 batteries of howitzers and mortars, or nearly 39 per cent of the total (normal proportion, 27 per cent).

(b) It is difficult to ascertain *the precise reenforcement made by the enemy from August 1 to 20*. According to the declarations of prisoners and documents which have fallen into our hands, it seems to have been relatively small on the left bank, where the enemy had already been induced, as a result of the battles of late June and of the month of July, to assemble a considerable mass of artillery. On the right bank it was more important, as several battalions of foot artillery arrived there during the first two weeks of August (the Sixty-sixth and Seventy-eighth Battalions of foot artillery).

It is also possible that *part of the divisional artillery of the four divisions in reserve may have been put in line*;¹ at least it is certain that this artillery was in the immediate rear of the front ready to enter into action on the very day of the attack.

(c) The mass of artillery thus assembled by the enemy was constituted as follows:

Field artillery.—Each division had at its disposal, in addition to its attached regiment, from six to nine batteries from an independent regiment.²

Foot artillery.—During a quiet period (north front of Verdun, in April and May) each division disposed of eight or nine batteries, largely belonging to Landwehr battalions or to position batteries. The reenforcement was made by means of newly-formed battalions withdrawn from the sectors of battles of last spring, the Aisne and Champagne.

¹ In total, the artillery at the disposal of the divisions which underwent our attack can be estimated to have been on August 20 *about 180 or 200 batteries*, which would correspond to an average density of 12 or 13 batteries per kilometer.

To have an idea of the artillery participating in the battle there should be added to this total seven or eight pieces of high-powered heavy artillery not dependent on the infantry divisions (report of the artillery intelligence service) and numerous batteries belonging to the adjoining divisions and acting on the flanks of our attack.

² Independent regiments identified on the front of attack: Left bank, Fourth Bavarian and Two Hundred and Sixty-sixth Foot Artillery Regiments; right bank, Twenty-eighth Reserve and Twenty-fourth Reserve Foot Artillery Regiments.

III. DISTRIBUTION OF THE ARTILLERY ON THE GROUND.

Several documents which have fallen into our hands indicate, for several divisional sectors, the arrangement of the artillery at different periods, one of which corresponds to a period of inactivity (Seventh Reserve Division, in April, 1917), and the others to different moments of the enemy reenforcement (Sixth Reserve Division, at the beginning of July, Twenty-ninth Division about August 1).

Examination of these documents suggests the following remarks:

1. In a quiet period each battery of heavy artillery has at its disposal at least *one alternative emplacement*. There are also a considerable number of *reenforcement emplacements*.

In case of the Seventh Reserve Division, for 18 batteries existing in April in its sector reenforcement by 12 batteries was contemplated¹ and emplacements for them were in course of construction.

2. In all the sectors studied the larger part of the enemy artillery is *in the rear of the artillery-protection position*. Some batteries of all calibers are pushed forward. Among these it is interesting to note the *particularly large proportion of guns* intended for the execution of harassing fire on our rear.

In the course of our preparation this arrangement was modified and most of the batteries of guns were withdrawn to the rear of the second position.

3. The enemy had organized in great detail for *defense against tanks*.² In each sector several 90-mm. pieces taken from position batteries and 77-mm. pieces detailed from batteries in the sector were pushed forward and made responsible solely for combating tanks or for fire against the infantry at the moment of the assault.

In the course of our preparation all these pieces were rendered incapable of intervening.

¹ The total of 30 batteries thus contemplated corresponds exactly to the density recommended in the German regulations of March 1 on "the principles of defensive battle in trench warfare" and to the actual density at the moment of our attack (see above).

² The Germans seem to have had a strong idea of the possible participation of tanks in our attack. Besides the artillery defense, cuts had been made in all roads perpendicular to the front.

CONCLUSIONS.

I. The numerical conclusions which we have reached in regard to the number of enemy batteries in line are considerably lower than the figures obtained by the artillery intelligence service. The reasons for this difference may be found in *the more and more frequent changes of position by batteries*, even in course of battle. According to the declarations of prisoners, the counter-battered batteries have first moved to their alternative emplacements, and when they were fired on the batteries have moved out into the open and thereby escaped any further losses from our counter battery.

II. To summarize, the enemy having sure knowledge as early as the end of July of our projected attacks, *reenforced, deployed, and utilized his artillery* exactly in accordance with the rules laid down by him in March, 1917, in his "Principles of Defensive Battle in Position Warfare."

This artillery, located with precision by us and energetically counter battered, is admitted by officer prisoners to have found it impossible to carry out the rôle expected of it. It is possible, therefore, that the enemy, if he has the means, will in future increase the density of artillery which he had planned for defensive battle. We must also expect to see him endeavor to diminish his losses by more and more frequent changes of position, even going so far as to put batteries in the open outside any prepared epaulement.

THE TRANSMISSION OF INTELLIGENCE IN THE GERMAN ARMY.

A German document of January 1, 1917 (Fifth Army: "Memorandum on the transmission of intelligence," signed V. Gallwitz), furnishes valuable information on this important point.

The thing to be noted is the eminently *defensive* character of the document. The liaison service is mainly utilized for the purpose of transmitting intelligence so as to assure, at the opportune time, the action of the artillery and the execution of counter attacks. The transmission of orders and the organization of liaisons in conquered ground are not even contemplated. It is probable that this document was written under the direct impression of the French attacks at the end of 1916. The "Instruction for the General Organization of Divisional Intelligence Service," which is dated March, 1917, has the same strictly defensive character.

I. GENERAL REGULATIONS.

The "memorandum" lays down the following principles:

"Both the general direction of operations and the coordination of the different arms of the service depend on the transmission of intelligence.

"Each process of transmission forms part of a definite whole. The cooperation of all must be assured by direct or lateral liaisons.

"As the first position is that most often destroyed by the enemy fire, prepare in advance a plan for the reorganization of the liaison service at points chosen both in the open ground and in the second and third positions.

"Improvise numerous surprise drills, assuming the loss of one or more positions. If possible, each regiment should be drilled every day, the tactical situation being changed each time.

"From the first lines to the regiment, only terms agreed upon must be used.

"During combat it may be advisable to send an officer to the immediately inferior unit.

"During attacks the assaulting infantry should be accompanied by an artillery officer with signal material.

"During reliefs the personnel of the intelligence service must not leave the sector until it has fully informed the relieving personnel.

"Active liaison between the infantry and the artillery officers.

"Do not post artillery observers with infantry except at points where the view is good and where sufficient liaison with the rear is assured.

"At rest and in a sector, habituate the troops to the regular utilization of the processes of transmitting intelligence. Especially instruct the infantry and artillery observers. The troops should know these different processes in order that if one fails they may use another.

"It is advisable to initiate the divisional cavalry in the telephone and signal services.

"The instruction will be given by the telephone detachments.

"The men who are sufficiently intelligent should know the Morse code. Numerous Morse alphabets should be posted in the cantonments.

"All noncommissioned officers, whatever the situation, should incessantly try to find new processes for assuring the liaison between the first line and the nearest sure telephone post. Suggestions should be brought to the attention of the Army."

II. MEANS OF LIAISON.

A. TELEPHONE.

The division commander and the commander of the divisional artillery should be in the same locality. The staff lines will be established only for messages and conversations of a tactical order. Be sparing of material.

B. T. P. S. (EARTH-CONDUCTION TELEGRAPHY).

The memorandum considers that this means of liaison is not yet sufficiently tested for the transmission of messages.

C. INFANTRY AIRPLANE.

(a) *Intruction.*—The memorandum insists on the instruction of the troops. It prescribes:

First. Drills with panels, newspapers, Bengal lights, wireless telegraphy, sirens, machine-gun fire, visual signals, etc.

Second. Lectures illustrated with slides.

Third. Detailed discussions with the troops, either at the aviation camp or at the cantonment.

Fourth. Courses of instruction for officers, noncommissioned officers, and men.

The memorandum adds:

"The infantry airplane should appear *every day*, weather permitting, over the infantry first lines and try some process of liaison.

"Repeat the signals to the troops until they signal 'Understood.'"

(b) *Organization of the liaison.*—The army corps should distribute the infantry airplanes among the divisions and organize conferences between the chiefs of wireless-telegraphy sections, of telephone sections, of the groups of infantry airplanes, and an officer of the staff of the general commanding the artillery.

The infantry divisions should, the moment an infantry airplane goes up, advise the interested sectors in order: First, that all may be ready to display the panels and to send the visual signals; second, that the wireless-telegraphy stations may receive the waves exactly.

Later the infantry divisions advise when the airplane has returned.

If telephonic communications are broken, the infantry divisions will assign *fixed hours* for liaison by infantry airplanes.

D. PANELS OF WHITE CLOTH.

Dimensions: 0.60 by 1.20 meters. Intervals: From 10 to 20 meters.

Make signals in Morse code with panels which are white on one side and dark on the other.

E. CARRIER PIGEONS.

The "memorandum" considers that their efficacy is *limited* (fog, obscure weather, varying results from different pigeons).

F. RUNNERS.

Very strict organization.

G. INTELLIGENCE COLLECTION STATIONS ("MELDESAMMEL-STELLEN").

They receive the duplicate of every intelligence report so that any that do not reach their destination may be made known promptly. The troops should know the emplacement of these stations. Choose emplacements near a road and connect the station to the telephone by horsemen, cyclists, automobiles, runners.

H. OBSERVATION POSTS INSIDE THE LINES.

"Particularly important," says the "memorandum," "is observation in the rear lines of the first position, in the second or third positions, or near them." Such observations often give indications essential for counter attacks when the enemy has momentarily penetrated the first line.

TRANSMISSION OF SIGNALS FOR BARRAGE FIRE.

The "memorandum" outlines a scheme for liaison service on the appearance of an enemy airplane. It recommends the installation at observation posts of orientation tables to permit specific report of the place for which barrage fire is requested.

The scheme is as follows:

1. In each corps the troops, the antiaircraft guns, the airplane-locating section notify the officer in charge of the antiaircraft defense of the corps.
2. The officers of the antiaircraft defense thereupon notify the aviation intelligence collection center of the group.
3. The latter notifies the pursuit squadron, the commander of the aviation groups, and the battle squadron.

Each airplane should be signaled *separately*, as a general message arrives too late.

The "memorandum" concludes as follows:

"Thanks to the various processes of transmitting intelligence, the high command and the artillery, even on days of great battles, can in one way or another be in liaison with the regiments, often with the battalion commanders, and also, in spite of interruptions, with the advanced lines of the infantry.

"Generals commanding army corps will use these suggestions to try out the dispositions taken for the transmission of intelligence, will improve on them, and multiply them constantly, and will stimulate the divisions by frequent drills. The absence of intelligence reports during the course of a battle is generally to be ascribed to lack of organization or to insufficient supervision."

GERMAN ATTACK BY GAS WAVES WHICH WAS TO HAVE TAKEN PLACE IN CHAMPAGNE IN SEPTEMBER, 1917.

The Germans last August had prepared a gas-wave attack as a preliminary to the infantry attack west of Souain Hill. It is now known that we forestalled this attack.

In the course of our surprise attacks, particularly that of September 3 on the Navarin farm, we captured orders and documents and took prisoners who furnished important information concerning the preparations for this attack.

The attention of the armies is called to this information, for it is to be expected that the Germans will not abandon their project, but will attempt to carry out on some other front the operation which failed in Champagne.

I. ANALYSIS OF THE FILES OF THE FIRST BAVARIAN DIVISION RELATING TO THE ATTACK BY GAS WAVES.

The operation was to have been carried out by the First Bavarian Division supported by the two neighboring divisions. The front of the First Bavarian Division extended from the Saint-Hilaire-Saint-Souplet road to Souain Hill (6 kilometers).

ORDERS NOS. 1, 2, AND 3 OF THE 12TH, 13TH, AND 17TH OF AUGUST, 1917.

GENERAL INSTRUCTIONS.

The First Bavarian Division will make use of the powerful effect of gas in order to penetrate the enemy positions on the entire divisional front.

Troops employed.—Twelve shock troops of the First Bavarian Division, three shock troops of the Second Assault Battalion, twelve salvage squads, twelve destruction squads (see the composition on pages 37 and 38).

Attack on the flank.—The attack of the First Bavarian Division will be flanked by attacks of shock troops from the two

neighboring divisions (the Thirtieth Division on the west and the Fifty-fourth Reserve Division on the east).

Mission.—To destroy the enemy defenses on as wide a front as possible; to bring back the greatest possible quantity of war material of all kinds, as well as documents. In the orders the operation is called *Sommerernte* (summer harvest); to determine the losses of the enemy.

The occupation of the position.—The original plan provided for a wide outflanking attack to capture and occupy territory.

The menace of our attack on the Verdun front obliged the Germans to withdraw the Thirtieth Division and the Fifty-fourth Reserve Division. In replacing them the enemy could dispose only of divisions which had already suffered severely in Flanders, the Two Hundred and Twenty-first and the Fifty-second Reserve Divisions.

Under these conditions the German commander reduced the scope of his plan (order of the 17th of August). After the gas emission the extent of the effect was to be observed, the destruction completed, and the greatest possible quantity of booty brought back; but there was to be no question of gaining territory.

Front and objective.—The line to be attained formed an arc the chord of which was approximately 9 kilometers (from a point 2 kilometers east of Auberive to the Souain Hill) and 3 kilometers deep (1 kilometer west-southwest of Souain). The order of the 17th of August provided that three shock troops would push beyond the line originally fixed, and have for their respective objectives Saint-Hilaire, the Vacques farm, and Souain.

Prospective date.—The cylinders were to be in position by August 15.¹ The emission was to take place, at the earliest, during the night of the 17th to 18th, one hour before daylight (order of the 12th of August). Owing to prevailing contrary winds, the order of the 17th of August postponed the operation to the 1st of September (at the earliest).

Evacuation of the trenches.—The advanced trenches were to be evacuated for the attack, and only pioneer gasers (Thirty-fifth Regiment Pioneers), the sanitary personnel, and holding garrison were to remain in them.

Minute detailed instructions were given concerning the assembling of the shock troops and the different squads. All orders were given by code-conventional words.

¹ The Thirty-fifth and Thirty-sixth Regiments of Pioneers seem to have arrived on the sector the beginning of July.

Emission—Crossing the trenches.—The emission will last 15 minutes. Six companies of the Thirty-fifth Pioneer Regiment will be distributed along the emission sector. If it is dangerous for the shock troops to cross the emission trenches at the appointed hour, the commanders of pioneer companies will either detain them or point out a safe route to them.

Use of the artillery and trench mortars.—During the entire operation the enemy artillery will be neutralized by the fire of shell and gas shell. In each regimental sector a platoon of field artillery will advance as far forward as possible for the immediate support of the shock troops during the advance. The divisional artillery will hold itself in readiness to execute, on request from the shock troops, a barrage fire in front of the objective assigned. The trench mortars, medium and light, of the divisional company will be employed to support the attack and to reduce isolated points of resistance.

Aviation.—Three infantry aeroplanes and one or two artillery aeroplanes will be employed in the attack.

Preliminaries.—Special instructions to the shock troops and squads. Detailed reconnaissance. Special organization of liaison. Partial rehearsal of the operation during the night of the 16th to the 17th.

COMPOSITION OF THE SHOCK TROOPS AND DETACHMENTS.

(a) *Shock troops.*—The First Bavarian Division will form 12 shock troops, Nos. 1–12 (4 per infantry regiment), and the Second Assault Battalion will furnish 3 (A, B, C), making a total of 15 shock troops.

Shock troops 1 to 12.

1 officer.	} Furnished by the infantry.
3 noncommissioned officers.	
16 men.	
1 light machine gun (5 men).	
2 signalers.	
1 noncommissioned officer, 4 miners, First Battalion of Pioneers.	
3 pioneer gasers from the Thirty-fifth Regiment.	
1 corporal and 3 miners.	} From Assault Battalion No. 2.
1 corporal and 6 grenade throwers.	
2 stretcher bearers.	

Total, 1 officer and 47 noncommissioned officers and men.

Shock troops Nos. 2, 7, and 10 will be known as the principal shock troops. They will have, in addition to the above, an artillery patrol (1 officer and 5 men, including 2 telephone operators and 2 signalers), one detachment of infantry telephone operators (1 noncommissioned officer and 3 men), one supplementary detachment of visual signalers (2 men), and one pigeon tender, making an additional force of 1 officer and 12 noncommissioned officers and men.

Shock troops A, B, C.

1 officer.	}	From Assault Battalion No. 2.
30 men.		
1 light machine gun (5 men).		
2 officers or warrant officers.	}	From the infantry trench-mortar detachments.
12 gunners and 2 light trench mortars.		
4 telephone operators.		
2 stretcher bearers.		

Total, 3 officers and 51 men.

(b) *Destruction and salvage squads.*—The First Bavarian Division will form 12 salvage squads, Nos. 1 to 12 (4 per infantry regiment), and the First Pioneer Battalion 12 destruction squads, 1 to 12.

Total strength of the salvage and destruction squads.

1 warrant officer.	}	Infantry.
3 noncommissioned officers.		
21 men.		
1 noncommissioned officer.	}	Pioneers.
4 pioneers.		
3 pioneer gasers.		

Total, 1 warrant officer and 32 noncommissioned officers and men.

Twelve men of each salvage squad will carry the ammunition for the light trench mortars of shock troops A, B, C.

(c) *Limber detachments (for removing enemy guns).*—Three limber detachments will be constituted, each comprising 1 officer, 4 six-horse teams, with the necessary drivers and gunners, and, in addition, 1 officer and 50 men of the pioneer battalion with entrenching material and explosives.

DETAILS OF EXECUTION OF THE OPERATION.

The forces intrusted with the operation will be arranged for the attack in the following order:

- (a) Shock troops 1 to 12 (first wave).
- (b) Shock troops A, B, C (second wave).
- (c) Salvage and destruction squads (third wave).

The principal shock troops (2, 7, and 10) will regulate the progress of the others.

The rôle of the shock troops will be to open a passage through the enemy's positions for the salvage and destruction squads, to break down the remaining resistance, to attain the objectives assigned them, and to protect the salvage and destruction squads during their operations.

If the shock troops attain their objectives and no enemy attacks occur during the day, the troops shall remain in the conquered lines until dark.

If the shock troops encounter a strong resistance, which they do not succeed in breaking down, they will hold out until the search for and seizure of the booty has been completed.

Before a superior enemy attack the shock troops will fall back slowly, protected by a barrage fire, which they will ask for.

The patrols of artillery officers marching with shock troops 2, 7, and 10 will support the advance by directing the fire of the advanced artillery platoons.

Shock troops A, B, and C, marching with the second wave, will support those who advanced with the first wave, breaking the enemy resistance as much as possible by flanking movements. They will put their trench mortars into action rapidly.

The salvage squads will explore the captured trenches. If the advance continues, they will organize a depot to which the companies in position will send their fatigue parties to transport important matériel to the rear.

All arms, appliances, telephones, listening apparatus, field glasses, searchlights, maps, orders, documents, equipment, and gas masks will be collected.

Enemies overcome by the gas fumes will be brought into our lines.

The rôle of the sappers-gasers operating with the shock troops and squads is to point out the passages free from gas and to warn the men against the danger of being overcome.

The *destruction squads*, after removing the booty, will destroy the principal enemy defenses (command posts, observation stations, shelters, etc.).

Aviation.—The infantry aeroplanes will hold themselves in liaison with the shock troops and will keep the regimental commanders and the divisional commander informed of the advance of the shock troops.

Should a counter attack menace the shock troops, the aeroplanes will give warning by machine-gun fire.

Liaison.—The liaisons will be organized in every detail, in order that the regimental and brigade commanders and the divisional commander may be kept informed of the advance of the shock troops. Liaison on the flanks will be constantly maintained. Only the principal shock troops (2, 7, and 10) will communicate with the rear. The others will maintain lateral liaison only.

The principal shock troops will dispose of the following means:

Telephone.—Six kilometers of wire and 3 telephones.

Visual signaling.—Three groups of signalers (1 for the rear, 1 for lateral liaison, and 1 for the artillery).

Pigeons.—Four pigeons.

Wireless.—Shock troop No. 7 will be accompanied by a group of wireless operators.

Rockets will only be used in requesting barrage fire or extension of fire.

All the shock troops will designate runners for use in case the other means of communication should fail.

ORDER NO. 4 OF THE 25TH OF AUGUST, 1917.

By the 21st the Germans knew that we had discovered their plans. On the entire front in question our artillery began demolition fire (21st of August), and our infantry multiplied its surprise attacks, resulting each time in the capture of prisoners and matériel. In order to face our offensive at Verdun, the German commander was obliged to call upon his remaining available resources west of the Argonne.

Therefore an order dated August 25 modified the arrangement. "Under the present conditions a more energetic action on the part of the enemy must be expected than was at first anticipated." Consequently—

The shock troops of each regimental sector will be placed under the orders of a battalion commander, who, with his staff,

will follow the movements of the principal shock troops. His duties will be: To determine what lines will be held, and for how long; to fix the moment of withdrawal, and to regulate the advance and the progressive withdrawal.

Each battalion commander will dispose of a platoon of at least 40 men, with two light machine guns, which will constitute a reserve to be called upon in case of need, particularly to support the shock troops in case of counter attacks.

The rear liaison installed by the three principal shock troops will be at the disposal of the three battalion commanders.

All the men of the attacking troops will have leather masks issued to them.

Each of the three battalion staffs will have a squad of six men furnished with Dreger apparatus.

Shortly before the sortie of the shock troops the trench mortars will direct an energetic fire on the breaches and on such machine guns as are still capable of operating.

POSTPONEMENT OF THE OPERATION "SINE DIE."

Finally, on the 29th of August a pioneer of the Thirty-fifth Regiment deserted, bringing us, in addition to the confirmation of a plan of attack, all the technical details to be desired. This desertion was noted, and the Germans became aware that they could no longer count on a surprise effect. Moreover, they had taken some prisoners from us, who, in all probability, informed them of our counter preparations.

Under such conditions the operation threatened to lose a good part of its effectiveness. The intensity of our fire (increased since August 27) no longer permitted the enemy to attempt even a restricted infantry action, and the gas receptacles under our bombardment became a source of danger to the Germans,¹ a danger which would be increased by an unfavorable wind. It seemed certain that our very deadly and very depressing fire would not diminish, while our patrols continued to point out surviving installations.

There remained, then, but one solution to the situation—the postponement of the plan sine die and the removal of all the

¹ According to the declarations of prisoners captured on the 29th of August, our artillery fire caused the explosion of numerous cylinders and this resulted in casualties. After the fire of the night of the 1st-2d all the cylinders which had been placed in the first trench were brought back to the second.

matériel as soon as possible, so that the enemy might be made aware of this through his patrols. On the 10th of September the Germans seem to have come to this decision.

To sum up, the "Sommerernte" seems to have gone through three phases—

Postponement of a very extensive plan because of atmospheric conditions and the menace of our attack along the Verdun front.

Reduction of the original plan owing to the Verdun attacks, while still maintaining a less comprehensive plan to be carried out as soon as the wind should permit.

Postponement sine die, if not definite abandonment, when all hope of surprise has been lost and the operation appeared more costly than profitable.

II. INFORMATION EMANATING FROM THE PAPERS OF A DESERTER AND THE DECLARATIONS OF PRISONERS.

NATURE OF THE GAS.

The attack provided for two emissions, each of a different gas:

First. Irritant gas (reizgas), probably sulphate of ethyl bichloride, white color, drug-store smell. Escapes under the form of a nontoxic vapor, accompanied by a little liquid, blue and turning brown in the air, very corrosive. This nontoxic gas penetrates the masks, and by irritating the skin compels their removal. Duration of the emission, four minutes.

Second. Toxic gas (kampfgas), a gas already known, immediately following the preceding. It was expected that at this moment, our men having taken off their masks, will be without protection.

The officers captured from the Second Army indicated an analogous procedure for bombardment with poisonous shells.

DETAILED DESCRIPTION OF THE APPARATUS FOR EMITTING IRRITANT GAS.

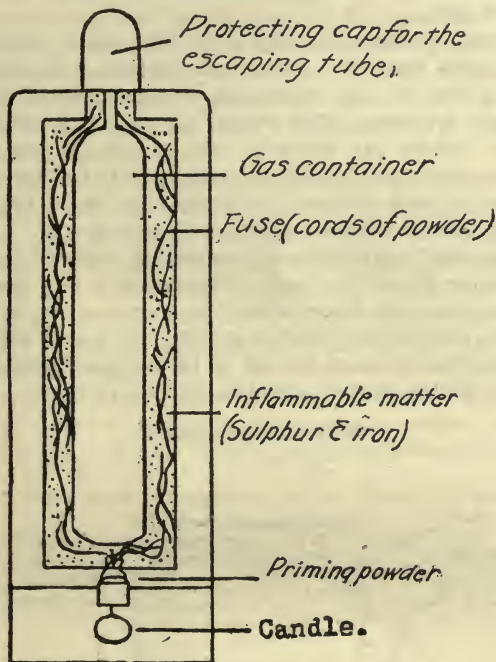
[Translation of a notebook taken on a deserter of the Thirty-fifth Regiment of Pioneers.]

IRRITANT GAS (REIZGAS).

It is contained in a case consisting of two cylindrical tin containers 70 centimeters high, handle 15 centimeters, escape tube 10 centimeters, the reservoir proper therefore being only 50 centimeters high.

The reservoir proper consists of the handle fastened at the bottom; above the handle the priming powder, ignited by a fuse primer placed in the handle, igniting itself when the handle is pulled.

The interior of the receiver is constructed as follows: Two tin cylinders (concentric), the exterior cylinder containing a mass of sulphur and iron through which run fuses that are in contact with the priming powder.



IRRITANT GAS
CONTAINER

(Kampfgas)

Manipulation of the apparatus.

The gas box being placed in position, supposing that the gas is to be released at 11 o'clock, at 5 minutes to 11 the men put on gas masks, making sure that they are properly adjusted.

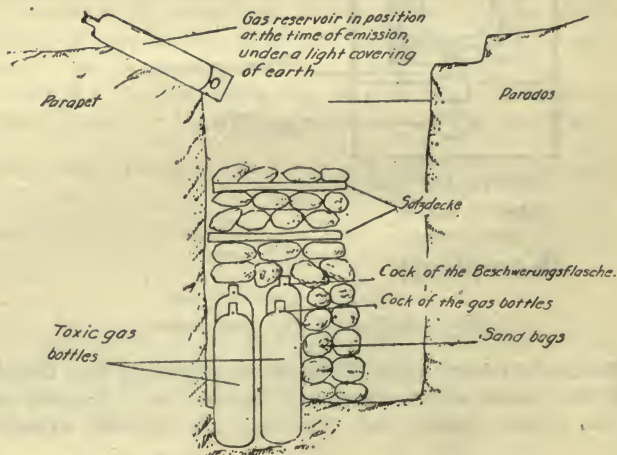
Then the commander of the battery (20 or 25 cylinders) gives the signal to release the gas. Grasp between the first finger and thumb of the left hand the point where the priming-powder tube is screwed on and, having first unscrewed the stopper of the escape neck, pull the fuse primer. A light whistle will indicate that the priming powder has taken. On hearing this whistle, take some earth and cover the bottom of the box with it, the remainder of the box being already covered with earth except the neck.

Wait two or three minutes until the heavy vapors have escaped; now open the heavy gas cylinder (Beschwerungsflasche; a rag or any other sign distinguishes it from the irritant-gas cylinders. The reason for this proceeding is to make the irritant gas (lighter) trail nearer the level of the ground, as otherwise it would rise and do no harm to the enemy. At the end of four minutes the irritant-gas box is empty, and then is the time to release the real asphyxiating gas.

On releasing the irritant gas from the box, a liquid forms and settles on the rim of the neck. This liquid is very dangerous. When removing the boxes after the operation, if this liquid comes into contact with hands and faces, the box of chloride of lime carried by everyone should be immediately employed and the parts affected washed with this chloride of lime.

Placing the gas bottles.

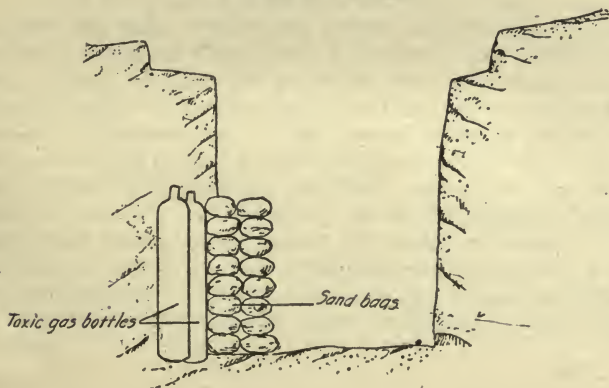
Sketch A



When the trench comprises a firing step, it is entirely removed. The toxic-gas cylinders are placed upright, buried at the bottom of the trench to a depth of 10 to 15 centimeters, and usually in two rows. They should be protected behind and on top with sandbags—two rows of sandbags behind the cylinders and at least four, preferably six, layers above. Between each pair of layers of sandbags on top of the cylinders there must be a sort of covering called by the prisoner “Salsdecke,” impregnated with a salt intended to absorb the gas, which would otherwise escape into the trench at the time of the emission. A spare Salsdecke is always kept in a corner of the trench section where the cylinders are. Should one of the cylinders explode as the result of a bombardment, the Salsdecke is at once thrown over the bottle and absorbs the gas. The Salsdecke is brownish in color, like wet earth.

At the time of the emission the sandbags covering the bottles are removed, the lead tubes are screwed to the neck; they are bound together in sheaves and thrown out onto the parapet of the trench. At the same time the irritant-gas cylinders are laid on the parapet. The whole arrangement before the emission resembles a firing platform made of sandbags. Only the ends of the keys of the cylinders can be distinguished, barely protruding behind the bags. One of these keys is marked with a distinguishing sign (a rag, for instance). It is the one to be opened at the same time as the irritant-gas bottles in order to weight the latter down. This is the “Beschwerungsflasche.”

SKETCH B.—Regulation arrangement for the future; the bottles to be set in the trench wall.



But in the future it is ordered that the bottles be placed in a sort of niche in the actual trench wall. Only the sandbags behind the bottles will project into the trench.

Probable duration of the attack.

Four minutes for the irritant gas and 20 minutes for the toxic gas. The effect of the toxic gas may be felt for a depth of 6 to 7 kilometers.

Instruction.

In the rear depots the new irritant gas is not yet known, and the men only know how to handle the old poisonous gas.

Masks.

The irritant gas will penetrate the new leather masks. When handling irritant gas, carry in addition individual oxygen bottles.

PREPARATION AND EXECUTION OF THE GERMAN ATTACK ALONG THE RIDGE FROM THE MENNE- CHET SIGNAL STATION TO THE CEPY FARM.

NIGHT OF AUGUST 9-10, ACCORDING TO STATEMENT OF PRISONERS.

[Extracts from investigations made by the Second Bureau of the Third Army and of the Eleventh Army Corps.]

Objective.—According to the consistent statement of all the prisoners, corroborated by a document found on the person of the commanding officer of the Third Battalion, Four Hundred and Fifty-first Regiment, the Germans wanted to seize the ridge Mennechet Signal—Hill 124—Cepy Farm, as far as the western military crest.

The plan required that the Four Hundred and Fifty-first, to which this operation was assigned, should retake its former trenches which it had lost on the 13th of last April, gain enough terrain in front to cover these trenches against any surprise attack, and install itself securely in the conquered position by constructing a double line of trenches.

TROOPS PARTICIPATING IN THE ATTACK—FROM NORTH TO SOUTH.

1. *In the first line.*—A platoon of the Ninth Company, ordered to cover the right flank of the attack; the Eleventh, Twelfth, Seventh, and Sixth Companies; a platoon of the Eighth Company ordered to flank the attack on the left; "Stosstrupps" (assault units), some belonging to the Third Light Infantry Battalion ("Sturmбатаillon" of the Second Germany Army), the others belonging to the "Sturmkompanie" of the Two Hundred and Thirty-fourth Infantry Division; pioneers of the Three Hundred and Sixtieth Company; three Stosstrupps (assault units, each of 8 to 10 men) and two groups of pioneers were assigned to each of the Twelfth and Seventh Companies; five to six "Stosstrupps" (assault units) and two groups of pioneers to each of the Eleventh and Sixth Companies placed on the wings.

The liaison between the Cepy Farm and the Eighth Company was assured by elements of the regiment at the right of the division occupying the Saint Quentin sector (Four Hundred and Forty-eighth Infantry Regiment, Two Hundred and Thirty-third Infantry Division).

2. *As support*.—Along the entrenched line of Hyènes, Bois Squaw, Terrier de Renard, 94.05: Two platoons of the Ninth Company, the Tenth and Fifth Companies, and two platoons of the Eighth Company.

These units were to furnish fatigue detachments, to reinforce and relieve at need the companies which suffered heavy losses, and to construct a line of trenches on the eastern slope of the ridge.

3. *As reserve*.—The First Battalion, with two companies in the former first position; the second company in the Hauptmann trench; the first company in the southern part of the Hêtre trench; two companies a little further to the rear; the fourth company in the shelters of the Huissier trench, and the third company in the Hamac trench.

The whole regiment had thus been pushed forward to take part in the attack or to support it if there were need. The attacking troops proper included 150 men for the "Stosstrupps" (assault units), 70 men for the pioneers, and 450 men at least of the Four Hundred and Fifty-first Infantry Regiment.

Preparations for the attack.—During the fortnight preceding the attack the Germans worked steadily in the construction of battery emplacements, trench mortar emplacements, shelters, buried telephone lines, and new communication trenches.

In addition the four companies intended for the first line were sent to Remaucourt between the 1st and the 7th of August to practice the projected attack; and each one of these companies took part in at least one attacking practice by day and two by night.

Preliminary movements.—On the 6th the attacking companies were taken to the Jungwaldstellung (Huissier and Hamac trenches); on the evenings of the 7th and 8th they occupied the first line (Hêtre trench).

During the night from the 9th to the 10th, between 11 and 12 o'clock¹ p. m. the supporting companies in their turn occupied the first line. The attacking companies, the "Stosstrupps" (assault units), and the pioneers attached to them were as-

¹All time indicated is French time.

sembled, the Eleventh Company on the western edge of the Indian Wood, the Twelfth near the road from Crater 93.13 to Fayet, the Seventh at Terrier de Renard, and the Sixth on road No. 44.

Between 12 o'clock midnight and 1 a. m., these four companies made a new rush forward and occupied their positions for the start, almost at the eastern military crest of the ridge, at a distance from the French line varying from 75 to 200 meters (see appended sketch), while the supporting companies took their place.

Arrangement.—The Sixth, Seventh, and Twelfth Companies were arranged in two waves, each formed of a line of skirmishers 20 meters apart. The eleventh company was formed in three waves, each composed of small detachments of eight men and one noncommissioned officer.

The first wave included the "Stosstrupps" of the Third Light Infantry Battalion and of the divisional Sturmkompanie, reenforced by groups chosen from the companies (Ersatzstosstrupps).

The second wave of each company (and the third of the Eleventh Company) had two or three light machine guns and two "Granatenwerfer" (bomb throwers).

The ordinary machine guns, grouped behind the Gangué and Hoquet trenches on the evening of the ninth, were to follow up the advance, but none of the prisoners saw them during action.

Finally, 100 or 200 meters to the rear of the second wave, fatigue detachments brought up matériel and munitions.

Missions.—The mission of the first waves ("Stosstrupps" and "Ersatzstosstrupps") was to seize the first French trench (Landerneau-Dancourt-Eylau) and to push on as quickly as possible to the determined objective.

The second waves were to occupy the Dancourt and Landerneau trenches, then utilize the shell holes to organize an advanced line, following approximately the military crest and passing about 30 meters west of crater 87.10, returning along the Gricourt Road, then advancing anew toward the west in the region of the Dancourt-Eylau junction.

The "Stosstrupps" were ordered to return to the rear as soon as their mission had been fulfilled and as soon as the fire of the French artillery should permit.

The aim of the support companies, in addition to the contingent reinforcement of the attacking waves and their replenishing, was likewise to advance to the eastern military crest of the ridge and to establish a trench there immediately, connecting the Indian Wood and the Squaw Wood, then to pass west of the Terrier de Renard to the extremity of the communication trenches dug before the attack connecting with garden 93.05.

(Photographs taken the 13th show that only a portion of this trench had been constructed at that date.)

Execution.—At 1 a. m. the German artillery and the “Minenwerfer” (noticeably increased for the operation) opened an extremely heavy fire on our first lines and to the rear of them.

At 10 minutes past 1 the heavy and medium trench mortars ceased fire and the artillery increased its fire.

The attacking waves, without waiting any other signal, immediately rushed toward our trenches. In spite of the resistance of our troops they succeeded in seizing the Landerneau and Dancourt trenches and in reaching the Saint-Quentin-Gricourt Road. On the wings the “Stosstrupps” attempted to advance to the Chilly and Eylau trenches, but they were soon stopped, and then repulsed in the vicinity of the road.

AUGUST 10 AND 11.

(a) *South sector of the line 87.09–91.11.*—As soon as they reached the west side of the hollow road the Sixth and Seventh Companies were subjected to a violent bombardment from the French artillery and suffered serious losses. They were each reenforced by a platoon of the Eighth Company, which was thus entirely engaged. In the afternoon of the 10th they tried in vain to advance to the Eylau trench, but a French counter attack pushed them back into the Dancourt trench, which position they held with difficulty.

At nightfall the Sixth and Seventh Companies were hastily relieved by the Fifth and Third Companies, each reinforced by a platoon of the Second Company. These latter succeeded in stopping our advance in the Dancourt trench and tried to organize their position but were prevented everywhere by our machine-gun fire.

On the afternoon of the 11th the French artillery fire, which was very accurate, increased in intensity. The number of killed and wounded increased rapidly and many men tried to escape into the Squaw Wood, the Terrier de Renard, and the

Garden 93.05 (die Gärtnerci), but the majority of them, stopped by the former French wire entanglements, which had not been completely destroyed, were killed by our projectiles.

In the energetic French counter attack at 6 p. m. the last occupants of the Dancourt trench, about 30 men per company, were either captured or killed.

(b) *North sector of the line 87.09-91.11.*—The Eleventh and Twelfth Companies, which took a position at the hollow road on the two sides of the Crater 87.10, immediately after the 1 o'clock attack, occupied at daybreak a line of shell holes situated about 30 meters west of this road. There they were subjected to a violent French bombardment, which was responsible for heavy losses, and they likewise suffered from a heavy German artillery barrage fire. In the afternoon of the 10th they were driven from the hollow road by one of our counter attacks and left several prisoners in our hands. They still hold the Landerneau trench.

In the evening they had to be relieved or reenforced by the Ninth and Tenth Companies which were in a position behind them as support.

On the morning of the 11th the French troops cleared the Landerneau trench by grenade combat and took up their position there, thus retaking all the terrain lost in this sector.

ARRANGEMENTS MADE BY THE GERMAN COMMANDER FOR THE ORGANIZATION OF THE CONQUERED TERRAIN.

The enemy intended to organize strongly the conquered position and to occupy it against all counter attacks from us.

Careful orders had been given to this end. All the regimental companies, including the machine-gun companies, three companies of pioneers, and of the "Armierungs bataillone" (battalions of laborers) were to participate in the work, each at a carefully defined point.

RÔLE OF THE ENEMY ARTILLERY AND TRENCH MORTARS.

Preparation.—It seems that the enemy artillery began, on July 25, to adjust their fire on all the important points of the sector, communication trenches and trenches; but this adjustment was made with such care not to alter the appearance of the regular fire that it was scarcely discernible.

On July 27 different caliber trench mortars in turn began their adjustment with the same caution.

There was increased activity in the adjustment during the first days of August; but at this time, following statements made by Polish deserters of the Twenty-third Reserve Infantry Regiment, who disclosed the intentions of the enemy, our artillery became more active and began its demolition fire on the trench-mortar positions which were known. This recrudescence of activity of the enemy artillery might easily have been taken as a simple reprisal.

On the 6th of August counter-battery fire began against our 75-mm. batteries in the Bois de la Loutre; 200 rounds of the 150's on one, 30 rounds of the 105's on the other.

The 7th was a quiet day, doubtless because of the thickness of the weather.

On August 8, at 9 a. m., the enemy began a violent demolition fire with 150's and large-caliber trench mortars (350 rounds in a few hours). From this time on the enemy artillery kept up a less violent but steady fire on our whole first line to prevent the trenches and auxiliary defenses from being repaired.

At 8 in the evening, moreover, the enemy caused us to open our barrage fire by firing red rockets. This was doubtless for the purpose of finding the range of our barrage batteries. On the 9th, at 11 a. m., he resumed his counter-battery fire, always in the region of the Bois de la Loutre, with time-fuse 105's and 150's (150 rounds in 3 hours).

EXECUTION OF THE ATTACK.

(a) On August 10, at 1 a. m., a very violent fire opened suddenly on our lines. The signal for it was given by two white rockets, one coming from Cepy Farm and the other from the Indian Wood, marking the line of attack.

This fire included:

1. A heavy bombardment of all caliber trench mortars on our first lines and their auxiliary defenses, from the Eylau trench to the Chilly trench. Flange bombs were thrown at the same time on the same points.

2. A violent barrage fire on the whole Fayet hollow.

3. A bombardment with all caliber shells on the village of Fayet, the Breton communication trench, and the Selency road.

At 10 minutes past 1 the trench-mortar fire stopped abruptly. This was the signal agreed upon for the attacking waves to start. The barrage fire and the rear bombardment continued until half-past 2, slightly diminishing in intensity.

During the entire afternoon of the 10th there was keen activity of the enemy artillery in the sector.

(b) *Counter battery*.—Neutralization fire on our batteries likewise commenced at 1 o'clock. It was aimed principally at the battalion which ordinarily dropped barrage on the attacked front. The fire seemed to be executed by two batteries of 150 mm. and one battery of 77 mm., solely with tear-producing and asphyxiating shells, and was conducted in two periods from 1 to 1.30 and from 2 to 3 at a slow rate, interspersed by rapid volleys.

The number of projectiles thus sent was calculated at 1,500.

DAYS FOLLOWING THE ATTACK.

The activity of the enemy artillery during the 10th and 11th consisted for the most part of barrage fire opened at different times to prevent any attempts at counter attacks and to keep our troops from being reassembled. This fire was directed almost exclusively on the hollow of Fayet and on the Chilly trench.

Several times, and particularly on the 11th, at 5 p. m., the enemy conducted a violent fire on our first line with heavy caliber.

No particular activity of the trench mortars was noticed after the attack.

IMPORTANCE OF ARTILLERY IN ACTION.

Forty-seven battery emplacements were reported in action during the night of the 9th-10th, 10 of which had not before this been sighted.

A comparison of all the batteries reported in action opposite the front of the Army Corps in the period from the 13th to the 23d of July (German attack on the Pire-Aller) with those in the period from the 3d to the 13th of August shows that the number of batteries was practically the same. But it was observed that 29 batteries seen in action from the 13th to the 23d of July, and almost all in the region including Isles-Harly-Mesnil-Saint-Laurent, have since disappeared, and that during the last 10 days 25 emplacements, either new or long since silent, displayed activity, almost all in the region Omissy-Morcourt-Saint-Quentin.

Account must be taken of the fact that certain emplacements are doubtful and that others may correspond only to a section,

or even a single piece. We are led to the conclusion that whenever the enemy makes attacks like that on Pire-Aller or on the Mennechet signal station they have at their disposal 15 or 20 batteries, withdrawn from near-by commands, to reinforce the commands supporting the attack.

As for the trench mortars, information supplied by prisoners regarding emplacements which they saw in action lead us to believe that the enemy used for the attack:

All the trench mortars (heavy, medium, and light) of the trench-mortar company of the Two Hundred and Thirty-fourth Infantry Division; light trench mortars of the Four Hundred and Fifty-first Infantry Regiment (12 pieces); and the larger part of the light trench mortars of the two regiments on the right and on the left of the Four Hundred and Fifty-first Infantry Regiment, or a total of four 240-mm. trench mortars, six 170-mm. trench mortars, and from thirty to forty 75-mm. trench mortars.

ARRANGEMENTS MADE BY THE ENEMY TO ORGANIZE THE CONQUERED POSITIONS (DANCOURT TRENCH).

By their attack on the 9th and 10th of August on our Lanterneau and Dancourt trenches the Germans counted on taking from us the whole ridge from the Mennechet signal station to the Cepy Farm, solidly organizing themselves there, occupying it in force, and repulsing all counter attacks on our part.

This fact is proved by a document found on the corpse of the lieutenant in command of the Third Company, Four Hundred and Fifty-first Regiment.

This document includes:

- (1) A battle map, with the plan of the trenches and communication trenches to be constructed.
- (2) A detailed list of the work to be undertaken by each company as soon as the position was conquered.

The translation of this document is given below, with the reproduction of the map. (The names of the French trenches and the French system of cross sectioning have been added to the latter to facilitate its reading.)

Before the attack the Four Hundred and Fifty-first Infantry Regiment occupied a first position (position A), including two lines of trenches—the Hauptmann and Hêtre trenches, the Gangue and Hoquet trenches; a second position (Bereitschaft support position), likewise including two lines—the Condole and Huissier trenches, the Humour trench (unfinished); and,

finally, toward the rear, an intermediate position—the Gland and Hamac trenches.

As soon as the Mennechet Ridge signal station was taken a new position, including two lines of trenches, was to be constructed—an “advanced line” following the western military crest of the ridge, utilizing in part our Dancourt trench, with a “counterslope line” following the eastern military crest.

These two lines were to be protected by extensive wire entanglements.

Four communication trenches were to be constructed, starting from the initial sections made before the attack, to connect this new position with the old ones.

In order to execute this work and at the same time occupy the sector with sufficient strength to resist all our counter attacks, the new position was to be held by four companies in the advanced line and four companies in the counterslope line.

The reserve battalion was to have two companies in the old first position and two companies in the old support position, and the works were to be carried on by trench-mortar companies and machine-gun companies in the preparation of their own positions, three companies of pioneers, specially charged with the construction of shelters and of command posts, and four companies of workmen (of Armierungs battalions) to make improvements in the former position and in its rear.

Everything had been carefully provided with reference to success.

ORDER OF THE COLONEL IN COMMAND OF THE FOUR HUNDRED AND FIFTY-FIRST INFANTRY REGIMENT.

[Translation of a German document.]

PROGRAM OF WORKS TO BE CONSTRUCTED AFTER AUGUST 9, 1917.

During periods when no important combats are taking place, the organization of the conquered height should be pushed with the utmost energy. The technical execution of this task should be guided by the following general principles:

(a) *Protective defenses of the first-line trench and the counterslope position.*—Fifty meters in front of our own trench, a first line of spiral wire; to the rear, on our side, hedgehogs about 1 meter wide and closely intertwined; immediately behind these, a second line of spiral wire, then a wire entanglement with a depth of 5 meters erected on screw stakes. The hedgehogs should be so placed that at the least displacement they become closely bound by their hooks to near-by wires. The second wire entanglement, with a depth of 8 meters, erected on screw stakes, should be located 10 meters further back.

(b) *Shelters.*—Do not repair the old French shelters in the first line unless their entrances face toward our side and unless they fulfill all conditions demanded by first-line shelters. Otherwise, construct new shelters. Shelters on the counterslope position should have a cover 8.50 meters thick; and this can be all the more easily provided as the terrain in this place rises from the entrance toward the shelter proper.

(c) *Trenches.*—Do not use the old trenches in the first line unless their construction is adaptable; if not, it is preferable to dig new trenches. In the counterslope position, first dig the small sections traced in color to a depth of 1.50 meters, then the junctions, and finally deepen all the trenches to 2.20 meters.

Number of the order.	Units.	Works to be constructed.	Numbers.	Length of the work.
1	Company A...	Construction of a trench from the Mennechet Mill to 100 meters north of the Petit Crater-Fayet Road. Excavation of recesses and construction of shelters for noncommissioned officers' stations.	$\frac{1}{2}$ company...	Will depend on the situation.
2	....do.....	Auxiliary defenses in front of this trench.	....do.....	
3	....do.....	Lookout service.	....do.....	
4	Company B...	Construction of a trench running from 100 meters north of the hollow road from Petit Crater to Fayet, to the southern extremity of the hollow road 200 meters south of Petit Crater (limit of the battalion). Excavation of recesses and construction of shelters for noncommissioned officers' stations.	....do.....	
5	....do.....	Auxiliary defenses in front of this trench.	....do.....	
6	....do.....	Lookouts.	....do.....	
7	Company C...	Construction of a new trench, including auxiliary defenses, going from the Mennechet Mill to the Indian Wood.	....do.....	
8	....do.....	Construction of a communication trench connecting the Squaw Wood to Company A's new trench.	....do.....	
9	....do.....	Construction with auxiliary defenses of the Bois Squaw trench and the Harem communication trench, from the Squaw Wood to the second line of position A (Hoquet trench); repairing of the first line of position A (with auxiliary defenses) from the boundary of the sector of the regiment at the right (91.17) as far as 92.14. Construction of shelters (see No. 40).	....do.....	
10	Company D...	Construction of a new trench, including auxiliary defenses, from the Mennechet Mill to the Indian Wood.	....do.....	
11	....do.....	Construction of a communication trench connecting the Terrier de Renard grove with the Petit Crater.	....do.....	
12	....do.....	Construction of the counter-slope position, including auxiliary defenses from the Squaw Wood (former Fayet position) to 150 meters southeast of the Grand Cratère Petit Cratère Road. Construction of shelters (see No. 38).	....do.....	

Number of the order.	Units.	Works to be constructed.	Numbers.	Length of the work.
13	Company E...	Construct, partly new and partly by transforming the old French trench, according to conditions, a trench going from the southern extremity of the hollow road, 100 meters south of Petit Cratère (battalion limit) to a point situated 360 meters beyond, in a southeasterly direction (limit of the sector of the company at the left).	$\frac{1}{2}$ company...	
14	.....do.....	Auxiliary defenses in front of this trench.	.....do.....	
15	.....do.....	Lookouts.....	.....do.....	
16	Company F...	Construction of a trench going from the left wing of E Company (see No. 13) to 150 meters northwest of the crossroads situated on the northwest peak of the Cepy Farm. Partly all new, partly restoration, according to conditions, of the old French trench. Construction of shelters for noncommissioned officers' stations and excavation of recesses.	.....do.....	
17	.....do.....	Auxiliary defenses in front of this trench.	.....do.....	
18	.....do.....	Lookouts.....	.....do.....	
19	Company G...	Construction of a new trench with auxiliary defenses, connecting the left wing of F Company to the trench of the adjoining regiment near the west of the Cepy Farm.	.....do.....	
20	.....do.....	Construction of the communication trench Hindenburg, from the Terrier de Renard to the first trench of E Company.	.....do.....	
21	.....do.....	Construction of the counter-slope position with auxiliary defenses, in liaison with D Company (see No. 12) as far as 150 meters northwest of the northwest peak of garden 95.15. Construction of shelters (see No. 38).	.....do.....	
22	Company H...	Construction of a new trench with auxiliary defenses connecting the left wing of F Company with the trench of the neighboring regiment west of Cepy Farm.	.....do.....	

Number of the order.	Units.	Works to be constructed.	Numbers.	Length of the work.
23	Company H..	Construction of a communication trench leading from the garden 95.15 to Company F's first trench.	$\frac{1}{3}$ company...	
24	.....do.....	Construction of the counterslope position, with obstacles, in liaison with G Company as far as the hollow road leading to the Cepy Farm, and the construction of shelters (see No. 38).	.....do.....	
25	Company I....	Repairing of the first line of position A with auxiliary defenses (Hauptmann trench) from 90.14 to 100 meters north of the small butt; maintenance of the Hindenburg communication trench (95.11-98.13-05.16) from the Hauptmann trench to the Hoquet and Preussenweg trench (from Grand Cratère to Hill 122).	$\frac{1}{3}$ company...	
26	.....do.....	Construction of the Hindenburg communication trench, from the Hauptmann trench to the counterslope position of G Company (92.09).	$\frac{1}{3}$ company...	
27	Company K...	Repair of the Hêtre trench with obstacles, from a point situated 100 meters north of the butt to the boundary of the regiment at the left. Maintenance of the Ludendorff communication trench (98.06 to 100.07).	$\frac{1}{3}$ company...	
28	.....do.....	Construction of the Ludendorff communication trench, from 98.06 to the termination of the communication trench of garden 95.05 in the counterslope position.	$\frac{1}{3}$ company...	
29	Company L....	Construction of shelters in the Hoquet trench (see No. 42).	16 men.....	2 shifts.
30	.....do.....	Construction of a shelter for the battalion command post (hill 122.8).	8 men.....	Do.
31	.....do.....	Concrete foundation for the signal station and the observation station of the command post of the regiment (20.18).	30 men.....	Do.
32	.....do.....	Repair of the company position and the Hindenburg communication trench from hill 118 to 98.13.	The rest.	

Number of the order.	Units.	Works to be constructed.	Numbers.	Length of the work.
33	Company M...	Safety troops and party for transfer to Morcourt.	$\frac{1}{2}$ company.	
34	.....do.....	Unloading and transportation parties.	.....do.....	
35	.....do.....	Maintenance of the company position and the Lüdendorff communication trench from the Hache trench to the Hoquet trench.	.....do.....	
36	Four hundred and fifty-first Company of Pioneers.	Transportation and placing of matériel for reenforcing the auxiliary defenses in front of the advanced first trenches on hills 124.2 and 126.4.	40 men.....	According to the situation.
37	.....do.....	Construction of the command post of the regiment.	40 men.....	The rest in two shifts.
38	One hundred and fifty-ninth Company of Pioneers.	Construction of shelters in the counter-slope position of hills 124.2 and 126.4 (reenforcing D, G, and H Companies).	28 men.....	2 shifts.
39	.....do.....	Clearing out of the blown-up shelter near Grand Cratère.	4 men.....	Do.
40	Three hundred and sixtieth Company of Pioneers.	Construction of shelters in the Squaw Wood position, on hill 126.4 (reenforcing E Company).	16 men.....	Do.
41	.....do.....	Construction of the battalion post of command, hill 122.8.	.....do.....	Do.
42	.....do.....	Construction of shelters in the Hoquet trench.	.....do.....	1 shift.
43	.....do.....	Concrete foundation for the observation station of the regimental command post and the signal station at Croix d'Omissy (19.17).	20 men.....	Do.
44	Machine-gun company.	Care of machine-gun emplacements in the Hauptmann and Hêtre trenches and construction of machine-gun nests continued.	78 men.....	According to the situation.
45	Light trench mortars.	Care of new trench-mortar emplacements; shelter construction continued and supply of necessary munitions.	60 men.	
46	Fifth Company of the Thirty-first Fatigue Battalion.	Drilling for a well north of hill 118.	8 men.....	1 shift (8 hours).
47	.....do.....	Completion of the Hindenburg trench from the Croix d'Omissy to the height where the post of command of C3 North Battalion is located (probably crossroads, hill 118).	132 men.	

Number of the order.	Units.	Works to be constructed.	Numbers.	Length of the work.
48	Fifth Company of the Thirty-first Fatigue Battalion.	Construction of shelters commenced in the intermediate north position (Gland trench).	$\frac{1}{2}$ company.	
49	.....do.....	Organization of the intermediate north position.	.....do.....	
50	Fourth Company Fifth Bavarian Fatigue Battalion.	Completion of the Hindenburg communication trench from the Croix d'Omissy to the post of command of the C3 North Battalion and following.	100 men.	
51	.....do.....	Completion of shelters commenced in the south intermediate position.	$\frac{1}{2}$ company...	2 shifts.
52	.....do.....	South Gland trench and Hamac trench and organization of the south intermediate position.	.....do.....	
53	Fatigue Battalion.	Construction of a communication trench from the post of command of the C3 South Battalion 07.11 to the Hamac trench.	1 company.	
54	.....do.....	Completion of the Hamac position.	$\frac{1}{2}$ company.	
55	.....do.....	Completion of auxiliary defenses provided for in No. 54.	.....do.....	

AUGUST 9, 1917.

(Signed) VON PONCET,
Major, in Command of the Regiment.

For duplicate copy :

WESTHAUSEN,

Lieut., Commanding Regimental Working Force.

TACTICS OF GERMAN ASSAULT DETACHMENTS.

Three successful coups, which are recounted below, were recently executed by German assault detachments on the heights of the Meuse and to the north of Rheims.

The methods used in the three cases varied according to the distance of the objective and the nature of the terrain.

In the first two cases it was a question of taking a distinct objective. The method used presents the following characteristics:

1. *Minute preparation of the operations in the rear.*—Getting together the units for the attack raised from the Sturm battalions, Sturm companies, and Stosstrupps for preparatory exercises lasting about one week on practice trenches representing the objectives to be taken.

2. *Preliminary reconnaissance.*—Executed by the heads of assault detachments one or two days in advance.

3. *Preparatory work.*—Openings in the German entanglements one or two days ahead of time, and in the French entanglements a few hours before the attack, the breeches being made with wire cutters.

4. *Preparation by the artillery and by the trench mortars.*—Very violent during the preparatory work. No immediate preparation. Caging fire from the beginning of the attack.

5. *Attack of the Stosstrupps (distance 1,100 m.).*—By groups, using the shell holes. Reenforced groups on the wings to insure the protection of the flanks.

In the third case it covered a very close objective, over difficult ground. The Germans wanted to take it by surprise, by means of a mine explosion. No preparations in the rear. No previous reconnaissance. Breeches made one day in advance by minenwerfers and artillery firing of all calibers, to isolate the breeches. The troops, not knowing the terrain, failed to find the breeches.

In the three cases the attacks failed, thanks to the vigilance of our watchmen and, especially in the third case, thanks to the ability of one regimental information officer.

1. *Operation at Villers-sous-Bonchamps (distance between the lines 1,100 meters).*—The village of Villers and the trenches to the east have the appearance, according to aerial photography, of an isolated center of resistance bound to the rear by one single very long communicating trench.

The Germans might have hoped, had they realized their surprise attack, to capture quite a large garrison and retire before the supporting troops could counter attack, because of their too great distance and because of the barrage fire.

Consequently the operation was confided to one very well trained Stosstrupp. Minute reconnaissance was made of the terrain, breeches were prepared in the entanglements, and a well-planned itinerary made. In a word, the operation was studied to the smallest detail.

On our side the flat and bare terrain, the great distance between the lines, and the difficulty of counter attacking had led us to cover ourselves by a mobile watching unit, which, seeing the arrival of the Stosstrupp, delayed it, gave the alarm, asked for a barrage, and, in a word, suppressed the surprise.

2. *Operation to the south of the Sechamp Woods (distance between the lines, about 250 meters).*—*Composition of assault detachment.*—Twenty men taken from Sturm Battalion I; 8 men taken from Sturm company of the Two Hundred and Twenty-seventh Division; 60 men taken from the infantry regiment of the Two Hundred and Twenty-seventh Division; 6 officers, 3 sergeants, 9 gefeite (106 men all told).

Preparatory exercises.—From the 17th to the 24th of July the detachment was exercised at a special training ground to the northwest of Avaux. The French trenches to be taken were represented in accordance with the most recent aerial photographs. A very detailed preparation of the surprise attack was made. In these preparatory exercises the artillery officers who were to support the attack took part.

The front attack was about 300 meters wide.

The detachment had two light machine guns and one automatic rifle (musket). Each man had a Mauser pistol, a trench knife, a bayonet, and in a sandbag 16 grenades with handles and 8 egg-shaped grenades.

Several heavy and field artillery batteries and about 50 trench mortars (small and medium-size minnenwerfers and Granatenwerfer) supported the attack.

Execution of the attack.—Two days before, viz, on the 24th of July, two men of each group and one lieutenant went up to

the front-line trench to look over the position, and, that night they made breaches in the German entanglements.

On the 25th of July, at 20 (8 p. m.) o'clock, the remainder of the detachment embarked in three autos for Pignicourt, by way of Neufchatel. From there they went on foot on the Moulin du Merlet, where it crosses the Suippe, reached the Fink Woods and the Sechamp Woods.

On July 26th, at 3 o'clock (a. m.) (German time), the detachment left the Sechamp Woods. Each group sent two men ahead, who advanced by creeping or by bounds, to make eight breaches of from one to one and a half meters in the French entanglements. The work was done in 10 minutes with wire clippers. The men returned, and the entire detachment came out of the V. Haeseler trench at 3.50 a. m., through the breach made in the German entanglements, and laid down in shell holes between the German and French entanglements.

During this time the light and medium size Minnenwerfer and the Granatenwerfer, placed back of the German front-line trenches, opened fire and battered the points from which a counter attack might come. Then the Minnenwerfers lengthened their fire on the French lines of resistance.

At the same time the infantry attack was started, but it was stopped, thanks to our illuminating rockets, and was attended to by one of our machine guns. The men fell to the ground or hid in the grass.

The attack did not pass our line of watching posts. In case the detachment had succeeded in further penetrating our lines the signal for lengthening fire was to have been given by means of small white signal flags, which were to be waved by signal men echeloned along the way they had come.

3. *Operations of the Eparges Woods.*—This operation, which was executed July 17, began the 14th, with enemy artillery adjustment on all the important points in the region between the Calonne trench and the Montgirmont crest, and heavy fire on our batteries.

On the 16th fire became greater and was accompanied by a destruction fire on the Gross trench with large Minnenwerfers. A breach was opened in our entanglements. The day of the 17th was calm, but at 8.30 p. m. a mine was fired at les Eparges and an extremely violent fire of all calibers began to isolate the points where the destruction had been made.

Here, too, the operation was confined to a "Stosstrupp," but these men were only brought up in an auto the evening of the

17th, without having made any previous reconnaissance. They had shown each man on an old aerial map what he must do. On our side the regimental information officer of the sector interpreted correctly the declarations of two deserters a few days before in that region. He studied with care the fire of the enemy's artillery and Minnenwerfer and the information from the special posts. He kept everybody awake and watching, and having guessed the point aimed at by the enemy, the disposition for the defense and the counter attack were made automatically.

The enemy gained nothing but losses.

NEW DEFENSIVE TACTICS.

TRANSLATION OF A GERMAN DOCUMENT.

[With reference to Ypres Group Ia 87084/88187.]

1. The following terms are laid down and will be strictly adhered to in connection with the new defensive tactics:

(a) *Outpost line of the forward zone (Sicherungslinie der Vorfeldzone)* to indicate our own front line in the forward zone.

(b) *Line of resistance of the forward zone (Widerstandslinie der Vorfeldzone)* to indicate that line to which the infantry in the forward zone will retire in the first instance, in the garrison of which it will be incorporated, and in which it will offer resistance.

(c) *Main line of resistance (Hauptwiderstandslinie)* to indicate the line where the decisive encounter will take place.

In order to avoid misunderstandings and confusion, no other terms will be used.

2. The forward zone in front of the main line of resistance will be held as lightly as possible. The strength of the garrison will depend on the ground and the locality. Generally speaking, the main bodies of the companies of the battalion in front line will be posted in the main line of resistance, and only small detachments (a group per company with 1 machine gun, or 2 or 3 platoons taken from 1 company) will be moved into the forward zone for the purpose of repelling large hostile patrols. With this object, it is advisable to hold the weakly garrisoned forward zone as a zone of defense, organized in depth, with the troops distributed checkerwise, and not to hold only the front line by a series of posts forming a single line which can be quickly penetrated.

The action of this garrison of the forward zone will vary. Generally speaking, it will resist and delay the enemy; that is, it will only retire when forced to by the enemy or on receipt of a definite order as to the origin of which the commander is satisfied. The establishment of hostile posts in our forward zone must be absolutely prevented.

3. On receipt of the code word "Grosskampf am 10.x 6 vorm" ("Large attack on 10/10 at 6.00 a. m."), which will be sent out by group headquarters as early as possible on the previous evening, if an attack on a large scale is anticipated, the front line of the forward zone will be withdrawn according to plan about 500 meters (beginning at the above-mentioned hour) into the "line of resistance of the forward zone," in which a few light machine guns and Granatenwerfer will have been previously dug in. This "line of resistance of the forward zone" must be permanently marked out on the ground by means of pegs, trip wire, posts, sticks painted with luminous paint, flags, etc.

At those points where the present front line of the forward zone is less than 500 meters from the main line of resistance, it is best for the outposts to fall back on the main line of resistance. When there is no forward zone, the disposition of the garrison will remain unaltered.

4. The distance of 500 meters appears to correspond with the British orders for the position of their barrage. The British first put a protective barrage on to the area to be attacked, consisting of a wave of fire 540 meters in depth, measured from the front line of our forward zone. This barrage then advances. It is heaviest in the vicinity of the front line of our forward zone, where it consists of artillery, machine-gun, and rifle fire. At a distance of 500-600 meters from the front line of our forward zone it is considerably less intense.

5. As a natural consequence, our artillery defense will be organized as follows:

Shortly after the zero fixed for the attack on a large scale, our barrage fire and annihilating fire, which have hitherto covered predetermined areas in front of our foremost outpost line, must now be put down farther back on this outpost line. The time allowed for the completion of the infantry movement will be fixed at 15 minutes.

The moment the British barrage commences our counter barrage must be put down at once with every battery of every caliber, with the exception of the heavy flat-trajectory guns, in order to catch the British before they can follow up their own barrage. The batteries of the flanking groups, if they can not switch their fire with direct observations, will continue to fire on their allotted areas until they receive orders to change the direction of their fire.

Our batteries will not register our original front line, but will each work out the correction required for shortening range 15 minutes after zero.

6. Should the expected attack in force not take place, the order, "Old line X/10, 7.30 p. m.," will be given as early as possible on X day; in which case, without further orders, the advanced posts will, commencing at 7.30 p. m., push forward again into the front line of our forward zone. This operation will be commenced from the line of resistance of the forward zone at 7.30 p. m. After 7.30 p. m., the barrage areas will be those previously registered in advance of the old front line of our forward zone.

7. Contact must be maintained without fail with units on the flanks, especially at divisional boundaries. Every commander is responsible for maintaining constant touch with the units on his flank.

8. Every opportunity for counter attack must be seized, whether it be made in front of the main line of resistance or in front of the line of resistance of the forward zone, as, for example, pursuit of the enemy who has been repulsed or compelled to retire. Experience has shown that these counter attacks yield booty and secure our hold on our forward zone.

9. (a) Should the enemy attack before the code word "Grosskampf" has been given, our counter barrage will be put down in front of the foremost outpost line of the forward zone. The outposts on the line of the attack, as soon as it is certain that an attack is taking place, will retire in order to the "line of resistance of the forward zone," and will be absorbed into its garrison. There they will make a stand, retiring on to the main line of resistance, either under pressure from the enemy or on receipt of an order.

Once it has been definitely ascertained that this movement has been completed, the company commander in the main line of resistance will send up a white flare, breaking into small stars. This signal will be repeated to the rear. The artillery will then immediately shorten range so as to place its barrage close in front of the main line of resistance.

(b) The same tactics will be resorted to when "Grosskampf" has been signaled, but the enemy attacks before the zero given, i. e., before the infantry has commenced to retire to the line of resistance of the forward zone. They will equally apply in the event of an attack subsequent to the reoccupation of an outpost

line in the evening which had been evacuated in the morning as the result of a "Grosskampf" signal.

(c) Should the enemy attack while the movements resulting from a "Grosskampf" signal are in progress (for example, between 6.00 and 6.15 a. m., when "Grosskampf" has been given for 6.00 a. m.), the artillery will at first put down a counter barrage in front of the original outpost line of the forward zone. The outposts will continue their methodical retirement from the outpost line to the line of resistance of the forward zone, and will be absorbed into the garrison of the latter. At 6.15 a. m., as prearranged, the barrage will jump back to our original outpost line. The infantry will make a stand in the line of resistance of the forward zone, retiring to the main line of resistance under pressure from the enemy or on receipt of an order. Subsequent action will be regulated in accordance with the second subparagraph of paragraph 9 (a).

(d) Those portions of the outpost line of the forward zone which are not attacked will hold their ground and cover their exposed flank by throwing it back. They can be further stiffened by pushing up weak supports from the line of resistance of the forward zone. They will only retire to the latter when forced to do so by threat of envelopment. The line of resistance of the forward zone will then be held according to plan.

10. The signal "Lift your fire" means that the artillery is to increase its range by 100 meters. The reason for the signal may be either that our artillery is firing short, i. e., shelling our own infantry, or that an attack which has been repulsed is to be followed by artillery fire as it retires.

Every time the signal is repeated the artillery will again increase its range by 100 meters. Attempts must be made and all means should be employed to ascertain exactly where the flare signals are being sent up, in order to prevent our barrage being withdrawn from the front of our main line of resistance when it is still needed by our infantry. It must be borne in mind that the British, in order to induce us to lift our fire from points where it is particularly accurate, often imitate our flare signal "Lift your fire." The range will, therefore, only be increased in response to flare signals if the sector in which the flare signals are being given can be established with some degree of certainty. The same applies to the signal for "Shorten range," which must only be given by the company commander or some senior officer.

Flare signals for "Lift your fire" will not apply to barrage and destructive fire on the areas in front of the foremost line of our defensive zone which have been registered with direct observation.

The cooperation of the artillery survey sections is of the greatest value in fixing the point at which the flare signals are being sent up, as they can determine the exact point where the signal was given by means of intersection on the flares. They will report the result of the intersection as quickly as possible to the artillery commanders, who will transmit it by the quickest means available to the batteries concerned which are firing in this sector.

11. The white flare signal for "Shorten range" will be given from the main line of resistance (by a company commander or senior officer) if it is seen that the troops stationed in the line of resistance of the forward zone are retiring from it.

Flare signals for "Shorten range" should only be provided for the main line of resistance. This flare signal should not be issued to the forward zone, in order to prevent it being used at the wrong time.

12. The main point in all alterations in the range of the artillery fire is direct observation of the battle field, which provides the most certain means of obtaining a clear idea of the situation and of deciding as to the targets to be fired at. Emphasis must once more be laid on the fact that an artillery liaison officer must be attached to every commander of the troops in line, and must be amply provided with telephone wire, with his own runners drawn from the artillery, and with all other means of communication (wireless, carrier pigeons, etc.). It is essential that every battery and every subgroup be supplied with a close-observation post.

13. Balloons and airmen should be provided with flare signals for barrage fire, annihilating fire, and "Shorten range." On days of very heavy fighting they must pay particular attention to observing where these signals are being given in our front line, and will call the attention of the artillery to the signals which are being sent up by the front line by repeating them. Balloons must also endeavor, by means of lines of direction laid far in advance of the balloon beds, to establish the points at which the individual flare signals are being sent up, and the information derived from their observation in this way must be transmitted to the artillery command posts, with which they

are connected by telephone. It is the duty of airmen, as soon as they have established the points at which the flare signals are being sent up, to transmit by wireless the meaning of the flare signals and the points from which they are being sent up.

14. These tactics of altering range aim at simplification and at preventing the enemy from passing through our barrage fire, as well as enabling us to withdraw our infantry without its coming under our own fire.

15. Regiments will practice these tactics immediately and explain their object to the men. In these operations emphasis must again and again be laid on the fact that the British infantryman is in no sense the equal of our infantry as soon as our infantry gets to grips with him in a counter attack.

(Signed) BRAUCHITSCH.



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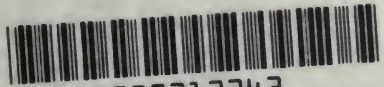
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