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## THE CONSTRUCTION OF DEFENSIVE POSITIONS.

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## THE CONSTRUCTION OF DEFENSIVE POSITIONS.

1. The nature of defensive positions has been essentially altered in character by the experience of the fighting during 1917. The positions of the Fourth Army will henceforward be constructed on the principles which follow.

Construction may be divided into three categories:—

- A. Construction of positions on the battlefield.
- B. Construction of new positions.
- C. Modification of old positions.

### A.—CONSTRUCTION OF POSITIONS ON THE BATTLEFIELD.

2. The positions hitherto constructed with several continuous lines have been methodically destroyed by the enemy, at the beginning of a battle, by the expenditure of great quantities of ammunition. The dug-outs situated in old trenches, principally in the first and second trenches, were man-traps, and have often led to the loss of a large number of prisoners. These circumstances prove the weakness of the rigid methods of defence hitherto practised shortly before and during the battle.

The strength of the defence in the defensive battle must lie in the concealment of our fighting resources from the enemy's observation; trenches, dug-outs, machine guns and battery positions which appear on the enemy's aeroplane photographs are certain to be destroyed by his artillery.

The severity of the enemy's fire makes it impossible to keep our trenches in repair. Any attempt to do so only exhausts the fighting strength of the troops prematurely, without it being possible for the repairs to keep pace with the work of destruction.

Another method of construction of positions must, therefore, be employed as soon as a battle begins. That is to say, there must be a deliberate transition from the old pattern of position, which is visible and will be shot to pieces by the enemy, to a zone of defence organized in depth. This must allow of offensive action by the defence from positions which are, as far as possible, concealed, and are lightly held in front and more strongly held in rear.

3. Principles.—(i.) As the destructive fire of the enemy proceeds, the mass of the infantry will be taken out of the forward, conspicuous and battered trenches and dug-outs, and will be distributed in depth in the open before the first infantry attack takes place.

In old positions, therefore, completely new dispositions must be made, solely in accordance with the circumstances of the battle, without reference to the existing trenches. It is the duty of all commanders on the battlefield to give timely orders for the methodical redistribution of the troops, and to carry out such orders unhesitatingly.

(ii.) During the battle, continuous trenches are no longer to be insisted on in the front line positions, but their place will be taken by shell hole nests, held by groups and single machine guns, distributed chequerwise. The shelter in the shell holes will be improved by the employment of mining frames or by joining adjacent shell holes by tunnels lined with frames. The excavated earth will be thrown into shell holes near by, or, if the ground permits, scattered on the surface. Thus, in the course of time, mined dug-outs will be formed, which appear to be merely shell holes and consequently escape detection by aeroplane observation. If frames cannot be used for the purpose, owing to the ground being waterlogged, the simplest means will be used to give protection against shrapnel fire.

Close behind the foremost shell hole line, strong points will be constructed for machine guns, assault troops and elements of the supports that have been brought forward. These strong points will usually be constructed near dug-outs, but, failing these, in the open. Wire will be erected in front of the forward shell hole line, irregular in trace, but, as far as possible, forming a continuous system. In this connection it has been found useful to fill the shell holes in advance of the front line with wire, in order to prevent their occupation by the enemy.

Farther back, it is best for the shell hole nests to be provided with wire entanglements which are only local in extent, since continuous belts make offensive action on our part more difficult.

There should be plenty of wire entanglements so arranged as to force the enemy to a particular direction and bring him under machine gun fire (cf. para. 18).

All defensive works must remain hidden from the enemy. Conspicuous works and connected trench lines do not fulfil this important condition.

(iii.) A great part of the supports and reserves will be accommodated in the open, in and near shell holes, in woods, hollows, etc., wherever cover from air observation exists. Villages, which, as experience shows, draw the enemy's fire, must be avoided whenever possible.

Supports and reserves must work methodically at the construction of a continuous system consisting of several lines of trenches, which must be screened as much as possible from the enemy's observation (a reverse slope position).

This system will form a support for the defenders who are organized in depth in front of it. It must be strongly wired, with gaps for the passage of troops to attack through, and must consist of several lines of trenches. Deep dug-outs will only be constructed in the second and third line. The first line will only contain small dug-outs for about one-sixth of the garrison.

This system will generally be the artillery protective line and will be about 1,650—2,200 yards from the foremost shell hole line.

(iv.) If there is sufficient labour available, additional lines will be constructed farther in rear, on these principles (to form supporting positions).

#### B.—THE CONSTRUCTION OF NEW POSITIONS.

4. When constructing new positions, the principles laid down for the construction of a zone of defence organized in depth must also be applied from the outset, by the simultaneous construction of the front line position, the artillery protective line, and the communication trenches between them.

5. It is not sufficient that only the infantry should be disposed in depth. The principles of organization in depth must also be followed in the disposition of machine guns and trench mortars, and, particularly, in the distribution of the artillery with its observation and command posts.

The chief strength of the position must be sought by organization in depth, the proper distribution of force over the whole fortified zone, and concealment.

6. Care will be taken that cover against air observation is ensured. Artillery positions and machine gun emplacements in the fortified zone, which are located during construction, lose value. Every single man must know this. Air photographs of our own positions must be taken to ensure that due precautions are being observed. Numerous dummy works will be employed in order to deceive the enemy.

7. The construction of dug-outs must, on principle, be begun at once throughout the whole depth of the defensive zone. Dug-outs will be provided in the first trench for 1/6th of the garrison of the front line position (fighting troops); in the second trench, for 1/3rd of the garrison; farther to the rear, as far as the artillery protective line (exclusive), for about 1/4 of the fighting troops. The same principles are to be followed in the construction of the artillery protective line which is intended for occupation by the supports.

Numerous dug-outs will be constructed outside the trenches, in readiness for the methodical distribution of the trench garrison over the intervening area, and outside the trenches, at the commencement of the defensive battle.

Where mined dug-outs can be constructed, there must be 26 to 33 feet of earth over them and they must be provided with at least two exits. Concrete dug-outs must not be conspicuously high, and the slopes of the earth covering them must be kept flat.

8. The dug-outs in the foremost lines must also be shell-proof; there must be just sufficient accommodation for the small proportion of the garrison laid down in para. 7.

If these shell-proof dug-outs can be constructed at a less depth than that entailed by mined dug-outs, by the use of material of great resisting power, such as concrete, iron and joists, this method of construction is very desirable, as it facilitates the rapid exit of the men.

Timber of good dimensions should be employed for casing when constructing mined dug-outs, so that the exits may be wide and high and facilitate the rapid egress of the garrison. Care must be taken that the exits have a sufficient thickness of earth cover.

In addition to these dug-outs, which should accommodate one group (1 N.C.O. and 8 men), splinter-proof observation posts are necessary close beside them. Observation will normally be carried out from these; during an intense bombardment, in addition to observation from posts in commanding positions in rear, observation will be carried out in the front line by stout-hearted men, who will leave the dug-outs at frequent intervals and observe over the parapet.

9. It is of advantage to provide mined dug-outs with exits from the rear leading to the surface behind the trench, preferably into shell holes, which will help to conceal them. The garrison can then leave their dug-outs when the enemy has penetrated into the trench (see sketch).



10. To ensure the alarm being given in mined dug-outs, it is recommended that the entrances to these dug-outs should be provided with several recesses in which sentries should be posted. These sentries will be able to engage the enemy directly he enters the trench, and will, by keeping the entrance free, enable the garrison to come out. With the same object in view, it is advisable in the case of concrete dug-outs to provide a trench block from which the entrance to the dug-out can be kept under fire, so that the enemy can be prevented from forcing his way into it.

11. In advance of the foremost trench, a strong and continuous wire entanglement is necessary, consisting of three belts each 33 feet wide, with intervals of 15 to 33 feet between the belts. This wire should be irregular in trace and should not be too high. Particular care must be taken to ensure that the front belt of wire can be swept by flanking fire. The wire should not be taut, as in that case it is severely damaged by the concussion caused by bursting shells. In emergency, strong wire fences, 8 to 5 feet high, at intervals of 6 to 10 feet, can be employed.

The first step in the construction of wire entanglements is the erection of the front belt of wire, the outer edge of which should be about 65 yards in advance of the front trench. In front of the second and third trenches (and in the case of rear positions, in front of the front trench also), gaps must be left for the passage of troops moving to the attack. In these gaps, only the posts should at first be driven in, the wire being merely placed in readiness.



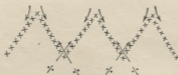
The first of the three belts of wire must be protected by sentries in holes or short lengths of trench behind it.

In the zone of defence organized in depth, the wire entanglements will be distributed over the whole area in blocks, about 30 feet wide, which are irregular and not continuous, or in numerous lengths of strong wire fencing, advantage being taken of natural cover, such as hedges, sunken roads, etc.

12. **Order in which new work will be carried out.**—Tracing—wiring—construction of dug-outs—last of all, the actual digging of the trenches, unless lack of material renders it necessary to proceed with this first.

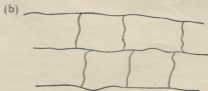
13. The construction of a very large number of machine gun emplacements in the ground between our various lines must be begun immediately. They will not be sited on commanding points, but on slopes and in hollows, with the special object of securing flanking fire.

They must come as a surprise to the enemy. It is therefore not advisable to place these machine guns in the angles of the wire, where the enemy is bound to suspect their presence (see sketch).



Only dummy emplacements should be constructed at these points, while the actual machine guns are sited in concealed emplacements to a flank or in rear. It is particularly important that machine gun emplacements should be concealed from air observation. Accordingly, the first step is to erect wire netting covered with brushwood over the excavation and the building materials. The machine gun emplacement must not be completely surrounded by high wire, which would disclose its position to the aviator. It is preferable to erect belts of wire or several strong wire fences, so arranged that the enemy must run into them, which can be swept by fire along their whole length.

14. In some parts of the position, the communication trenches between the several lines can be built obliquely without much increasing their length (see sketches (a) and (b)). This will provide a network of trenches in which the communication trenches, which must always be provided with wire and be organized for fire, can at the same time be utilized as switch lines.



The arrangement shown in sketch (a) has the great advantage that the enemy cannot clearly locate our defensive system. If he intends to destroy the position, he must bombard the whole of the area between the 1st and 3rd lines. This will render his artillery preparation more difficult, and increase the area with which it must deal. An enemy who has penetrated into the position, is caught in the network, and is prevented from surrounding those portions of the trench garrison which are holding out in front.

If the communication trenches are dug in straight lines as in sketch (b), the enemy can bombard the separate lines and neglect the ground between them.

#### C.—RECONSTRUCTION OF OLD POSITIONS.

15. In the old positions, and also in many parts of the "Flandern-Stellung" (i.e., the Staden—Zonnebeke Line), the majority of the dug-outs are in the first trench, and there are but few in the back lines. This mistake must be avoided in future, for it leads to crowding in the forward line of defence, with its well-known disastrous consequences.

In the back lines, and in the "Flandern-Stellung," where the ground permits, this mistake will be remedied by digging a new trench in front of the old first trench.

In the old front lines, where this is out of the question, the alteration will be effected by the rapid construction of dug-outs in the back lines. As this work progresses, the number of dug-outs in the front line will be gradually reduced. This can be done either by removing the material of superfluous dug-outs and employing it for dug-outs in the back lines, or by barricading existing concrete dug-outs so that they cannot be opened except on the express order of responsible commanders. They will then afford convenient points of assembly for our own assault troops in case we attack.

When the sketch showing work done is submitted on the 25th of each month, all Groups and the Guard Corps will report how the reconstruction of old positions has progressed, having regard to local conditions.

16. In certain sectors, and especially in the back lines, the work on positions has been chiefly directed to the upkeep of trenches. The fortification of a zone organized in depth has not everywhere been sufficiently thoroughly carried out. I am aware that the maintenance of positions in certain sectors is very difficult, and makes very heavy demands on the troops. In spite of the great amount of work accomplished, parts of the positions, as is shown in the reports, are not capable of defence owing to the state of the ground. In such sectors the value of a zone of defence organized in depth is considerably increased.

(Signed) SIXT VON ARMIN.