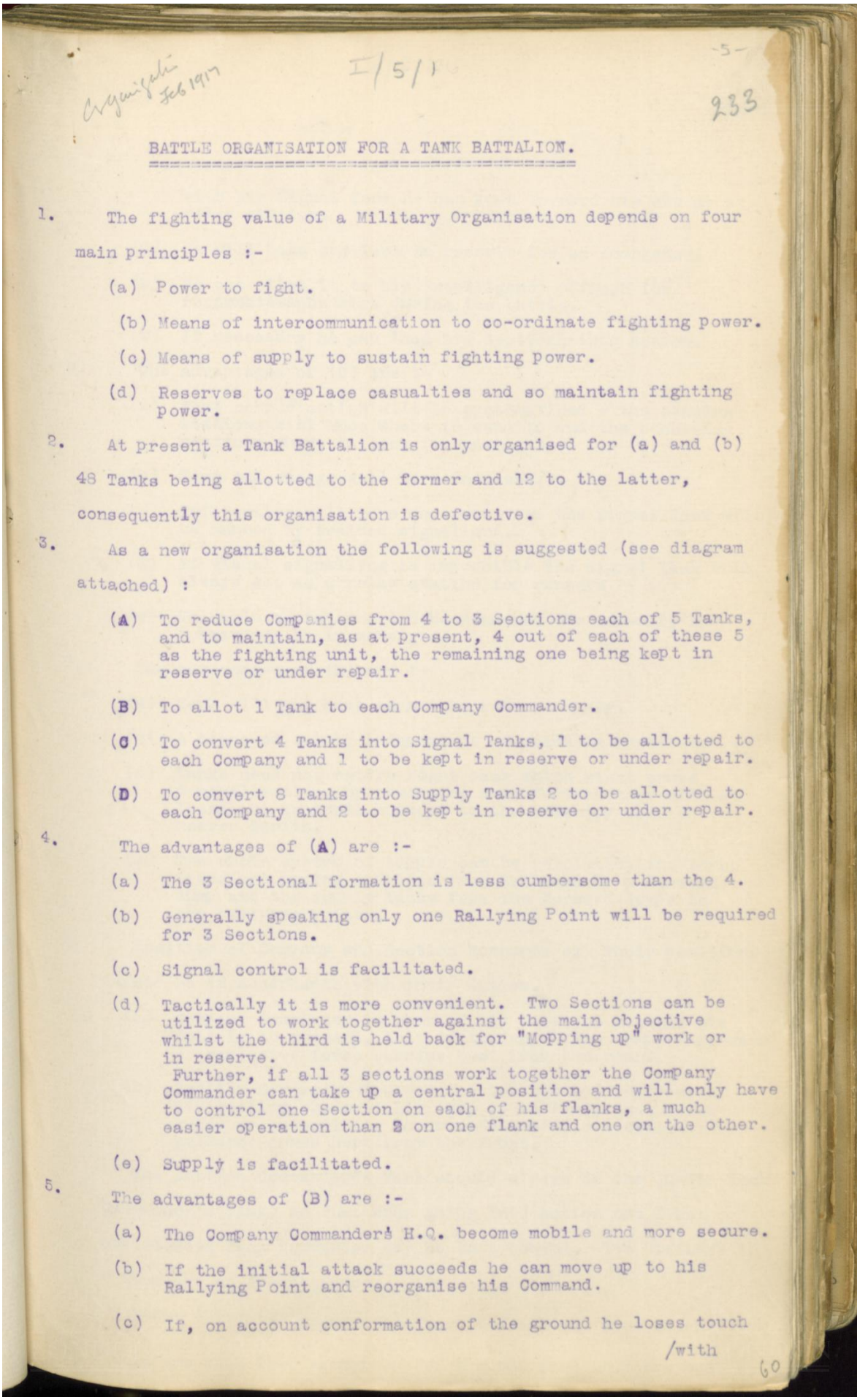

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BATTLE ORGANISATION FOR A TANK BATTALION.

1. The fighting value of a Military Organisation depends on four main principles :-

(a) Power to fight.

(b) Means of intercommunication to co-ordinate fighting power.

(c) Means of supply to sustain fighting power.

(d) Reserves to replace casualties and so maintain fighting power.

2. At present a Tank Battalion is only organised for (a) and (b) 48 Tanks being allotted to the former and 12 to the latter, consequently this organisation is defective.

3. As a new organisation the following is suggested (see diagram attached) :

(A) To reduce Companies from 4 to 3 Sections each of 5 Tanks, and to maintain, as at present, 4 out of each of these 5 as the fighting unit, the remaining one being kept in reserve or under repair.

(B) To allot 1 Tank to each Company Commander.

(C) To convert 4 Tanks into Signal Tanks, 1 to be allotted to each Company and 1 to be kept in reserve or under repair.

(D) To convert 8 Tanks into Supply Tanks 2 to be allotted to each Company and 2 to be kept in reserve or under repair.

4. The advantages of (A) are :-

(a) The 3 Sectional formation is less cumbersome than the 4.

(b) Generally speaking only one Rallying Point will be required for 3 Sections.

(c) Signal control is facilitated.

(d) Tactically it is more convenient. Two Sections can be utilized to work together against the main objective whilst the third is held back for "Mopping up" work or in reserve.
Further, if all 3 sections work together the Company Commander can take up a central position and will only have to control one Section on each of his flanks, a much easier operation than 2 on one flank and one on the other.

(e) Supply is facilitated.

5. The advantages of (B) are :-

(a) The Company Commander's H.Q. become mobile and more secure.

(b) If the initial attack succeeds he can move up to his Rallying Point and reorganise his Command.

(c) If, on account conformation of the ground he loses touch

/with

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- 2 -

with his Signal Tank he can push forward his own as a relay station.

(d) He will have one Tank in reserve for an emergency.

(e) He can allot it to his Intelligence Officer for reconnaissance work during the battle.

(f) If necessary he can lead his Sections into action.

6. The advantages of (C) are :-

(a) That communication will be systematised - the sending stations will know where to send to and the receiving stations where to look for messages.

(b) Time and energy will be economised.

(c) Information will more accurate, for the Signal Tank will be manned by trained signallers.

(d) If visual signalling is impossible the Signal Tank will always act as a relay station for runners.

(e) Valuable assistance can be rendered the Infantry by forwarding their messages.

7. The advantages of (D) are :-

(a) Tank will not have to put back to resupply.

(b) A means of supply independent of roads is instituted.

(c) Tanks need not retire right back which might cause demoralization; by remaining well forward they will at least act as moral support to the infantry and be nearer Berlin.

(d) The whole system of supply can be regulated, the lorry transport moving supplies from Railhead to a forward dump and the supply Tanks from the forward dumps to the rallying points.

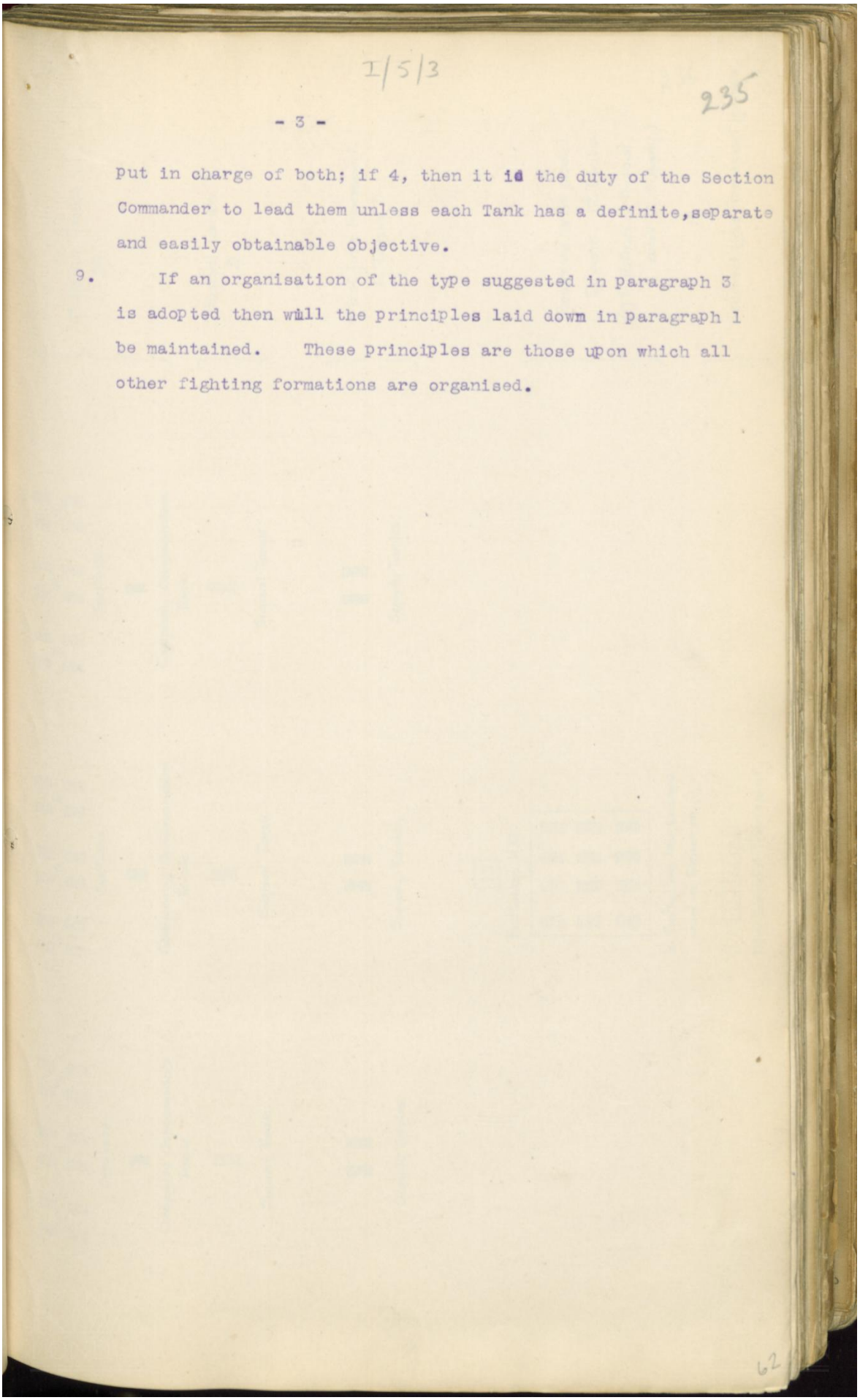
8. Position of Company and Section Commanders. Their positions should be in accordance with their duties.

(a) Company Commander in rear of his Sections because his duty is to command, that is to propel his Company forward - explosive force carries best from the rear.

(b) Section Commandern(better Section leader) in front of his section, because his duty is to lead, that is to guide or co-ordinate the movement of his section - guidance comes best from the front.

The Section Commander's Tank should always be the junior Tank Commander's Tank, so that when going into action the least experienced Tank Commander may be left behind. Two Officers in a Tank are an encumberance.

Every multiple organisation requires a head; even if only two Tanks are sent into action one of the two Tank Officers must be 6\



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- 3 -

Put in charge of both; if 4, then it is the duty of the Section Commander to lead them unless each Tank has a definite, separate and easily obtainable objective.

9. If an organisation of the type suggested in paragraph 3 is adopted then will the principles laid down in paragraph 1 be maintained. These principles are those upon which all other fighting formations are organised.

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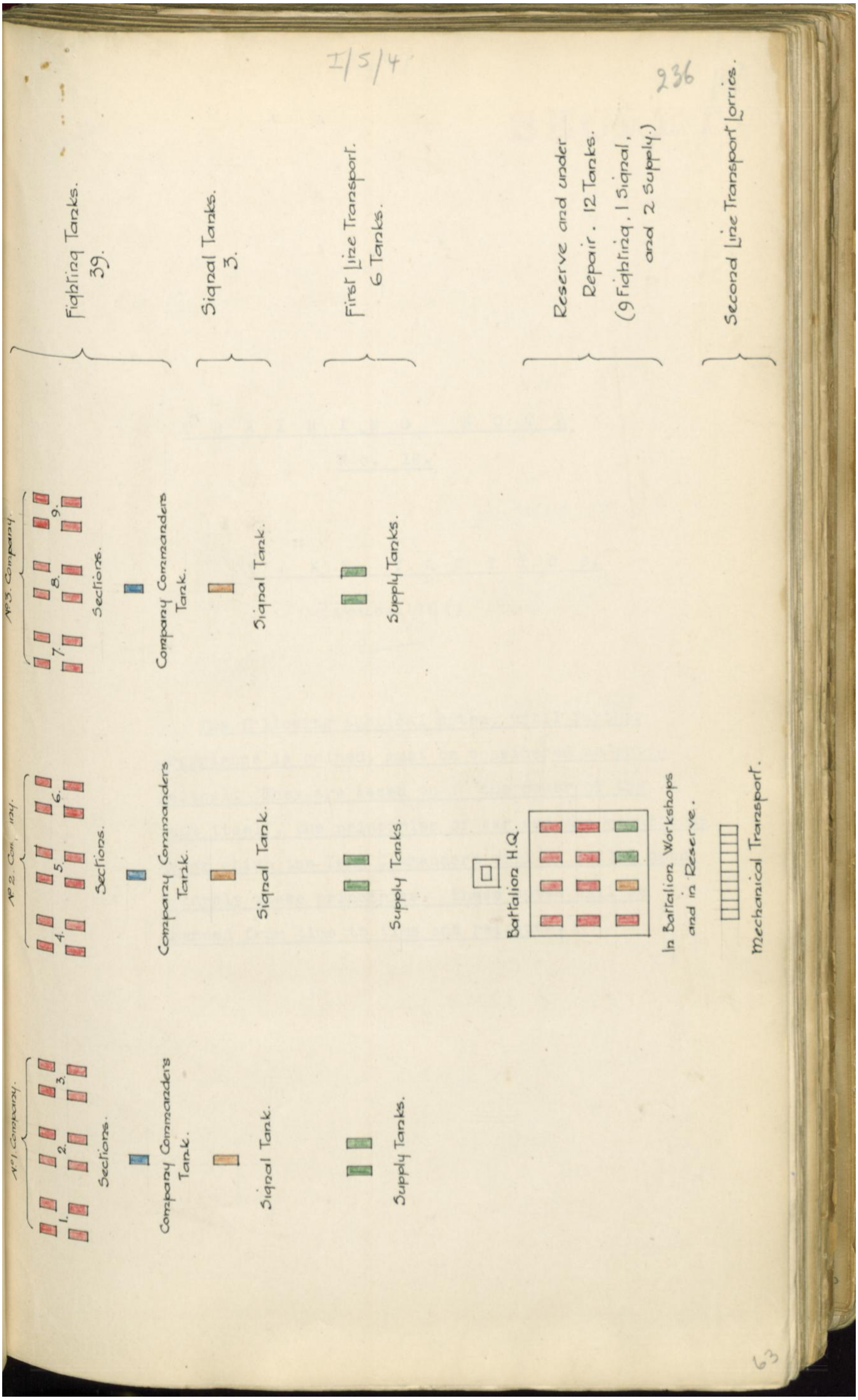
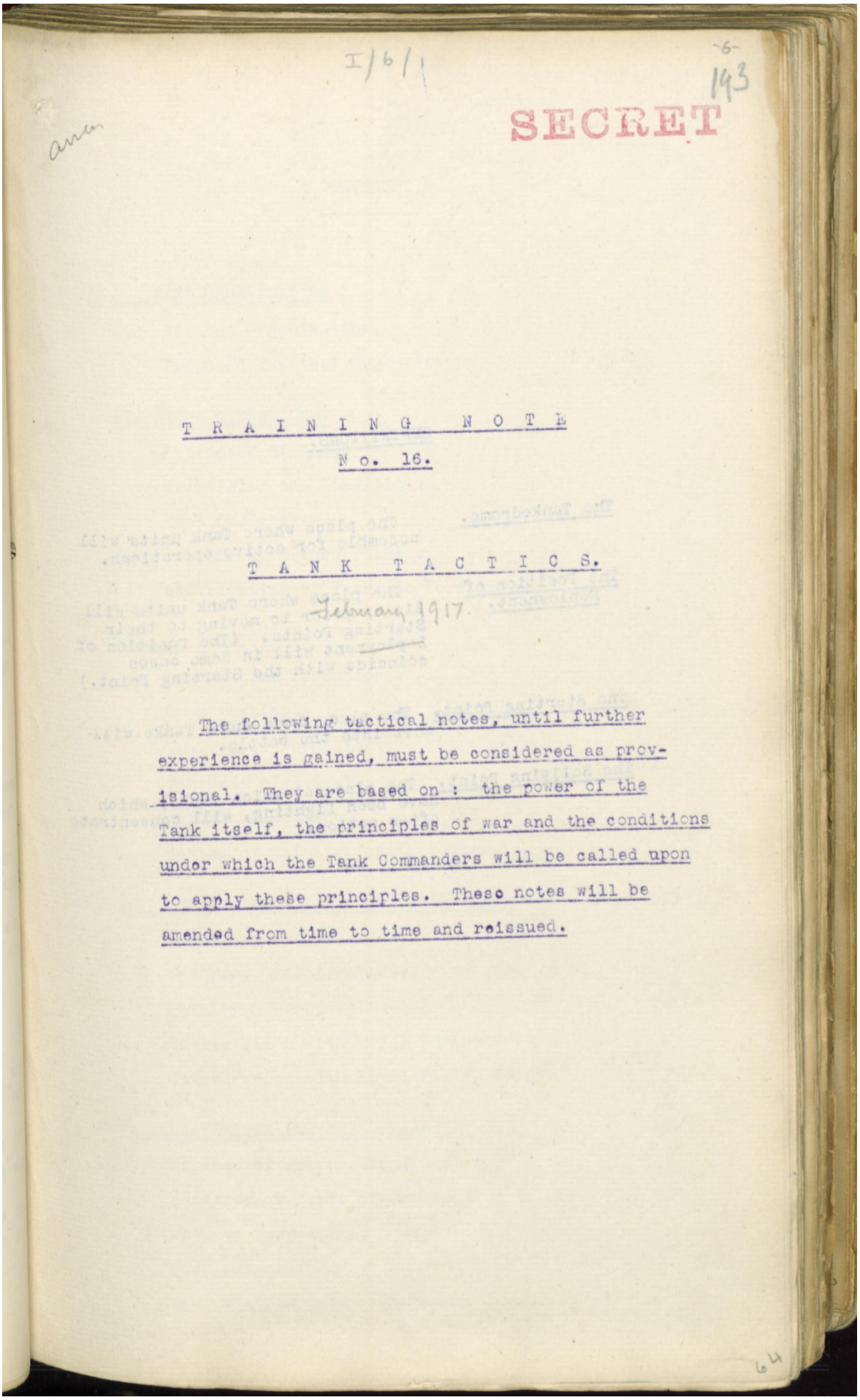
KING'S College LONDON The Serving Soldier





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SECRET

T R A I N I N G N O T E

No. 16.

T A N K T A C T I C S.

February 1917.

The following tactical notes, until further experience is gained, must be considered as provisional. They are based on : the power of the Tank itself, the principles of war and the conditions under which the Tank Commanders will be called upon to apply these principles. These notes will be amended from time to time and reissued.

Proposed Tactical Organization.

. TANK OPERATIONS. 2.

Character of Tank.

Principles and Conditions.

Tank Objectives.

Mopping up Strong Points.

Distribution of Tanks to Formations.

II. TANK TACTICS. 7.

Tank Battle Formations.

Tank Tactics.

The Triple Formation.

The Unit of Attack.

Anti-Tank Tactics.

Action of Infantry against Tanks.

V. TANK CO-OPERATION WITH OTHER ARMS. 10

Artillery Co-operation.

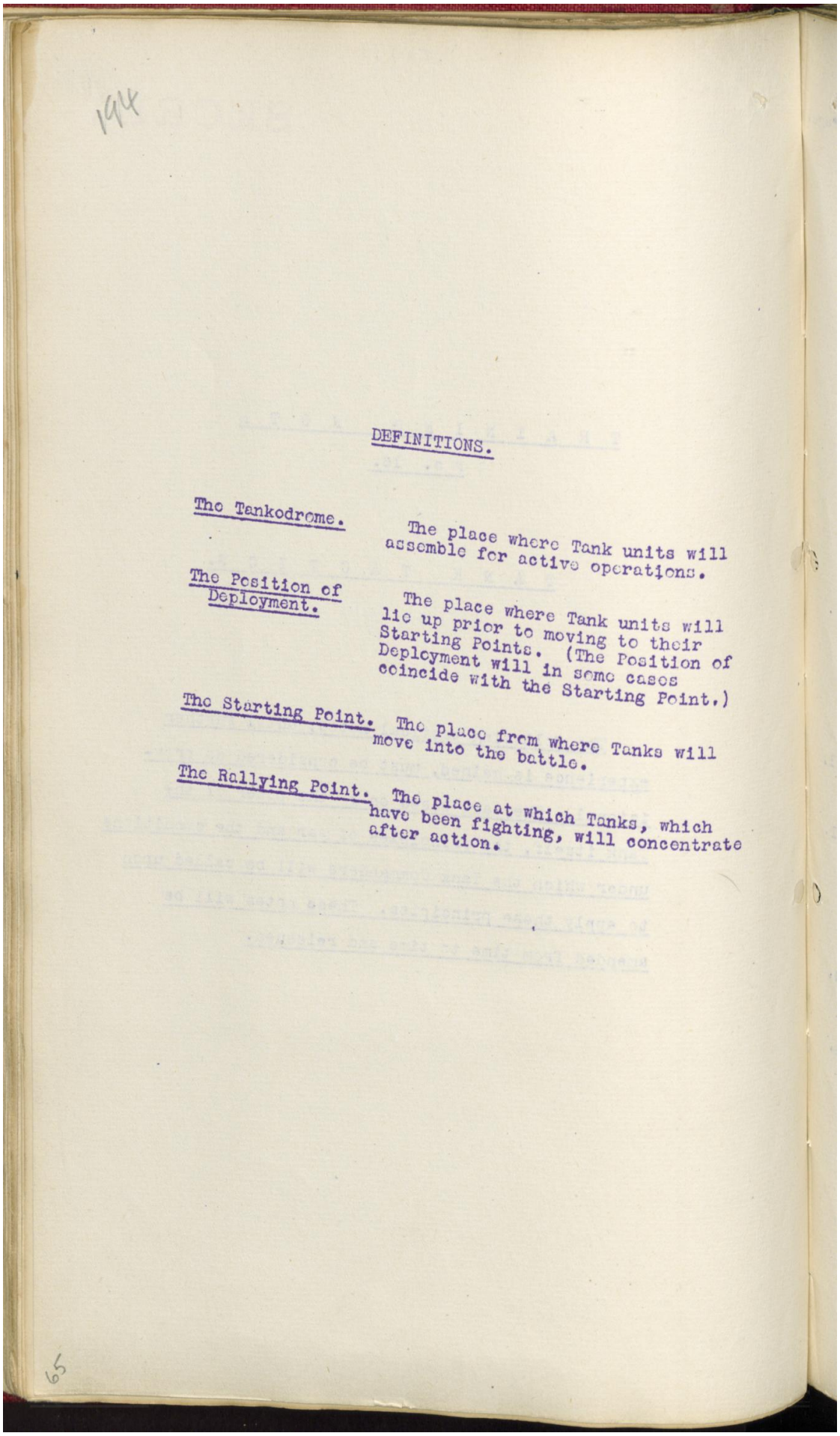
Infantry Co-operation.

Cavalry Co-operation.

Co-operation with Royal Engineers.

Co-operation with Royal Flying Corps.

. PREPARATIONS FOR THE OFFENSIVE. 1



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DEFINITIONS.

The Tankodrome. The place where Tank units will assemble for active operations.

The Position of Deployment. The place where Tank units will lie up prior to moving to their Starting Points. (The Position of Deployment will in some cases coincide with the Starting Point.)

The Starting Point. The place from where Tanks will move into the battle.

The Rallying Point. The place at which Tanks, which have been fighting, will concentrate after action.

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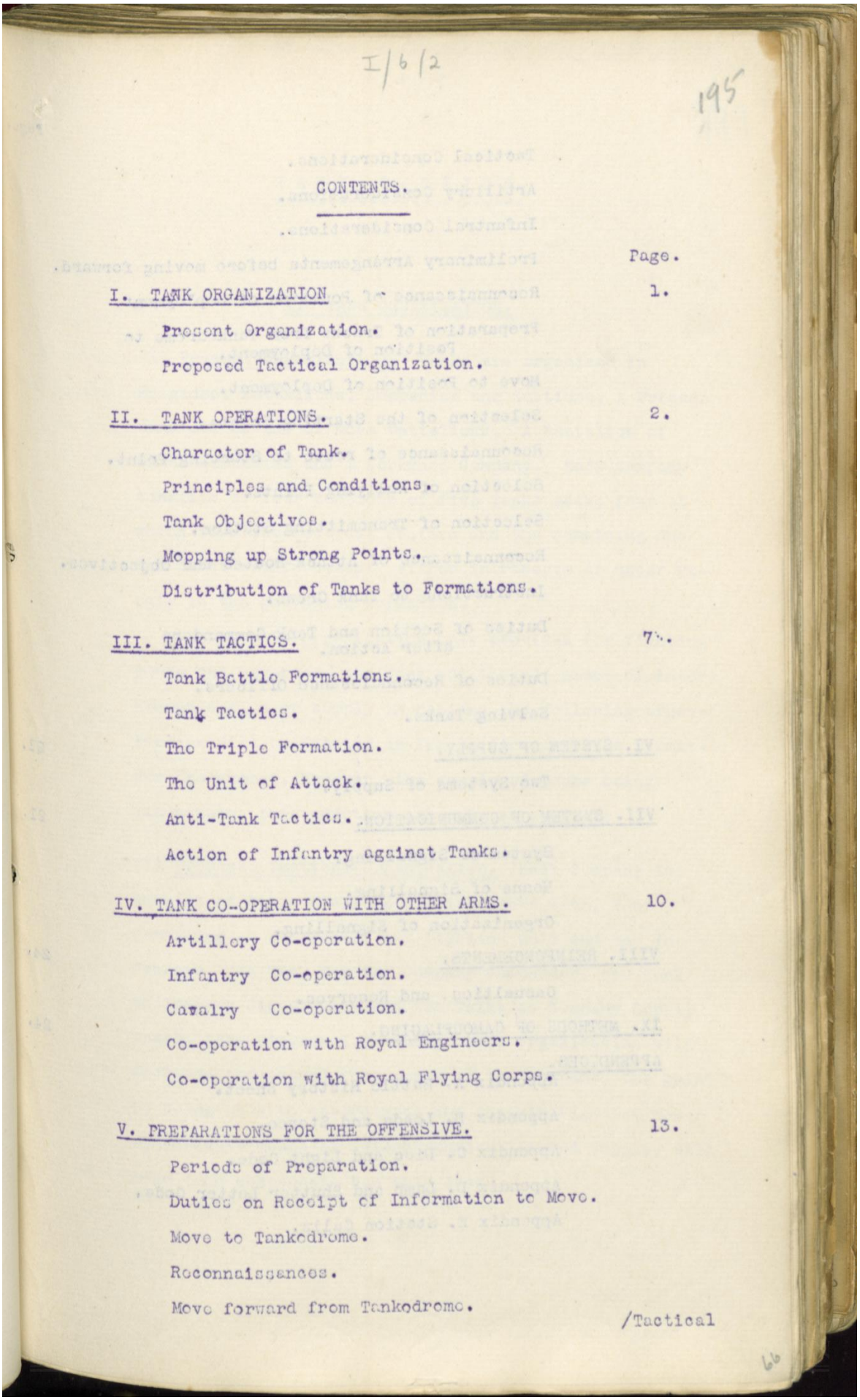

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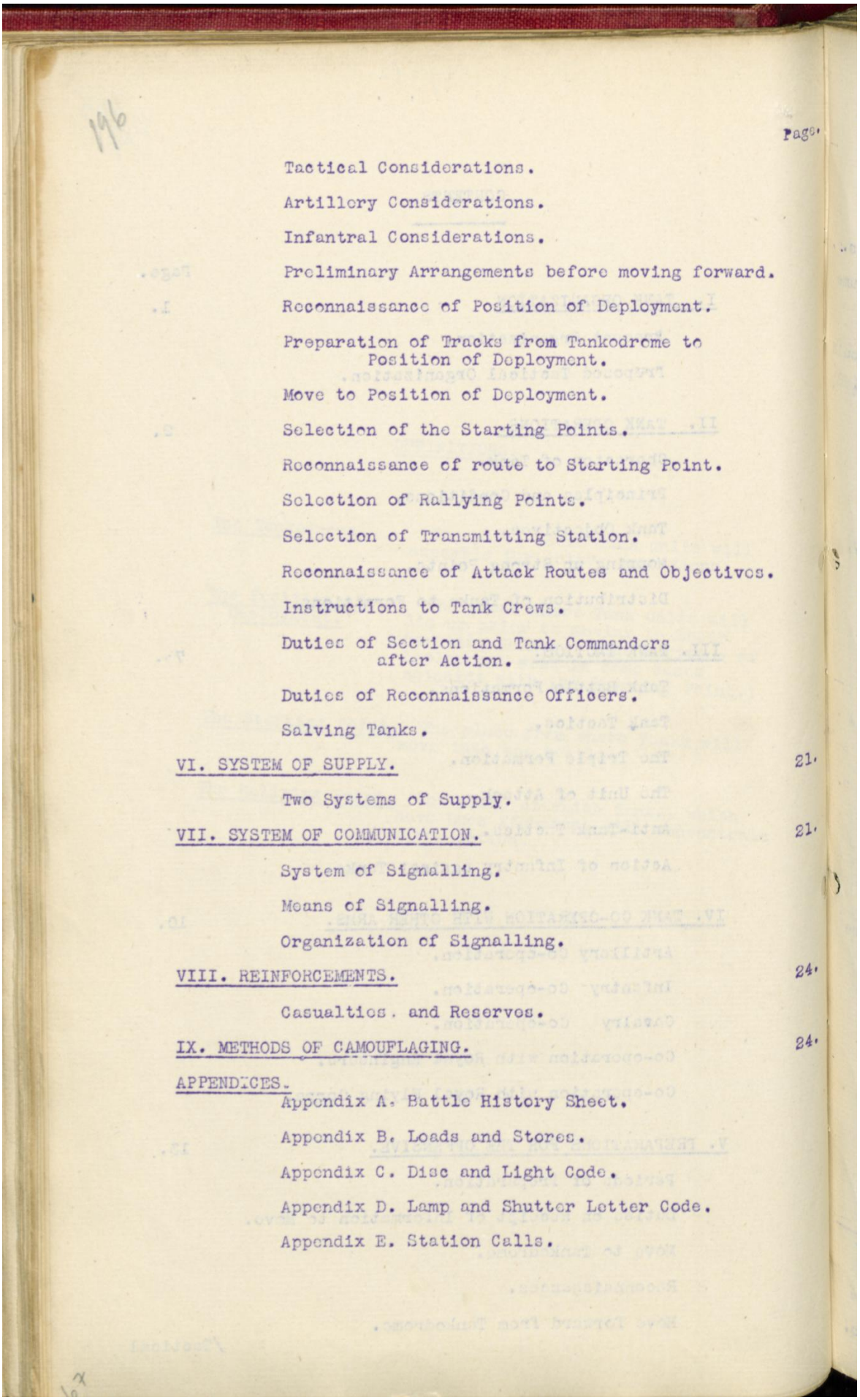
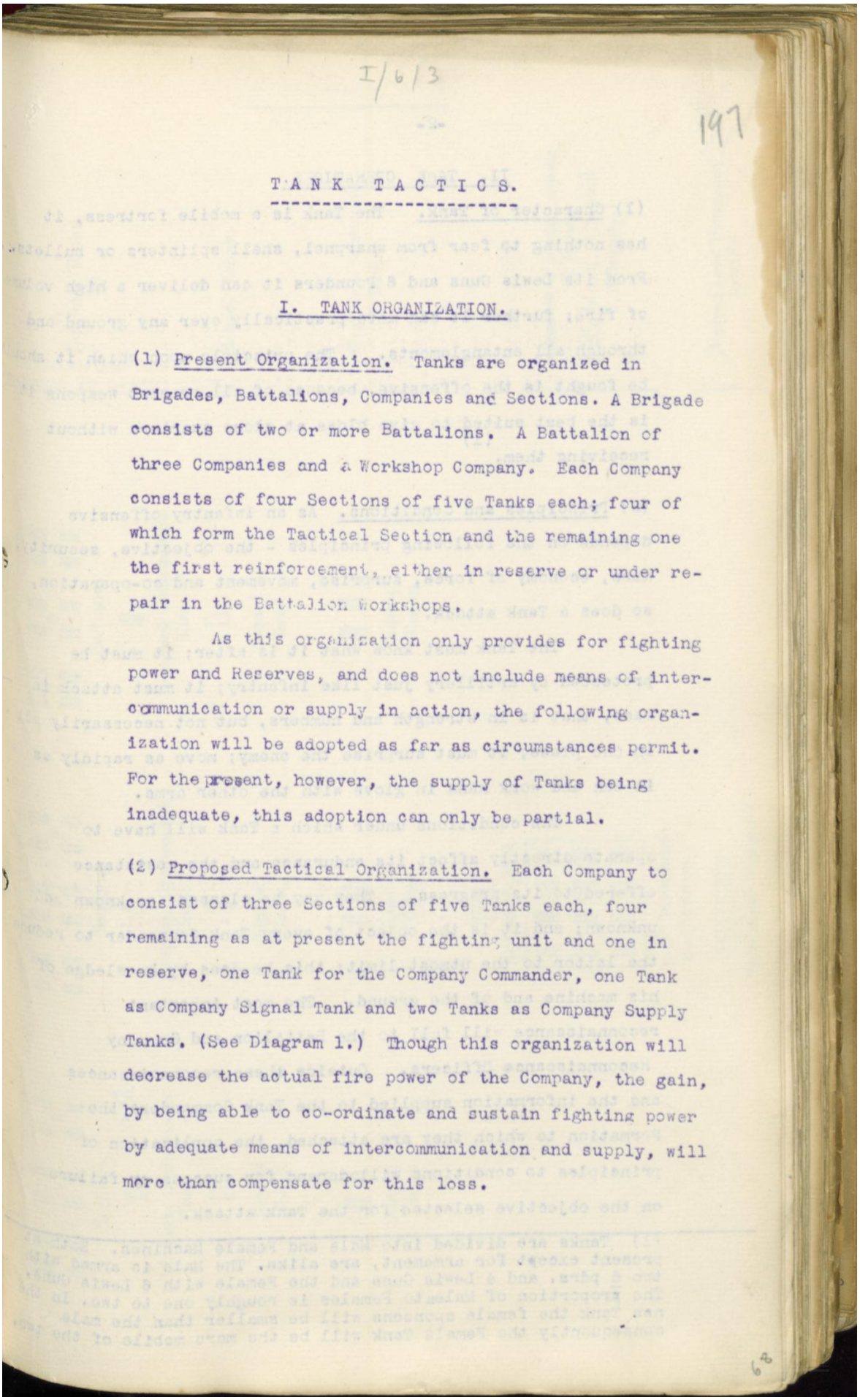
/Tactical





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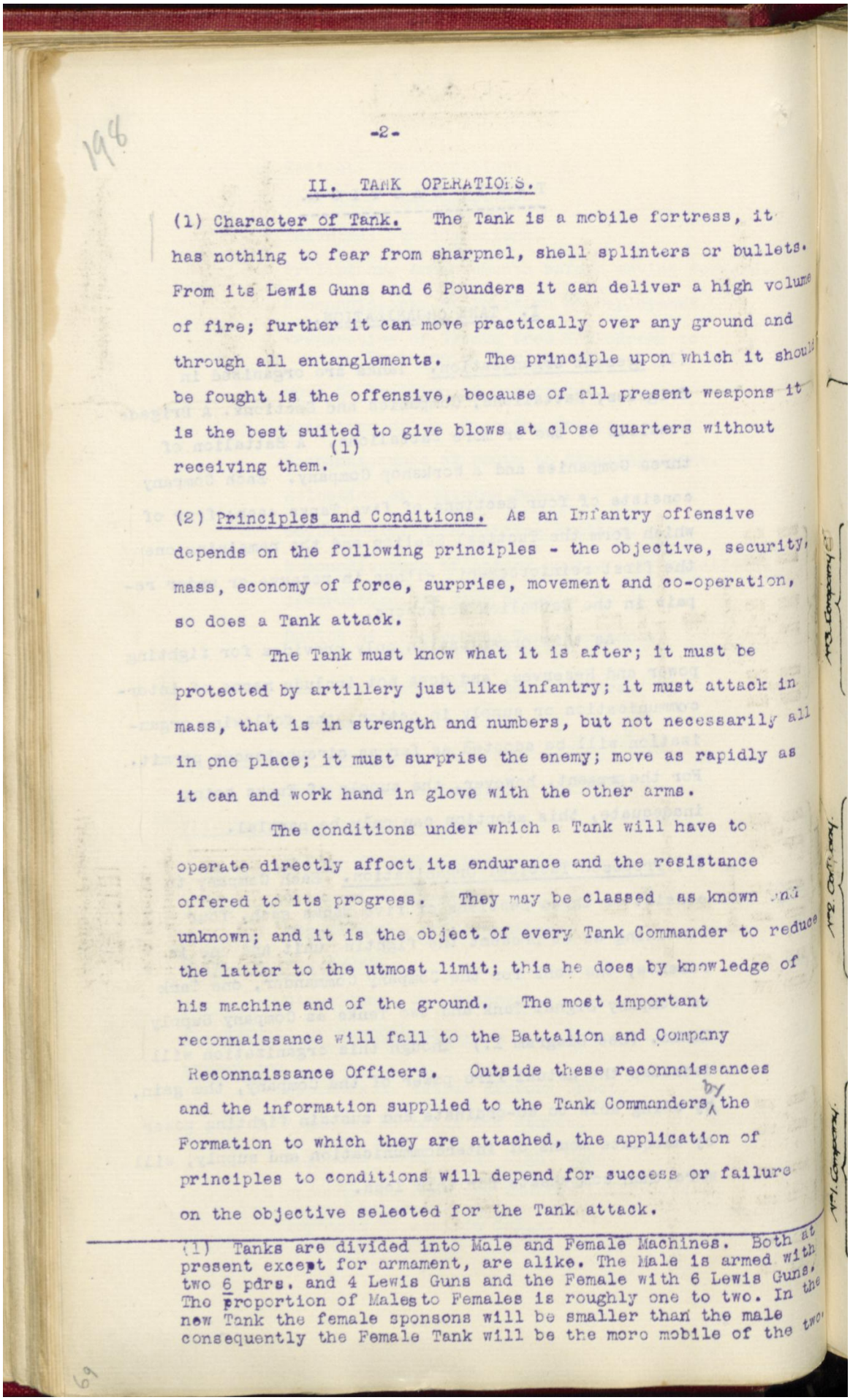
TANK TACTICS.

I. TANK ORGANIZATION.

(1) Present Organization. Tanks are organized in Brigades, Battalions, Companies and Sections. A Brigade consists of two or more Battalions. A Battalion of three Companies and a Workshop Company. Each Company consists of four Sections of five Tanks each; four of which form the Tactical Section and the remaining one the first reinforcement, either in reserve or under repair in the Battalion Workshops.

As this organization only provides for fighting power and Reserves, and does not include means of intercommunication or supply in action, the following organization will be adopted as far as circumstances permit. For the present, however, the supply of Tanks being inadequate, this adoption can only be partial.

(2) Proposed Tactical Organization. Each Company to consist of three Sections of five Tanks each, four remaining as at present the fighting unit and one in reserve, one Tank for the Company Commander, one Tank as Company Signal Tank and two Tanks as Company Supply Tanks. (See Diagram 1.) Though this organization will decrease the actual fire power of the Company, the gain, by being able to co-ordinate and sustain fighting power by adequate means of intercommunication and supply, will more than compensate for this loss.



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II. TANK OPERATIONS.

(1) Character of Tank. The Tank is a mobile fortress, it has nothing to fear from sharpnel, shell splinters or bullets. From its Lewis Guns and 6 Pounders it can deliver a high volume of fire; further it can move practically over any ground and through all entanglements. The principle upon which it should be fought is the offensive, because of all present weapons it is the best suited to give blows at close quarters without receiving them. (1)

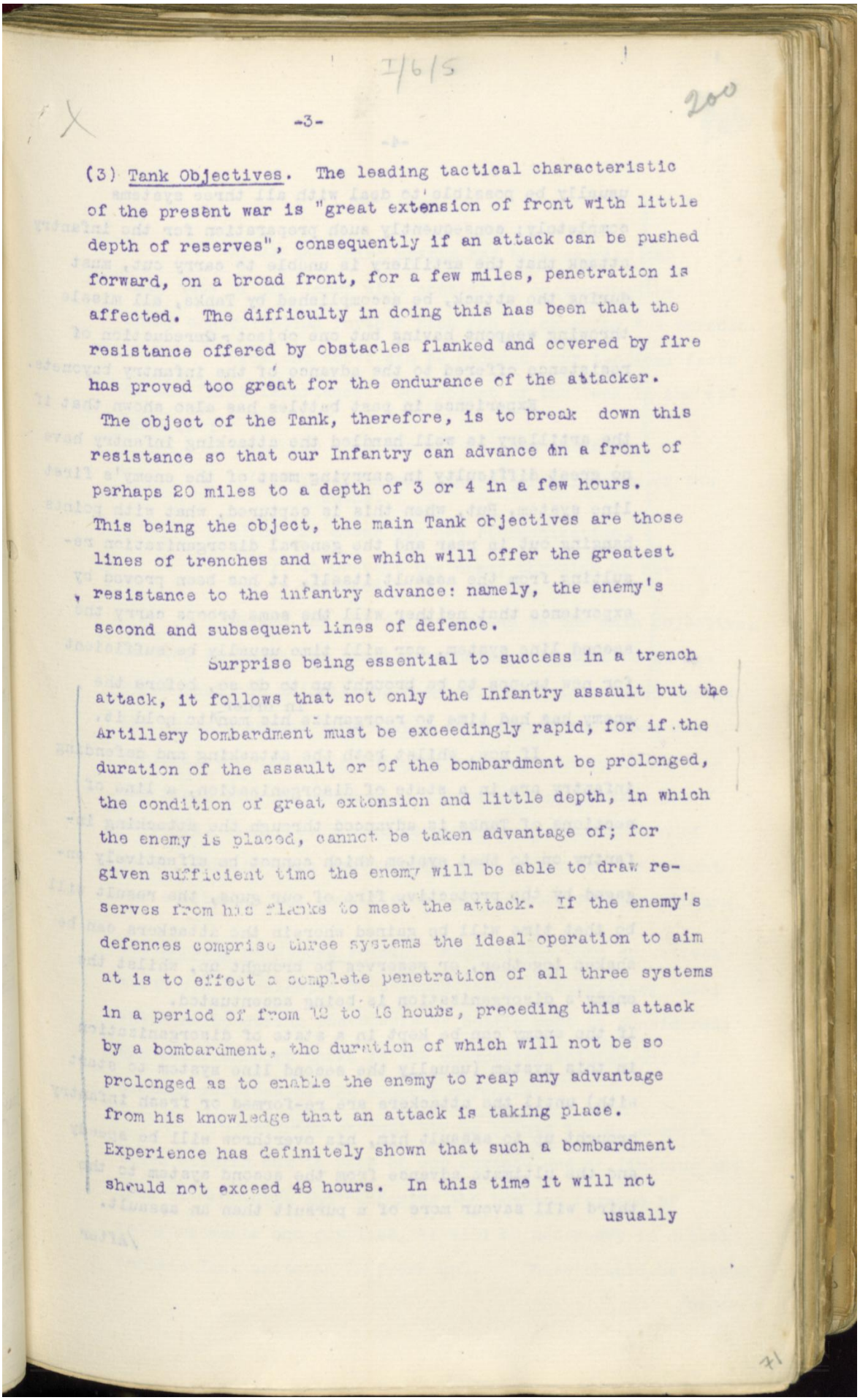
(2) Principles and Conditions. As an Infantry offensive depends on the following principles - the objective, security, mass, economy of force, surprise, movement and co-operation, so does a Tank attack.

The Tank must know what it is after; it must be protected by artillery just like infantry; it must attack in mass, that is in strength and numbers, but not necessarily all in one place; it must surprise the enemy; move as rapidly as it can and work hand in glove with the other arms.

The conditions under which a Tank will have to operate directly affect its endurance and the resistance offered to its progress. They may be classed as known and unknown; and it is the object of every Tank Commander to reduce the latter to the utmost limit; this he does by knowledge of his machine and of the ground. The most important reconnaissance will fall to the Battalion and Company Reconnaissance Officers. Outside these reconnaissances and the information supplied to the Tank Commanders by the Formation to which they are attached, the application of principles to conditions will depend for success or failure on the objective selected for the Tank attack.

(1) Tanks are divided into Male and Female Machines. Both at present except for armament, are alike. The Male is armed with two 6 pdrs. and 4 Lewis Guns and the Female with 6 Lewis Guns. The proportion of Males to Females is roughly one to two. In the new Tank the female sponsons will be smaller than the male consequently the Female Tank will be the more mobile of the two.

I/6/4
DIAGRAM 1.
199
No. 1 Company.
No. 2 Company.
No. 3 Company.
Sections.
Company Commanders Tank.
Signal Tank.
Supply Tanks.
Battalion H.Q.
In Bn. Workshops & in reserve.
Mechanical Transport.
Fighting Tanks. 39.
Signal Tanks. 3.
First Line Transport 6 Tanks.
Reserve & under repair 12 Tanks. (9 Fighting, 1 Signal & 2 Supply.)
Second Line Transport Lorries.
10



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(3) Tank Objectives. The leading tactical characteristic of the present war is "great extension of front with little depth of reserves", consequently if an attack can be pushed forward, on a broad front, for a few miles, penetration is affected. The difficulty in doing this has been that the resistance offered by obstacles flanked and covered by fire has proved too great for the endurance of the attacker.

The object of the Tank, therefore, is to break down this resistance so that our Infantry can advance on a front of perhaps 20 miles to a depth of 3 or 4 in a few hours. This being the object, the main Tank objectives are those lines of trenches and wire which will offer the greatest resistance to the infantry advance: namely, the enemy's second and subsequent lines of defence.

Surprise being essential to success in a trench attack, it follows that not only the Infantry assault but the Artillery bombardment must be exceedingly rapid, for if the duration of the assault or of the bombardment be prolonged, the condition of great extension and little depth, in which the enemy is placed, cannot be taken advantage of; for given sufficient time the enemy will be able to draw reserves from his flanks to meet the attack. If the enemy's defences comprise three systems the ideal operation to aim at is to effect a complete penetration of all three systems in a period of from 12 to 16 hours, preceding this attack by a bombardment, the duration of which will not be so prolonged as to enable the enemy to reap any advantage from his knowledge that an attack is taking place. Experience has definitely shown that such a bombardment should not exceed 48 hours. In this time it will not usually

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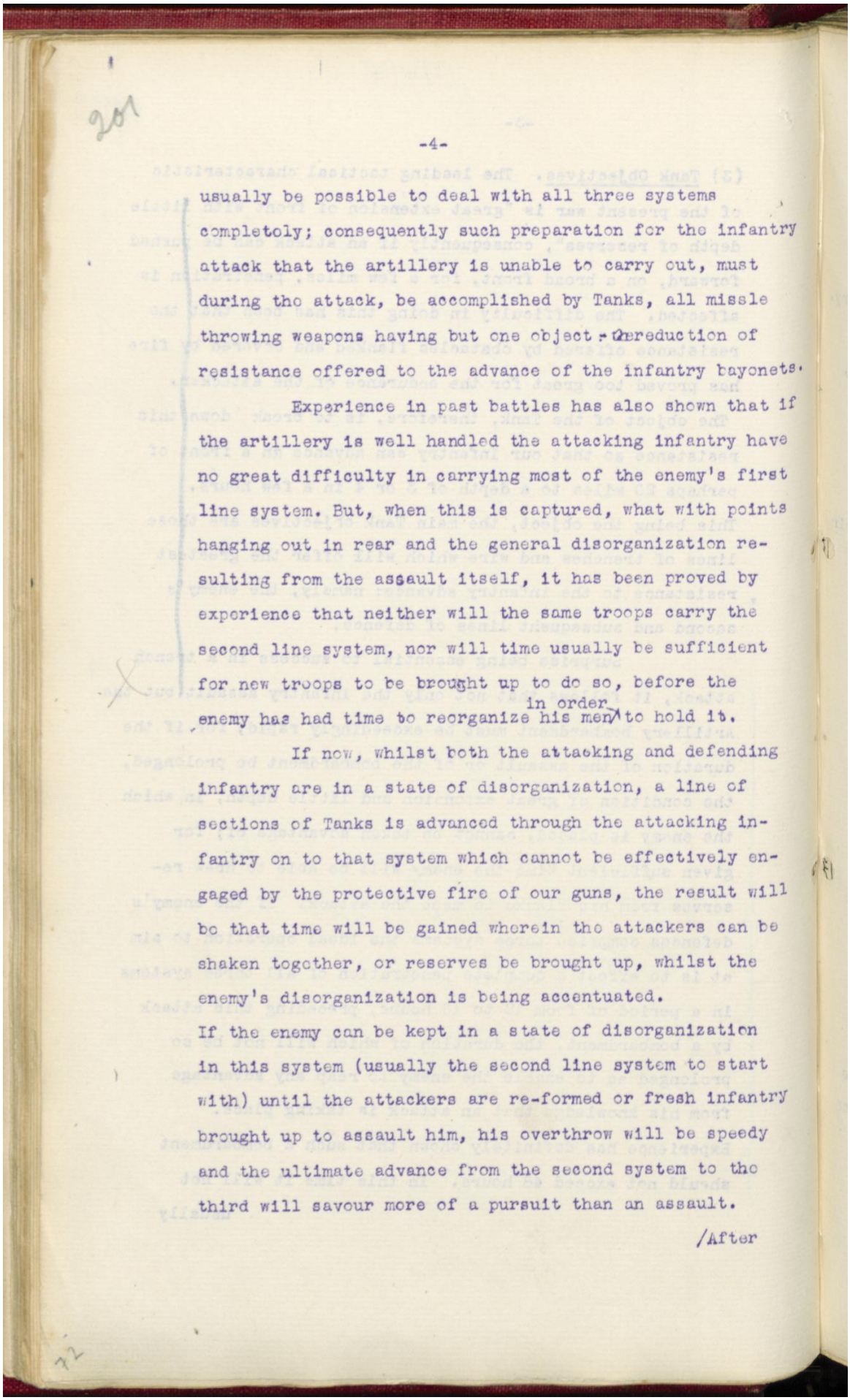
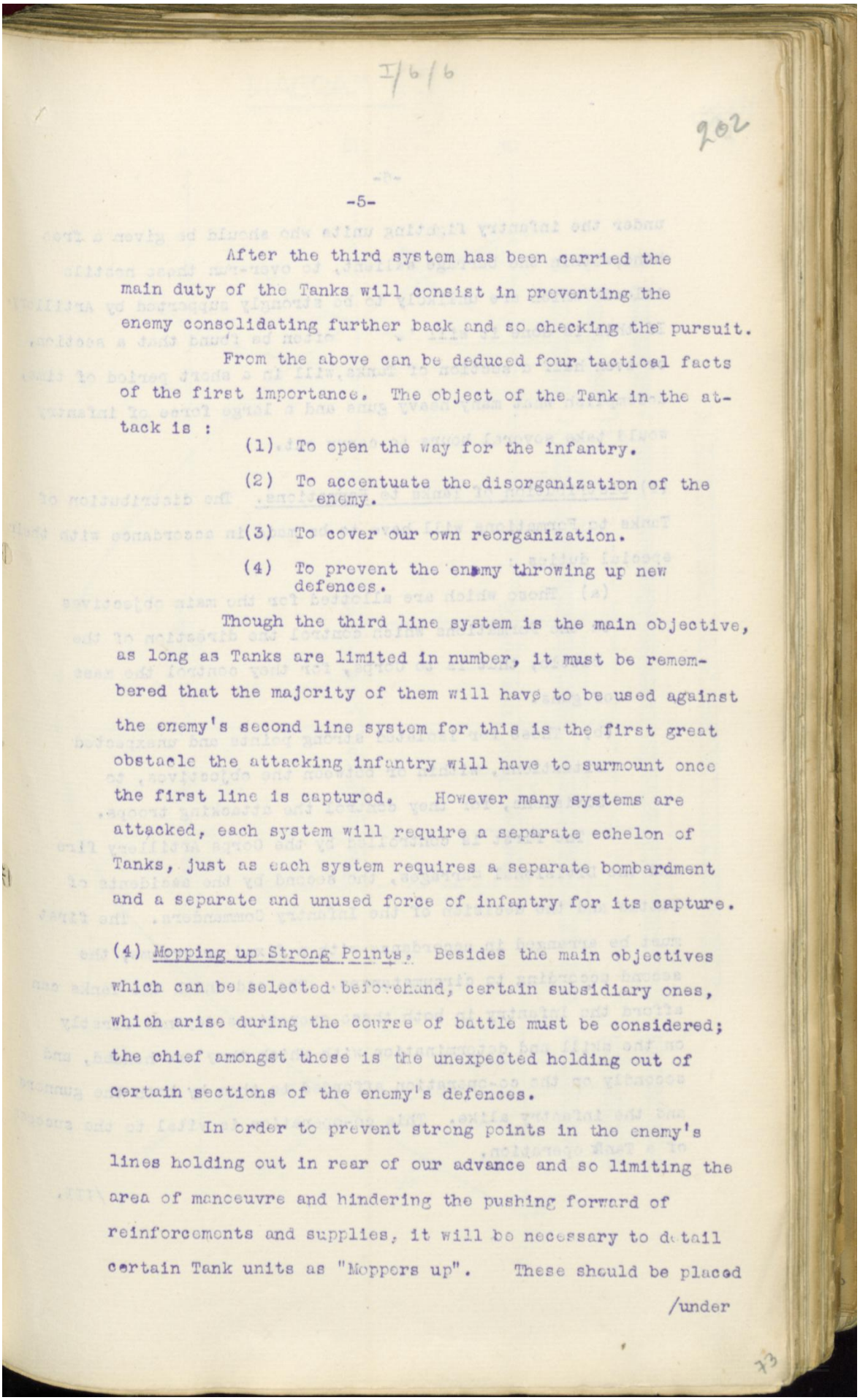


usually be possible to deal with all three systems completoly; consequently such preparation for the infantry attack that the artillery is unable to carry out, must during the attack, be accomplished by Tanks, all missle throwing weapons having but one object - the reduction of resistance offered to the advance of the infantry bayonets.

Experience in past battles has also shown that if the artillery is well handled the attacking infantry have no great difficulty in carrying most of the enemy's first line system. But, when this is captured, what with points hanging out in rear and the general disorganization resulting from the assault itself, it has been proved by experience that neither will the same troops carry the second line system, nor will time usually be sufficient for new troops to be brought up to do so, before the enemy has had time to reorganize his men in order to hold it.

If now, whilst both the attacking and defending infantry are in a state of disorganization, a line of sections of Tanks is advanced through the attacking infantry on to that system which cannot be effectively engaged by the protective fire of our guns, the result will be that time will be gained wherein the attackers can be shaken together, or reserves be brought up, whilst the enemy's disorganization is being accentuated.
If the enemy can be kept in a state of disorganization in this system (usually the second line system to start with) until the attackers are re-formed or fresh infantry brought up to assault him, his overthrow will be speedy and the ultimate advance from the second system to the third will savour more of a pursuit than an assault.

/After



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After the third system has been carried the main duty of the Tanks will consist in preventing the enemy consolidating further back and so checking the pursuit.

From the above can be deduced four tactical facts of the first importance. The object of the Tank in the attack is :

(1) To open the way for the infantry.

(2) To accentuate the disorganization of the enemy.

(3) To cover our own reorganization.

(4) To prevent the enemy throwing up new defences.

Though the third line system is the main objective, as long as Tanks are limited in number, it must be remembered that the majority of them will have to be used against the enemy's second line system for this is the first great obstacle the attacking infantry will have to surmount once the first line is captured. However many systems are attacked, each system will require a separate echelon of Tanks, just as each system requires a separate bombardment and a separate and unused force of infantry for its capture.

(4) Mopping up Strong Points. Besides the main objectives which can be selected beforehand, certain subsidiary ones, which arise during the course of battle must be considered; the chief amongst these is the unexpected holding out of certain sections of the enemy's defences.

In order to prevent strong points in the enemy's lines holding out in rear of our advance and so limiting the area of manoeuvre and hindering the pushing forward of reinforcements and supplies, it will be necessary to detail certain Tank units as "Moppers up". These should be placed

/under

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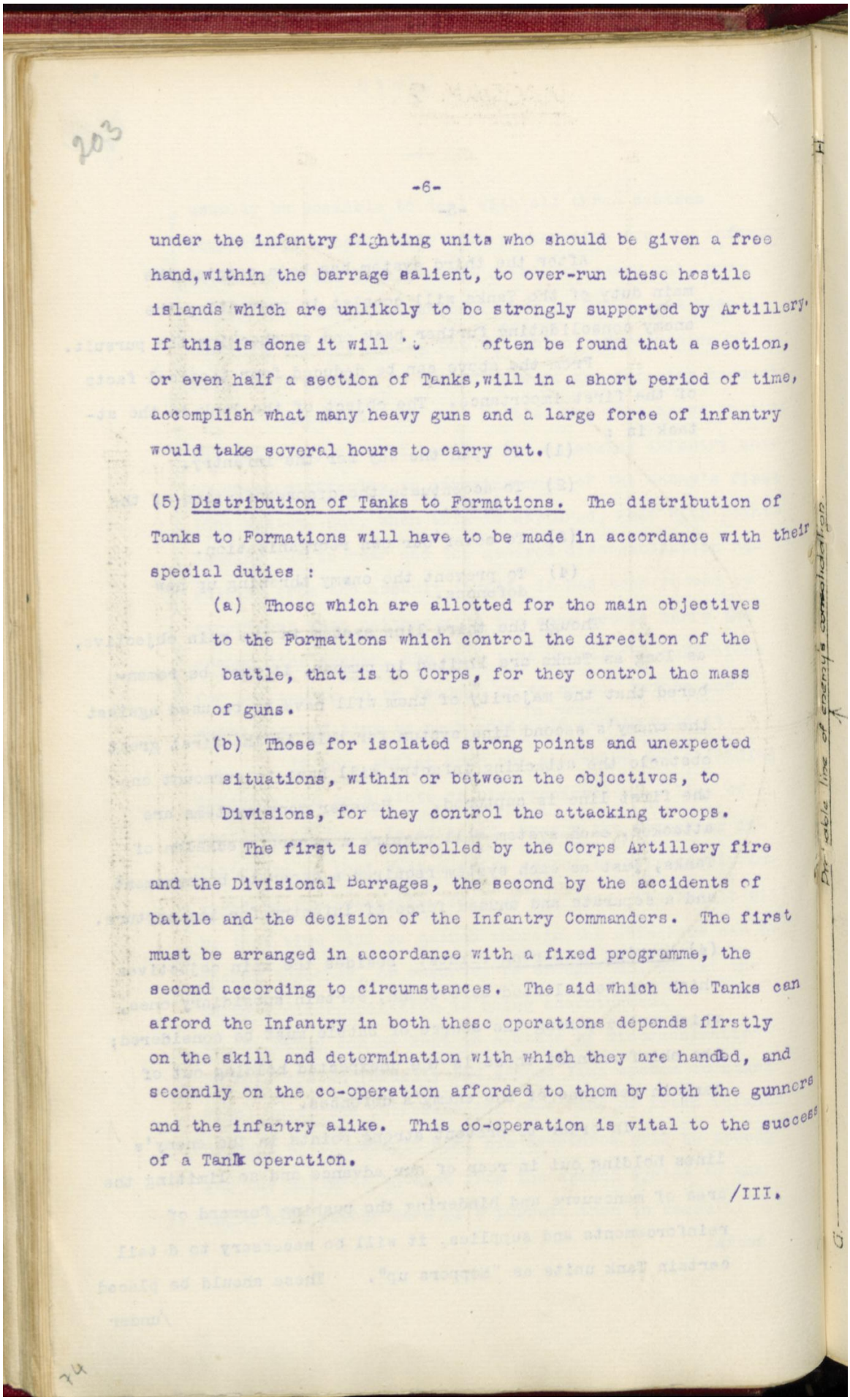

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under the infantry fighting units who should be given a free hand, within the barrage salient, to over-run these hostile islands which are unlikely to be strongly supported by Artillery. If this is done it will often be found that a section, or even half a section of Tanks, will in a short period of time, accomplish what many heavy guns and a large force of infantry would take several hours to carry out.

(5) Distribution of Tanks to Formations. The distribution of Tanks to Formations will have to be made in accordance with their special duties :

(a) Those which are allotted for the main objectives to the Formations which control the direction of the battle, that is to Corps, for they control the mass of guns.

(b) Those for isolated strong points and unexpected situations, within or between the objectives, to Divisions, for they control the attacking troops.

The first is controlled by the Corps Artillery fire and the Divisional Barrages, the second by the accidents of battle and the decision of the Infantry Commanders. The first must be arranged in accordance with a fixed programme, the second according to circumstances. The aid which the Tanks can afford the Infantry in both these operations depends firstly on the skill and determination with which they are handled, and secondly on the co-operation afforded to them by both the gunners and the infantry alike. This co-operation is vital to the success of a Tank operation.

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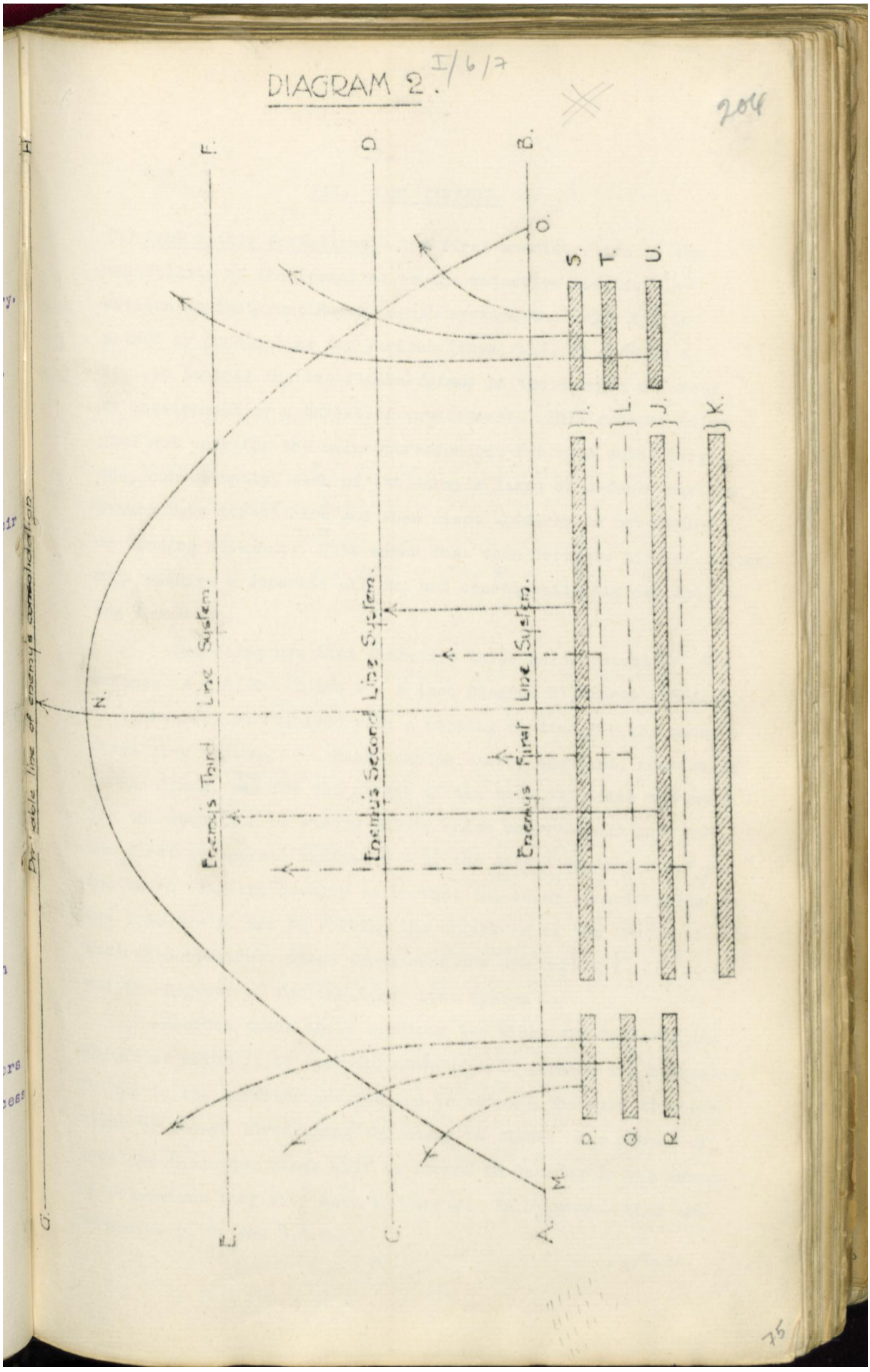
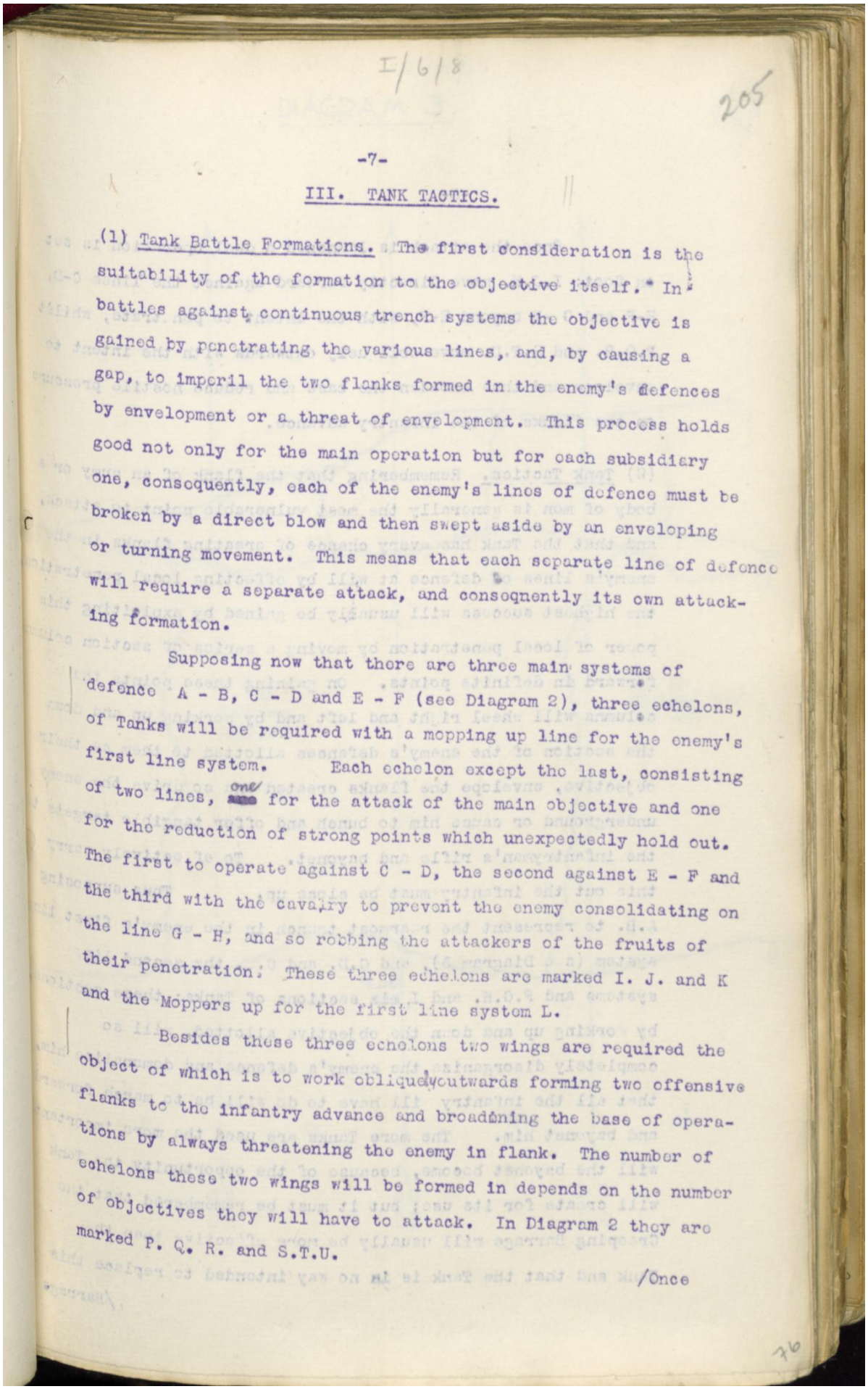


DIAGRAM 2.
I/617
204
H.
F.
D.
B.
O.
S.
T.
U.
V.
L.
J.
K.
N.
Enemy's Third Line System.
Enemy's Second Line System.
Enemy's Final Line System.
Practicable line of enemy's consolidation.
G.
P.
Q.
R.
M.
E.
C.
A.
75



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III. TANK TACTICS.

(1) Tank Battle Formations. The first consideration is the suitability of the formation to the objective itself. In battles against continuous trench systems the objective is gained by penetrating the various lines, and, by causing a gap, to imperil the two flanks formed in the enemy's defences by envelopment or a threat of envelopment. This process holds good not only for the main operation but for each subsidiary one, consequently, each of the enemy's lines of defence must be broken by a direct blow and then swept aside by an enveloping or turning movement. This means that each separate line of defence will require a separate attack, and consequently its own attacking formation.

Supposing now that there are three main systems of defence A - B, C - D and E - F (see Diagram 2), three echelons, of Tanks will be required with a mopping up line for the enemy's first line system. Each echelon except the last, consisting of two lines, one for the attack of the main objective and one for the reduction of strong points which unexpectedly hold out. The first to operate against C - D, the second against E - F and the third with the cavalry to prevent the enemy consolidating on the line G - H, and so robbing the attackers of the fruits of their penetration. These three echelons are marked I. J. and K and the Moppers up for the first line system L.

Besides these three echelons two wings are required the object of which is to work obliquely outwards forming two offensive flanks to the infantry advance and broadening the base of operations by always threatening the enemy in flank. The number of echelons these two wings will be formed in depends on the number of objectives they will have to attack. In Diagram 2 they are marked P. Q. R. and S.T.U.

/Once

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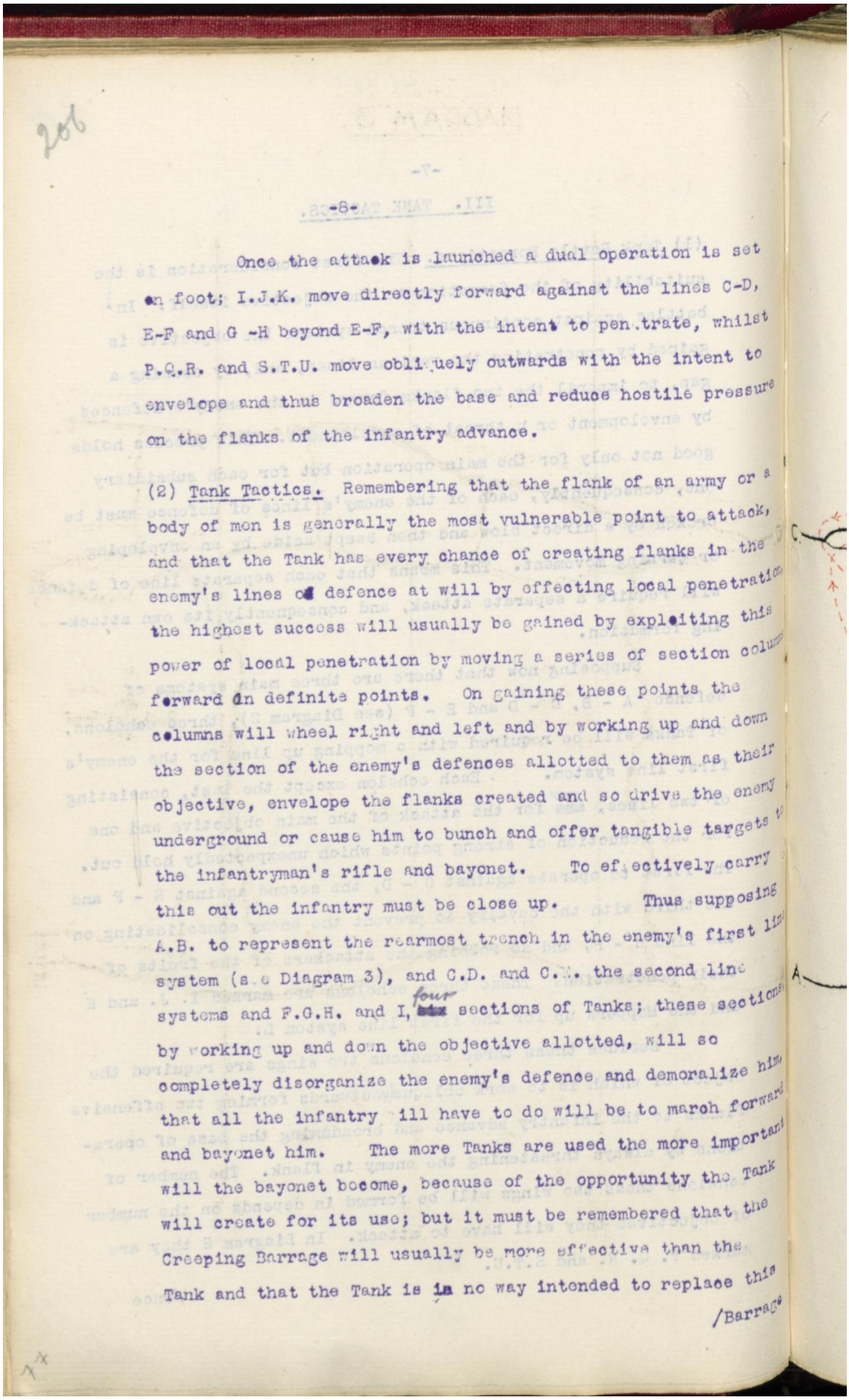

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Once the attack is launched a dual operation is set on foot; I.J.K. move directly forward against the lines C-D, E-F and G -H beyond E-F, with the intent to pen.trate, whilst P.Q.R. and S.T.U. move obliquely outwards with the intent to envelope and thus broaden the base and reduce hostile pressure on the flanks of the infantry advance.

(2) Tank Tactics. Remembering that the flank of an army or a body of men is generally the most vulnerable point to attack, and that the Tank has every chance of creating flanks in the enemy's lines of defence at will by effecting local penetration, the highest success will usually be gained by exploiting this power of local penetration by moving a series of section columns forward on definite points. On gaining these points the columns will wheel right and left and by working up and down the section of the enemy's defences allotted to them as their objective, envelope the flanks created and so drive the enemy underground or cause him to bunch and offer tangible targets to the infantryman's rifle and bayonet. To effectively carry this out the infantry must be close up. Thus supposing A.B. to represent the rearmost trench in the enemy's first line system (s e Diagram 3), and C.D. and C.. the second line systems and F.G.H. and I, four sections of Tanks; these sections by working up and down the objective allotted, will so completely disorganize the enemy's defence and demoralize him, that all the infantry ill have to do will be to march forward and bayonet him. The more Tanks are used the more important will the bayonet become, because of the opportunity the Tank will create for its use; but it must be remembered that the Creeping Barrage will usually be more effective than the Tank and that the Tank is in no way intended to replace this

/Barrage

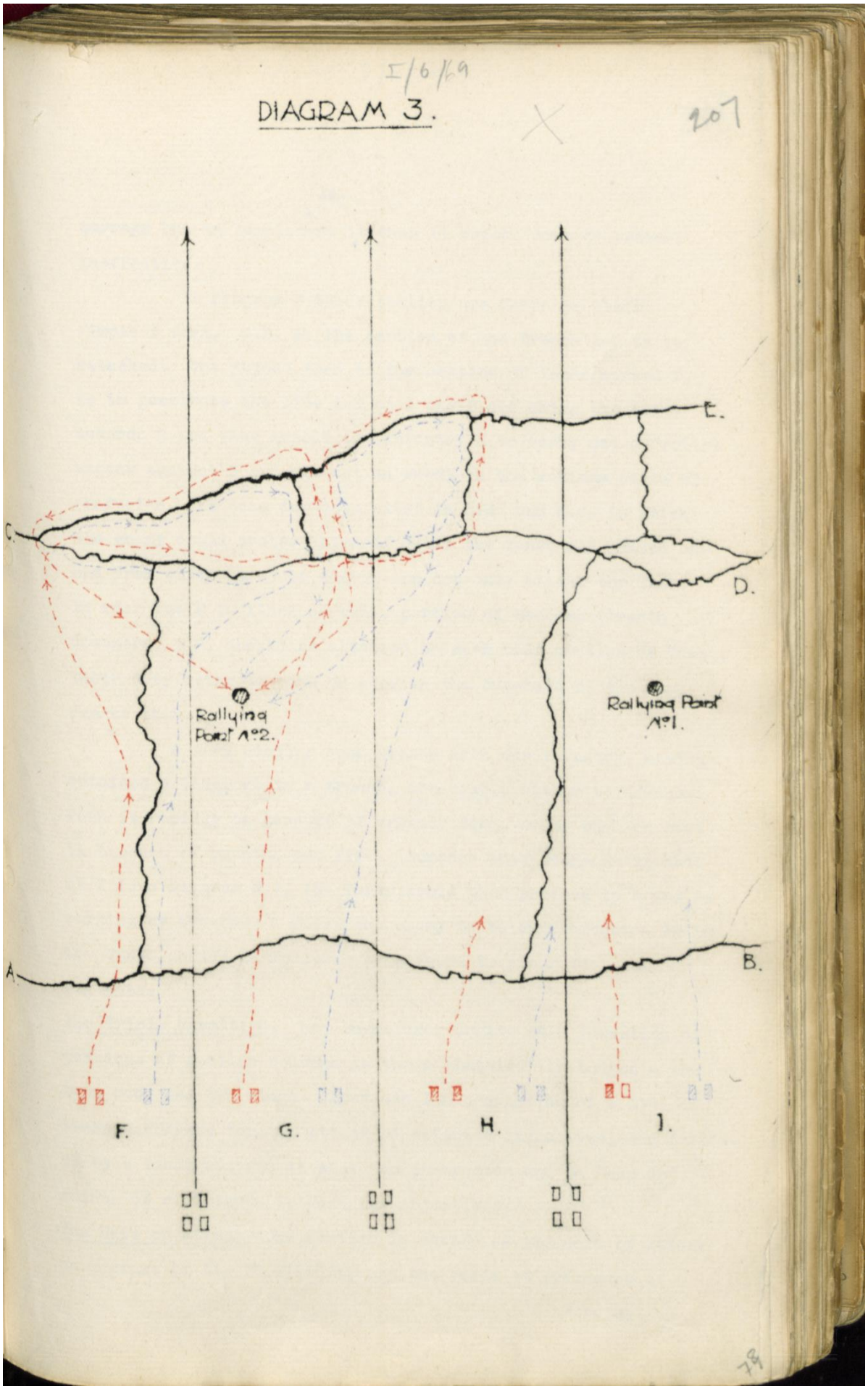
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DIAGRAM 3.
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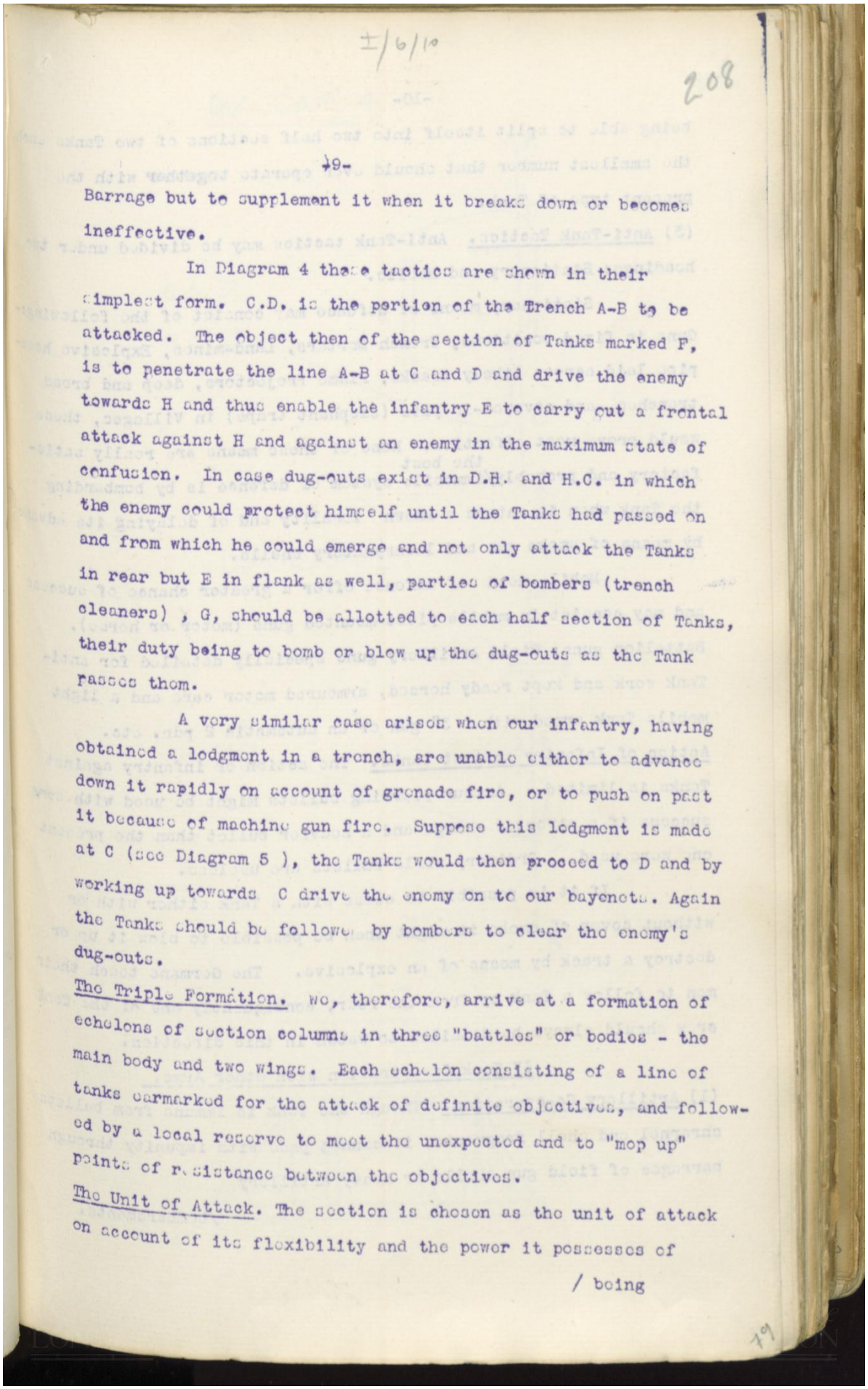
E.
C.
D.
Rallying Point No 2.
Rallying Point No 1.
A.
B.
F.
G.
H.
I.



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Barrage but to supplement it when it breaks down or becomes ineffective.

In Diagram 4 these tactics are shown in their simplest form. C.D. is the portion of the Trench A-B to be attacked. The object then of the section of Tanks marked F, is to penetrate the line A-B at C and D and drive the enemy towards H and thus enable the infantry E to carry out a frontal attack against H and against an enemy in the maximum state of confusion. In case dug-outs exist in D.H. and H.C. in which the enemy could protect himself until the Tanks had passed on and from which he could emerge and not only attack the Tanks in rear but E in flank as well, parties of bombers (trench cleaners) , G, should be allotted to each half section of Tanks, their duty being to bomb or blow up the dug-outs as the Tank passes them.

A very similar case arises when our infantry, having obtained a lodgment in a trench, are unable either to advance down it rapidly on account of grenade fire, or to push on past it because of machine gun fire. Suppose this lodgment is made at C (see Diagram 5), the Tanks would then proceed to D and by working up towards C drive the enemy on to our bayonets. Again the Tanks should be followed by bombers to clear the enemy's dug-outs.

The Triple Formation. We, therefore, arrive at a formation of echelons of section columns in three "battles" or bodies - the main body and two wings. Each echelon consisting of a line of tanks earmarked for the attack of definite objectives, and followed by a local reserve to meet the unexpected and to "mop up" points of resistance between the objectives.

The Unit of Attack. The section is chosen as the unit of attack on account of its flexibility and the power it possesses of

/ being

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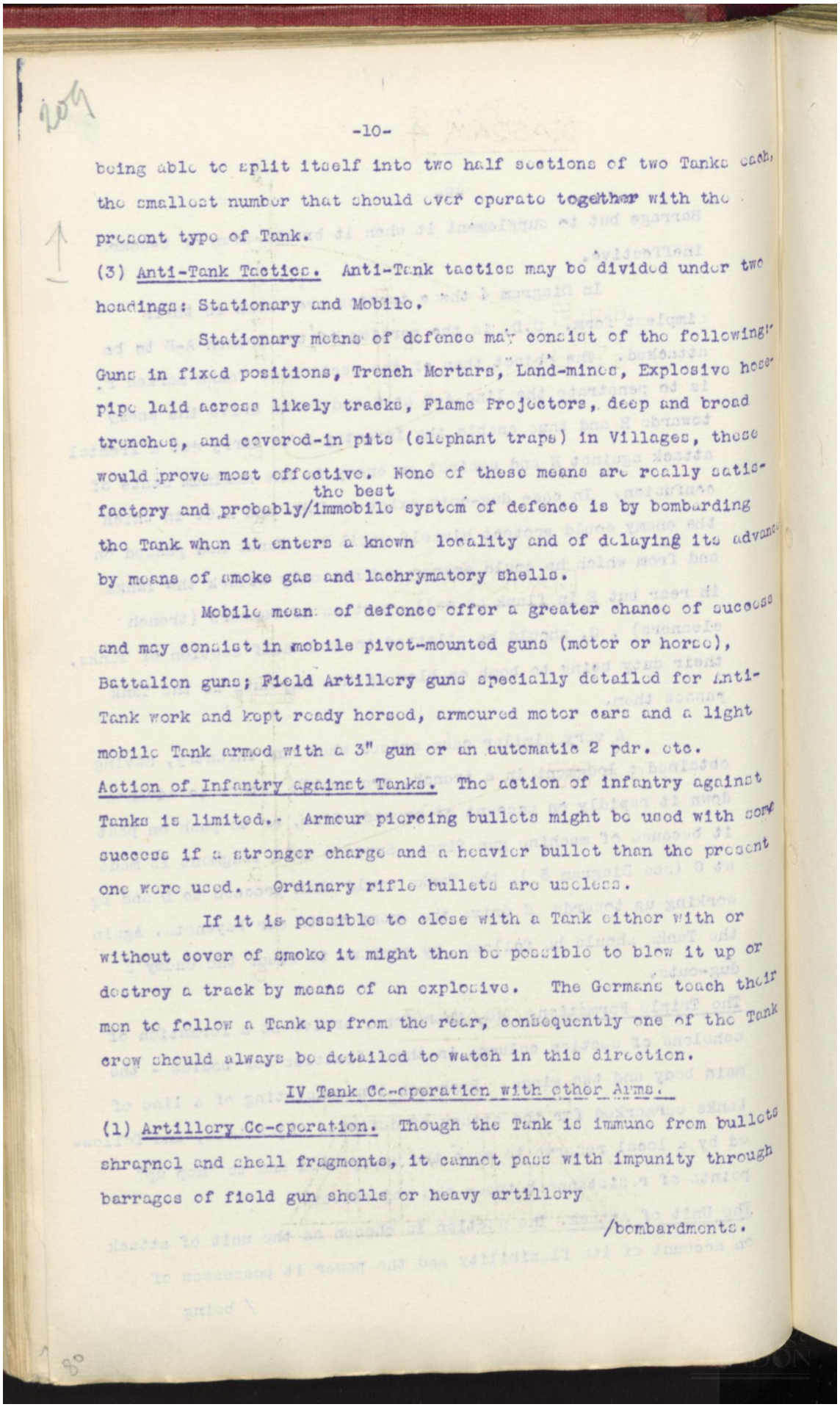

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being able to split itself into two half sections of two Tanks each, the smallest number that should ever operate together with the present type of Tank.

(3) Anti-Tank Tactics. Anti-Tank tactics may be divided under two headings: Stationary and Mobile.

Stationary means of defence may consist of the following:- Guns in fixed positions, Trench Mortars, Land-mines, Explosive hose-pipe laid across likely tracks, Flame Projectors, deep and broad trenches, and covered-in pits (elephant traps) in Villages, these would prove most effective. None of these means are really satisfactory and probably the best immobile system of defence is by bombarding the Tank when it enters a known locality and of delaying its advance by means of smoke gas and lachrymatory shells.

Mobile means of defence offer a greater chance of success and may consist in mobile pivot-mounted guns (motor or horse), Battalion guns; Field Artillery guns specially detailed for Anti-Tank work and kept ready horsed, armoured motor cars and a light mobile Tank armed with a 3" gun or an automatic 2 pdr. etc.

Action of Infantry against Tanks. The action of infantry against Tanks is limited. Armour piercing bullets might be used with some success if a stronger charge and a heavier bullet than the present one were used. Ordinary rifle bullets are useless.

If it is possible to close with a Tank either with or without cover of smoke it might then be possible to blow it up or destroy a track by means of an explosive. The Germans teach their men to follow a Tank up from the rear, consequently one of the Tank crew should always be detailed to watch in this direction.

IV Tank Co-operation with other Arms.

(1) Artillery Co-operation. Though the Tank is immune from bullets shrapnel and shell fragments, it cannot pass with impunity through barrages of field gun shells or heavy artillery

/bombardments.

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DIAGRAM 4.

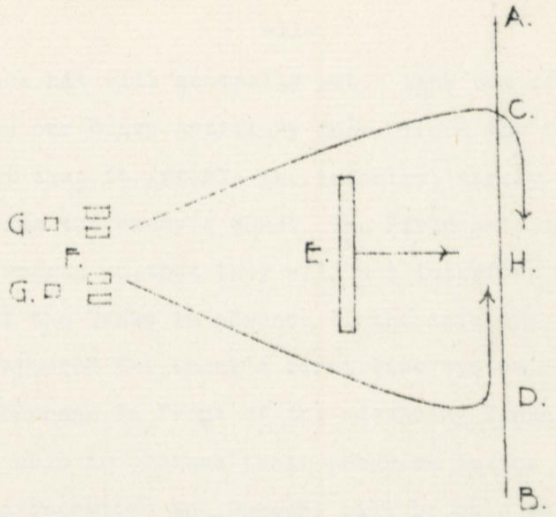


DIAGRAM 5.

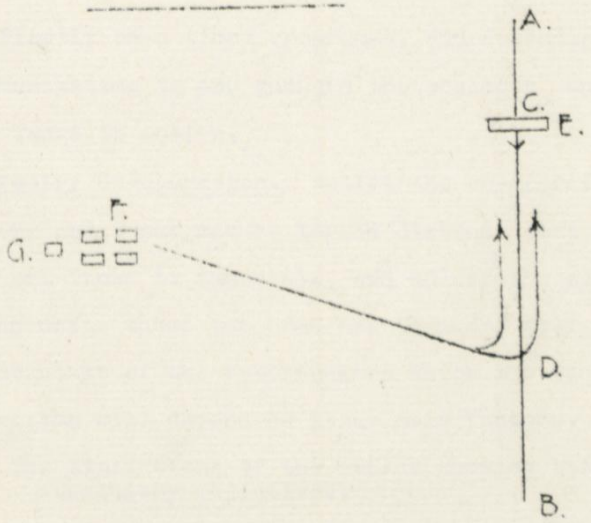
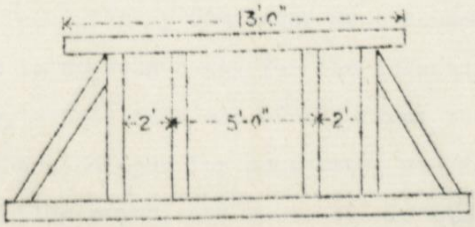


DIAGRAM 6.



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A direct hit will generally put a Tank out of action, consequently our heavy Artillery must afford the Tanks a similar support that it affords the infantry, namely by counter-battering the enemy's guns. The Field Artillery by timing its barrages so that they will not interfere with the movement of the Tanks in advance of the infantry, when the infantry have captured the enemy's first line system. By throwing a smoke barrage in front of the advancing Tanks the Field Guns may be able to obscure their progress to the enemy. But the real co-operation the Gunners will be able to afford is the silencing of the enemy's guns, for these are the only weapons which directly affect the Tank. This co-operation will depend; firstly on a timed programme, and secondly on the rapidity in communicating to the gunners the position and requirements of the Tanks in action.

(2) Infantry Co-operation. Whilst the co-operation between Artillery and Tanks may be termed distant, that between infantry and Tanks is immediate, and unless the closest bond of sympathy unite these two arms the infantry will not be able to take advantage of the opportunites which the Tanks will create. Co-operation will depend on three main factors.

(a) The limitations of the attack showing the main and subsidiary objectives.

(b) The combined reconnaissances of these by the Infantry and Tank Commanders.

(c) The possibilities of rapid communication between Tanks & Infantry and Infantry & Tanks,

The Infantry Commander must remember that the duty of the Tank is to open a way for the infantry and not to pull the infantry's chestnuts out of the fire; that if the Tank is perpetually called upon for assistance disorganization and loss of fighting power, and above all of time, will result;

and

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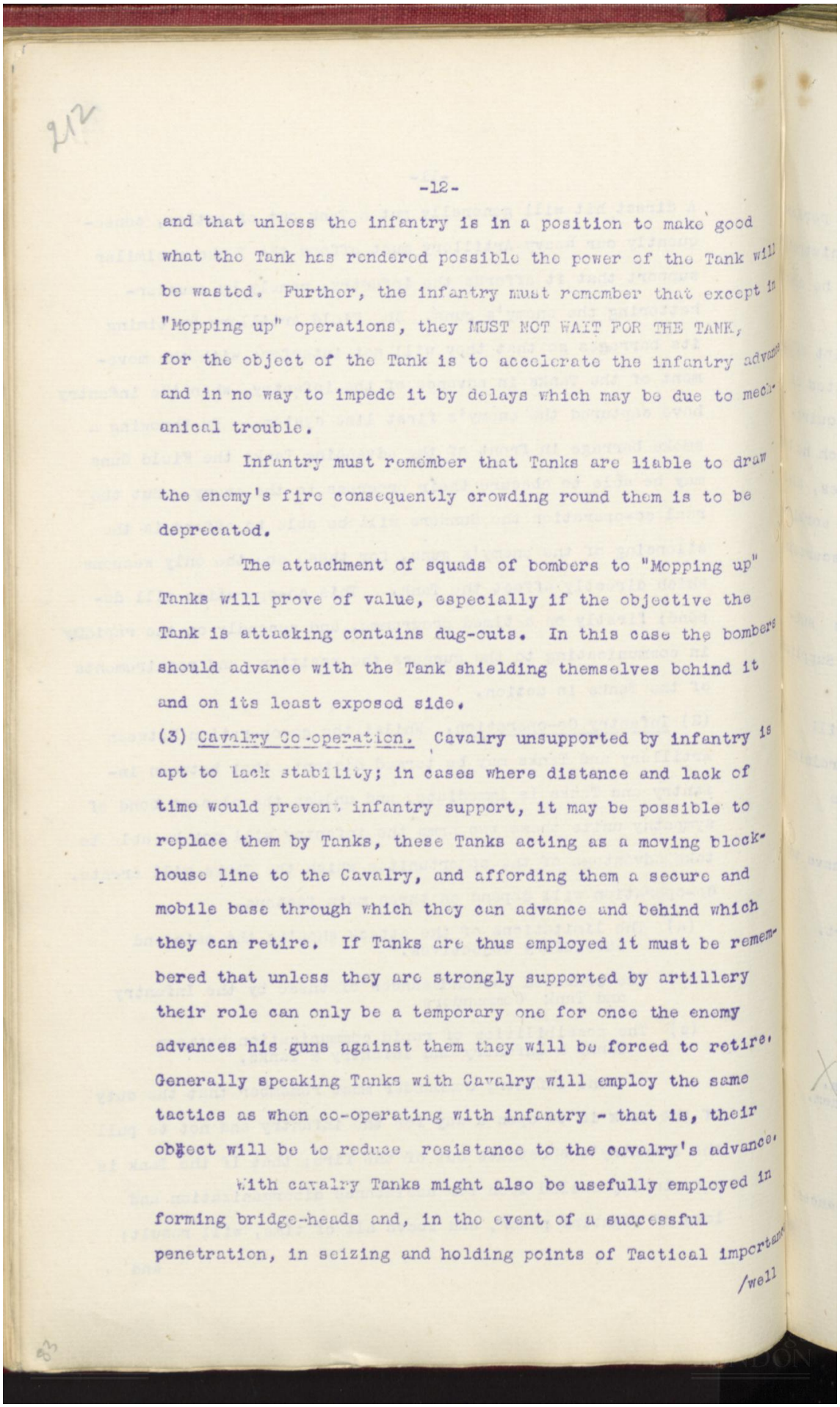

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and that unless the infantry is in a position to make good what the Tank has rendered possible the power of the Tank will be wasted. Further, the infantry must remember that except in "Mopping up" operations, they MUST NOT WAIT FOR THE TANK, for the object of the Tank is to accelerate the infantry advance and in no way to impede it by delays which may be due to mechanical trouble.

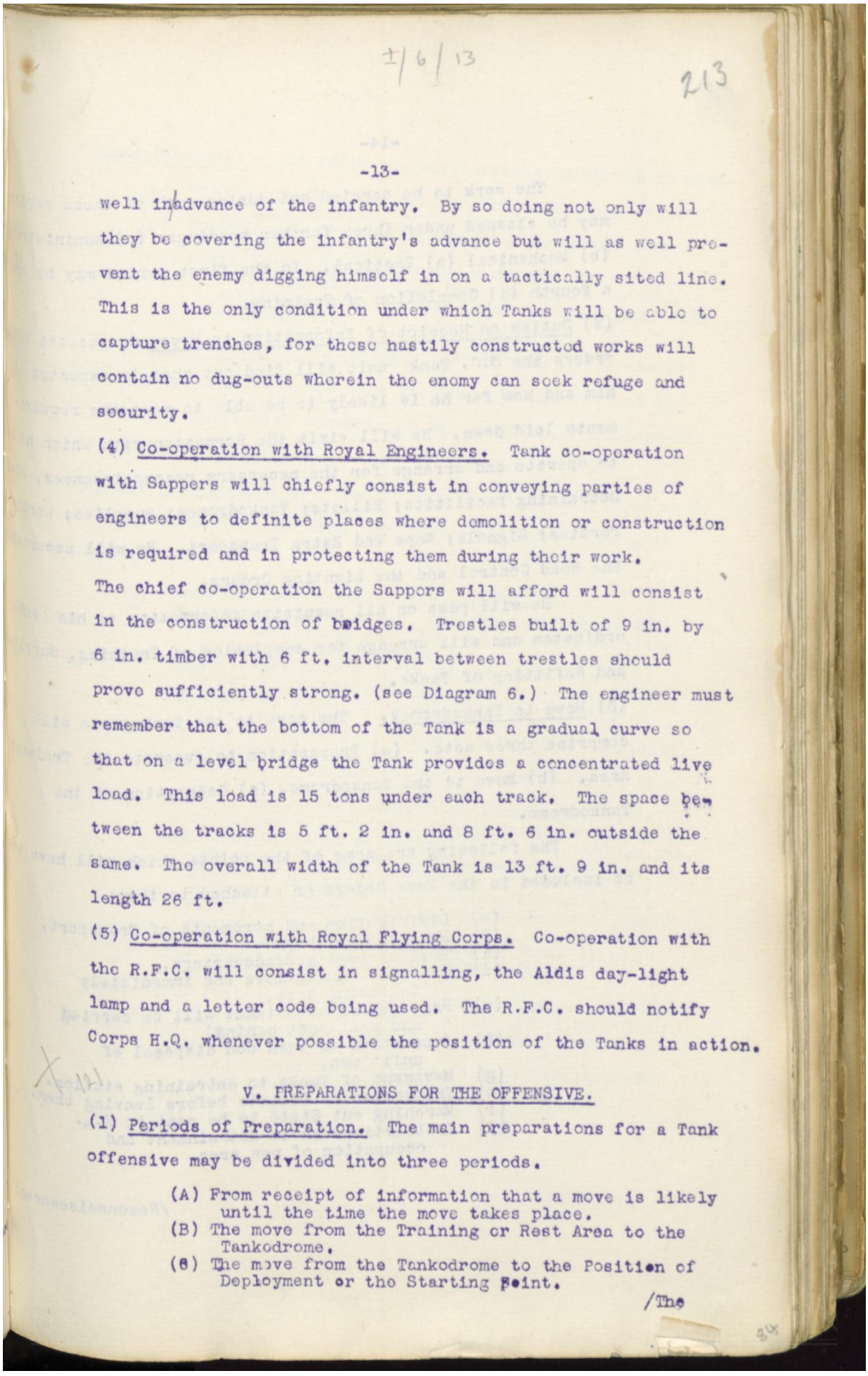
Infantry must remember that Tanks are liable to draw the enemy's fire consequently crowding round them is to be deprecated.

The attachment of squads of bombers to "Mopping up" Tanks will prove of value, especially if the objective the Tank is attacking contains dug-outs. In this case the bombers should advance with the Tank shielding themselves behind it and on its least exposed side.

(3) Cavalry Co-operation. Cavalry unsupported by infantry is apt to lack stability; in cases where distance and lack of time would prevent infantry support, it may be possible to replace them by Tanks, these Tanks acting as a moving block-house line to the Cavalry, and affording them a secure and mobile base through which they can advance and behind which they can retire. If Tanks are thus employed it must be remembered that unless they are strongly supported by artillery their role can only be a temporary one for once the enemy advances his guns against them they will be forced to retire. Generally speaking Tanks with Cavalry will employ the same tactics as when co-operating with infantry - that is, their object will be to reduce resistance to the cavalry's advance.

With cavalry Tanks might also be usefully employed in forming bridge-heads and, in the event of a successful penetration, in seizing and holding points of Tactical importance

/well



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well in advance of the infantry. By so doing not only will they be covering the infantry's advance but will as well prevent the enemy digging himself in on a tactically sited line. This is the only condition under which Tanks will be able to capture trenches, for these hastily constructed works will contain no dug-outs wherein the enemy can seek refuge and security.

(4) Co-operation with Royal Engineers. Tank co-operation with Sappers will chiefly consist in conveying parties of engineers to definite places where demolition or construction is required and in protecting them during their work. The chief co-operation the Sappers will afford will consist in the construction of bridges. Trestles built of 9 in. by 6 in. timber with 6 ft. interval between trestles should prove sufficiently strong. (see Diagram 6.) The engineer must remember that the bottom of the Tank is a gradual curve so that on a level bridge the Tank provides a concentrated live load. This load is 15 tons under each track. The space between the tracks is 5 ft. 2 in. and 8 ft. 6 in. outside the same. The overall width of the Tank is 13 ft. 9 in. and its length 26 ft.

(5) Co-operation with Royal Flying Corps. Co-operation with the R.F.C. will consist in signalling, the Aldis day-light lamp and a letter code being used. The R.F.C. should notify Corps H.Q. whenever possible the position of the Tanks in action.

V. PREPARATIONS FOR THE OFFENSIVE.

(1) Periods of Preparation. The main preparations for a Tank offensive may be divided into three periods.

(A) From receipt of information that a move is likely until the time the move takes place.
(B) The move from the Training or Rest Area to the Tankodrome.
(C) The move from the Tankodrome to the Position of Deployment or the Starting Point.

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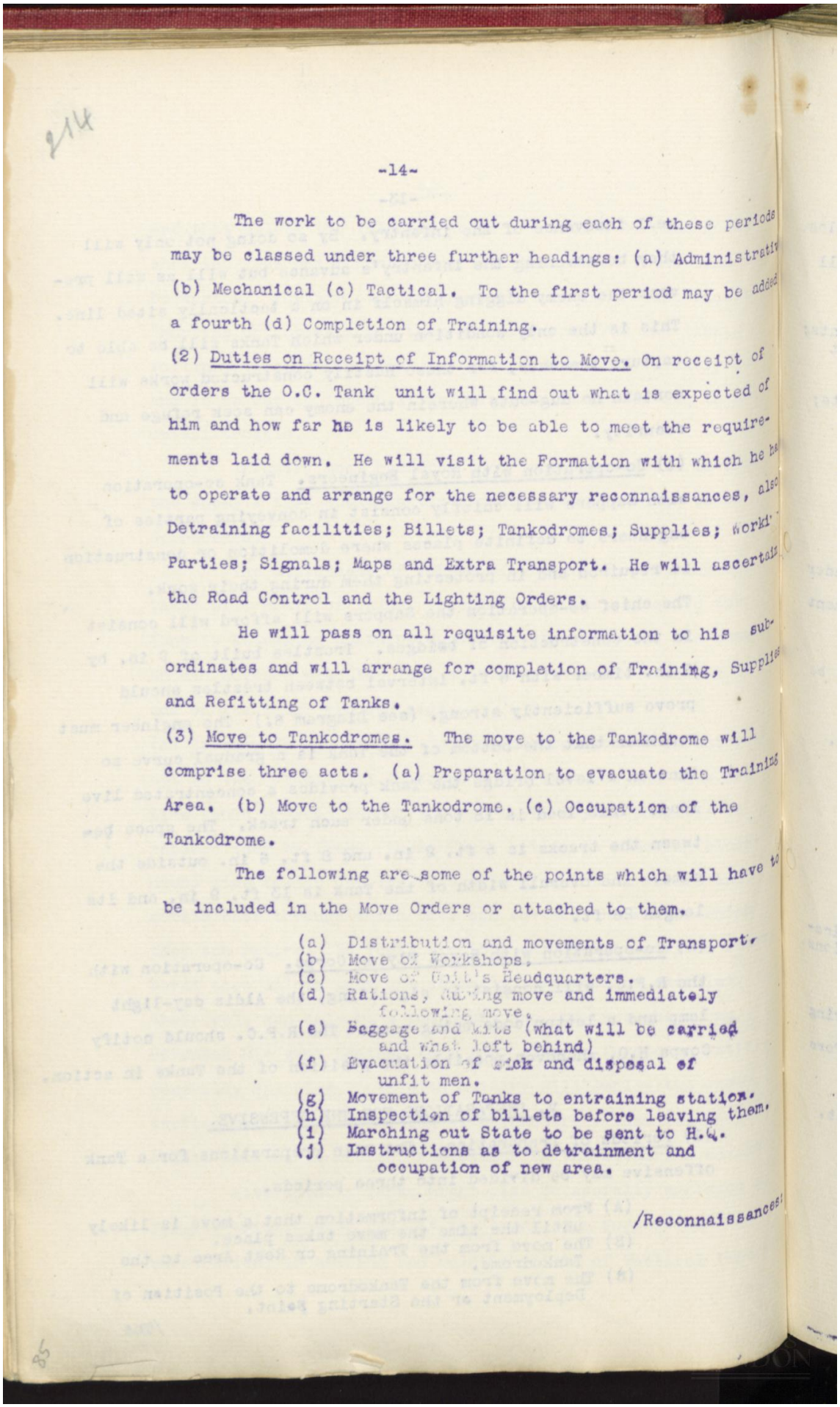

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The work to be carried out during each of these periods may be classed under three further headings: (a) Administrative (b) Mechanical (c) Tactical. To the first period may be added a fourth (d) Completion of Training.

(2) Duties on Receipt of Information to Move. On receipt of orders the O.C. Tank unit will find out what is expected of him and how far he is likely to be able to meet the requirements laid down. He will visit the Formation with which he has to operate and arrange for the necessary reconnaissances, also Detraining facilities; Billets; Tankodromes; Supplies; Working Parties; Signals; Maps and Extra Transport. He will ascertain the Road Control and the Lighting Orders.

He will pass on all requisite information to his subordinates and will arrange for completion of Training, Supplies and Refitting of Tanks.

(3) Move to Tankodromes. The move to the Tankodrome will comprise three acts. (a) Preparation to evacuate the Training Area. (b) Move to the Tankodrome. (c) Occupation of the Tankodrome.

The following are some of the points which will have to be included in the Move Orders or attached to them.

(a) Distribution and movements of Transport.
(b) Move of Workshops.
(c) Move of Unit's Headquarters.
(d) Rations, during move and immediately following move.
(e) Baggage and kits (what will be carried and what left behind)
(f) Evacuation of sick and disposal of unfit men.
(g) Movement of Tanks to entraining station.
(h) Inspection of billets before leaving them.
(i) Marching out State to be sent to H.Q.
(j) Instructions as to detrainment and occupation of new area.

/Reconnaissances

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Reconnaissances. The following reconnaissances should be made:

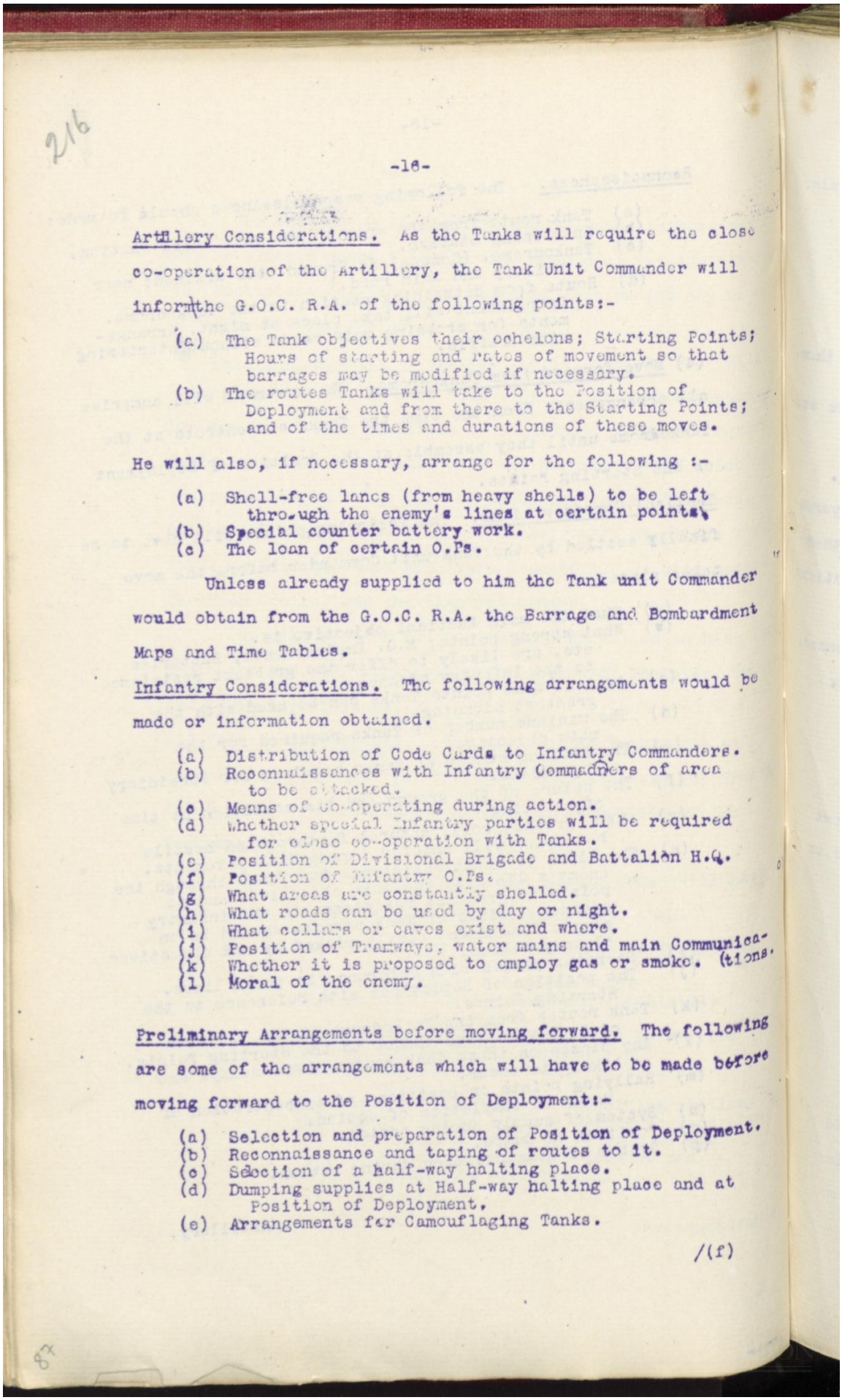
(a) Tank route from the area to the entraining station.
(b) Entraining Station.
(c) Tankodrome. (Concealed; Ground well drained; near Railway and Main road.)
(d) Route from detraining station to the Tankodrome. Detrainment will take place at night. Arrangements for crossing main roads without interfering with traffic.

(4) Move forward from Tankodrome. The movement will comprise all arrangements from the time the Tanks concentrate at the Tankodrome until they assemble at the Position of Deployment or the Starting Points.

Tactical Considerations. The following points will have to be finally settled by the Tank unit Commander before the move takes place:

(a) What the main tactical objective is.
(b) What strong points; M.G. Emplacements, Batteries etc. are likely to offer the greatest resistance to the infantry advance.
(c) Against what points Tanks can be used with the greatest advantage.
(d) The minimum number of Tanks required for the main objective.
(e) The minimum number of Tanks required for subsidiary objectives.
(f) The nature of the ground and its condition at time of starting.
(g) Where ground, soil, natural features and hostile batteries will chiefly impede Tank movements.
(h) The lines of least resistance for Tanks through the enemy's lines to the main objectives and to points of greatest resistance to the infantry advance. (Lines of Tank advance should be on simple landmarks, easily picked up and objectives clearly defined.)
(i) Starting points with reference to these lines.
(j) The position of Deployment with reference to the Starting Points.
(k) Tank routes from the Tankodrome to the position of Deployment and thence to the Starting Points.
(l) Any places on these Tank routes where delays are likely to occur.
(m) Rallying points or positions of concentration of Tanks on completion of action.
(n) System of supply during action.
(o) Position of Dumps.
(p) System of Communication during action.

/Artillery.



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Artillery Considerations. As the Tanks will require the close co-operation of the Artillery, the Tank Unit Commander will inform the G.O.C. R.A. of the following points:-

(a) The Tank objectives their echelons; Starting Points; Hours of starting and rates of movement so that barrages may be modified if necessary.
(b) The routes Tanks will take to the Position of Deployment and from there to the Starting Points; and of the times and durations of these moves.

He will also, if necessary, arrange for the following :-

(a) Shell-free lanes (from heavy shells) to be left through the enemy's lines at certain points.
(b) Special counter battery work.
(c) The loan of certain O.Ps.

Unless already supplied to him the Tank unit Commander would obtain from the G.O.C. R.A. the Barrage and Bombardment Maps and Time Tables.

Infantry Considerations. The following arrangements would be made or information obtained.

(a) Distribution of Code Cards to Infantry Commanders.
(b) Reconnaissances with Infantry Commanders of area to be attacked.
(c) Means of co-operating during action.
(d) Whether special Infantry parties will be required for close co-operation with Tanks.
(e) Position of Divisional Brigade and Battalion H.Q.
(f) Position of Infantry O.Ps.
(g) What areas are constantly shelled.
(h) What roads can be used by day or night.
(i) What cellars or caves exist and where.
(j) Position of Tramways, water mains and main Communica-
(k) Whether it is proposed to employ gas or smoke. (tions.
(l) Moral of the enemy.

Preliminary Arrangements before moving forward. The following are some of the arrangements which will have to be made before moving forward to the Position of Deployment:-

(a) Selection and preparation of Position of Deployment.
(b) Reconnaissance and taping of routes to it.
(c) Selection of a half-way halting place.
(d) Dumping supplies at Half-way halting place and at Position of Deployment.
(e) Arrangements for Camouflaging Tanks.

/(f)

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(f) Move of first aid lorries to Position of Deployment.
(g) Supplies to be carried in Tanks.
(h) Equip ment to be brought forward.
(i) Guides to be provided and equipped with two electric torches each.
(j) Cessation of fire from certain batteries during move.
(k) Noise barrage.
(l) Synchronization of watches.
(m) Hours of rendering progress reports.
(n) Telephonic communication.
(o) Move orders.

Reconnaissance of Position of Deployment. This position must primarily depend on tactical considerations.

(a) It must afford concealment for Tanks and Crews.
(b) It should afford accommodation for the crews so that they may obtain rest.
(c) A covered means of approach such as a communication trench should lead up to it.
(d) The position must be so chosen, that whilst there, Tanks can be fitted with spuds. This means that no hard surfaces will have to be crossed between it and the Starting Points.

Preparation of tracks from Tankodrome to Position of Deployment.

Each track must be carefully reconnoitred and the following points observed:-

(a) That these tracks may have to be used at times when traffic behind our lines is congested.
(b) Existing air lines across the tracks must be raised 10 feet, and those on the ground buried 1. foot.
(c) All trenches over which Tanks will pass must be revetted or units occupying them warned to repair them after the Tank has passed.
(d) Passages over the trenches must be clearly marked.
(e) Bad shell holes must be prepared for crossing and steep slopes avoided or eased.
(f) Troops in the vicinity of Tank Routes must be warned of the probable time Tanks will use the tracks.

Move to Position of Deployment. When possible tracks should be selected which will enable Tanks to move along the side of roads as the spoor is then not so likely to show. As many tanks as possible should move along the same track. Tracks should be taped whenever an uncertainty of direction may occur. All movements will take place at night.

/Reconnaissances.

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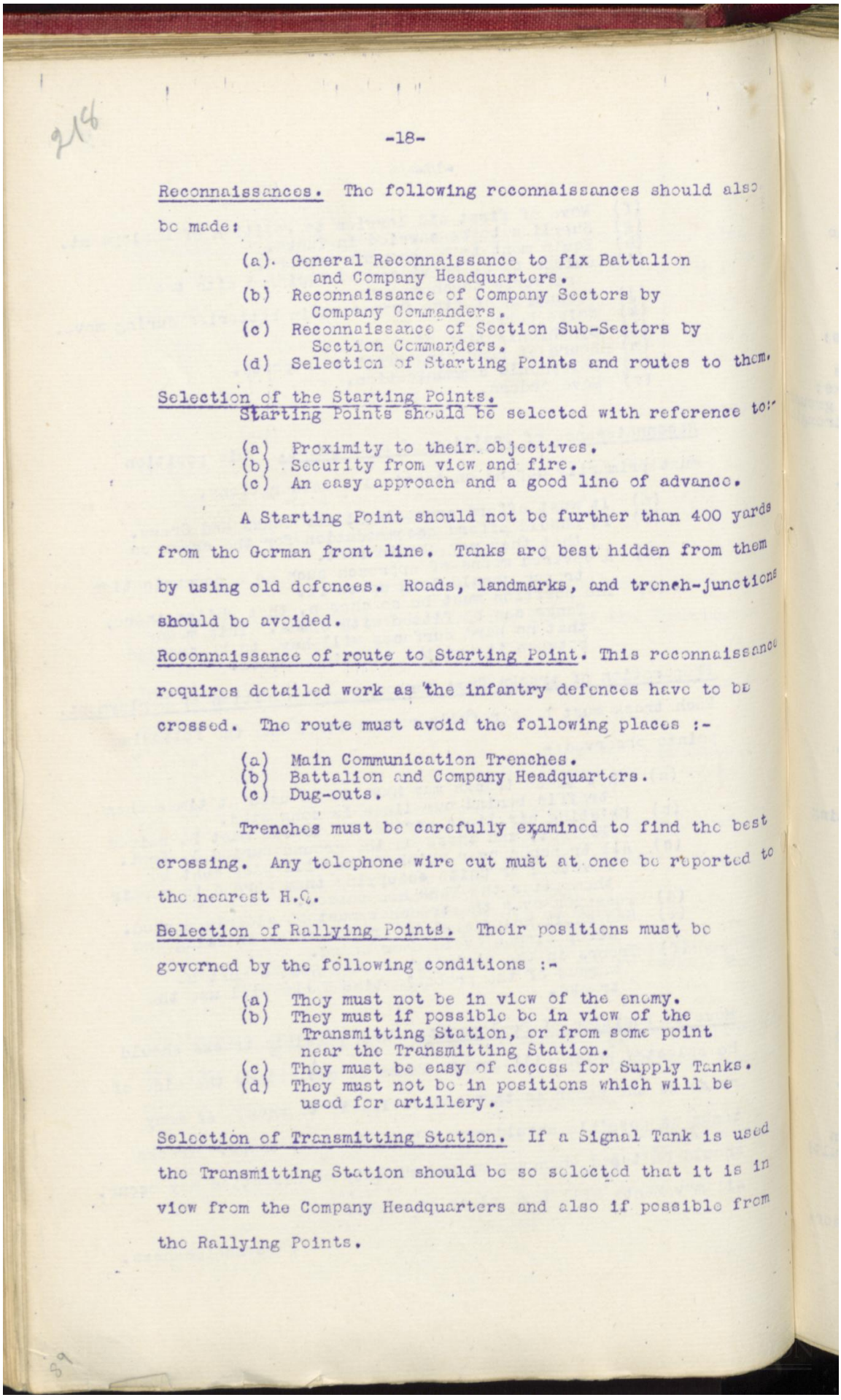

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Reconnaissances. The following reconnaissances should also be made:

(a). General Reconnaissance to fix Battalion and Company Headquarters.
(b) Reconnaissance of Company Sectors by Company Commanders.
(c) Reconnaissance of Section Sub-Sectors by Section Commanders.
(d) Selection of Starting Points and routes to them.

Selection of the Starting Points.
Starting Points should be selected with reference to:-

(a) Proximity to their objectives.
(b) Security from view and fire.
(c) An easy approach and a good line of advance.

A Starting Point should not be further than 400 yards from the German front line. Tanks are best hidden from them by using old defences. Roads, landmarks, and trench-junctions should be avoided.

Reconnaissance of route to Starting Point. This reconnaissance requires detailed work as the infantry defences have to be crossed. The route must avoid the following places :-

(a) Main Communication Trenches.
(b) Battalion and Company Headquarters.
(c) Dug-outs.

Trenches must be carefully examined to find the best crossing. Any telephone wire cut must at once be reported to the nearest H.Q.

Selection of Rallying Points. Their positions must be governed by the following conditions :-

(a) They must not be in view of the enemy.
(b) They must if possible be in view of the Transmitting Station, or from some point near the Transmitting Station.
(c) They must be easy of access for Supply Tanks.
(d) They must not be in positions which will be used for artillery.

Selection of Transmitting Station. If a Signal Tank is used the Transmitting Station should be so selected that it is in view from the Company Headquarters and also if possible from the Rallying Points.

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Reconnaissance of Attack Routes and Objectives.
Reconnaissances of Tank objectives and the routes leading to them should be carried out from

(a) Observation Posts.
(b) Maps and Reports.
(c) Aeroplane photographs.

All obstacles and likely routes should be clearly marked on a large scale map before going into action.

Instructions to Tank Crews. The following instructions should be issued to Tank Crews before going into action.

(a) Position of Battalion and Company Headquarters.
(b) Synchronization of Watches.
(c) General idea of the operations. Infantry objectives and Artillery barrages.
(d) System of signals. Codes and Special Communications.
(e) Tank objective.
(f) Route to the objective and routes of Tanks on either flank.
(g) General Compass bearing of objective.
(h) Mechanical duties.
(i) To fight the Tank to the last. If the Tank is knocked out to defend it or join in the Infantry attack.
(j) To keep on moving and harry the enemy.
(k) No orders to be accepted from strangers especially as regards retirement.
(l) No prisoners to be taken. Prisoners to be left to the Infantry.
(m) Position of the Rallying Point.

(5) Duties of Section or Tank Commander after Action.

As soon after arriving at the Rallying Point as possible communication should be opened with the Signal Tank if there is one, or direct with Company Headquarters and the following information sent :-

(a) The number of each Tank which has assembled at the Rallying Point.
(b) Whether it is fit or unfit for further action.
(c) What supplies it requires.
(d) What Tanks are known to be broken down and where.
(e) The line the infantry were holding when the Tank retired.

As soon as possible after this each Tank Commander will fill in the "Battle History Form" (See Appendix A.) and send it to the Company Headquarters.

/(6) Duties

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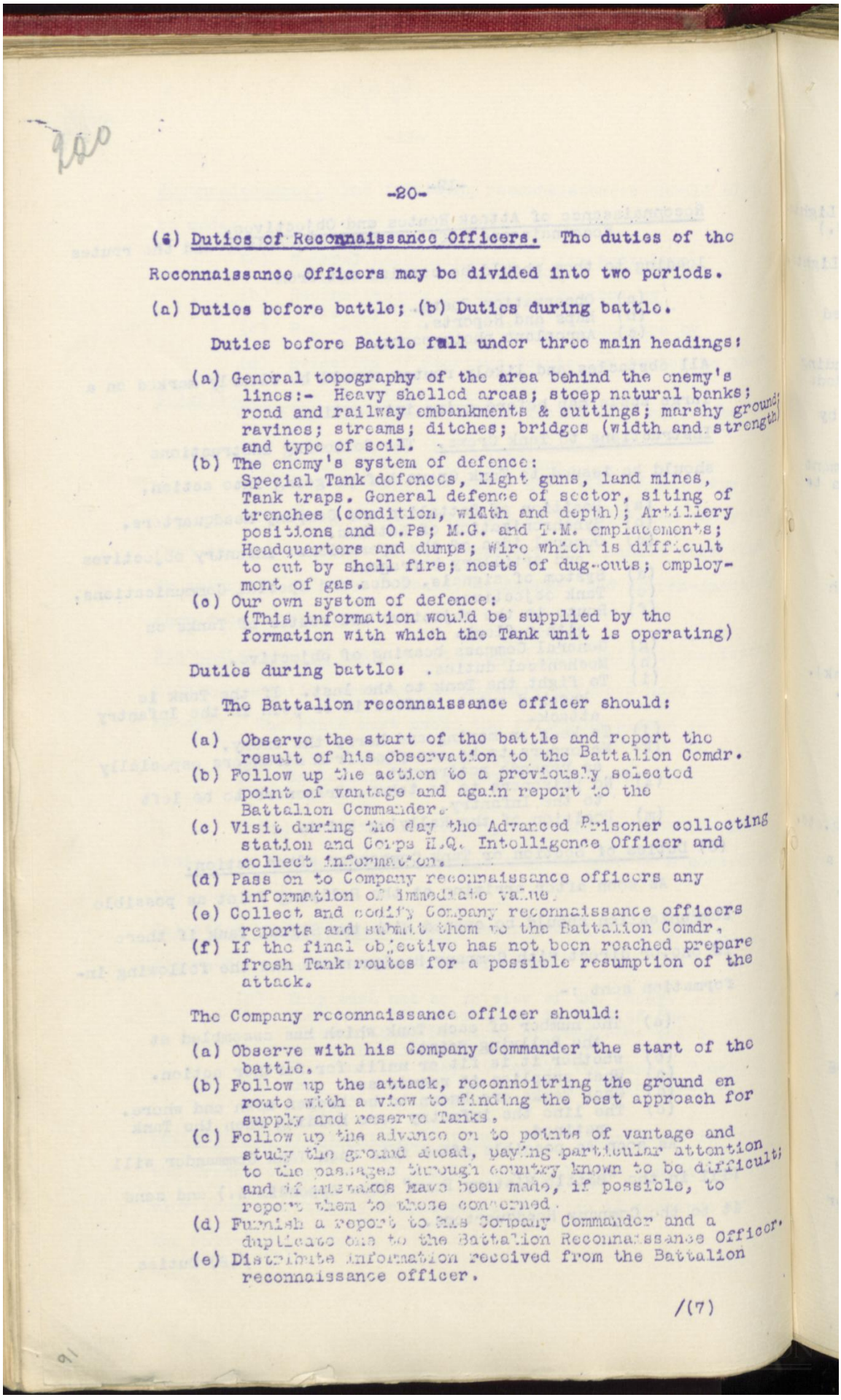

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(6) Duties of Reconnaissance Officers. The duties of the Reconnaissance Officers may be divided into two periods.

(a) Duties before battle; (b) Duties during battle.

Duties before Battle fall under three main headings:

(a) General topography of the area behind the enemy's lines:- Heavy shelled areas; steep natural banks; road and railway embankments & cuttings; marshy ground; ravines; streams; ditches; bridges (width and strength) and type of soil.
(b) The enemy's system of defence:
Special Tank defences, light guns, land mines, Tank traps. General defence of sector, siting of trenches (condition, width and depth); Artillery positions and O.Ps; M.G. and T.M. emplacements; Headquarters and dumps; Wire which is difficult to cut by shell fire; nests of dug-outs; employment of gas.
(c) Our own system of defence:
(This information would be supplied by the formation with which the Tank unit is operating)

Duties during battle:

The Battalion reconnaissance officer should:

(a) Observe the start of the battle and report the result of his observation to the Battalion Comdr.
(b) Follow up the action to a previously selected point of vantage and again report to the Battalion Commander.
(c) Visit during the day the Advanced Prisoner collecting station and Corps H.Q. Intelligence Officer and collect information.
(d) Pass on to Company reconnaissance officers any information of immediate value.
(e) Collect and codify Company reconnaissance officers reports and submit them to the Battalion Comdr.
(f) If the final objective has not been reached prepare fresh Tank routes for a possible resumption of the attack.

The Company reconnaissance officer should:

(a) Observe with his Company Commander the start of the battle.
(b) Follow up the attack, reconnoitring the ground en route with a view to finding the best approach for supply and reserve Tanks.
(c) Follow up the advance on to points of vantage and study the ground ahead, paying particular attention to the passages through country known to be difficult; and if instances have been made, if possible, to report them to those concerned.
(d) Furnish a report to his Company Commander and a duplicate one to the Battalion Reconnaissance Officer.
(e) Distribute information received from the Battalion reconnaissance officer.

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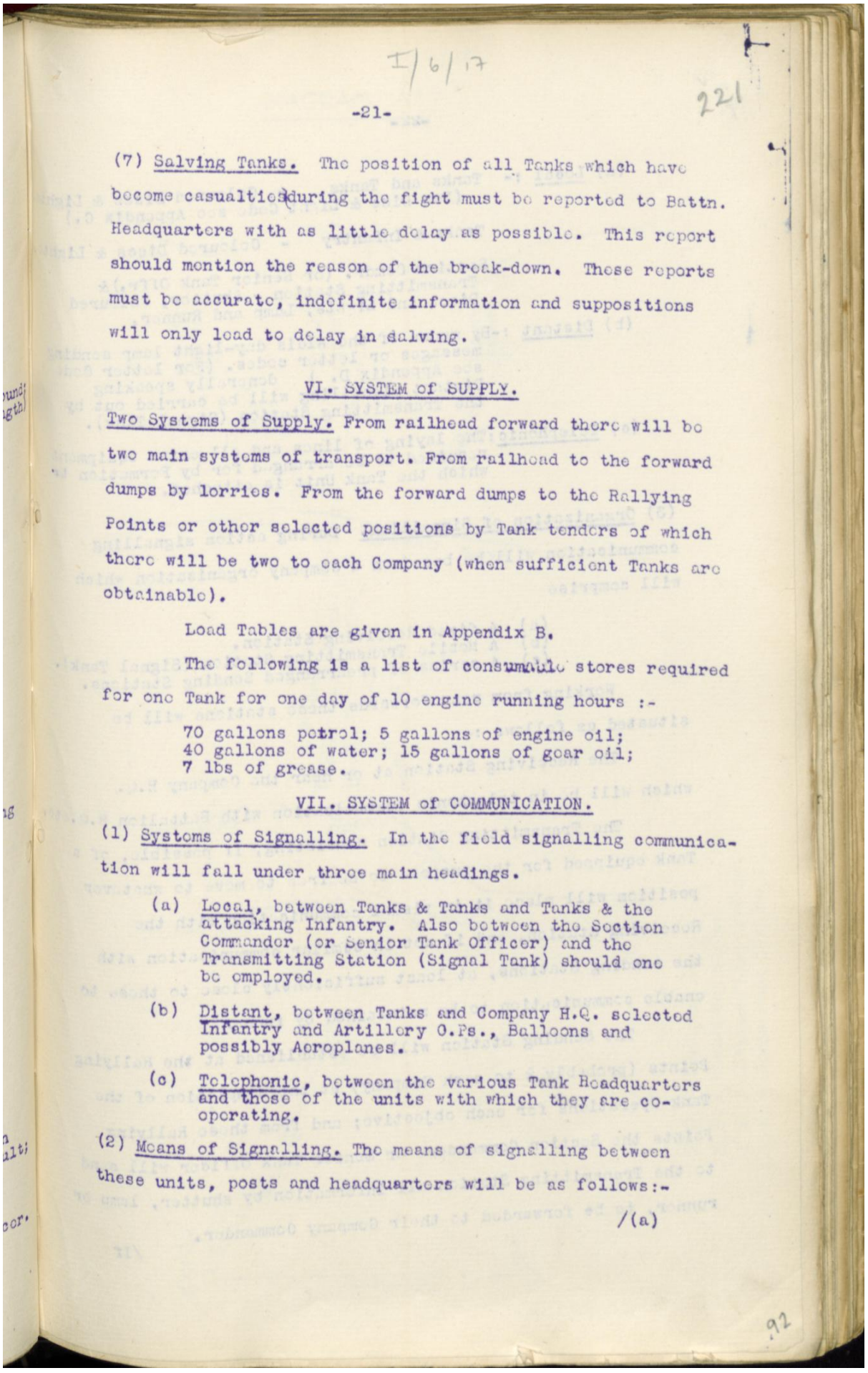

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(7) Salving Tanks. The position of all Tanks which have become casualties during the fight must be reported to Battn. Headquarters with as little delay as possible. This report should mention the reason of the break-down. These reports must be accurate, indefinite information and suppositions will only lead to delay in salving.

VI. SYSTEM of SUPPLY.

Two Systems of Supply. From railhead forward there will be two main systems of transport. From railhead to the forward dumps by lorries. From the forward dumps to the Rallying Points or other selected positions by Tank tenders of which there will be two to each Company (when sufficient Tanks are obtainable).

Load Tables are given in Appendix B.

The following is a list of consumable stores required for one Tank for one day of 10 engine running hours :-

70 gallons petrol; 5 gallons of engine oil;
40 gallons of water; 15 gallons of gear oil;
7 lbs of grease.

VII. SYSTEM of COMMUNICATION.

(1) Systems of Signalling. In the field signalling communication will fall under three main headings.

(a) Local, between Tanks & Tanks and Tanks & the attacking Infantry. Also between the Section Commander (or Senior Tank Officer) and the Transmitting Station (Signal Tank) should one be employed.

(b) Distant, between Tanks and Company H.Q. selected Infantry and Artillery O.Ps., Balloons and possibly Aeroplanes.

(c) Telephonic, between the various Tank Headquarters and those of the units with which they are co-operating.

(2) Means of Signalling. The means of signalling between these units, posts and headquarters will be as follows:-

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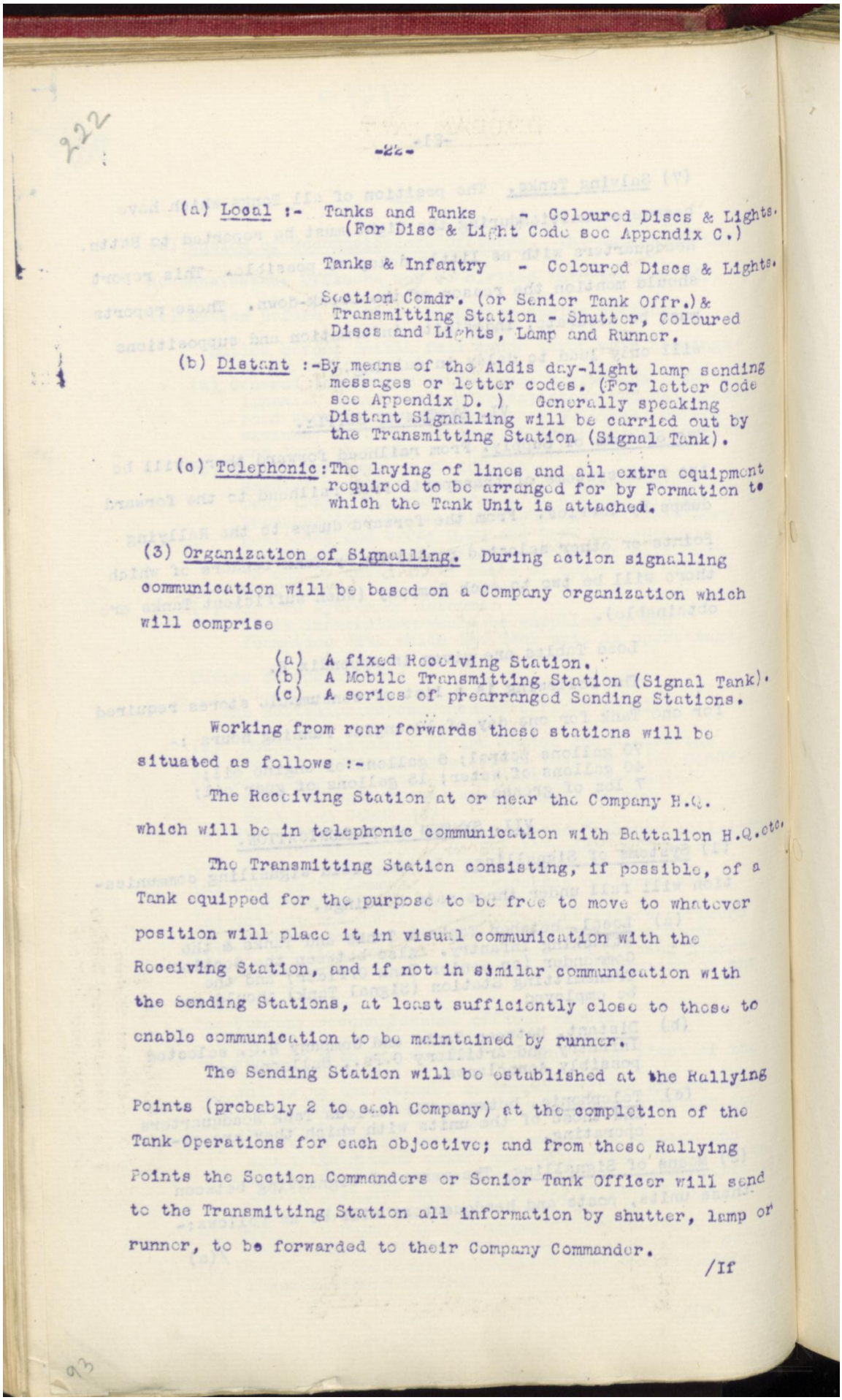

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(a) Local :- Tanks and Tanks - Coloured Discs & Lights. (For Disc & Light Code see Appendix C.)

Tanks & Infantry - Coloured Discs & Lights.

Section Comdr. (or Senior Tank Offr.) & Transmitting Station - Shutter, Coloured Discs and Lights, Lamp and Runner.

(b) Distant :-By means of the Aldis day-light lamp sending messages or letter codes. (For letter Code see Appendix D.) Generally speaking Distant Signalling will be carried out by the Transmitting Station (Signal Tank).

(c) Telephonic: The laying of lines and all extra equipment required to be arranged for by Formation to which the Tank Unit is attached.

(3) Organization of Signalling. During action signalling communication will be based on a Company organization which will comprise

(a) A fixed Receiving Station.
(b) A Mobile Transmitting Station (Signal Tank).
(c) A series of prearranged Sending Stations.

Working from rear forwards these stations will be situated as follows :-

The Receiving Station at or near the Company H.Q. which will be in telephonic communication with Battalion H.Q. etc.

The Transmitting Station consisting, if possible, of a Tank equipped for the purpose to be free to move to whatever position will place it in visual communication with the Receiving Station, and if not in similar communication with the Sending Stations, at least sufficiently close to these to enable communication to be maintained by runner.

The Sending Station will be established at the Rallying Points (probably 2 to each Company) at the completion of the Tank Operations for each objective; and from these Rallying Points the Section Commanders or Senior Tank Officer will send to the Transmitting Station all information by shutter, lamp or runner, to be forwarded to their Company Commander.

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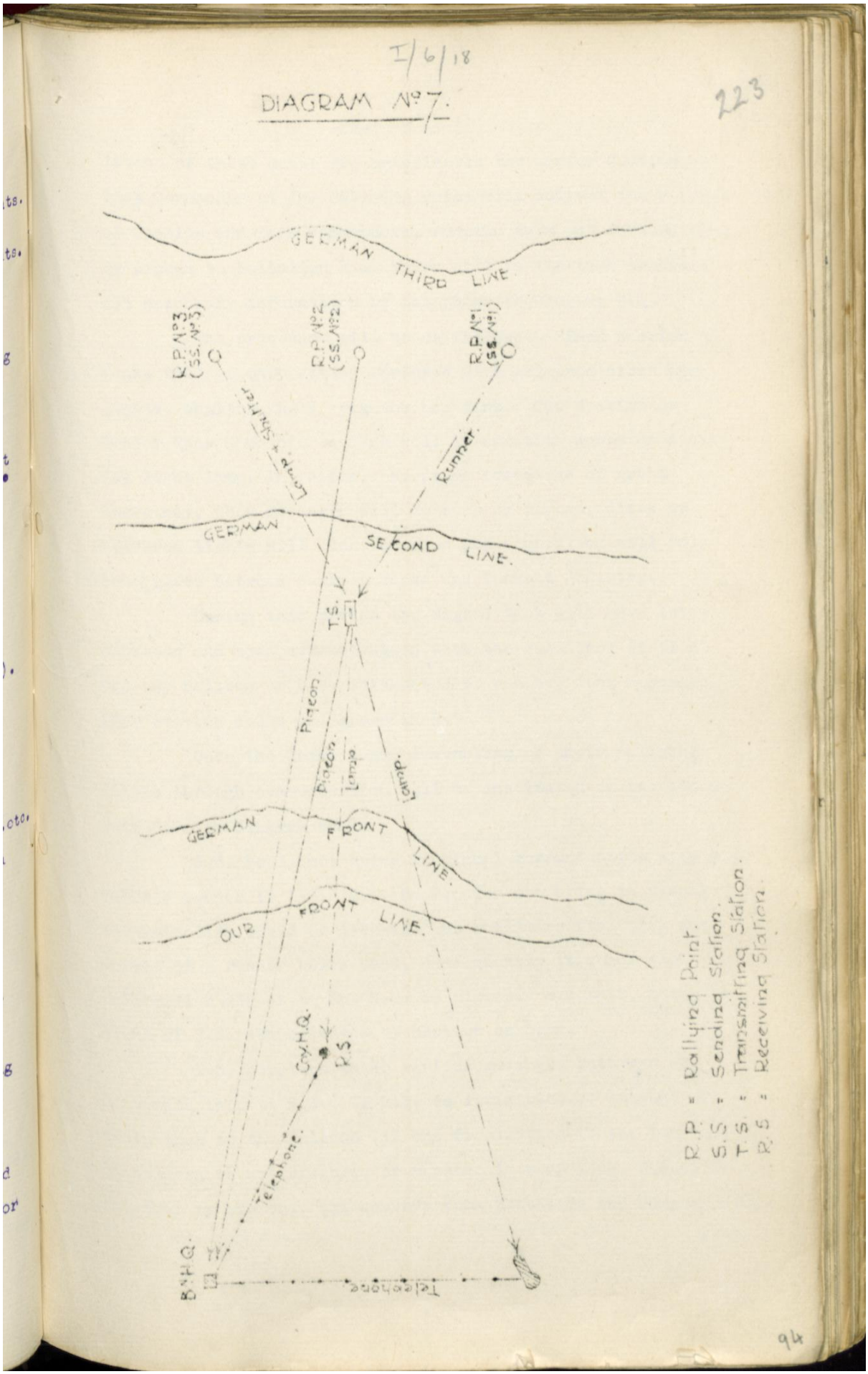
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DIAGRAM No 7.
223
GERMAN THIRD LINE
R.P.No.3 (S.S.No.3)
R.P.No.2 (S.S.No.2)
R.P.No.1 (S.S.No.1)
Runner.
GERMAN SECOND LINE.
T.S.
Pigeon.
Pigeon.
Lamp.
Lamp.
GERMAN FRONT LINE.
OUR FRONT LINE.
Bde H.Q.
Telephone.
Telephone.
Cyc H.Q.
R.S.
R.P. = Rallying Point.
S.S. = Sending Station.
T.S. = Transmitting Station.
R.S. = Receiving Station.
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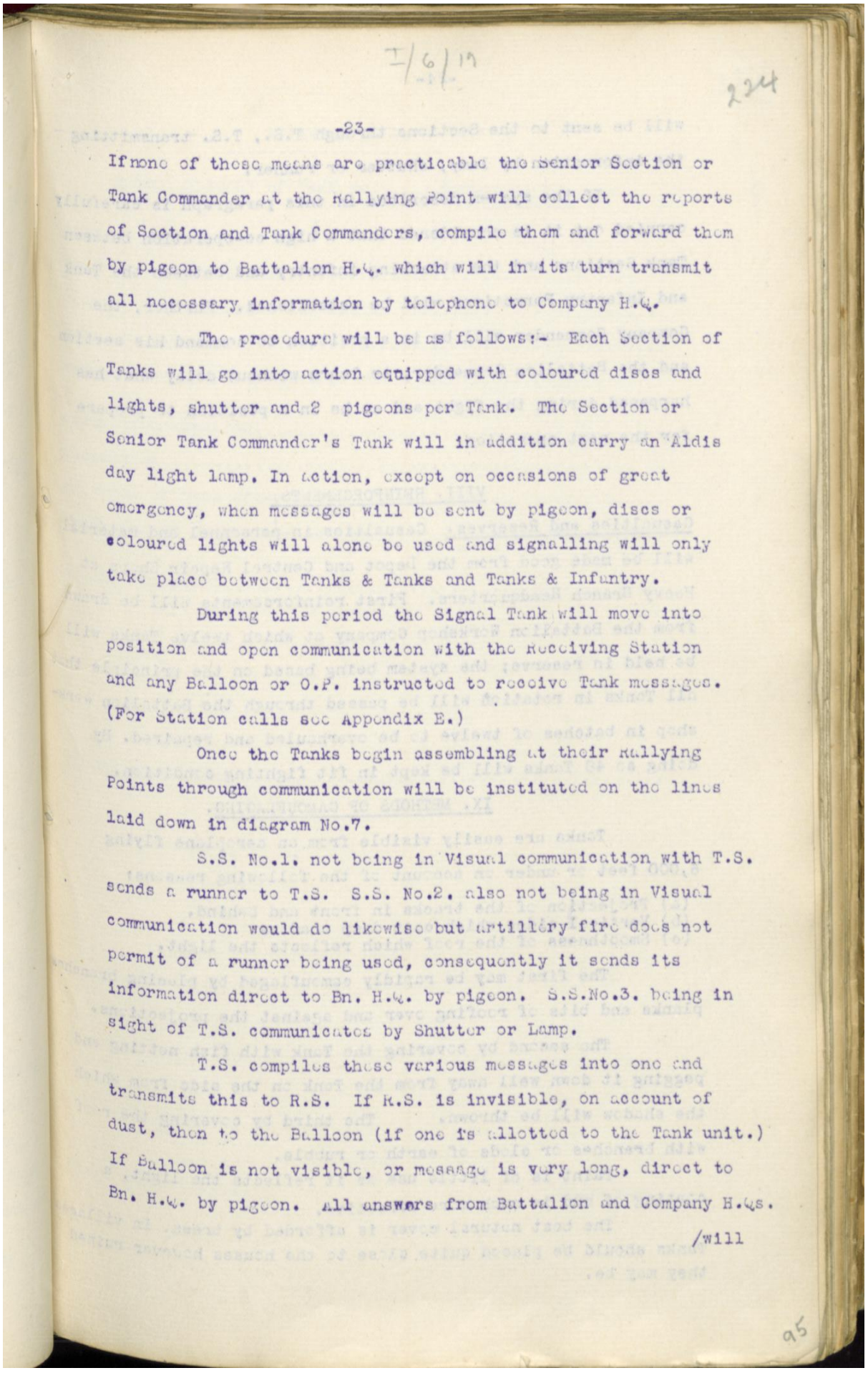

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If none of these means are practicable the Senior Section or Tank Commander at the Rallying Point will collect the reports of Section and Tank Commanders, compile them and forward them by pigeon to Battalion H.Q. which will in its turn transmit all necessary information by telephone to Company H.Q.

The procedure will be as follows:- Each Section of Tanks will go into action equipped with coloured discs and lights, shutter and 2 pigeons per Tank. The Section or Senior Tank Commander's Tank will in addition carry an Aldis day light lamp. In action, except on occasions of great emergency, when messages will be sent by pigeon, discs or coloured lights will alone be used and signalling will only take place between Tanks & Tanks and Tanks & Infantry.

During this period the Signal Tank will move into position and open communication with the Receiving Station and any Balloon or O.P. instructed to receive Tank messages. (For Station calls see Appendix E.)

Once the Tanks begin assembling at their Rallying Points through communication will be instituted on the lines laid down in diagram No.7.

S.S. No.1. not being in Visual communication with T.S. sends a runner to T.S. S.S. No.2. also not being in Visual communication would do likewise but artillery fire does not permit of a runner being used, consequently it sends its information direct to Bn. H.Q. by pigeon. S.S.No.3. being in sight of T.S. communicates by Shutter or Lamp.

T.S. compiles these various messages into one and transmits this to R.S. If R.S. is invisible, on account of dust, then to the Balloon (if one is allotted to the Tank unit.) If Balloon is not visible, or message is very long, direct to Bn. H.Q. by pigeon. All answers from Battalion and Company H.Qs.

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a5

will be sent to the Sections through T.S., T.S. transmitting the information by lamp, shutter or runner.

If the system described in this paragraph is carefully carried out it is considered that a high co-operation between Tank Sections and the attacking infantry and between the Tank and Infantry Formations will be established. Further, the Company Commander will be in a position to command his section and the Battalion Commander, to learn without delay what has happened during the fight and so be in a position to prepare for the next operation.

VIII. REINFORCEMENTS.

Casualties and Reserves. Casualties in personnel and material will be made good from the Depot and Central Repair Shops at Heavy Branch Headquarters. First reinforcements will be drawn from the Battalion Workshop Company at which twelve Tanks will be held in reserve; the system being based on the principle that all Tanks in rotation will be passed through the Battalion workshop in batches of twelve to be overhauled and repaired. By doing so 48 Tanks will be kept in fit fighting condition.

IX. METHODS OF CAMOUFLAGING.

Tanks are easily visible from an aeroplane flying 6,000 feet or under on account of the following reasons:

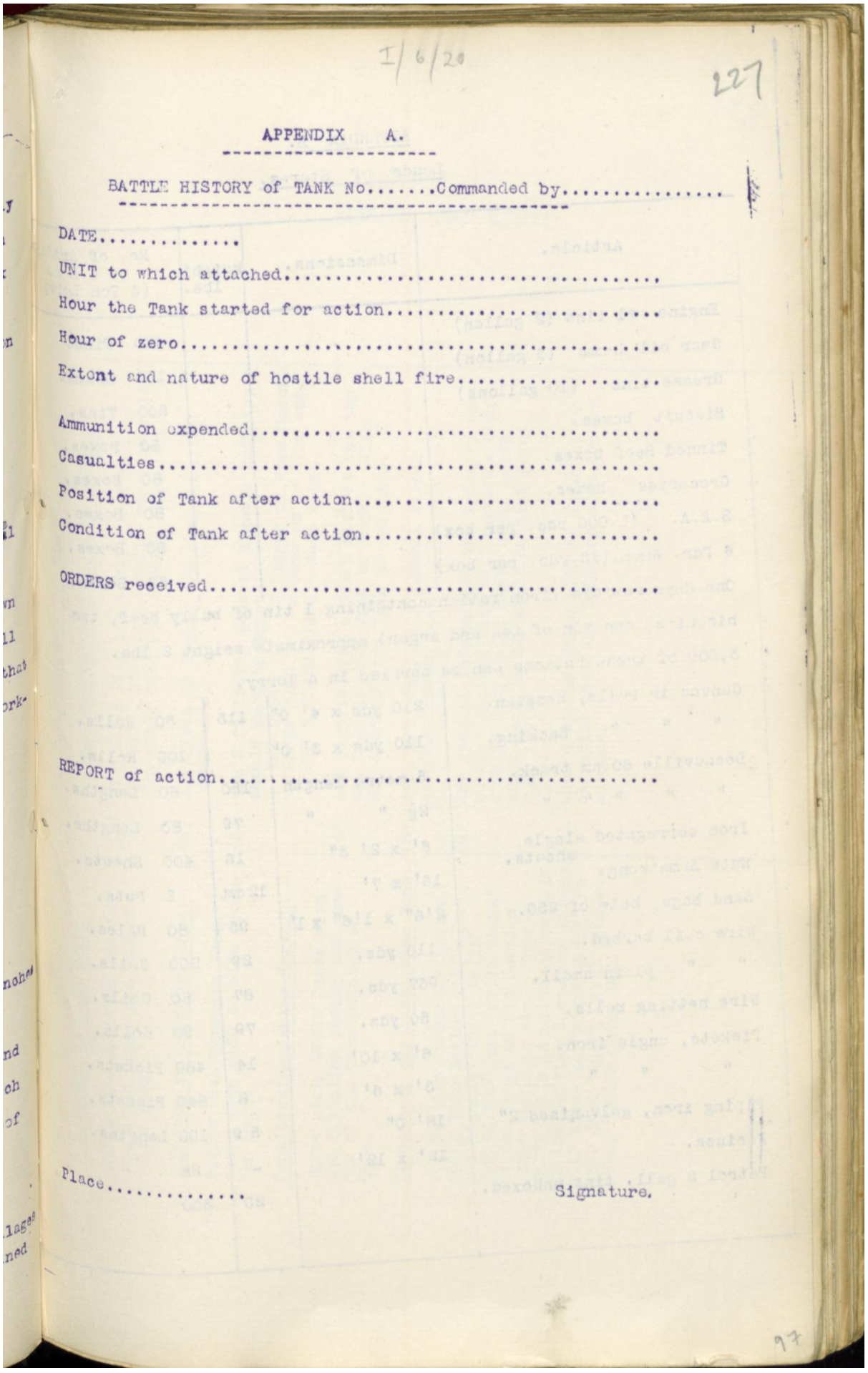
(a) Projection of the tracks in front and behind.
(b) Vertical sides which cast deep shadows.
(c) Smoothness of the roof which reflects the light.

The first may be rapidly camouflaged by placing branches planks and bits of roofing over and against the projections.

The second by covering the Tank with fish netting and pegging it down well away from the Tank on the side from which the shadow will be thrown. The third by covering the roof with branches or clods of earth or rubble.

Paint is of little use as it reflects the light, a coating of mud is much more effective.

The best natural cover is afforded by trees. In villages Tanks should be placed quite close to the houses however ruined they may be.



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APPENDIX A.

BATTLE HISTORY of TANK No.....Commanded by.....

DATE.....

UNIT to which attached.....

Hour the Tank started for action.....

Hour of zero.....

Extent and nature of hostile shell fire.....

Ammunition expended.....

Casualties.....

Position of Tank after action.....

Condition of Tank after action.....

ORDERS received.....

REPORT of action.....

Place.....

Signature.

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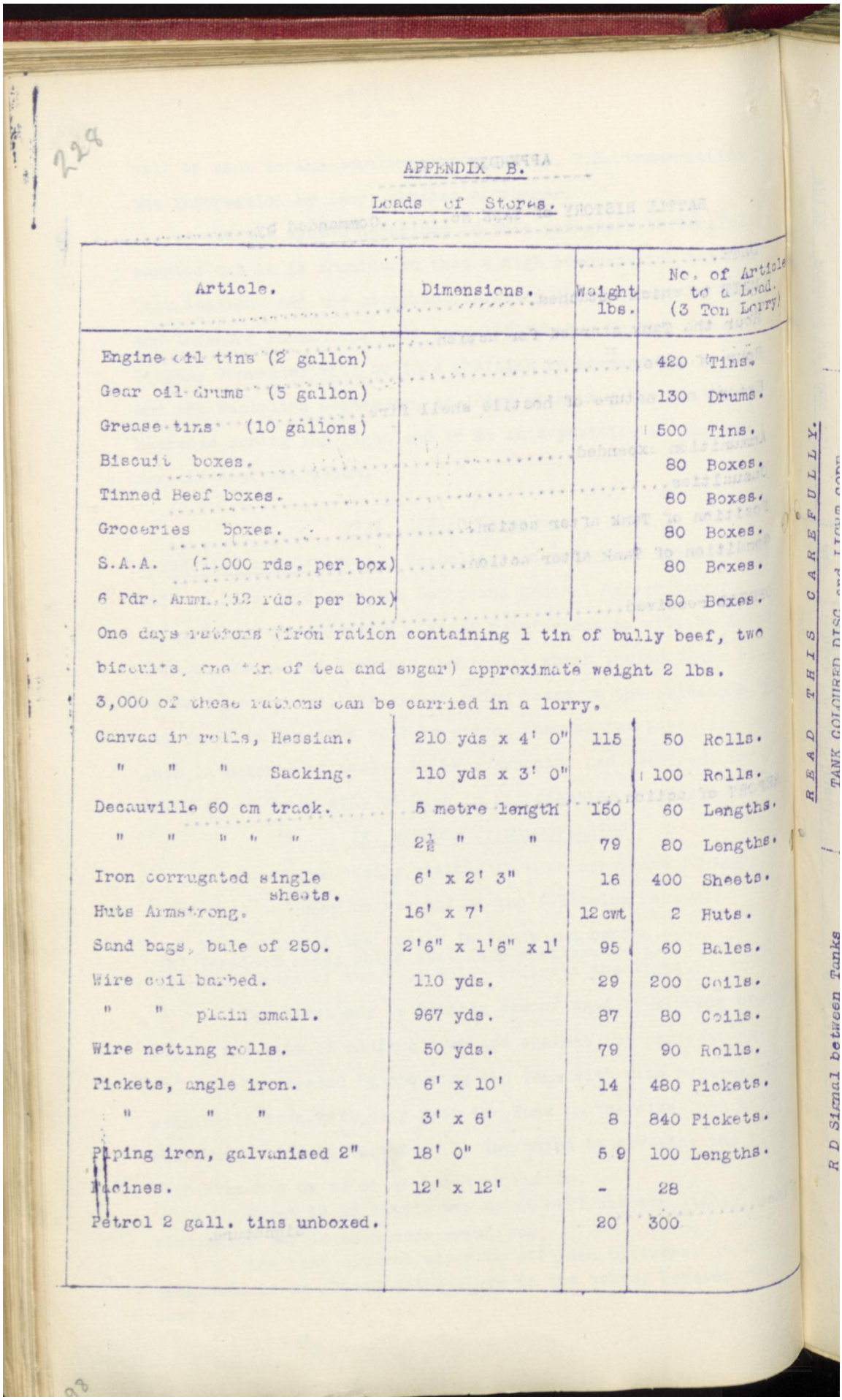

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APPENDIX B.

Loads of Stores.

Article.	Dimensions.	Weight lbs.	No. of Article to a Load. (3 Ton Lorry)
Engine oil tins (2 gallon)			420 Tins.
Gear oil drums (5 gallon)			130 Drums.
Grease tins (10 gallons)			500 Tins.
Biscuit boxes.			80 Boxes.
Tinned Beef boxes.			80 Boxes.
Groceries boxes.			80 Boxes.
S.A.A. (1,000 rds. per box)			80 Boxes.
6 Pdr. Amm. (52 rds. per box)			50 Boxes.
One days rations (Iron ration containing 1 tin of bully beef, two biscuits, one tin of tea and sugar) approximate weight 2 lbs.			
3,000 of these rations can be carried in a lorry.			
Canvas in rolls, Hessian.	210 yds x 4' 0"	115	50 Rolls.
" " " Sacking.	110 yds x 3' 0"		100 Rolls.
Decauville 60 cm track.	5 metre length	150	60 Lengths.
" " " " "	2½ " "	79	80 Lengths.
Iron corrugated single sheets.	6' x 2' 3"	16	400 Sheets.
Huts Armstrong.	16' x 7'	12 cwt	2 Huts.
Sand bags, bale of 250.	2'6" x 1'6" x 1'	95	60 Bales.
Wire coil barbed.	110 yds.	29	200 Coils.
" " plain small.	967 yds.	87	80 Coils.
Wire netting rolls.	50 yds.	79	90 Rolls.
Pickets, angle iron.	6' x 10'	14	480 Pickets.
" " "	3' x 6'	8	840 Pickets.
Piping iron, galvanised 2"	18' 0"	5 9	100 Lengths.
Facines.	12' x 12'	-	28
Petrol 2 gall. tins unboxed.		20	300

READ THIS CAREFULLY.
TANK COLOURED DISC and LIGHT CODE
R D Signal between Tanks

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APPENDIX O.

Disc and Light Codes.

READ THIS CAREFULLY.

R D Signal between Tanks	TANK COLOURED DISC and LIGHT CODE.
WHITE DISC or LIGHT twisted round and round and pushed up and down.	(1) The WHITE Disc has a black rim to it. The RED Disc has a white bar across it. The GREEN Disc has a white rim to it.
R D from Infantry to Tanks.	(2) All Discs or lights are read from top downwards.
Rifles with Bayonets fixed waved from side to side above the head.	(3) The 3 following general signals Infantry should know by heart: RED DISC = Danger or Wire Uncut. GREEN DISC = Come on Wire cut. RED & GREEN DISCS - Wait a bit.
Tank Distinguishing Signal.	
Three plain WHITE Discs with the Battalion letter and number of the Crew painted on them.	(4) All signals with a WHITE Disc at the top are Signals from Tank to Tank. With RED & GREEN from Tank to Infantry.
To call up any particular Tank.	(5) RED, RED, RED, is a general signal meaning "Broken Down".
The Section Commander before going into action will allot the signals "WHITE WHITE" "WHITE RED" and "WHITE GREEN" to the Tanks of his Section other than his own. Thus if WHITE WHITE is allotted to B.17. If the Section Commander wishes B.17 alone to "Right wheel" he will send "WHITE WHITE" followed by "WHITE GREEN RED."	(6) Any special information the infantry require signalled back will commence with a GREEN Disc, e.g. GREEN GREEN WHITE might mean "ENEMY still holding Point D.26.b.7.2" (7) When a single GREEN DISC is shown it is essential that the Infantry move forward at once.

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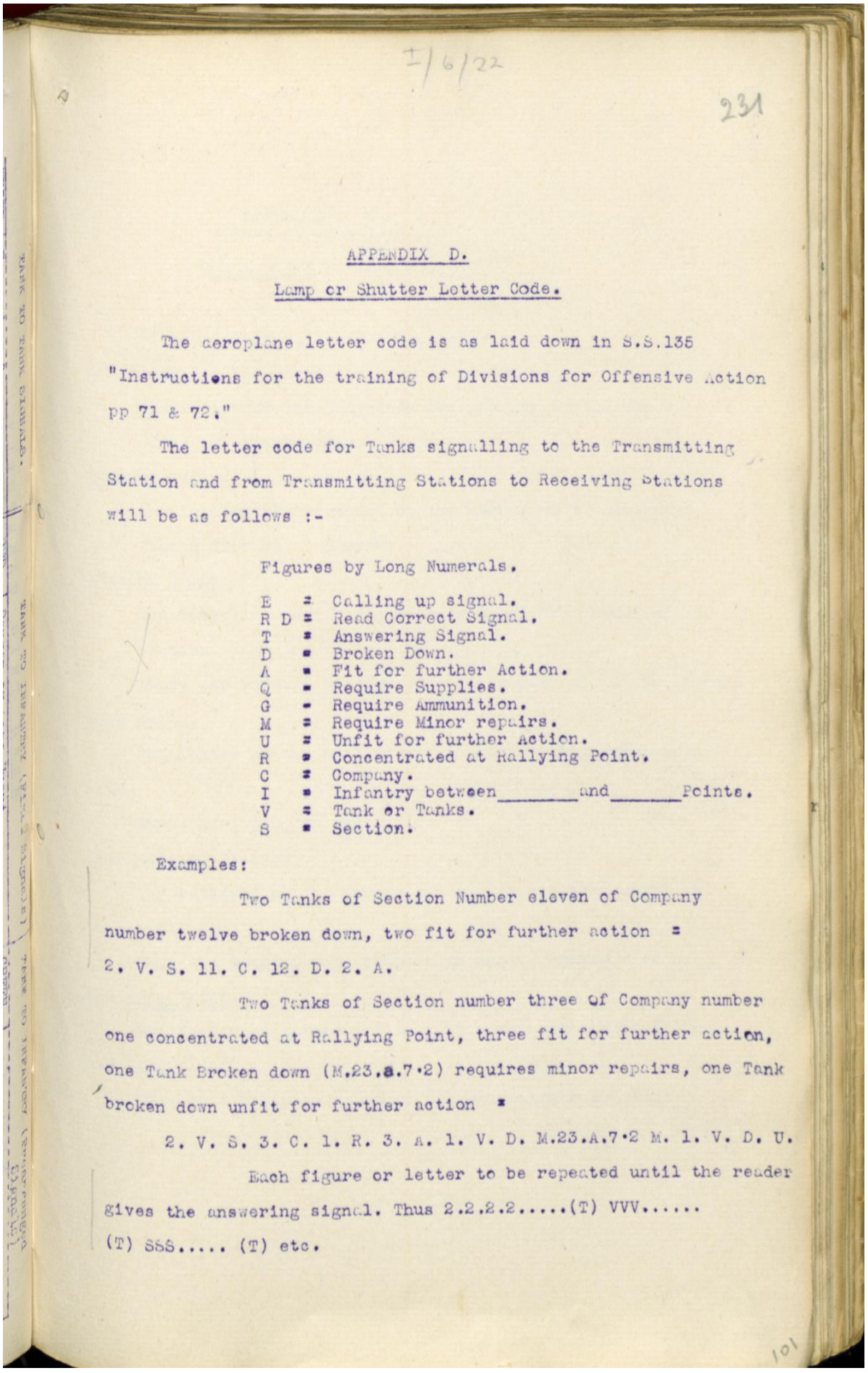
MARK IV TANK SIGNALS.

MARK IV INFANTRY (MALE & FEMALE)

WHITE	Forward or Come on.	RED	Danger or Wire Uncut.	GREEN
WHITE WHITE WHITE RED	Tank Number.....	RED RED RED WHITE	Enemy in Strength.	GREEN WHITE GREEN GREEN
WHITE GREEN	Tank Number.....	RED GREEN	Wait a bit.	GREEN GREEN RED
WHITE WHITE WHITE RED	Concentrate on Rallying Point.	RED RED RED WHITE	Broken down.	GREEN GREEN WHITE GREEN
WHITE WHITE GREEN WHITE	Left incline.	RED RED GREEN RED	Enemy Counter-attacking	GREEN RED RED GREEN
WHITE RED WHITE RED	Extend	RED WHITE RED WHITE	Enemy is in Dug-outs.	RED WHITE GREEN WHITE
WHITE RED RED	Come to me.	RED WHITE WHITE	Trench unoccupied.	GREEN WHITE GREEN
WHITE RED GREEN	Section Commander's Tank	RED WHITE GREEN	Enemy is Retiring.	GREEN WHITE RED
WHITE GREEN WHITE	Converge on Centre	RED GREEN RED	Our Infantry attack is held up	GREEN WHITE WHITE
WHITE GREEN RED	Right Wheel.	RED GREEN WHITE	Our Infantry attack is progressing.	
WHITE GREEN GREEN GREEN	Left wheel.	RED GREEN GREEN	Have reached my objective	
RED RED RED	Broken Down.	GREEN	Come on or Wire cut.	



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APPENDIX D.

Lamp or Shutter Letter Code.

The aeroplane letter code is as laid down in S.S.135 "Instructions for the training of Divisions for Offensive Action pp 71 & 72."

The letter code for Tanks signalling to the Transmitting Station and from Transmitting Stations to Receiving Stations will be as follows :-

Figures by Long Numerals.

E = Calling up signal.
R D = Read Correct Signal.
T = Answering Signal.
D = Broken Down.
A = Fit for further Action.
Q = Require Supplies.
G = Require Ammunition.
M = Require Minor repairs.
U = Unfit for further Action.
R = Concentrated at Rallying Point.
C = Company.
I = Infantry between_____and_____Points.
V = Tank or Tanks.
S = Section.

Examples:

Two Tanks of Section Number eleven of Company number twelve broken down, two fit for further action =

2. V. S. 11. C. 12. D. 2. A.

Two Tanks of Section number three of Company number one concentrated at Rallying Point, three fit for further action, one Tank Broken down (M.23.a.7.2) requires minor repairs, one Tank broken down unfit for further action =

2. V. S. 3. C. 1. R. 3. A. 1. V. D. M.23.A.7.2 M. 1. V. D. U.

Each figure or letter to be repeated until the reader gives the answering signal. Thus 2.2.2.2.....(T) VVV..... (T) SSS..... (T) etc.

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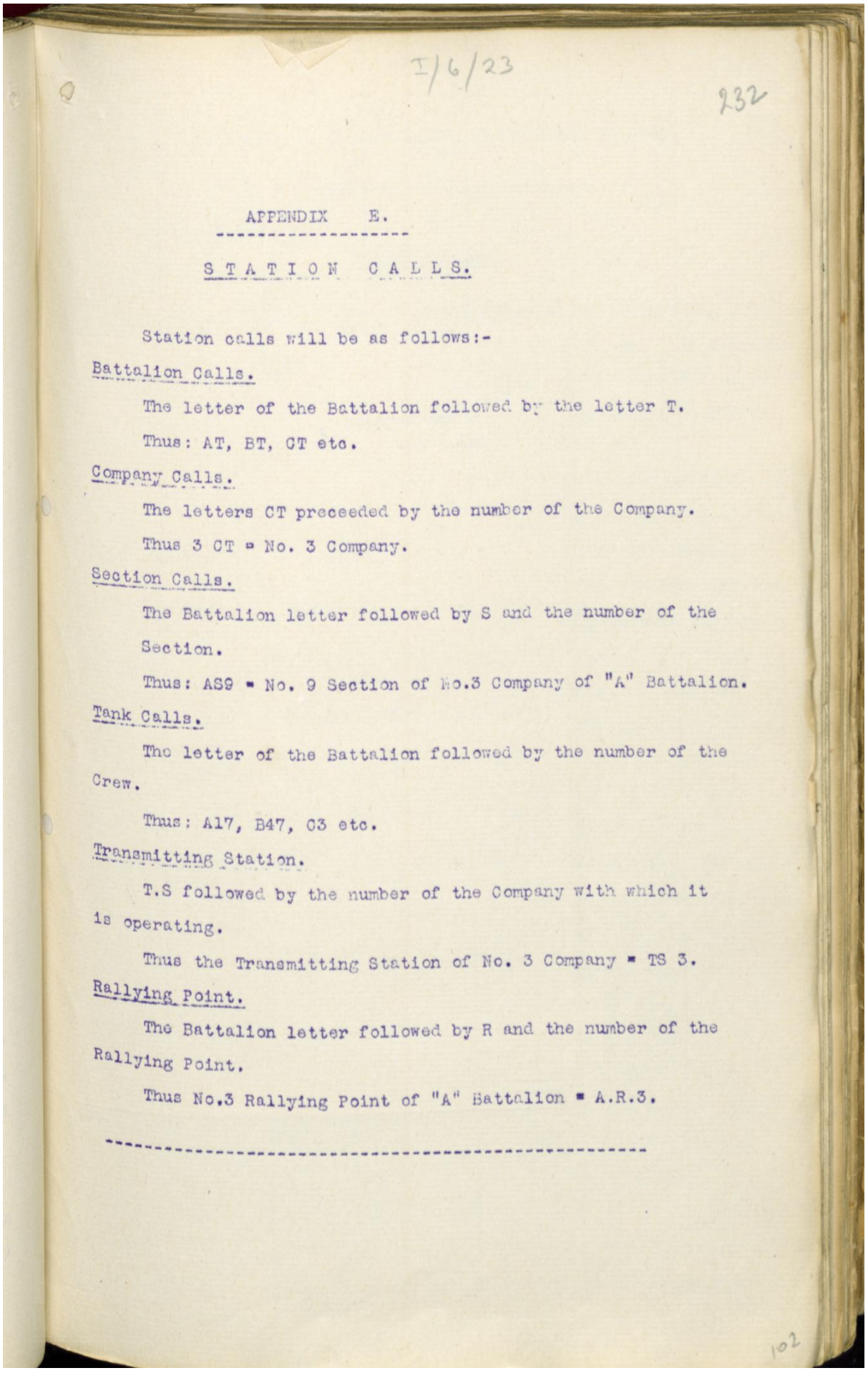

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APPENDIX E.

STATION CALLS.

Station calls will be as follows:-

Battalion Calls.

The letter of the Battalion followed by the letter T.

Thus: AT, BT, CT etc.

Company Calls.

The letters CT preceeded by the number of the Company.

Thus 3 CT = No. 3 Company.

Section Calls.

The Battalion letter followed by S and the number of the Section.

Thus: AS9 = No. 9 Section of No.3 Company of "A" Battalion.

Tank Calls.

The letter of the Battalion followed by the number of the Crew.

Thus: A17, B47, C3 etc.

Transmitting Station.

T.S followed by the number of the Company with which it is operating.

Thus the Transmitting Station of No. 3 Company = TS 3.

Rallying Point.

The Battalion letter followed by R and the number of the Rallying Point.

Thus No.3 Rallying Point of "A" Battalion = A.R.3.

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HEADQUARTERS

XVIII. CORPS.

15. 3. 17

Dear Fuller. I have been reading your dossier on Tanks which is simply excellent. More + more must we replace man power by mechanical power. Tanks are in their infancy + the old old cry of "too late" will echo down the corridors of history. An opportunity missed. I wish

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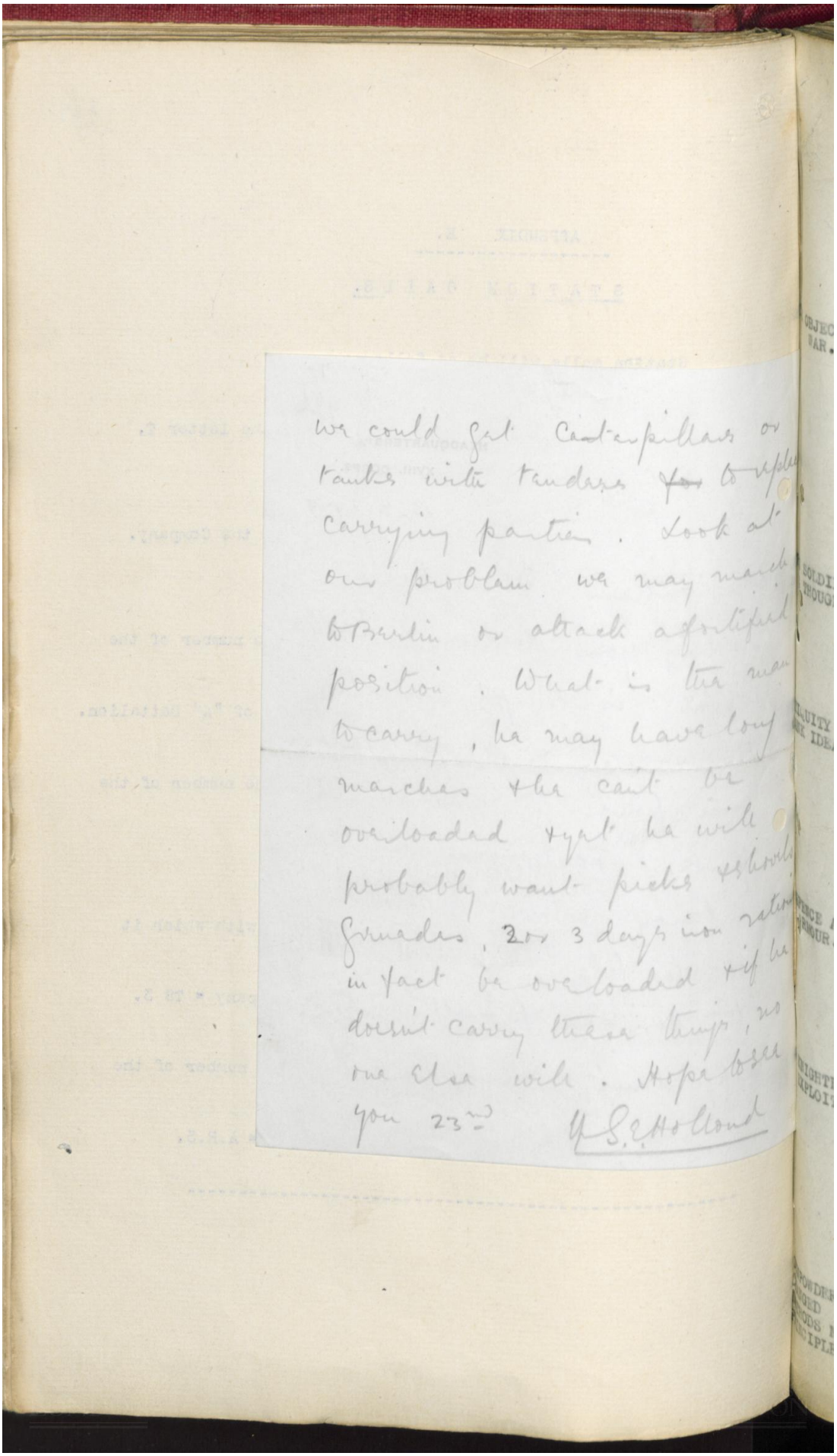
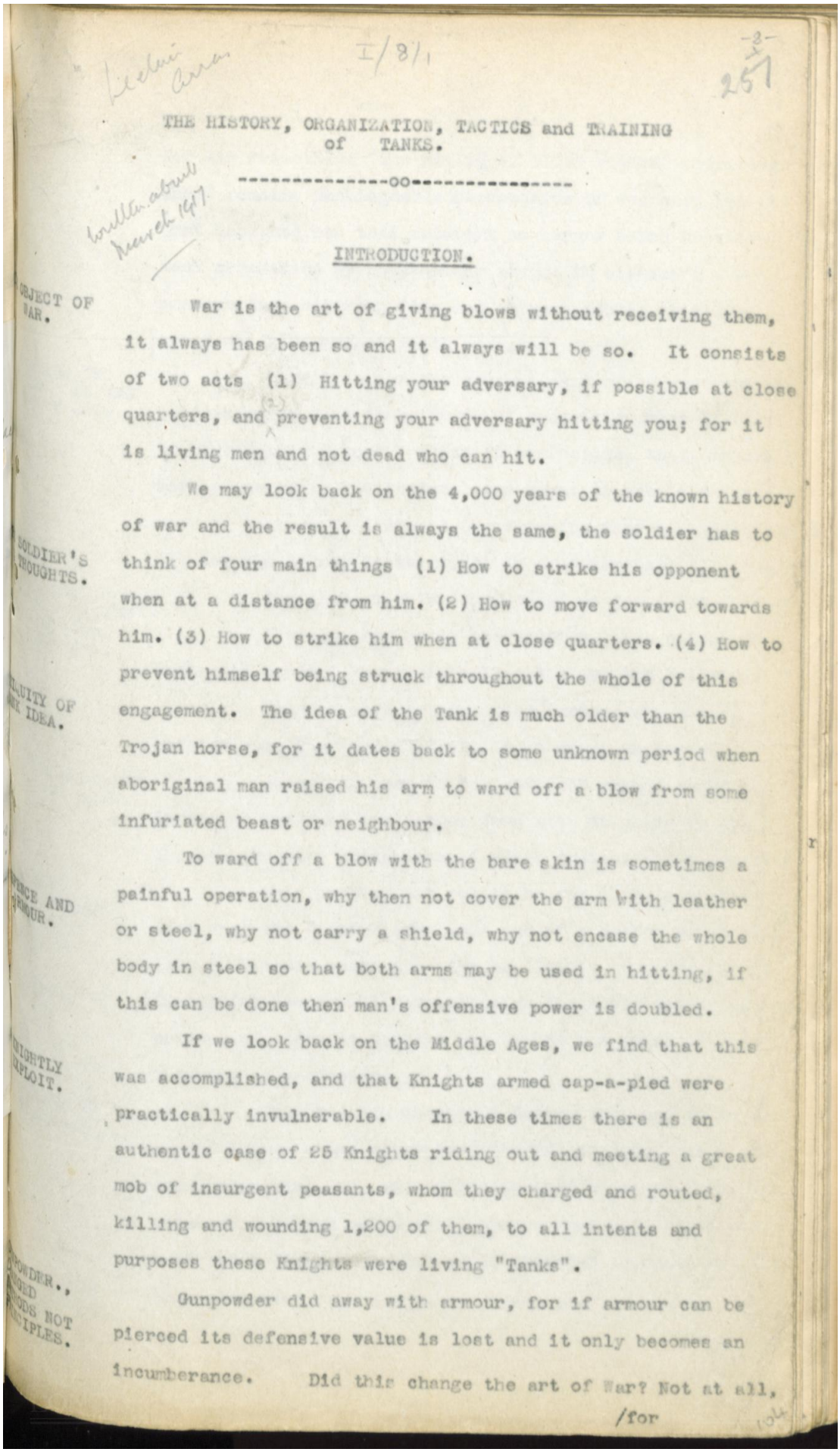


we could get Caterpillars on
tanks with tenders ~~for~~ to replace
carrying parties. Look at
our problem we may march
to Berlin or attack a fortified
position. What is the man
to carry, he may have long
marches & he can't be
overloaded & yet he will
probably want picks & shovels
& grenades, 2 or 3 days iron ration
in fact be overloaded if he
doesn't carry these things, as
no one else will. Hope to see
you 23rd

Yrs Sincerely
H. Holland



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THE HISTORY, ORGANIZATION, TACTICS and TRAINING
of TANKS.

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INTRODUCTION.

OBJECT OF WAR.

War is the art of giving blows without receiving them, it always has been so and it always will be so. It consists of two acts (1) Hitting your adversary, if possible at close quarters, and preventing your adversary hitting you; for it is living men and not dead who can hit.

SOLDIER'S THOUGHTS.

We may look back on the 4,000 years of the known history of war and the result is always the same, the soldier has to think of four main things (1) How to strike his opponent when at a distance from him. (2) How to move forward towards him. (3) How to strike him when at close quarters. (4) How to prevent himself being struck throughout the whole of this engagement. The idea of the Tank is much older than the Trojan horse, for it dates back to some unknown period when aboriginal man raised his arm to ward off a blow from some infuriated beast or neighbour.

...UITY OF ...R IDEA.

...FENCE AND ...OUR.

To ward off a blow with the bare skin is sometimes a painful operation, why then not cover the arm with leather or steel, why not carry a shield, why not encase the whole body in steel so that both arms may be used in hitting, if this can be done then man's offensive power is doubled.

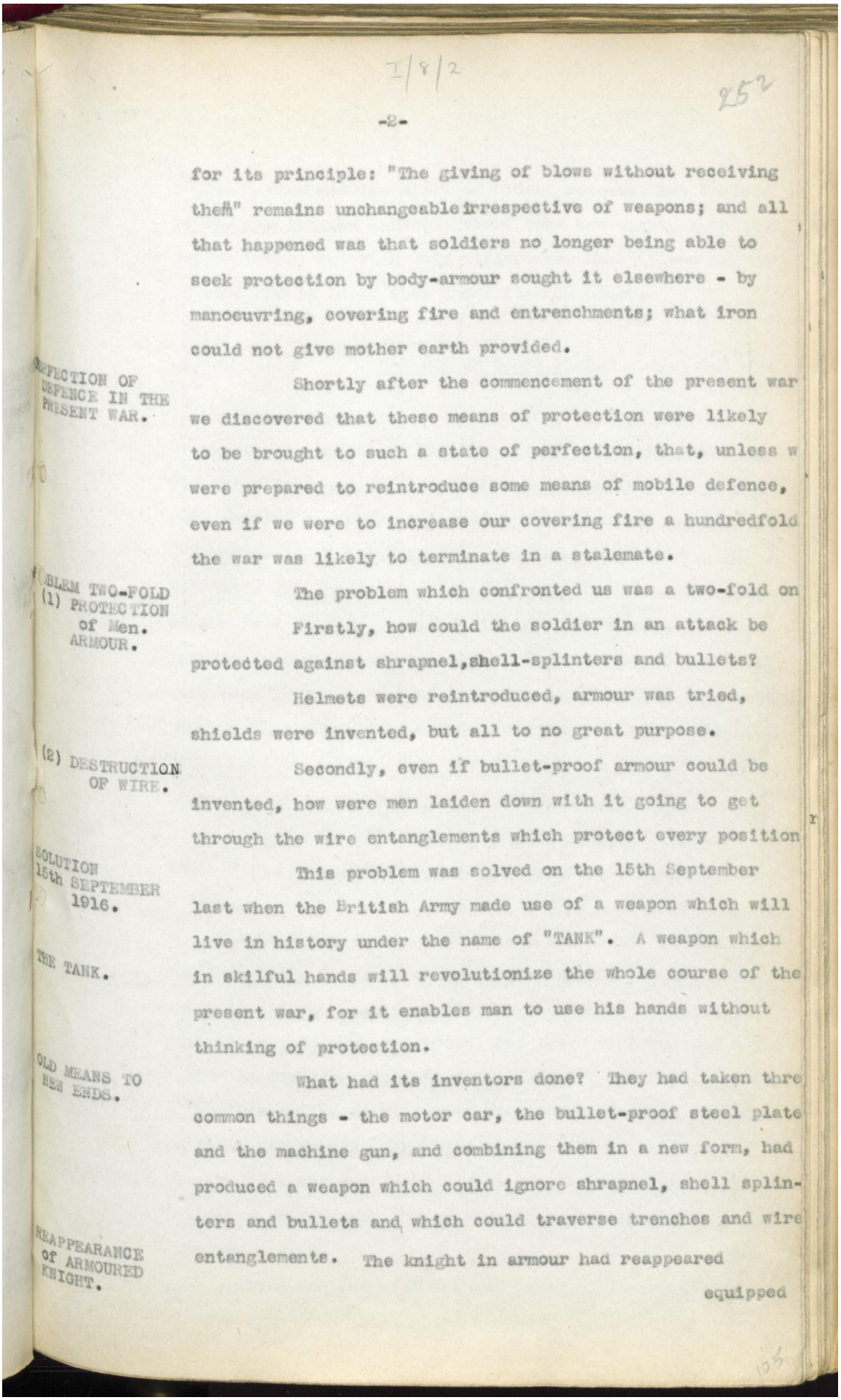
...IGHTLY ...PLOIT.

If we look back on the Middle Ages, we find that this was accomplished, and that Knights armed cap-a-pied were practically invulnerable. In these times there is an authentic case of 25 Knights riding out and meeting a great mob of insurgent peasants, whom they charged and routed, killing and wounding 1,200 of them, to all intents and purposes these Knights were living "Tanks".

...POWDER., ...GED ...DS NOT ...IPLES.

Gunpowder did away with armour, for if armour can be pierced its defensive value is lost and it only becomes an incumberance. Did this change the art of War? Not at all,

/for



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for its principle: "The giving of blows without receiving them" remains unchangeable irrespective of weapons; and all that happened was that soldiers no longer being able to seek protection by body-armour sought it elsewhere - by manoeuvring, covering fire and entrenchments; what iron could not give mother earth provided.

PERFECTION OF DEFENCE IN THE PRESENT WAR.

Shortly after the commencement of the present war we discovered that these means of protection were likely to be brought to such a state of perfection, that, unless w were prepared to reintroduce some means of mobile defence, even if we were to increase our covering fire a hundredfold the war was likely to terminate in a stalemate.

PROBLEM TWO-FOLD
(1) PROTECTION of Men. ARMOUR.

The problem which confronted us was a two-fold on

Firstly, how could the soldier in an attack be protected against shrapnel, shell-splinters and bullets?

Helmets were reintroduced, armour was tried, shields were invented, but all to no great purpose.

(2) DESTRUCTION OF WIRE.

Secondly, even if bullet-proof armour could be invented, how were men laiden down with it going to get through the wire entanglements which protect every position

SOLUTION 15th SEPTEMBER 1916.

This problem was solved on the 15th September last when the British Army made use of a weapon which will live in history under the name of "TANK". A weapon which in skilful hands will revolutionize the whole course of the present war, for it enables man to use his hands without thinking of protection.

THE TANK.

OLD MEANS TO NEW ENDS.

What had its inventors done? They had taken thre common things - the motor car, the bullet-proof steel plate and the machine gun, and combining them in a new form, had produced a weapon which could ignore shrapnel, shell splinters and bullets and which could traverse trenches and wire entanglements. The knight in armour had reappeared

REAPPEARANCE of ARMOURED KNIGHT.

equipped

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equipped with all the skill of modern science; but instead of one man incased insteel, there were now eight, a veritable Trojan horse, but with this difference, that it was not made of wood and it could move under its own power.

HISTORY OF TANKS 1916.

TYPES OF TANKS. The Tanks that , so far, have been used in France are of two types - male and female. They differ in armament, otherwise they are exactly similar. Originally the female Tank carried 4 Vickers guns and 1 Hotchkiss and the male 2 6 pounders and 4 Hotchkiss, now, however, the Vickers and Hotchkiss guns have been replaced by Lewis guns. The speed of the Tank on open ground is 120 yds per minute, but when crossing trecnhes and obstacles it is not safe to count on more than 30 yards, whilst over very heavily shelled ground the speed is often only 15 yds a minute. By night the speed often does not exceed this last figure, and the crossing of obstacles presents considerable difficulty.

ARMAMENT.

SPEED.

LENGTH 26'

The length of a tank is 26 feet, width from track to track 8 ft. 6 in., from sponson to sponson 13 feet; height 8 feet.

TRENCHES.

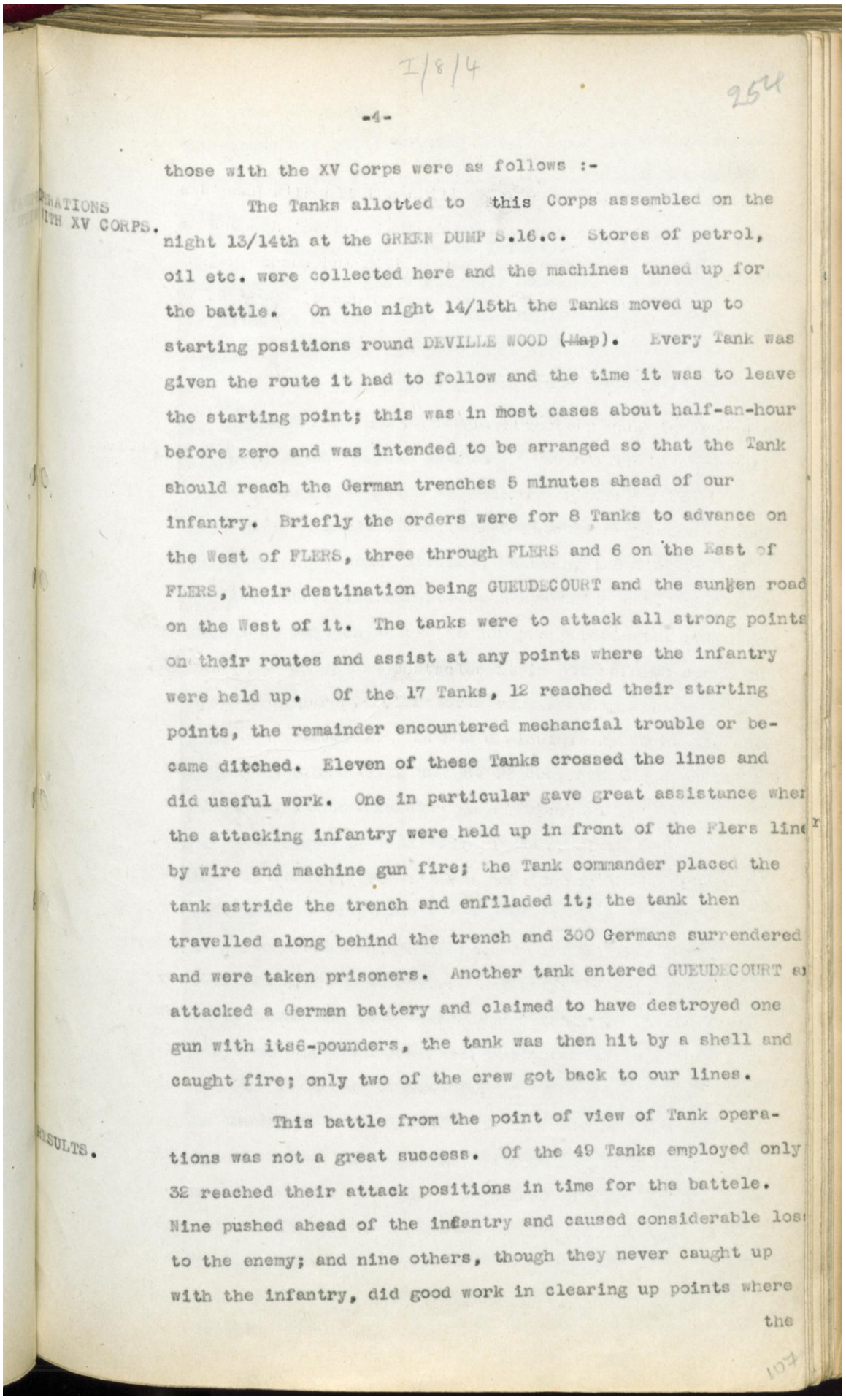
A Tank can cross a 10 ft. gap and climb a 5 ft. vertical wall, it can traverse any entanglement, through which it leaves a gap passable for infantry. It can also push its way through brushwood, but trees of more than a few inches in diameter will stop it.

OPERATIONS 15th SEPTR.

During the first fortnight in September two companies of Tanks, 49 in all, assembled at the "LOOP", half way between FRICOURT and BRAY. They were allotted to Corps as follows:- XIV Corps, 17; XV Corps, 17; III Corps, 8 and Reserve Army, 7.

CONCENTRATION.

Those working with the XIV Corps, III Corps and Reserve Army were not a great success, the operations of those



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those with the XV Corps were as follows :-

PERATIONS WITH XV CORPS.

The Tanks allotted to this Corps assembled on the night 13/14th at the GREEN DUMP S.16.c. Stores of petrol, oil etc. were collected here and the machines tuned up for the battle. On the night 14/15th the Tanks moved up to starting positions round DEVILLE WOOD (Map). Every Tank was given the route it had to follow and the time it was to leave the starting point; this was in most cases about half-an-hour before zero and was intended to be arranged so that the Tank should reach the German trenches 5 minutes ahead of our infantry. Briefly the orders were for 8 Tanks to advance on the West of FLERS, three through FLERS and 6 on the East of FLERS, their destination being GUEUDECOURT and the sunken road on the West of it. The tanks were to attack all strong points on their routes and assist at any points where the infantry were held up. Of the 17 Tanks, 12 reached their starting points, the remainder encountered mechancial trouble or became ditched. Eleven of these Tanks crossed the lines and did useful work. One in particular gave great assistance when the attacking infantry were held up in front of the Flers line by wire and machine gun fire; the Tank commander placed the tank astride the trench and enfiladed it; the tank then travelled along behind the trench and 300 Germans surrendered and were taken prisoners. Another tank entered GUEUDECOURT and attacked a German battery and claimed to have destroyed one gun with its6-pounders, the tank was then hit by a shell and caught fire; only two of the crew got back to our lines.

RESULTS.

This battle from the point of view of Tank operations was not a great success. Of the 49 Tanks employed only 32 reached their attack positions in time for the battele. Nine pushed ahead of the infantry and caused considerable loss to the enemy; and nine others, though they never caught up with the infantry, did good work in clearing up points where the

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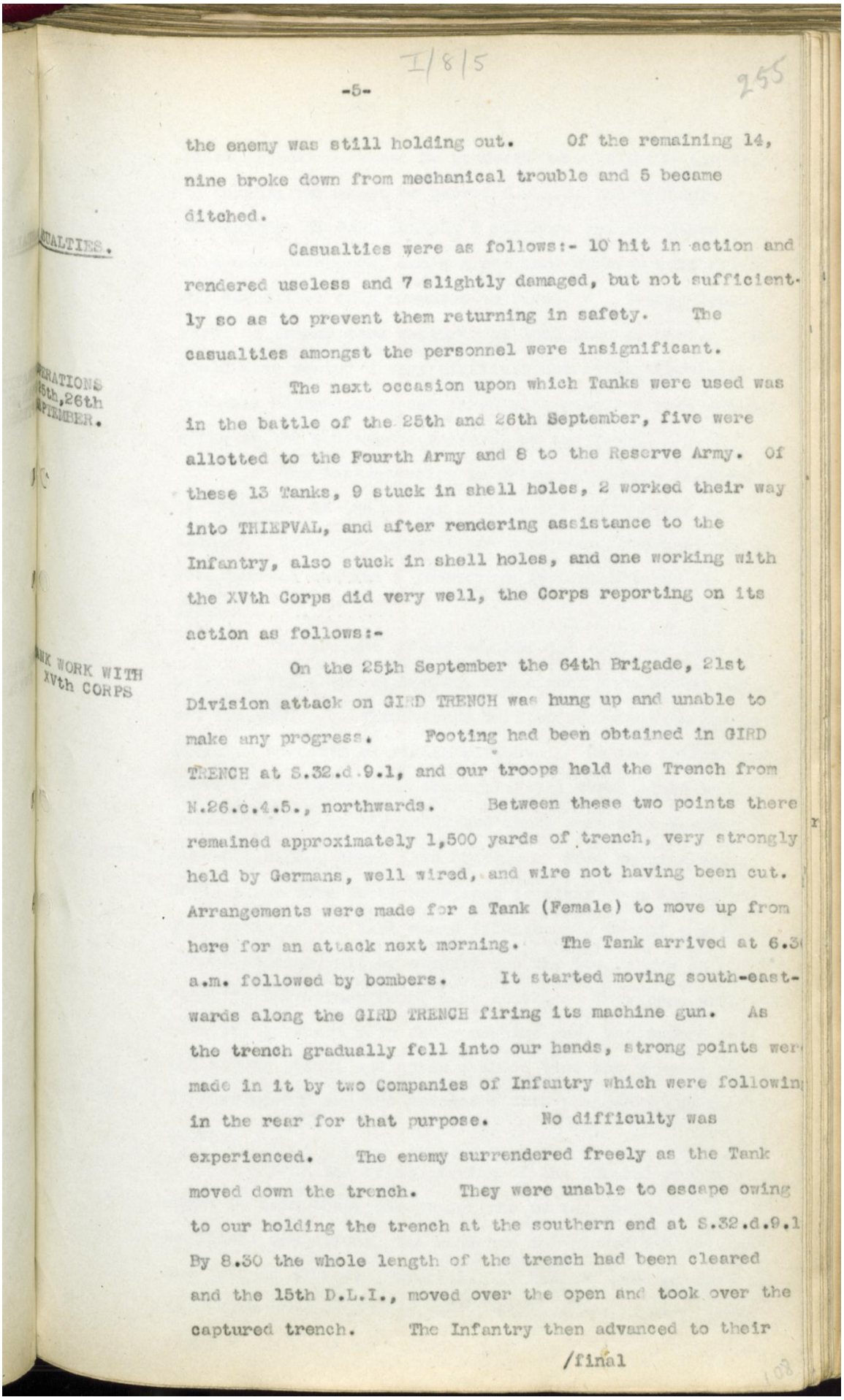

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the enemy was still holding out. Of the remaining 14, nine broke down from mechanical trouble and 5 became ditched.

ALTIES.

Casualties were as follows:- 10 hit in action and rendered useless and 7 slightly damaged, but not sufficiently so as to prevent them returning in safety. The casualties amongst the personnel were insignificant.

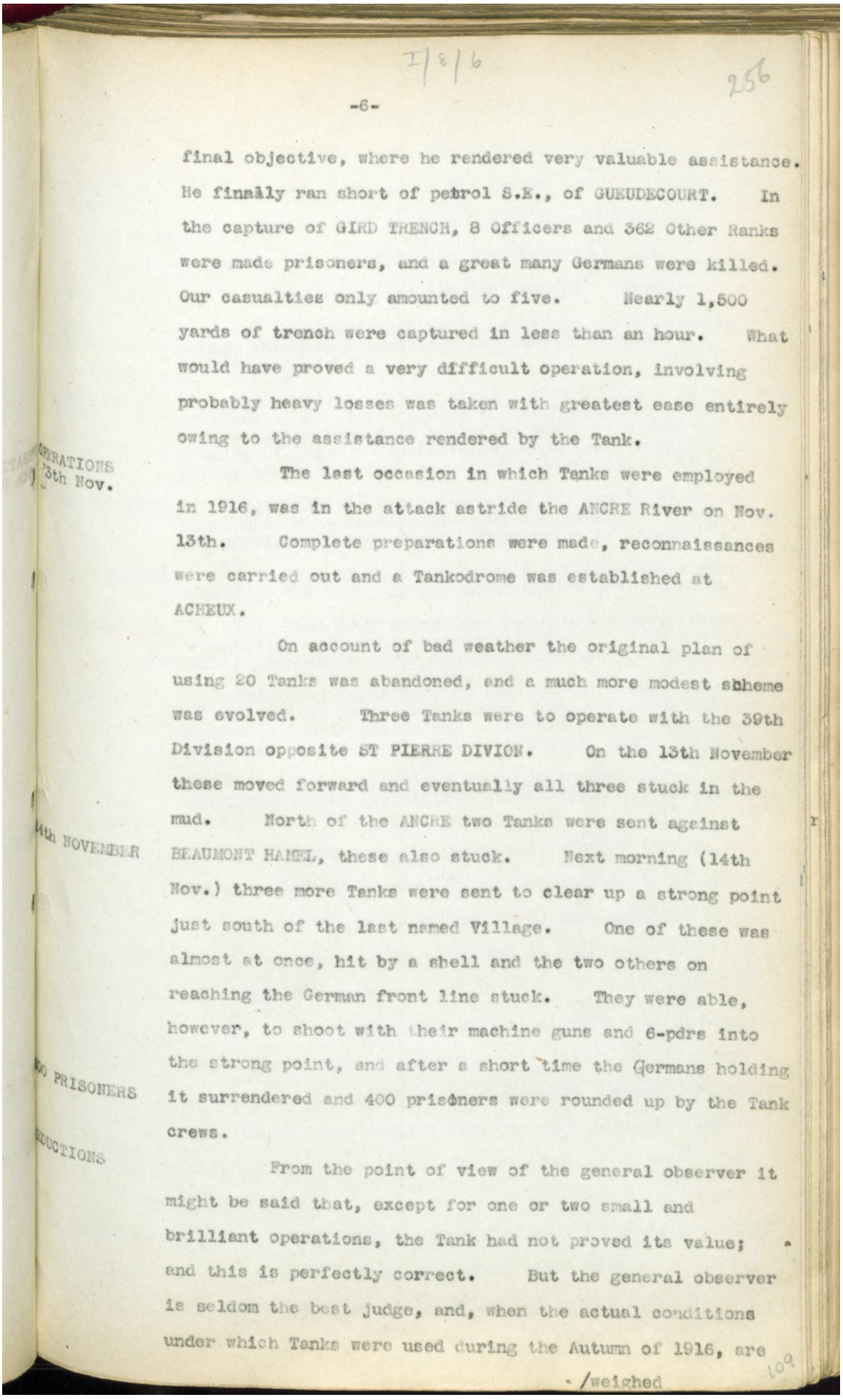
RATIONS
5th,26th
PTEMBER.

The next occasion upon which Tanks were used was in the battle of the 25th and 26th September, five were allotted to the Fourth Army and 8 to the Reserve Army. Of these 13 Tanks, 9 stuck in shell holes, 2 worked their way into THIEPVAL, and after rendering assistance to the Infantry, also stuck in shell holes, and one working with the XVth Corps did very well, the Corps reporting on its action as follows:-

NK WORK WITH
XVth CORPS

On the 25th September the 64th Brigade, 21st Division attack on GIRD TRENCH was hung up and unable to make any progress. Footing had been obtained in GIRD TRENCH at S.32.d.9.1, and our troops held the Trench from N.26.c.4.5., northwards. Between these two points there remained approximately 1,500 yards of trench, very strongly held by Germans, well wired, and wire not having been cut. Arrangements were made for a Tank (Female) to move up from here for an attack next morning. The Tank arrived at 6.3 a.m. followed by bombers. It started moving south-eastwards along the GIRD TRENCH firing its machine gun. As the trench gradually fell into our hands, strong points were made in it by two Companies of Infantry which were following in the rear for that purpose. No difficulty was experienced. The enemy surrendered freely as the Tank moved down the trench. They were unable to escape owing to our holding the trench at the southern end at S.32.d.9.1 By 8.30 the whole length of the trench had been cleared and the 15th D.L.I., moved over the open and took over the captured trench. The Infantry then advanced to their

/final



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final objective, where he rendered very valuable assistance. He finally ran short of petrol S.E., of GUEUDECOURT. In the capture of GIRD TRENCH, 8 Officers and 362 Other Ranks were made prisoners, and a great many Germans were killed. Our casualties only amounted to five. Nearly 1,500 yards of trench were captured in less than an hour. What would have proved a very difficult operation, involving probably heavy losses was taken with greatest ease entirely owing to the assistance rendered by the Tank.

OPERATIONS
13th Nov.

The last occasion in which Tanks were employed in 1916, was in the attack astride the ANCRE River on Nov. 13th. Complete preparations were made, reconnaissances were carried out and a Tankodrome was established at ACHEUX.

On account of bad weather the original plan of using 20 Tanks was abandoned, and a much more modest scheme was evolved. Three Tanks were to operate with the 39th Division opposite ST PIERRE DIVION. On the 13th November these moved forward and eventually all three stuck in the mud. North of the ANCRE two Tanks were sent against BEAUMONT HAMEL, these also stuck. Next morning (14th Nov.) three more Tanks were sent to clear up a strong point just south of the last named Village. One of these was almost at once, hit by a shell and the two others on reaching the German front line stuck. They were able, however, to shoot with their machine guns and 6-pdrs into the strong point, and after a short time the Germans holding it surrendered and 400 prisoners were rounded up by the Tank crews.

14th NOVEMBER

400 PRISONERS

REDUCTIONS

From the point of view of the general observer it might be said that, except for one or two small and brilliant operations, the Tank had not proved its value; and this is perfectly correct. But the general observer is seldom the best judge, and, when the actual conditions under which Tanks were used during the Autumn of 1916, are

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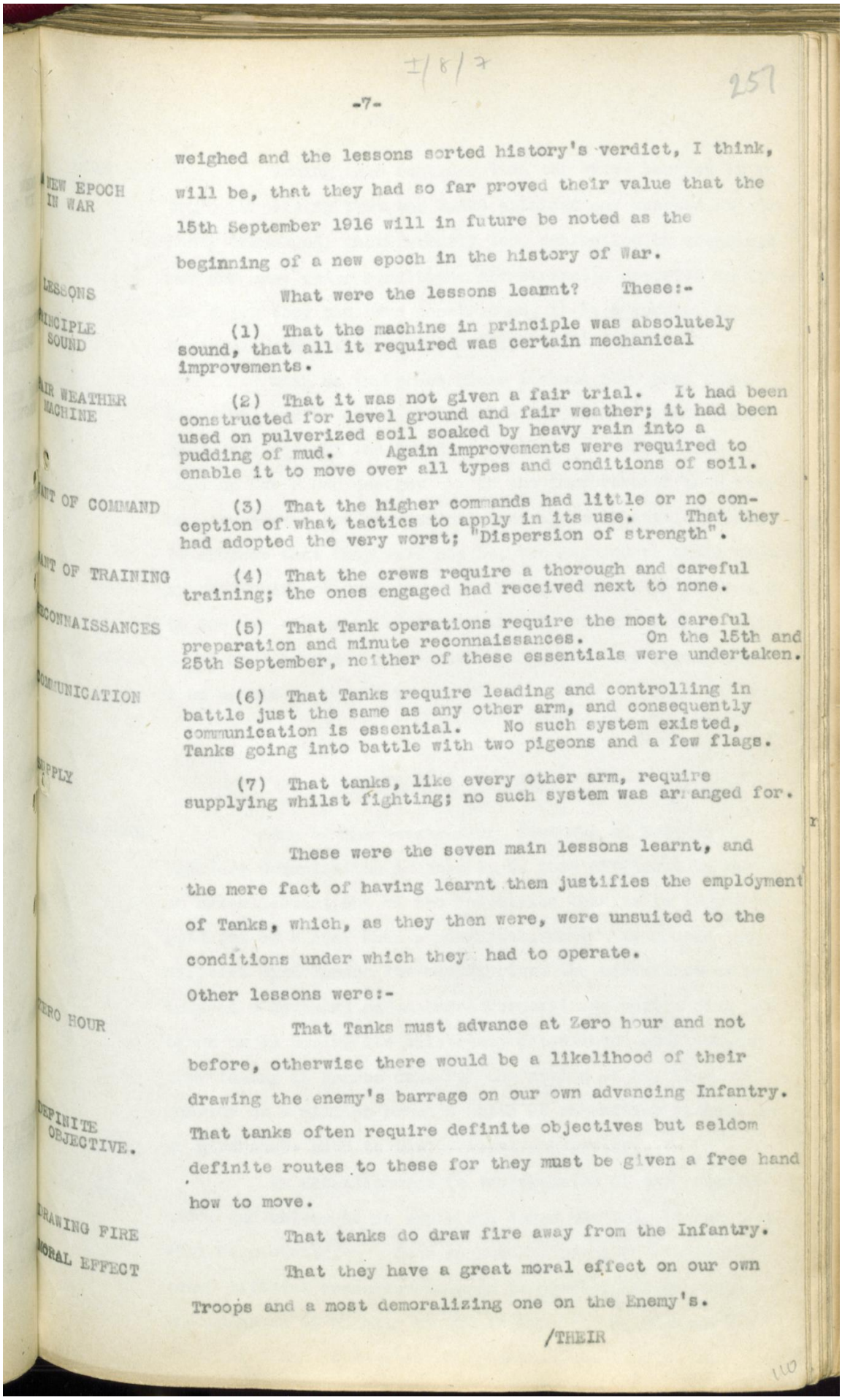

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weighed and the lessons sorted history's verdict, I think,

A NEW EPOCH IN WAR — will be, that they had so far proved their value that the 15th September 1916 will in future be noted as the beginning of a new epoch in the history of War.

LESSONS — What were the lessons learnt? These:-

PRINCIPLE SOUND — (1) That the machine in principle was absolutely sound, that all it required was certain mechanical improvements.

FAIR WEATHER MACHINE — (2) That it was not given a fair trial. It had been constructed for level ground and fair weather; it had been used on pulverized soil soaked by heavy rain into a pudding of mud. Again improvements were required to enable it to move over all types and conditions of soil.

LACK OF COMMAND — (3) That the higher commands had little or no conception of what tactics to apply in its use. That they had adopted the very worst; "Dispersion of strength".

LACK OF TRAINING — (4) That the crews require a thorough and careful training; the ones engaged had received next to none.

RECONNAISSANCES — (5) That Tank operations require the most careful preparation and minute reconnaissances. On the 15th and 25th September, neither of these essentials were undertaken.

COMMUNICATION — (6) That Tanks require leading and controlling in battle just the same as any other arm, and consequently communication is essential. No such system existed, Tanks going into battle with two pigeons and a few flags.

SUPPLY — (7) That tanks, like every other arm, require supplying whilst fighting; no such system was arranged for.

These were the seven main lessons learnt, and the mere fact of having learnt them justifies the employment of Tanks, which, as they then were, were unsuited to the conditions under which they had to operate.

Other lessons were:-

ZERO HOUR — That Tanks must advance at Zero hour and not before, otherwise there would be a likelihood of their drawing the enemy's barrage on our own advancing Infantry.

DEFINITE OBJECTIVE. — That tanks often require definite objectives but seldom definite routes to these for they must be given a free hand how to move.

DRAWING FIRE — That tanks do draw fire away from the Infantry.

MORAL EFFECT — That they have a great moral effect on our own Troops and a most demoralizing one on the Enemy's.

/THEIR

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IR GREAT SUCCESS.

Taking into consideration the above lessons it is truly surprising that the Tanks attained any success at all. Badly Commanded, indifferently led, controlled by untrained men and used under conditions diametrically opposite to those for which they had been constructed, it is a wonder, almost a miracle, that they did so well.

PROVED MACHINE

With us in France these lessons have been taken to heart, and we trust that in England this also has been the case; for all the tactical skill in the world will not make up for a bad design. If the improvements that have been suggested are carried out, and there is little reason to suspect that they will not be, the machine we shall employ in the Spring, though not a new design, should prove from 50 to 100 per cent more efficient than the original one. Later on we hope to get a "Non-stop" Machine, but concerning this I am unable to inform you.

N-STOP TANK.

ORGANIZATION OF TANKS.

STABLISHMENTS.

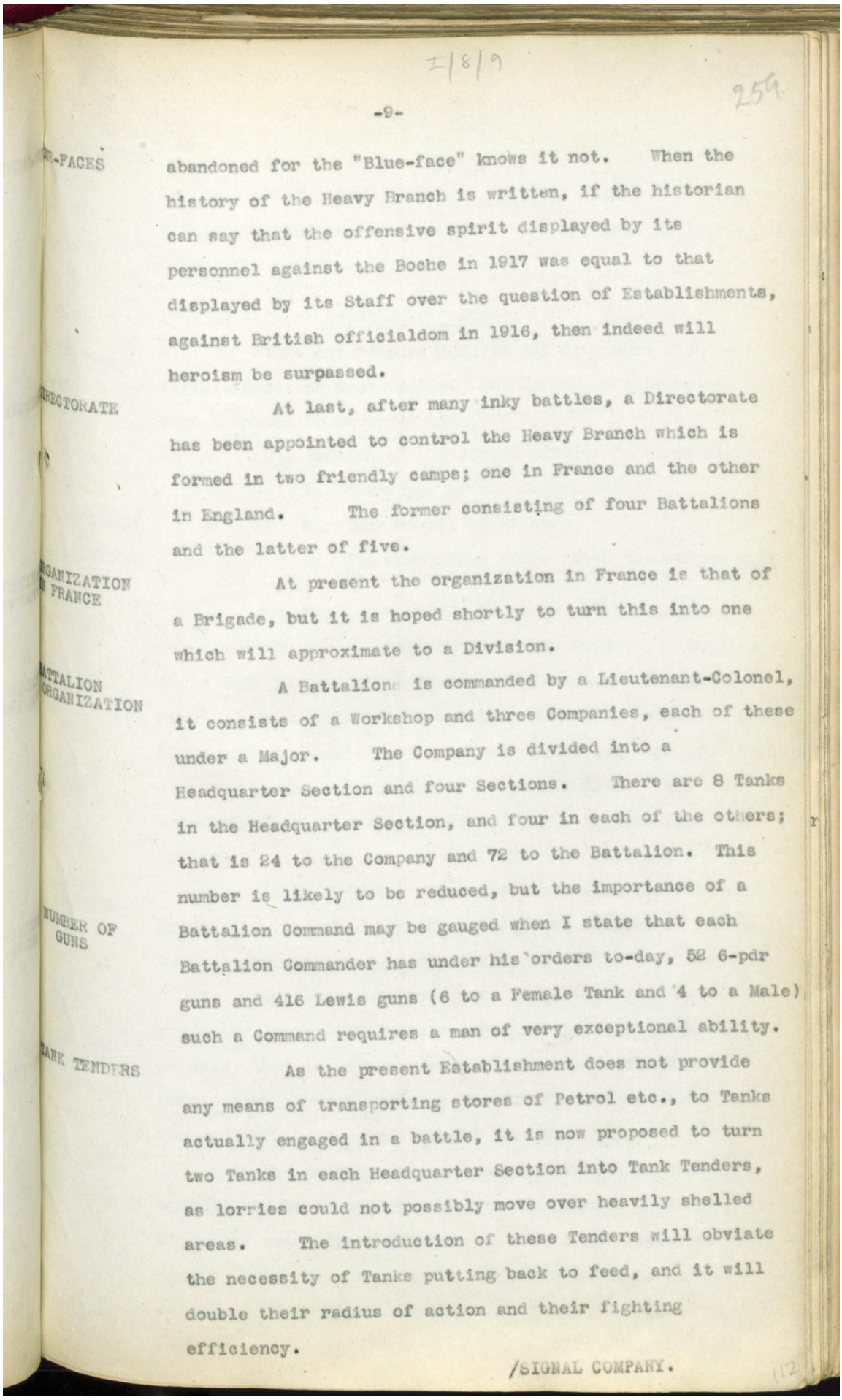
One of the outstanding features of British Military Organization is that it is more difficult to obtain an Establishment out of the War Office than it is to extract gold ~~out of~~ from a Jew. When a new Establishment is mooted the official mind looses its equilibrium. The difference of pay between a Corporal and a Lance Corporal may cost a King his crown or an Empire its existence; yet, without question, any Army to-day in France can, for the asking of it, "blow off" a quarter of a million pound's worth of ammunition without let or hindrance- such is the official perspective.

NUTIÆ

KELETON OF AN RGANIZATION

An Establishment is the skeleton of any organization, and unless it is ample and sound the body it supports will be ricketty. Once an Establishment is sanctioned every official endeavour is made to prevent its growth. The skeleton of a child of two is unsuited to support the flesh of a man of twenty. Reason, however, must be

/abandoned



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BLUE-FACES

abandoned for the "Blue-face" knows it not. When the history of the Heavy Branch is written, if the historian can say that the offensive spirit displayed by its personnel against the Boche in 1917 was equal to that displayed by its Staff over the question of Establishments, against British officialdom in 1916, then indeed will heroism be surpassed.

DIRECTORATE

At last, after many inky battles, a Directorate has been appointed to control the Heavy Branch which is formed in two friendly camps; one in France and the other in England. The former consisting of four Battalions and the latter of five.

ORGANIZATION IN FRANCE

At present the organization in France is that of a Brigade, but it is hoped shortly to turn this into one which will approximate to a Division.

BATTALION ORGANIZATION

A Battalion is commanded by a Lieutenant-Colonel, it consists of a Workshop and three Companies, each of these under a Major. The Company is divided into a Headquarter Section and four Sections. There are 8 Tanks in the Headquarter Section, and four in each of the others; that is 24 to the Company and 72 to the Battalion. This number is likely to be reduced, but the importance of a Battalion Command may be gauged when I state that each Battalion Commander has under his orders to-day, 52 6-pdr guns and 416 Lewis guns (6 to a Female Tank and 4 to a Male) such a Command requires a man of very exceptional ability.

NUMBER OF GUNS

TANK TENDERS

As the present Establishment does not provide any means of transporting stores of Petrol etc., to Tanks actually engaged in a battle, it is now proposed to turn two Tanks in each Headquarter Section into Tank Tenders, as lorries could not possibly move over heavily shelled areas. The introduction of these Tenders will obviate the necessity of Tanks putting back to feed, and it will double their radius of action and their fighting efficiency.

/SIGNAL COMPANY.

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GNAL COMPANY

Another deficiency in the existing Establishment is the lack of a Signal Company to each Brigade, at present 4 Telephonists are allowed, these will no doubt be increased before the next War.

TACTICS OF TANKS

CTICAL STABLISHMENT.

I do not propose here to lay down more than an Establishment of Tank Tactics, but as far as this Establishment goes I intend to be unstinting.

The tactics of any weapon depends on three factors:-

1. The power of the weapon itself.
2. The principles of War.
3. The conditions under which the man weapon will be called upon to apply these principles.

POWER
PRINCIPLES
CONDITIONS

OBILE FORTRESS.

The Tank is a mobile fortress, it has nothing to fear from shrapnell, shell splinters or bullets. From its Lewis Guns it can, if necessary, deliver 1,000 rounds a minute, consequently it is a weapon admirably suited to give blows without receiving them; further, it can move practically over any ground and through all entanglements. The principle upon which it should be fought is therefore the offensive.

FFENSIVE

EMAINING RINCIPLES

As an Infantry offensive depends on the following principles, the objective,security,mass, economy of force, surprise,movement and co-operation, so does a Tank attack.

CTION OF TANKS CCORDING TO RINCIPLES

The Tank must know what it is after; it must be protected just like Infantry, by Artillery; it must attack in mass, that is in numbers, but not necessarily all in the same place; it must surprise the enemy; move as rapidly as it can and work hand in glove with the other arms.

ONDITIONS KNOWN ND UNKNOWN

The conditions under which a Tank will have to operate may be classed ~~into~~ under known and unknown , and it is the object of every Tank Commander to reduce the latter to the utmost limit, this he does by reconnaissance, the most important of which will fall to the Battalion and Company

ECONNAISSANCE .INTELLIGENCE FICER.

/Intelligence

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Intelligence Officers, who must be men of exceptional ability and training. Outside these reconnaissances and the information supplied to the Tank Commander by the Units to which they are attached, the application of principles to condition will depend for success or failure on the objective selected for the Tank attack.

JECTIVE ALL PORTANT

PENDS ON NERAL PLAN

To lay bare this objective, which at present must be subordinate to the main objective of Penetrating the enemy's lines on a sufficiently broad front as to profit by the penetration, it is necessary to realize the leading tactical features of a trench attack.

CTICAL ATURE OF S WAR

(1) Both sides are drawn out in line many hundreds of miles long and some three miles deep. Of the total forces of each side this narrow belt contains 60% of the total Infantry and 90% of the total guns. If, at the present moment, we could advance, in the space of a few hours, on a front of say 40 miles and to the depth of three, we should capture and disorganize such an enormous number of the enemy's Infantry and guns that there is little likelihood of the enemy being able to refill the gap by the reserves at his disposal.

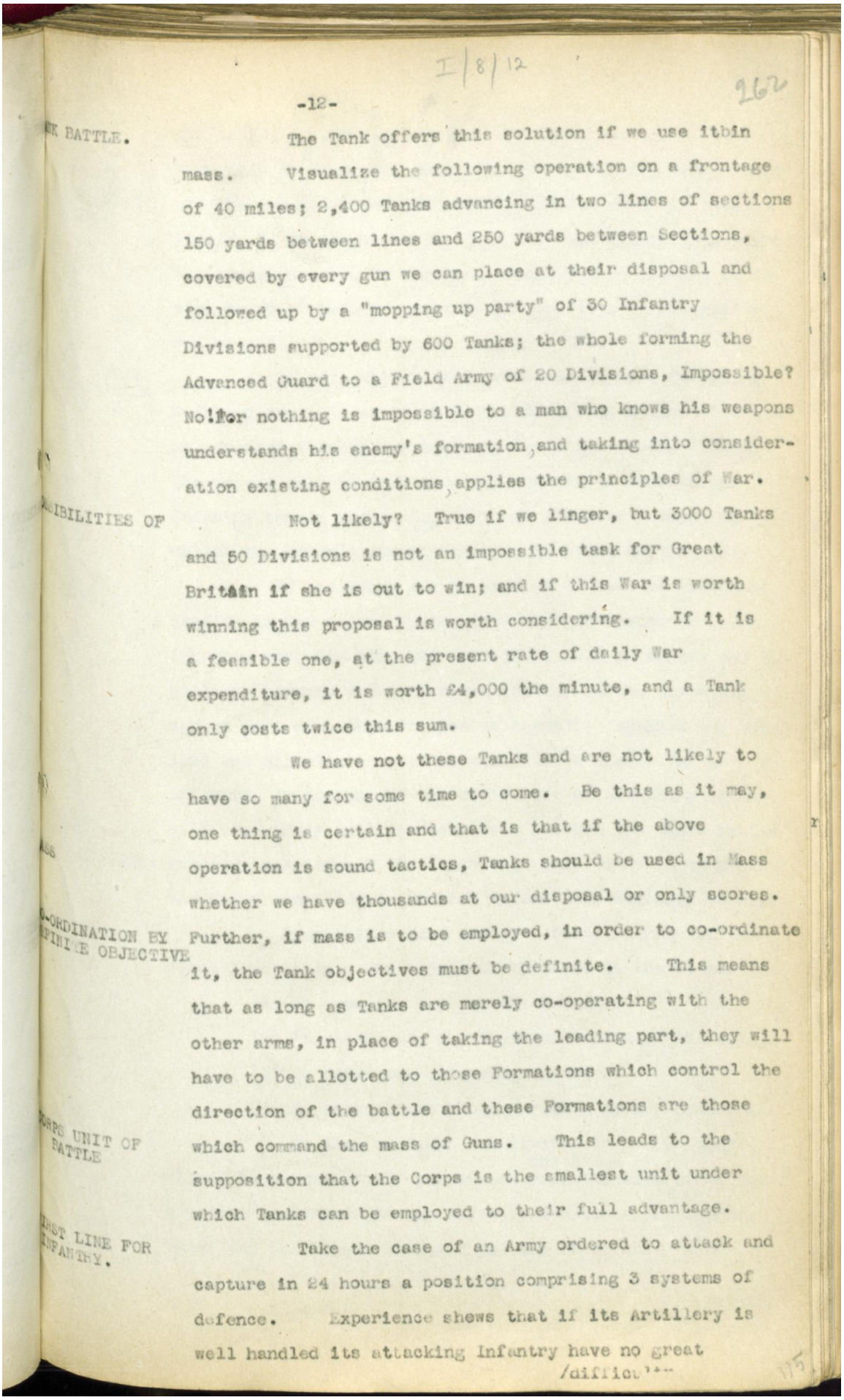
SISTANCE DEFENCES

(2) The difficulty of doing this has always been that on such a frontage we cannot accummulate sufficient means - men and guns to overcome the enemy's resistance; and if we select a narrow front to operate against the resistance met is sufficient to wear down the endurance of our troops and to allow of the enemy bringing up reserves and so checking our progress.

ING DITIONS TO FAVOUR

If now we accept these conditions, and, in place of attempting to change the first, turn its leading characteristic - length with little depth, to our favour, we shall be nearing a solution to the second, because the cordon system of tactics is the very worst when a penetration is effected. A penetration on the front of 40 miles would lead to the debacle of the whole German Army.

TRATION CORDON TEM



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K BATTLE.

The Tank offers this solution if we use itbin mass. Visualize the following operation on a frontage of 40 miles; 2,400 Tanks advancing in two lines of sections 150 yards between lines and 250 yards between Sections, covered by every gun we can place at their disposal and followed up by a "mopping up party" of 30 Infantry Divisions supported by 600 Tanks; the whole forming the Advanced Guard to a Field Army of 20 Divisions, Impossible? No! for nothing is impossible to a man who knows his weapons understands his enemy's formation, and taking into consideration existing conditions, applies the principles of War.

SIBILITIES OF

Not likely? True if we linger, but 3000 Tanks and 50 Divisions is not an impossible task for Great Britain if she is out to win; and if this War is worth winning this proposal is worth considering. If it is a feasible one, at the present rate of daily War expenditure, it is worth £4,000 the minute, and a Tank only costs twice this sum.

We have not these Tanks and are not likely to have so many for some time to come. Be this as it may, one thing is certain and that is that if the above operation is sound tactics, Tanks should be used in Mass whether we have thousands at our disposal or only scores.

SS

O-ORDINATION BY FINITE OBJECTIVE

Further, if mass is to be employed, in order to co-ordinate it, the Tank objectives must be definite. This means that as long as Tanks are merely co-operating with the other arms, in place of taking the leading part, they will have to be allotted to those Formations which control the direction of the battle and these Formations are those which command the mass of Guns. This leads to the supposition that the Corps is the smallest unit under which Tanks can be employed to their full advantage.

ORPS UNIT OF BATTLE

IRST LINE FOR NFANTRY.

Take the case of an Army ordered to attack and capture in 24 hours a position comprising 3 systems of defence. Experience shews that if its Artillery is well handled its attacking Infantry have no great

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difficulty in carrying most of the first system. But when this is captured, what with points hanging out in rear and the general disorganization resulting from the assault itself, it is the exception that the same troops will carry the second system, or that new troops can be brought up in time to do so before the enemy has had time to reorganize and hold it.

INFANTRY DELAY 2nd LINE

If now, whilst both the attacking and defending infantry are in a state of disorganization, a line of Tanks is advanced through our infantry in to the second system, the result will be that time will be gained wherein our infantry can be shaken together, or reserves brought up whilst the enemy's disorganization is being accentuated.

TANKS TO COVER REORGANIZATION OF INFANTRY

If the enemy can be kept in a state of disorganization in his second system until our re-formed or fresh infantry assaults him, his over-throw will be speedy and the ultimate advance from the second system to the third will savour more of a pursuit than an assault. Against the third line the majority of the Tanks should be massed for here the infantry, on account of the diminution of artillery support, will need their full co-operation. After the Third system has been carried all the Tanks will have to do is to prevent the enemy consolidating behind it and thus checking pursuit.

ADVANCE TO 3rd LINE.

CHECKING ENEMY'S CONSOLIDATION.

From this we can deduce a tactical rule of the first importance. The object of the Tank in the attack is:

(1) To open the way for the infantry.

(2) To accentuate the disorganization of the enemy.

(3) To cover our own reorganization.

(4) To prevent the enemy throwing up new defences.

MAIN DUTY OF TANKS.

As long as Tanks are limited in number they should be earmarked for the attack of/which will offer the greatest resistance to the Infantry advance - the second, third and subsequent line and not the first one. Each obstacles

/system

system will require a separate echelon of Tanks, just as each system requires a separate and unused force of infantry.

PPING UP NKS.

In order to prevent strong points in the enemy's lines holding out in rear of our advance and so limiting the area of manoeuvre and hindering the pushing forward of reinforcements and supplies, it will be necessary to detail a certain number of Tanks as moppers up, and these should be placed under the orders of the Divisions, that is of the infantry fighting Units who should give them a free hand, within the barrage salient, to over run these hostile islands which are unlikely to be strongly supported by Artillery. If this is done it will be found that a section, or even half a section of Tanks, will in a short period accomplish what many heavy guns and a large force of Infantry would take several hours to carry out.

TICAL STRIBUTION TANKS.

We, therefore, find that given any number of Tanks from a Battalion upwards there are two main tactical distributions:-

(1) The Corps distribution for the main objective.

(2) The Divisional distribution for isolated strongpoints.

PS DISTRI- TION ON ED OGRAMME. VISION ON CUMSTANCES

The first is controlled by the Corps Artillery fire and the Divisional barrages, the second by the accidents of battle and the decision of the Infantry Commanders. The first must be arranged on a fixed programme, the second according to circumstances. The aid which the Tanks can afford the Infantry in both these operations depends firstly on the skill and determination with which they are handled and secondly on the co-operation afforded to them by both the gunners and the Infantry. This co-operation is vital to success.

ARTILLERY CO-OPERATION. The gunner must realize that though the Tank can pass through all wire and over most trenches it cannot pass with impunity through barrages of field gun shells or heavy Artillery bombardments. The heavy artillery must, therefore,

/afford

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ARTS REQUIRE SUPPORT OF HEAVY ARTILL- RY & ADJUST- ENT OF BAR- AGES IN FIELD.

afford it a similar support that it does the infantry, namely by counter battering the enemy's guns. The field artillery by timing its barrages so that they will not interfere with the movement forward of the Tanks in advance of the infantry, when the infantry have captured the enemy's first line system. If by throwing a smoke barrage in front of the advancing Tanks the field guns obscure their progress so much the better; but when once the infantry is brought to a standstill through the disorganization inherent in all attacks, if the standing barrages are established with reference to the infantry only then will the Tanks suffer more through our own fire than the enemy's. By arranging their barrages so as to preclude ~~of~~ this danger, then will the gunners be co-operating in the fullest sense of the word; and this co-operation will depend: firstly on a timed programme, secondly on establishing some rapid means of communication between the Tanks and the Artillery OPs.

INFANTRY CO-OPERATION. Whilst the co-operation between Artillery and Tanks may be termed distant, that between infantry and Tanks is immediate, and unless the closest bond of sympathy unite these two arms the infantry will not be able to take advantage of the opportunities which the Tanks will create. In this case co-operation will depend on three main factors.

(1) The limitations of the attack showing the main and subsidiary objectives.

(2) The combined reconnaissances of these by the Infantry and Tank Commanders.

(3) The possibilities of rapid communication between Tanks and Infantry and Infantry and Tanks.

The Infantry Commander must remember that the Tank is an engine of war and not a miracle, that its duty is to open a way for the infantry and not to pull the infantry's chestnuts out of the fire. That if it is perpetually called upon

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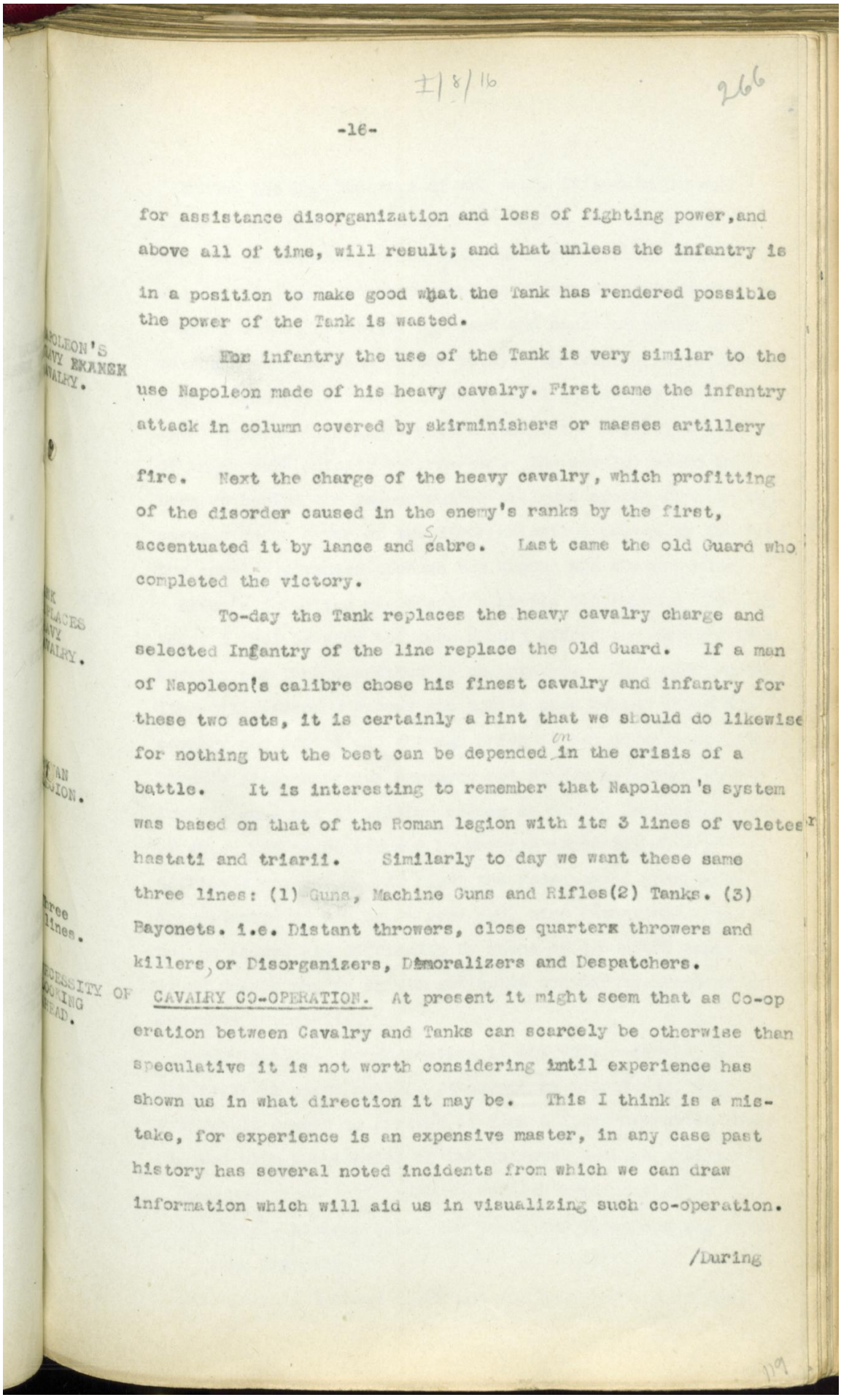

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for assistance disorganization and loss of fighting power, and above all of time, will result; and that unless the infantry is in a position to make good what the Tank has rendered possible the power of the Tank is wasted.

NAPOLEON'S HEAVY CAVALRY.

For infantry the use of the Tank is very similar to the use Napoleon made of his heavy cavalry. First came the infantry attack in column covered by skirminishers or masses artillery fire. Next the charge of the heavy cavalry, which profitting of the disorder caused in the enemy's ranks by the first, accentuated it by lance and sabre. Last came the old Guard who completed the victory.

TANK REPLACES HEAVY CAVALRY.

To-day the Tank replaces the heavy cavalry charge and selected Infantry of the line replace the Old Guard. If a man of Napoleon's calibre chose his finest cavalry and infantry for these two acts, it is certainly a hint that we should do likewise for nothing but the best can be depended on in the crisis of a battle. It is interesting to remember that Napoleon's system was based on that of the Roman legion with its 3 lines of veletes hastati and triarii. Similarly to day we want these same three lines: (1) Guns, Machine Guns and Rifles (2) Tanks. (3) Bayonets. i.e. Distant throwers, close quarters throwers and killers, or Disorganizers, Demoralizers and Despatchers.

ROMAN LEGION.

Three lines.

NECESSITY OF LOOKING AHEAD.

CAVALRY CO-OPERATION. At present it might seem that as Co-operation between Cavalry and Tanks can scarcely be otherwise than speculative it is not worth considering until experience has shown us in what direction it may be. This I think is a mistake, for experience is an expensive master, in any case past history has several noted incidents from which we can draw information which will aid us in visualizing such co-operation.

/During

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During the Hussite wars of the early fifteenth century Zisca found such difficulty in attacking the compact hedgehogs of Lansknechts, armed with Lance and halbad, that he mounted his guns, crude weapons on blocks without wheels, on country carts, protected by beams and sacks of earth, and advanced them in line on the enemy. In front of this line of wagons came his cavalry. The enemy's phalaux on seeing the cavalry would turn about retire behind the wagons, the horses of which were quickly unharnessed. The cavalry would then form up behind the wagons whilst the guns opened fire on the enemy. Under cover of the disorganization caused by the fire the cavalry advanced through the wagons and charged home.

Zisca's formation was one of a mobile block-house line, and this, I feel is what the Tank should afford the cavalry if a Cavalry and Tank operation is undertaken. This block-house line will afford a secure and mobile base behind which the cavalry can retire and through which it can advance at will. Zisca's Wagenburg was employed not simply to afford wheels for his guns but to utilize wagons as moving fortresses, each of which had to be stormed by heavily armoured men - a difficult operation. At first the hedgehog of spears was as inpenitrable to him as, a year ago, wire entanglement was to us, he solved his difficulty by means of a country cart, there is no reason why we should not solve our own by means of an armoured automobile.

Communication. Communication is not only essential but difficult to carry out. It cannot be improvised, and unless a workable scheme is arrived at Tank tactics cannot be co-ordinated with the tactics of the Infantry and the Artillery.

Communications fall under three main headings.

(1) Local, between Tanks and Tanks, and Tanks and the attacking Infantry.

(2) Distant, between Tanks and the headquarters of the

/main

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main Infantry and Artillery formations and also with the fixed Artillery O.Ps.

(3) Telephonic: between Tank H.Q. and battalion and Company H.Q., and to Corps and Divisional H.Q. and also the Tank O.Ps.

ERATIVE.

At present no establishment exists for any of these organizations, nevertheless, establishment or no establishment all three will have to be created if the Tank battle is ever to take place.

AL
ALLING.

Local signalling for its success depends on three factors:-

(a) The signal must be readable by eye up to 800 yds and by glasses up to 1 mile. This applies to both day and night.

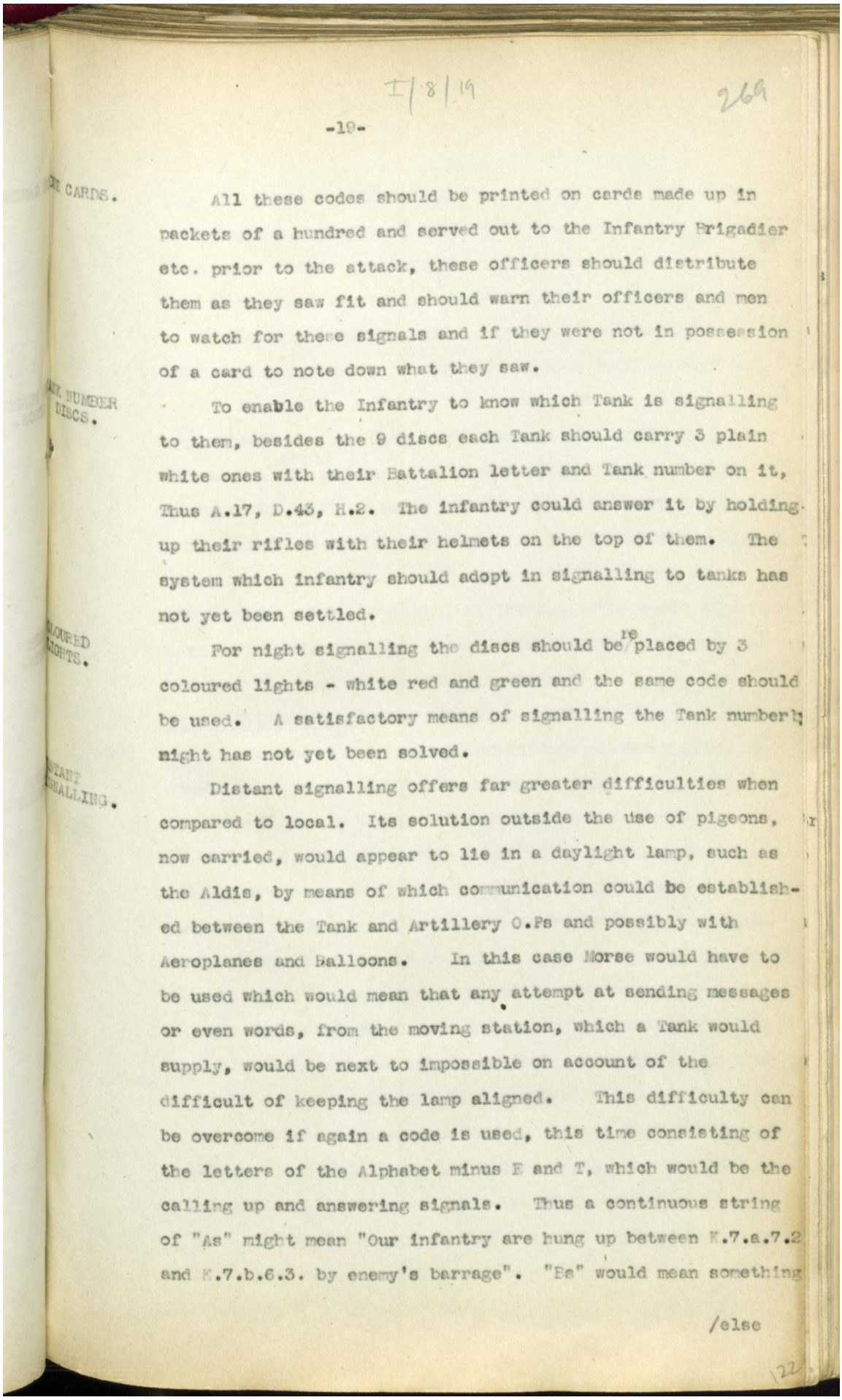
(b) Infantry must be able to read the signal without possessing any knowledge of Morse or Semaphore.

(c) Signalling must be extremely rapid.

OURED
CS.

A solution to this problem is by means of coloured discs three in number - a white with a black ring round it, a red with a white horizontal bar across it and a green with a white ring round it. Each disc is 15 in. in diameter. In all these are nine of them which give 39 easily readable combinations - thus, white, 2 whites, red, red green, red green white etc. The discs are fixed in a pole and are read from top downwards. All those beginning with a white disc will be for inter-Tank communication and those with red and green for infantry, the red representing fixed signals for general information e.g. "Wire cut", "Enemy in dug-outs", "Trenches clear", and the green signals arranged for immediately prior to the attack for special information e.g. "Point G.23.a.7.3. still strongly held", "Wire completely cut between K.7.a.7.2. and K.7.b.6.3.

/All



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CODE CARDS.

All these codes should be printed on cards made up in packets of a hundred and served out to the Infantry Brigadier etc. prior to the attack, these officers should distribute them as they saw fit and should warn their officers and men to watch for these signals and if they were not in possession of a card to note down what they saw.

TANK NUMBER DISCS.

To enable the Infantry to know which Tank is signalling to them, besides the 9 discs each Tank should carry 3 plain white ones with their Battalion letter and Tank number on it, Thus A.17, D.43, H.2. The infantry could answer it by holding up their rifles with their helmets on the top of them. The system which infantry should adopt in signalling to tanks has not yet been settled.

COLOURED LIGHTS.

For night signalling the discs should be replaced by 3 coloured lights - white red and green and the same code should be used. A satisfactory means of signalling the Tank number by night has not yet been solved.

DISTANT SIGNALLING.

Distant signalling offers far greater difficulties when compared to local. Its solution outside the use of pigeons, now carried, would appear to lie in a daylight lamp, such as the Aldis, by means of which communication could be established between the Tank and Artillery O.Ps and possibly with Aeroplanes and Balloons. In this case Morse would have to be used which would mean that any attempt at sending messages or even words, from the moving station, which a Tank would supply, would be next to impossible on account of the difficult of keeping the lamp aligned. This difficulty can be overcome if again a code is used, this time consisting of the letters of the Alphabet minus E and T, which would be the calling up and answering signals. Thus a continuous string of "As" might mean "Our infantry are hung up between K.7.a.7.2 and K.7.b.6.3. by enemy's barrage". "Bs" would mean something

/else

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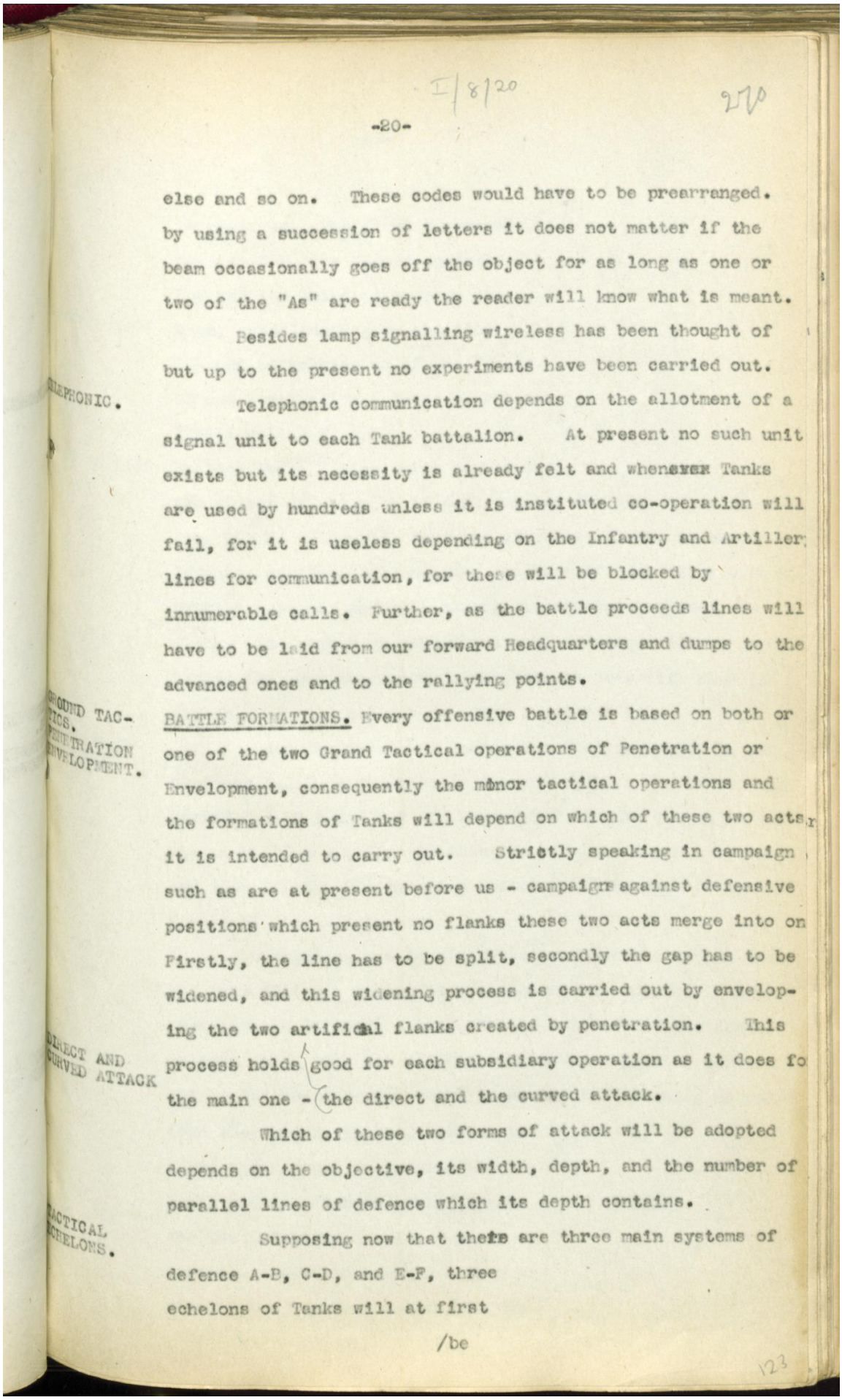

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else and so on. These codes would have to be prearranged. by using a succession of letters it does not matter if the beam occasionally goes off the object for as long as one or two of the "As" are ready the reader will know what is meant.

Besides lamp signalling wireless has been thought of but up to the present no experiments have been carried out.

TELEPHONIC. Telephonic communication depends on the allotment of a signal unit to each Tank battalion. At present no such unit exists but its necessity is already felt and whenever Tanks are used by hundreds unless it is instituted co-operation will fail, for it is useless depending on the Infantry and Artillery lines for communication, for these will be blocked by innumerable calls. Further, as the battle proceeds lines will have to be laid from our forward Headquarters and dumps to the advanced ones and to the rallying points.

GROUND TACTICS. PENETRATION ENVELOPMENT. BATTLE FORMATIONS. Every offensive battle is based on both or one of the two Grand Tactical operations of Penetration or Envelopment, consequently the minor tactical operations and the formations of Tanks will depend on which of these two acts it is intended to carry out. Strictly speaking in campaign such as are at present before us - campaigns against defensive positions which present no flanks these two acts merge into on Firstly, the line has to be split, secondly the gap has to be widened, and this widening process is carried out by enveloping the two artificial flanks created by penetration. This

DIRECT AND CURVED ATTACK process holds good for each subsidiary operation as it does for the main one - the direct and the curved attack.

Which of these two forms of attack will be adopted depends on the objective, its width, depth, and the number of parallel lines of defence which its depth contains.

TACTICAL ECHELONS. Supposing now that there are three main systems of defence A-B, C-D, and E-F, three echelons of Tanks will at first

/be

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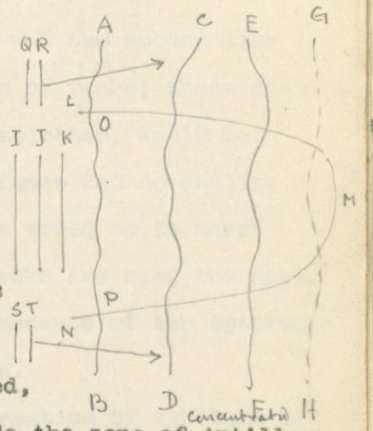
be required. The first to operate against C-D, the second against E-F and the third to prevent the

DIRECT ATTACK

enemy consolidating on the line G-H and so robbing us of the fruits of our penetration. These 3 echelons I will call I,J, & K.



ECEIVED ATTACK

Besides these 2 wings will be required, the object of which is to work outside the zone of Artillery fire L M N; These will form two offensive flanks to the infantry advance, will broaden the base of operations O.P. by working outwards and will always threatening the enemy in flank. The number of echelons these two wings will be formed in depends upon the number of objectives they will have to attack. I will call these wings Q R and S T.

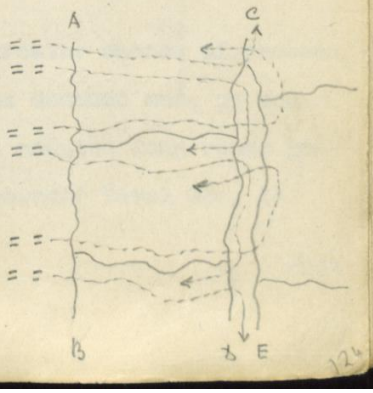
UMBER OF CHELONS IN INGS.

UAL NATURE F ATTACK.

Once the attack is launched a dual operation is set on foot; I.J.K. move directly forward against the lines ~~and beyond~~ A B, C D and E F and beyond E F with the intent to penetrate Q R and S T obliquely outwards with the intent to envelop and thus broaden the base and reduce hostile pressure on the flanks of the infantry advance.

ECTION ACTICS.

Descending now to minor tactics it would appear that the most suitable method is not ~~suitable~~ to advance in line covering the infantry attack, but by a series of sectional columns which make for definite points. On gaining these points the columns will wheel right and left working up and down the trench systems, driving the enemy underground or causing him to bunch and so offer tangible targets for the infantrymans rifle and bayonet. Thus supposing A B to represent the rearmost trench of the



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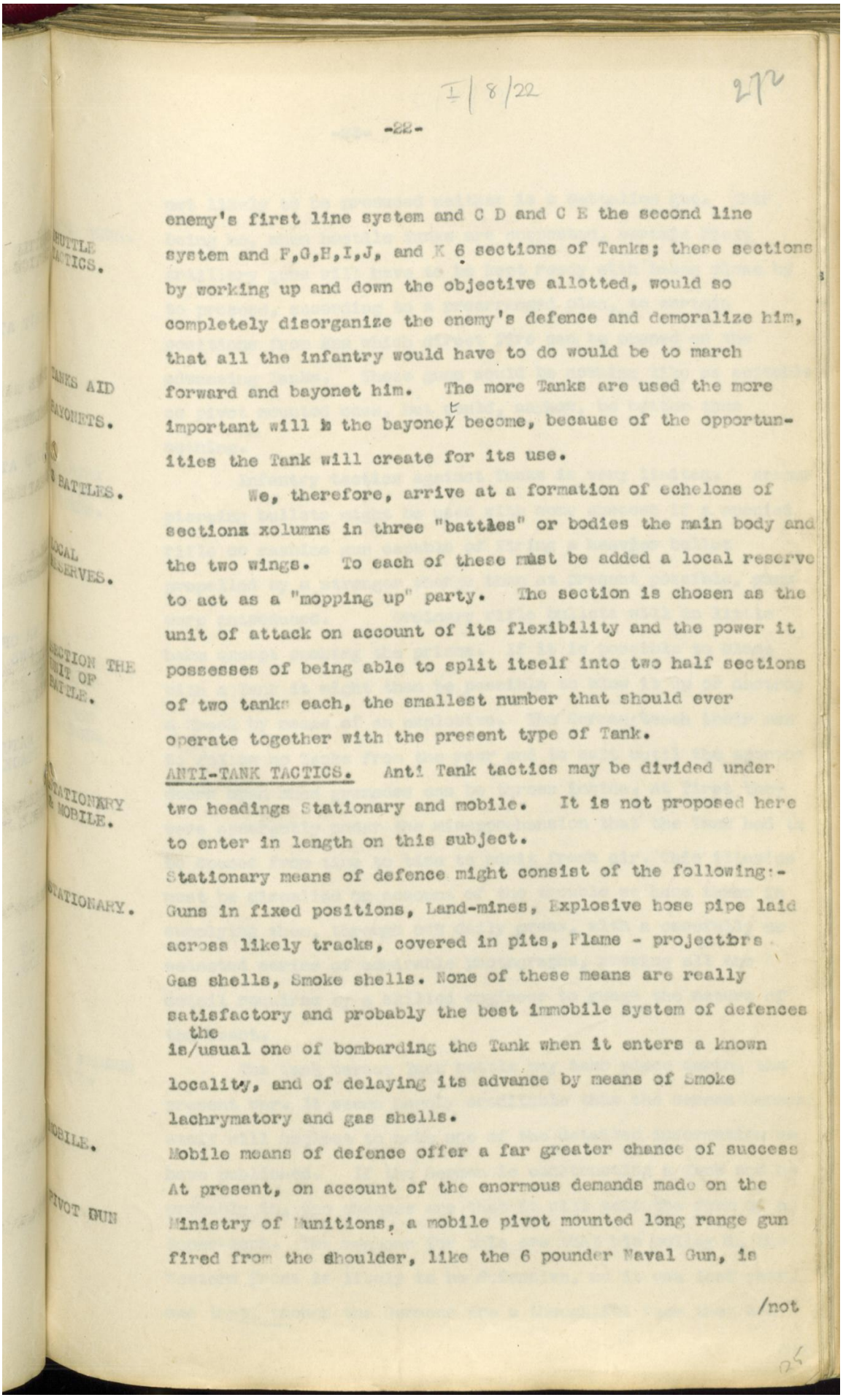

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enemy's first line system and C D and C E the second line system and F,G,H,I,J, and K 6 sections of Tanks; these sections by working up and down the objective allotted, would so completely disorganize the enemy's defence and demoralize him, that all the infantry would have to do would be to march forward and bayonet him. The more Tanks are used the more important will be the bayonet become, because of the opportunities the Tank will create for its use.

SHUTTLE TACTICS.

TANKS AID BAYONETS.

BATTLES.

We, therefore, arrive at a formation of echelons of sections columns in three "battles" or bodies the main body and the two wings. To each of these must be added a local reserve to act as a "mopping up" party. The section is chosen as the unit of attack on account of its flexibility and the power it possesses of being able to split itself into two half sections of two tanks each, the smallest number that should ever operate together with the present type of Tank.

LOCAL RESERVES.

SECTION THE UNIT OF BATTLE.

ANTI-TANK TACTICS. Anti Tank tactics may be divided under two headings Stationary and mobile. It is not proposed here to enter in length on this subject.

STATIONARY OR MOBILE.

STATIONARY.

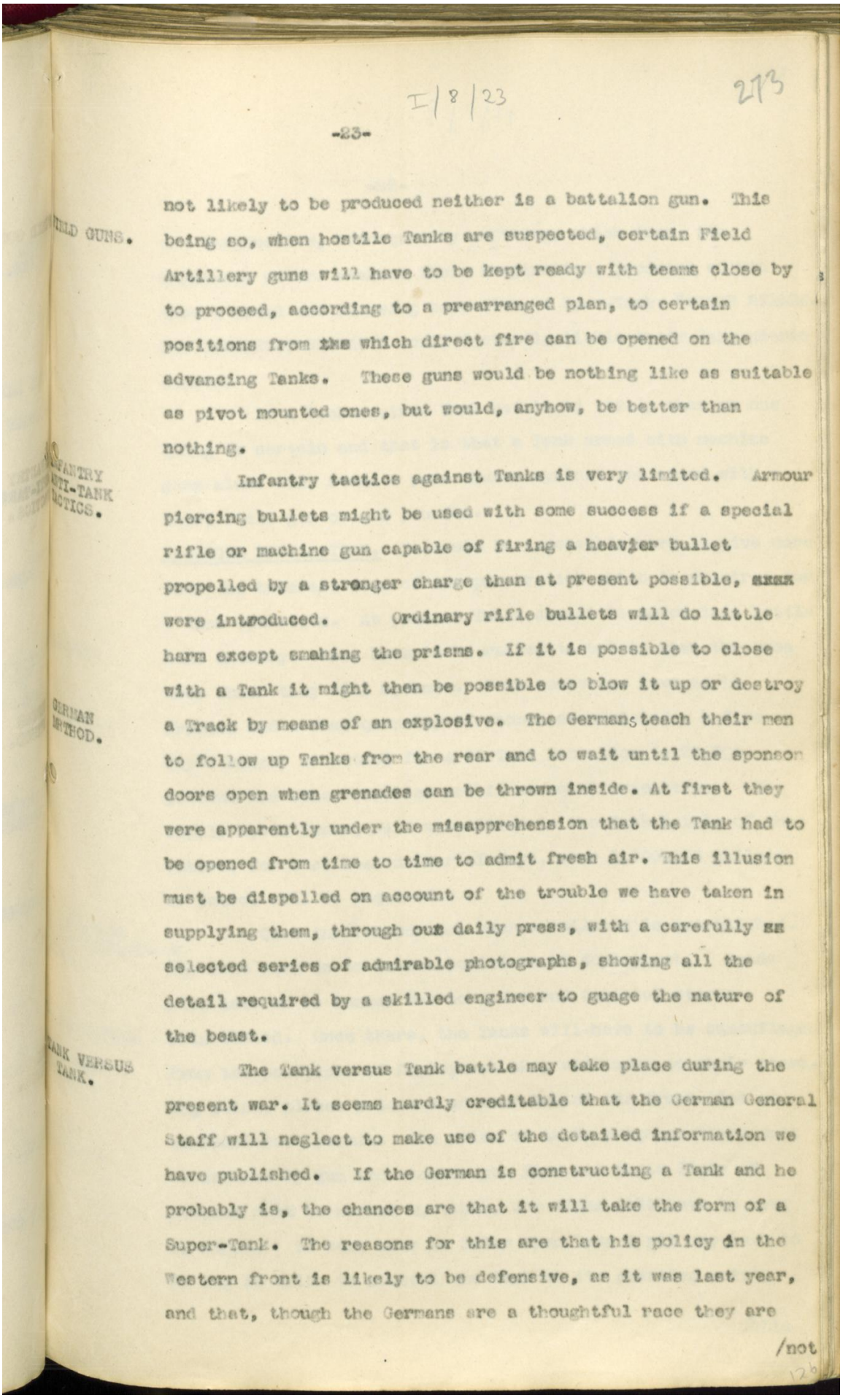
Stationary means of defence might consist of the following:- Guns in fixed positions, Land-mines, Explosive hose pipe laid across likely tracks, covered in pits, Flame - projectors. Gas shells, Smoke shells. None of these means are really satisfactory and probably the best immobile system of defences is/usual the one of bombarding the Tank when it enters a known locality, and of delaying its advance by means of Smoke lachrymatory and gas shells.

MOBILE.

Mobile means of defence offer a far greater chance of success At present, on account of the enormous demands made on the Ministry of Munitions, a mobile pivot mounted long range gun fired from the shoulder, like the 6 pounder Naval Gun, is

PIVOT GUN

/not



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FIELD GUNS.

not likely to be produced neither is a battalion gun. This being so, when hostile Tanks are suspected, certain Field Artillery guns will have to be kept ready with teams close by to proceed, according to a prearranged plan, to certain positions from ~~the~~ which direct fire can be opened on the advancing Tanks. These guns would be nothing like as suitable as pivot mounted ones, but would, anyhow, be better than nothing.

INFANTRY ANTI-TANK TACTICS.

Infantry tactics against Tanks is very limited. Armour piercing bullets might be used with some success if a special rifle or machine gun capable of firing a heavier bullet propelled by a stronger charge than at present possible, were introduced. Ordinary rifle bullets will do little harm except smahing the prisms. If it is possible to close with a Tank it might then be possible to blow it up or destroy a Track by means of an explosive. The Germans teach their men to follow up Tanks from the rear and to wait until the sponson doors open when grenades can be thrown inside. At first they were apparently under the misapprehension that the Tank had to be opened from time to time to admit fresh air. This illusion must be dispelled on account of the trouble we have taken in supplying them, through our daily press, with a carefully selected series of admirable photographs, showing all the detail required by a skilled engineer to guage the nature of the beast.

GERMAN METHOD.

TANK VERSUS TANK.

The Tank versus Tank battle may take place during the present war. It seems hardly creditable that the German General Staff will neglect to make use of the detailed information we have published. If the German is constructing a Tank and he probably is, the chances are that it will take the form of a Super-Tank. The reasons for this are that his policy in the Western front is likely to be defensive, as it was last year, and that, though the Germans are a thoughtful race they are

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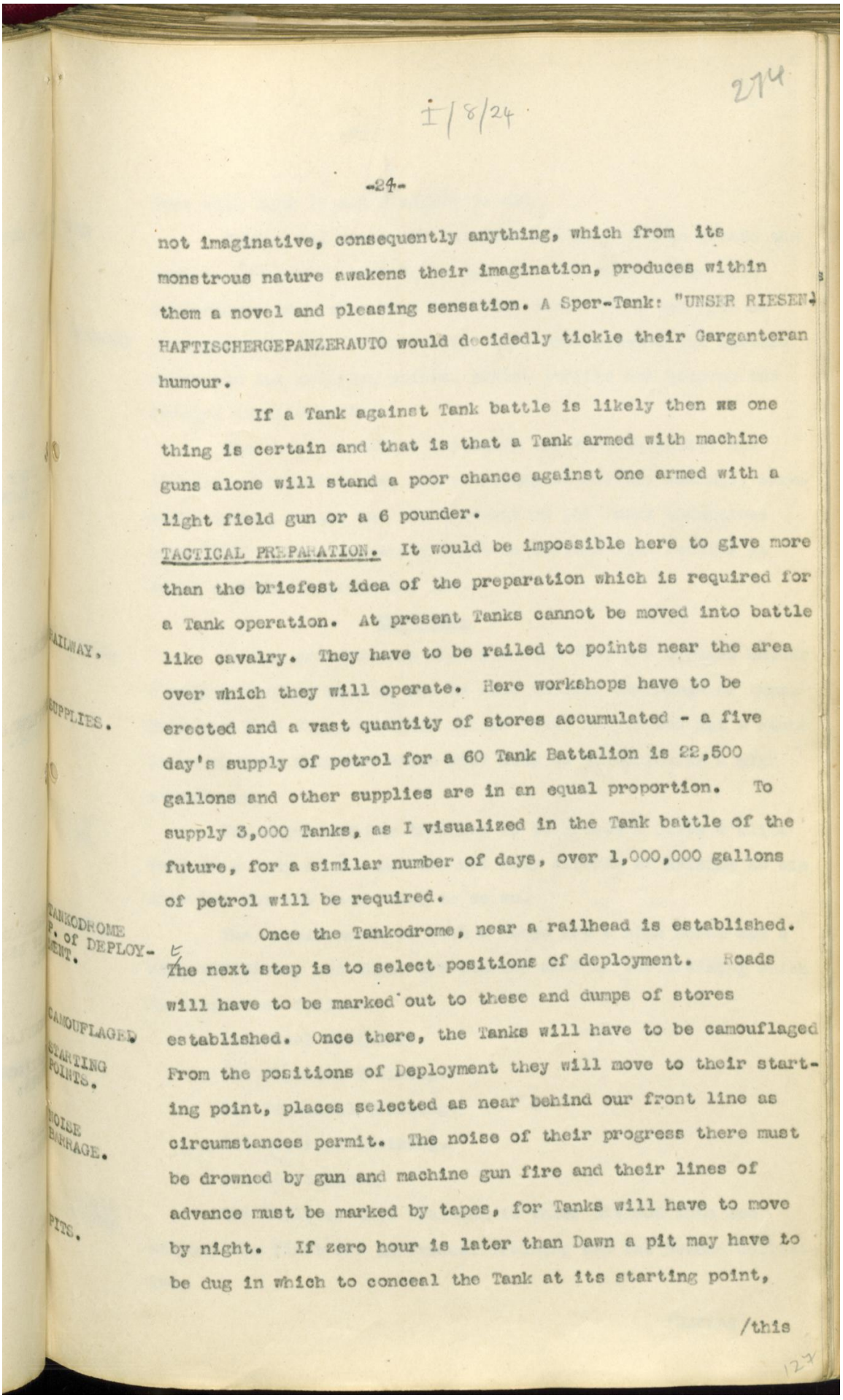

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not imaginative, consequently anything, which from its monstrous nature awakens their imagination, produces within them a novel and pleasing sensation. A Sper-Tank: "UNSER RIESEN-HAFTISCHERGEPANZERAUTO would decidedly tickle their Garganteran humour.

If a Tank against Tank battle is likely then ~~as~~ one thing is certain and that is that a Tank armed with machine guns alone will stand a poor chance against one armed with a light field gun or a 6 pounder.

TACTICAL PREPARATION. It would be impossible here to give more than the briefest idea of the preparation which is required for a Tank operation. At present Tanks cannot be moved into battle like cavalry. They have to be railed to points near the area over which they will operate. Here workshops have to be erected and a vast quantity of stores accumulated - a five day's supply of petrol for a 60 Tank Battalion is 22,500 gallons and other supplies are in an equal proportion. To supply 3,000 Tanks, as I visualized in the Tank battle of the future, for a similar number of days, over 1,000,000 gallons of petrol will be required.

RAILWAY.

SUPPLIES.

TANKODROME P. of DEPLOY-MENT.

Once the Tankodrome, near a railhead is established. The next step is to select positions of deployment. Roads will have to be marked out to these and dumps of stores established. Once there, the Tanks will have to be camouflaged

CAMOUFLAGE.

STARTING POINTS.

From the positions of Deployment they will move to their starting point, places selected as near behind our front line as circumstances permit. The noise of their progress there must be drowned by gun and machine gun fire and their lines of advance must be marked by tapes, for Tanks will have to move by night. If zero hour is later than Dawn a pit may have to be dug in which to conceal the Tank at its starting point,

NOISE BARRAGE.

PITS.

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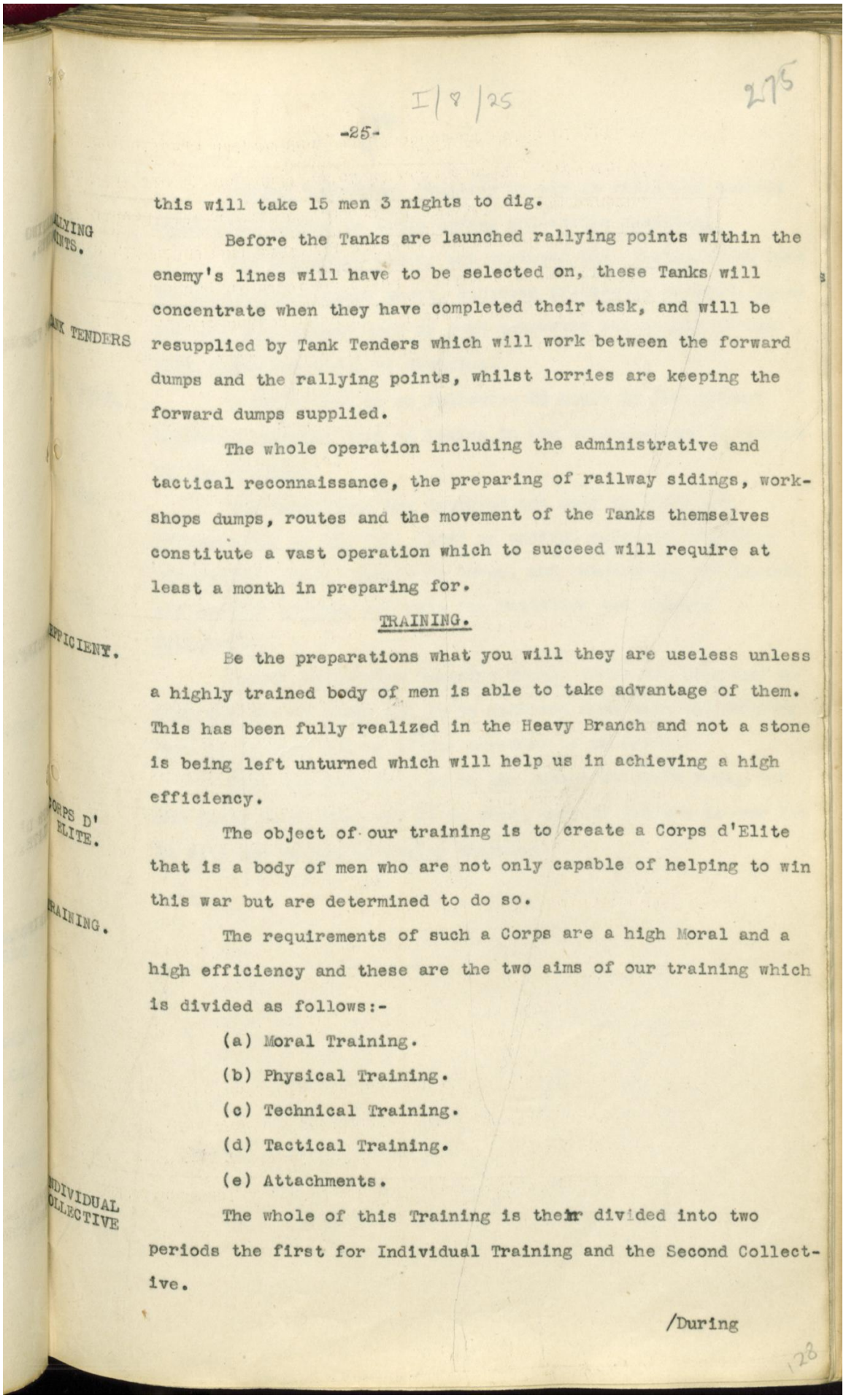

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this will take 15 men 3 nights to dig.

RALLYING POINTS.

Before the Tanks are launched rallying points within the enemy's lines will have to be selected on, these Tanks will concentrate when they have completed their task, and will be

TANK TENDERS

resupplied by Tank Tenders which will work between the forward dumps and the rallying points, whilst lorries are keeping the forward dumps supplied.

The whole operation including the administrative and tactical reconnaissance, the preparing of railway sidings, work-shops dumps, routes and the movement of the Tanks themselves constitute a vast operation which to succeed will require at least a month in preparing for.

TRAINING.

EFFICIENY.

Be the preparations what you will they are useless unless a highly trained body of men is able to take advantage of them. This has been fully realized in the Heavy Branch and not a stone is being left unturned which will help us in achieving a high efficiency.

CORPS D' ELITE.

The object of our training is to create a Corps d'Elite that is a body of men who are not only capable of helping to win this war but are determined to do so.

TRAINING.

The requirements of such a Corps are a high Moral and a high efficiency and these are the two aims of our training which is divided as follows:-

(a) Moral Training.
(b) Physical Training.
(c) Technical Training.
(d) Tactical Training.
(e) Attachments.

INDIVIDUAL COLLECTIVE

The whole of this Training is their divided into two periods the first for Individual Training and the Second Collective.

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RAINING
RINCIPLES.

During Individual Training we aim at skill and technic which once gained we apply during Collective Training.

The following points are insisted on. Instructions must be interesting, hours short, subjects frequently changed. Games are not only looked upon as good exercise but as one of the most important parts of training.

AY'S WORK.

A day's work is as follows:- 3½ hours in the morning football, Company runs or boxing in the afternoon and a lecture in the evening.

CTURES.

The Battalions are lectured not only by their own Officers but by the H.Q. Staff on various subjects including Discipline, Moral, Esprit de Corps, and Leadership, and indoor and outdoor schemes are held for Battalion and Company Commanders.

CHEMES.

UMMY
TANKS.

During Collective Training dummy Tanks are used and we have now 100 of these and it is insisted upon that all schemes must be carried out as if in the presence of an enemy.

What the Tank will do in the future we don't know, but one thing we do know and it is this, that if failure is our lot it will not be due to faulty training.

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