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Speculations—I

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SPECULATIONS—I.

By LIEUTENANT W. S. KING-HALL, Royal Navy.

FOREWORD.

THE following speculative notes deal with an aspect of future warfare belonging to the transition period in the change from muscular armies to mechanical armies.

These notes are the result of speculations as to what may happen when the tank ashore has reached a position of importance equal to that attained by the submarine in sea warfare to-day.

For this reason the "Transport Tank" is considered at some length. In the far future the actual destruction of enemy communications which feed armies of foot and horse soldiers will be unnecessary, because there will be no foot and horse soldiers except for ceremonial purposes. These men will then be regarded much as to-day we regard the beefeaters.

In the course of the last war several million men endeavoured to destroy each other in France, and during the four years which elapsed before the German Field Army was broken in battle, there were periods when the situation reminded one of the old conundrum—"What happens if an irresistible force meets an immovable body?"

These great masses of men who fought face to face can be compared to two blocks of granite revolving on delicate spindles.

If one side could have ruptured the enemy's spindle the granite block would have fallen helpless to the ground.

But neither side could get on the enemy's line of communication and operate thereon with effect.

This statement should perhaps be qualified to the extent that there was no physical reason preventing the Germans operating on that portion of our lines of communication which ran across the Channel waters—for some reason they never attempted the feat, though if an attempt had been made in the critical days of March, 1918, it might have changed the course of the war. From the British point of view the problem of how to rupture the enemy's communication was purely military.

Behind the German front stretched roads and railways, sensitive to attack as a raw nerve to the touch, but, broadly speaking, these communications remained in working order up to the end.

The Air Force did their utmost, but compared to the steady stream of movement which took place day after day and particularly night after night the damming effect of the air raids upon the flow was slight.

The Air Force were handicapped in that they were instruments obliged to remain in the air, yet unable to hover, whilst attacking movements and traffic lines which remained on the ground.

To rupture communications behind an army of many corps so that the safety of the whole army, or even one of its corps, is in jeopardy requires a considerable concentration of power at the most vital spots along the lines of communication; and further, this concentration must remain there and carry on its work of destruction for some time.

A transitory attack such as might be delivered at a road or rail junction by a strong force of aeroplanes may seriously inconvenience the enemy, but unless the latter is very improvident it will not cause his batteries to run short of shell or his troops to have empty bellies. Ten thousand men properly equipped and operating fifty miles in rear of even a very big army might cause great dislocation of enemy communications with correspondingly fruitful results.

In the last war it was impossible on the Western Front to throw ten thousand men on to the enemy's lines of communications. Four methods of attempting this were available; each had objections:—

- (1) *The men could have tried to walk there.*

Objection—

- (a) They would have been shot in the first mile.

- (2) *The men might have tried to fly there.*

Objections—

- (a) State of aircraft development necessitated too many aeroplanes being used.
- (b) Difficulty of landing 1,000 'planes.
- (c) Impossibility of carrying necessary equipment to enable the force either to remain for a period on the lines of communication, or to do the maximum amount of damage whilst they were there.

- (3) *The men might have attempted to ride there on horses.*
(They succeeded in Palestine.)

Objections—

- (a) Rather slow.
- (b) Impossible to penetrate enemy's line unless he was in a state of utter confusion.
- (c) Horses are a nuisance.
- (d) Difficulty of carrying equipment necessary to smash up well-protected communications.

- (4) *The men could have tried to get on the enemy's lines of communication in Tanks.*

Objections—

- (a) In 1917-18 the Tank was slow.
- (b) Not sufficient numbers of them available.
- (c) The instrument was still too crude.

So, for the reasons outlined above, together with others not mentioned, the records of the great war on the Western Front do not contain any account of raids on the enemy's communications on the large scale.

What of the future?

The physical properties of man and his horse remain unchanged, therefore methods (1) and (3) may be eliminated. In mechanics we advance from year to year, therefore methods (2) and (4) are of potential interest.

Of these two methods it is the writer's personal opinion that the use of Tanks for raiding communications will give greater results than the use of aircraft. Briefly the reasons for this belief are as follows:—

- (1) The Tank operates in the same plane in which the communications move.
- (2) A "battle" Tank is and will be a more powerful offensive instrument than a "battle" plane, in land warfare.
- (3) A "transport" Tank has a greater carrying capacity than a transport aeroplane.
- (4) There is no reason why a Tank should not be produced to-day capable of travelling across country at twenty miles per hour for 200 miles.
- (5) It can carry within its hold perhaps fifty men.

These figures will doubtless be exceeded in the near future, the time interval between now and that day being directly proportional to the amount of money available for experiment.

Let it be assumed that we have at our disposal for purposes of imagination four types of Tanks:—

- (a) The transport Tank.
- (b) The scout Tank.
- (c) The battle Tank.
- (d) The auxiliary Tank.

It is suggested that the transport Tank will have capacity for 100 men, and a speed of thirty miles per hour. Its function, like that of the transport at sea, will be to convey man-power to the selected spot, viz., a nerve centre on the enemy's lines of communication. Therefore, its first essentials are capacity and speed combined with reasonable protection for its cargo. Its armour will probably be sufficient to keep out bullets from portable guns, but not anything in the nature of shell. Its armament would be limited to machine-guns, which would enable it to defend itself from attacks by exposed enemy soldiers.

To convey 10,000 men would require about 125 transport Tanks. To move 125 Tanks, ships, motor cars or any other form of conveyance from one place to another requires organization. The transport Tanks would have to be divided up into divisions and sub-divisions.

The author is not aware what experiments have been carried out in this respect, but it is suggested that if each Tank be given 150 feet of line ahead space then the convoy could proceed in six divisions. Tanks in division in line ahead, divisions disposed abeam. The suggested

space between divisions is 100 yards. It would be as perilous to despatch an unprotected convoy of transport Tanks, such as outlined above, into the enemy country as it would be to send a convoy of troopships without escort across a stretch of sea.

The degree of safety with which 10,000 troops are carried across an area of sea depends upon the extent to which control is exercised in that area. If control at sea is complete, as it was for Britain in the Boer War, troop convoys can be safely sent great distances with weak local escorts, or even unescorted. If control is disputed, as it was in the last war, then each convoy must have a local escort to protect it from sporadic attack; and in addition, the main battle fleet endeavours to destroy the enemy battle fleet, because if that act can be accomplished the exercise of control all over the seas will be the easier.

It will be the same on land. The convoy of transport Tanks, moving rapidly across country, will have certain enemies.

If it is desired to launch an attack with men in transport Tanks upon lines of communication which are vital to the safety of a large enemy force, it is to be expected that the enemy will dispute the passage of the convoy with all means at his disposal.

Unless the geographical situation is exceptionally favourable to the enemy, fixed defences will not pay him as a weapon against Tanks, any more than fixed defences (including minefields) can prevent a manifestation of naval power by a fleet or convoy of transports moving across water, except in special cases such as the Dardanelles. The only way open to the enemy in which he can defend a line of communication against attack by men in Tanks is to have a Tank battle fleet, and with it defeat our Tank battle fleet.

If the enemy can do this, he will then be able to destroy the transport Tanks at his leisure. Similarly, before we send out the convoy, it will be necessary to mask or destroy the enemy Tank battle fleet. Therefore, the operations involved in carrying out an attack on the enemy's communications will consist of:—

- (1) The elimination of the enemy's Tank fleet.
- (2) The despatch of the convoy.
- (3) Provision of local escort for the convoy whilst the latter is tanking to its objective in case any of the enemy Tank fleet evade our own battle fleet; and to protect the convoy from low-flying armoured bombers.

It will be dependent upon general circumstances whether the Tank battle fleet and the convoy move in company. If possible it will be better from the tactical point of view that they operate separately.

The enemies of the transport Tanks will be:—

- (a) Aircraft.
- (b) Enemy battle Tanks.
- (c) Artillery not in Tanks.

(a) and (b) will be the most dangerous, for they alone will have the same or greater rapidity than the transport Tanks, together with

the power of destroying the convoy; (c) will be dangerous, indeed fatal, to the convoy if the latter gets within range of the guns. But a convoy will evade a battery if it knows the latter's position; therefore the battery will be concealed, hoping to ambush the convoy. The analogy with a submarine is striking. The submarine under water is slower than the surface ship, and relies for success upon its invisibility; if the ship has information of the submarine's position she usually succeeds in evading underwater attack. So that, as regards protection from artillery, the convoy of transport Tanks will rely upon information which will enable them to evade the enemy batteries, or, if the latter command an area through which the convoy *must pass*, then steps must be taken to eliminate the enemy's guns or their personnel before the convoy comes into the area.

As regards battle Tanks it seems well within the possibilities that in the near future they will be armed with two 4-in., perhaps 4·7-in. or 6-in. short-calibre guns, three or four inches of armour over vitals, and a speed of thirty miles per hour over level ground. The difficulty to be overcome when designing battle Tanks with heavier armament and armour is that the weight carried per square foot of moving track must be kept below a certain limit. If the weight of the hull and armament is increased the track area must be similarly increased. There would appear to be three ways of achieving this:—

- (a) Increase in length of Tanks.
- (b) Increase in beam of Tanks.
- (c) Re-design of track system.

(a) and (b) are certainly the simplest methods, and whilst they each have objections, just as the increase in size of the capital ship at sea has made her draw more water, cost more, require big docks and harbours, etc., the increases in (a) and (b) have certain advantages. Within the limits permissible by the requirements of longitudinal strength increased length makes it easier for the Tanks to cross wide, deep trenches. Increased beam makes for more room in rear of the guns and might permit of a gun on top of the Tank with an all-round field of fire.

A time will come in development when the battle Tank's armament will tend to reach a calibre for which the ammunition will be very heavy. It is not thought likely that within the time limit of this speculation battle Tanks will be armed with power-worked guns, but if a 6-in. armament be considered, this being the limit of hand working, 200 shells at 100 lbs. each would be a big weight and occupy much space.

It is conceivable that the battle Tank may tow a magazine Tank behind it, if the ammunition becomes very heavy.

It was said that if raids on communications with transport Tanks are to take place, a battle for the "command of the land" between battle Tanks is a likely event. The tactics of such a battle will now be considered.

The possible development of the battle Tank has already been briefly discussed. Difficult though it may be to prophesy exactly

her mechanical details, we cannot go wrong in stating that, like her sister at sea, the battle Tank will from year to year embody in herself the maximum fighting power; that is to say, the best combination of armament, speed, and protection admitted by technical limitations at the date of her construction.

In considering battle tactics there are two points to be remembered :—

- (1) Numbers of the unit required to work together.
- (2) Capabilities of the units.

In naval warfare to-day we think that a battle fleet of forty capital ships a great force, but in the Peloponnesian wars fleets contained thousands of vessels. As far as my knowledge goes it is a fact that throughout history, irrespective of the number of ships engaged, the limit of length of the battle formation has been between five and ten miles, i.e., about normal visibility.

In this analogy it is suggested that, under the best conditions, the Tank battle line will not be more than 15,000 yards long. At one Tank per hundred yards this gives a force of 150 Tanks. This number will seem small to anyone accustomed to think of Tanks in thousands, but doubtless a captain of a trireme, several centuries B.C., not having seen a modern battle fleet at sea, would be inclined to scoff at a battle line of forty ships. As regards the second point which must be considered in deducing battle tactics, i.e., the capabilities of the unit, the battle Tank will be well nigh as tactically incomplete in herself as is a modern battleship.

Designed for battle, the "Capital Tank" will have to rely upon other instruments for the service of information and for certain services during the battle itself, just as the battle fleets at sea rely upon their light cruiser and aerial screens for information, and upon their destroyers, fighting planes, and cruisers for various tactical purposes in battle.

In Tank warfare the battle Tanks will advance under cover of a screen of fast-scouting Tanks, lineal descendants of the present-day whippets. Still further in advance an aerial screen will doubtless be employed. The scouts must be designed to fulfil three requirements :—

- (1) High speed.
- (2) Good communications.
- (3) Land-worthy.

By (3) is meant that they must be capable of negotiating difficult obstacles so that they may thoroughly examine all the ground in advance of the Tank battle fleet. Their discoveries are useless unless communicated in a certain and speedy manner to the C.-in-C., Tanks; therefore good communications are necessary.

The chief duty of the scout Tanks as regards the service of information will be to examine ground which cannot be properly surveyed by the aircraft screen. The C.-in-C., Tanks, will rely more upon his aircraft screen for reports of the enemy Tank fleet than upon his scout Tanks, but it must be remembered that in certain weather

aircraft operations will be at a discount; under these conditions the scout Tanks will have to use every endeavour to get through or round the enemy screen and sight the enemy battle Tanks.

Speculations as to how the scout Tanks will operate on the screen would require more space than is available here. When battle is joined, the scout Tanks will have other duties which will be described when more has been written as to the battle itself.

How will 150 Tanks fight each other? Obviously not in one huge *melée*, Red *versus* Blue and everyone for himself. Whichever side fights in the best tactical manner will defeat their opponents, other things being equal. (Compare the steady development in aerial tactics, from the day when pilots shot at each other with revolvers up to the methods of the present time.)

The difficulty in forecasting future tactics lies in the fact that tactics influence weapons and weapons influence tactics, hence we must resolve an equation with both "x" and "y" as unknown!

It has been assumed that the gun as understood to-day will be the primary weapon of the battle Tank during the next ten years. Upon the disposition of the guns in the Tank much depends.

Tactically it would be desirable to have all-round fire. Constructionally this will probably be difficult, but if a battle Tank is armed with two heavy guns it should not be beyond the craft of the engineers to arrange them so that one has an arc of fire from 120 deg. left through right ahead to 120 deg. right, whilst the other sweeps from 60 deg. left through right astern to 60 deg. right. With this arrangement of armament the Tank would have arc of fire for both guns of 30 deg. each side of the beam bearing. Consequently, some form of line ahead would be a necessary formation in order to develop maximum gun-fire. However, it is not thought that in future Tank battles the fleets will get into one unbroken line, or line of divisions, and fire at each other like sea fleets.

This belief is founded upon the following facts:—

- (1) The speed will be high on both sides, somewhat higher than the speed of sea battle lines.
- (2) The range will be shorter than sea ranges.
- (3) The land, unlike the sea, is not usually entirely flat.

This last point will be of the utmost importance in Tank tactics.

It has already been hinted that though the Tank commander will be spared the menace of sub-earth attack he will have to consider situations somewhat similar in principle to those which confront an admiral who is handling a surface fleet in waters infested by enemy submarines.

The matter of concealed artillery was mentioned as a danger to cruising Tanks.

In battle (except on open plains) the contours of the land and the presence of water will have great influence. In undulating country it will be neither feasible nor advantageous for a Tank fleet to attempt to go into battle in one long line. Individual divisions of Tanks should fight in line ahead or in quarter line, but once battle is joined

the divisional commanders will have to operate independently to a far greater degree than they do at present in sea warfare.

Having stated that the tactical formation of a division of Tanks will be line ahead, some idea germinates as to how the fleet will approach battle. The main requirement of an approach formation is that at the correct moment the fleet shall be able to change from cruising to battle formation in the shortest possible time.

Here again "ground formation" plays an important part.

Three cases will be considered:—

I.—*Very bad Tank ground*, i.e., swampy ground with a narrow, firm area through it, or ravines through hills.

In this case double or single line ahead with a fast division of Tanks leading and in rear would be the proper formation, as the frontage of advance must be small. On sighting the enemy, the van and rear diverge and leave the centre free.

II.—*Average to indifferent Tank ground*, i.e., broken moorland with streams, hills, or woody country.

In this case the formation of the phalanx is suggested, the fast divisions being in the centre.

III.—*Good Tank ground*, i.e., undulating, open country or flat plains.

The formation suggested is either simple line abreast or divisions in line abreast.

In battle it was stated that the divisions will work independently, the more undulating the ground the more will this be so. This is not intended to mean that divisions will not support each other; what it does mean is that, as divisions will often be out of sight of each other, such support will be difficult. Further, one division if being pressed by superior force must try not to be driven into a position in which by reason of a river or other obstacle the other divisions cannot get to its support.

These thoughts lead to the conclusion that in a Tank battle nothing will be of greater importance than communications between divisional commanders and the C.-in-C., Tanks, and what may be described as "ground" tactics.

For the purpose of communication between divisions, wireless telephony may be practicable, also rockets, etc., but many cases will probably arise in which messages will have to be conveyed by whippet Tanks.

The Commander-in-Chief's Tank in a big fleet of Tanks will probably carry no guns larger than machine-guns. Qualities of roominess, armour, speed, and signalling devices will usurp space and weight to such an extent that gun-power will have to be sacrificed. The C.-in-C., Tanks, may perhaps choose to get into the air.

Further speculation on the detailed course of the battle would be tedious. The following suggestions seem worthy of examination by anyone interested in this matter:—

- I.—Tactical details of the gun-fight between two divisions of Tanks.
- (a) Gun control.
 - (b) Concentration of fire.
 - (c) Battle communication between Tanks in a division.
 - (d) The value of speed.
 - (e) The choice of soil with reference to speed.
 - (f) The use of smoke.
 - (g) Zig-zagging.
- II.—Attack and defence of battle Tanks by scout Tanks firing pom-poms at close range, or hurling howitzer bombs at close range (c.f. this slow-moving projectile with the torpedo in sea war.)
- III.—The possibility of leading the enemy over contact or electromagnetic mines previously concealed in undergrowth by Tank mine layers.
- IV.—The use of gas Tanks, etc., etc.

CONCLUSION.

The author's conclusion of this business is that we are approaching a period in the history of warfare when certain land tactics will have much in common with those of sea fighting.

It has been said that all things move in cycles; one thousand years ago sea tactics were copied from those of land warfare. May we not be half way round the circle at the present time?

It is, of course, a matter for consideration whether in the more or less remote future all land fighting will not be done in Tanks, but this development will take place gradually; the foregoing speculations seem to the author as likely to be facts within about seven to ten years, at which time we shall be in the transition stage between the old land fighting and the complete Tank fighting.

Gradually, as the communications of the P.B.I. become more and more the object of Tank battles, all the infantry will get into Tanks or aircraft, and we shall have defended Tank ports and bases on land, with fleets and squadrons cruising in the intervening country to clear the way for the great armadas of Tanks with which one continental nation will invade the other, in order to win the war by attacking the civil population in the enemy country.

This attack on the civil population will probably take place in the following manner:—

The invading forces, having broken their enemy's Tank fleet in battle, will advance into the hostile country and systematically gas every living thing within a given area of, say, fifty square miles. If the enemy did not capitulate another area would be laid waste, and so on.

But I am trespassing on a field of thought worthy of Speculation No. II.