SUBJECT: Antitank Doctrine and Development.

AG 320.2
(7-3-40) M-C 1st Ind. SCS/jjr

War Department, AGO, July 16, 1940 - To the Commandant, Command ang General Staff School, Fort Leavenworth, Kansas

For remark and recommendation.

By order of the Secretary of War:

Adjutant General

Syns. comp.

2d Ind.

C.&G.S.Sch., Ft.Leavenworth, Kansas, July 29, 1940 - To The Adjutant General, Washington, D.C.

1. The Chief of Infantry has made an able and interesting analysis of an important but controversial subject. Undoubtedly it would be concurred in by many officers, especially those who see great possibilities in mechanized vehicles. The Assistant Commandant is one of this group, since he advocates opposing mechanization by mechanization. My own view is that the doctrines stated are seriously faulty - not as to tactical employment alone, but also as a basis of armament and organization. They are materially contrary to the doctrine promulgated by the War Department in its letter of March 15, 1938, subject Defense against Mechanized Units (AG 537.3, Misc. M-C); also to that in FSR, 1939, paragraphs 254-262.

2. The study is based on certain asserted fundamental characteristics of antitank guns which are summarized below. The references in parenthesis are to paragraphs of the basic communication.

a. They are vulnerable when moving (3b). Comment: Agree, but applicable equally to infantry heavy weapons and artillery also, and does not preclude offensive employment.

b. They are effective only in the firing position (3b; 6b; 11). Comment: Same as a above.

c. When in position, they must be protected by foot troops against hostile foot troops (3b; 4a; 4c; 8b; 9). Comment: Same as a above.

d. They must be in position before an attack starts; there is no chance of moving into position after the attack starts (5a; 6b; 6c; 8a; 9; 11). Comment: See paragraph 3 below.

e. They can not counterattack armored units (3b; 5b; 9). Comment: Disagree. They are capable of fire and movement, hence can counterattack in the same sense as infantry heavy weapons and artillery.

f. They may serve as a "pivot of maneuver" in offensive action by armored units and infantry tanks (4c; 5b; 6c; 8a; 8b; 9; 11). Comment: This assertion contradicts e, but is essentially correct. It would be better perhaps to describe the action as supporting the attack of armored units and infantry tanks.

g. They are inferior to armored units in antitank defense (5b; 5c; 6a; 6d; 7; 8b; 10; 11). Comment: See paragraph 4 below.

3. The ability of an antitank unit to move to meet an armored unit depends on the distances and speeds involved at the instant of receiving warning of attack. The matter was investigated extensively during the test of the proposed infantry division in 1937. The speed of the antitank unit averaged 9 miles per hour in the forward areas under tactical conditions, more on roads. Two minutes was required to occupy position. The speed of the armored unit no doubt would be less, but may be taken safely as the same. Then if the armored unit is say 5 miles away when discovered, the antitank unit can move to the threatened point from a distance of 4.7 miles. The difference of 0.3 miles is a constant, independent of distance and due to the time of occupying position. Thus it is essential (1) that the warning be as early as possible and (2) that the antitank unit be capable of high speed.

4. The assertion that antitank units are inferior to armored units in antitank defense (par. 2 g above) is disputed. The following comments are made:

a. The armored vehicle came into being in order to secure immunity to small arms fire. Its natural and proper victim is unprotected personnel and materiel.

b. When the armored vehicle attempts to attack one of its own kind, the outcome is a question of numbers, armor, and armament. The contest is not the one-sided affair of a, but one in which both sides are certain to sustain heavy losses in costly materiel - materiel which could be employed more profitably and effectively against more vulnerable targets.

c. When the armored vehicle faces the antitank gun, the combat is essentially a fire action between a moving gun platform in plain view and a small, carefully concealed, stationary gun platform. The struggle is analogous to that between ships and shore guns, and there is no question that the shore guns are superior - so muhh so that ships do not accept such a contest. The Chief of Infantry in effect asserts that ships are superior to shore guns.

d. My practical experience has been that the 75mm. field gun is superior to a tank, and this gun clearly is ill adapted to such fire for technical reasons. A real antitank gun should outmatch the tank without question. However, if there still is question on this fundamental, it should be settled forthwith by exhaustive firing tests, since sound action can not be taken so long as there is doubt on this score.

e. But, even granting that the antitank gun outmatches the tank, there still is a question as to how fast a gun can put out tanks in succession; in other words, how many guns are needed in relation to tanks. In the absence of conclusive practical experience, it would be unwise to assume that a gun could account for more than two tanks within its effective range.

f. If the gun outmatches the tank, then not only is the gun superior to the tank in antitank defense, but employing armored units against other armored units positively should be avoided whenever possible. The gun, supported properly by foot troops, should defeat hostile armored units by fire and free the friendly armored units for action against objectives which are vulnerable to them.

g. The Chief of Infantry asserts that the guns would not be in position to fire against hostile armored units. It is not apparent how the friendly armored units could find the hostile armored units more promptly than could the antitank guns. The latter are faster if anything, and should meet the threat sooner.

5. In paragraph 9, basic communication, tank needs are estimated as 10,000. It is assumed that tanks of the armored force are included. Then the total number might be broken down as follows:

10 armored divisions at 480 tanks	4,800 tanks
100 infantry tank battalions at 55 tanks	5,500
	10,300 tanks

6. Assuming a total of 100 infantry divisions (triangular), and disregarding antitank guns under 37mm. in caliber, the antitank guns would be roughly as follows:

Infantry regiments at 8 guns	2,400 antitank guns
50 reinforcing battalions at 36 guns (par. 11, basic communication)	1,800
10 armored divisions at 12 organic guns	120
reinforcing battalions at 36 guns (par. 11, basic communication)	360
	4,680 antitank guns

Of this number, 2,520 organic guns, 54%, would be usable only for local actions, Only 2,160 guns, 46%, would be available as a mobile reserve to meet great masses of tanks.

7. If paragraph 9, basic communication, is to be understood as advocating that infantry-tank battalions be distributed along the front for counterattacks, such employment certainly is unsound. It would involve a rank dispersion of force. If tanks, like armored divisions, are employed by concentration, then armored divisions and infantry-tank battalions both are deadly threats to be defeated by antitank guns. If the ratio of one gun per two tanks be accepted as a minimum of guns, there should be at least 5,000 guns available as mobile reserves. The 2,160 guns indicated above would be grossly inadequate.

8. As to paragraph 10, basic communication, it is believed that the European war to date has supplied no conclusive lessons as to antitank defense, other than that it has been inadequate. If antitank guns have failed to stop tanks, it is necessary to inquire how many guns actually opposed the great tank concentrations. It may be taken as certain that the organic quotas of guns of infantry divisions, dispersed along the front, would be unable to stop a serious tank attack, but it is contended that they would be more effective in such an effort than an equal number of tanks. Antitank guns must be organized and "multiplied" so as to permit their timely concentration in numbers commensurate with the strength of the hostile tank attack. Their organic assignment to divisions and similar units tends to prevent their concentration when and where needed, and subjects us to the inevitable consequences of dispersion. An antitank gun is cheaper than a tank. Providing antitank guns in fully adequate numbers is a waste of resources only in case such guns are dispersed so widely as to be effective nowhere.

9. My conclusions as to a sound basis of developing an effective antitank defense may be summarized as follows:

a. Conclusive field firing tests should be conducted under representative tactical conditions, in order to determine:

(1) The relative effectiveness of firing by antitank guns against tanks and by tanks against antitank guns in position.

(2) The average number of tanks advancing in combat formation which may be expected to be destroyed by each antitank gun in position.

(3) The corresponding losses of antitank guns due to artillery fire, tank fire, antitank gun fire, and airplane fire.

b. Based on these data, determine the number of antitank guns required surely to counter the estimated number of hostile tanks. This number of guns should be organized in tactically self-sufficient battalions, each complete with warning communications. The organization of regiments and higher units for training, tactical command, and administration would depend on the number of battalions found necessary. In any event, this number of guns should constitute a mobile GHQ reserve, available for meeting major masses of tanks. It goes without saying that such a reserve might be parceled out on occasions to armies, corps, and divisions,

according to the dispositions of the hostile tanks from time to time and the information available as to such dispositions.

c. The calibers included should be surely sufficient to outmatch the hostile tanks, the number of each caliber being somewhat in proportion to the numbers of the several types of hostile tanks. Future tank development should be anticipated, not followed. Every antitank gun should have the dominant and controlling characteristic of the highest practicable muzzle velocity, in order to secure a flat trajectory and the greatest probablility of hitting. Unless there are technical obstacles, the velocity should be 2800 f/s, instead of 2600 f/s as now used. The maximum range of effective penetration should be extended if possible to 1500 yards, since all guns can not be directly in the path of the tanks and there must be latitude in selecting positions rapidly and according to the terrain. With these specifications, the caliber and corresponding weight of the materiel in the firing position follow directly from the thickness of the armor to be attacked.

d. In addition to the general reserve of guns, about 24 and not more than 36 guns should be provided organically in the infantry division, in order that it never may feel helpless against tanks. The guns may be organized as a division battalion, or one-third assigned organically to each infantry regiment. Paragraph 11, basic communication, that organic antitank guns in the field artillery units are incorrect, is concurred in.

e. The employment of reserve antitank guns is similar to that of any other reserve. Their movement follow closely those of the hostile tanks. While some distribution laterally and in depth may be advisable at times, control and the ability to concentrate with great speed must not be jeopardized. To oppose effectively the mass of hostile tanks must be the primary objective at all times.

f. The use of antitank units to support tank attacks seems appropriate, partly to counter hostile antitank guns, and partly to attack hostile tanks if the tank dispositions of the enemy indicate that they are likely to be present.

No incls.

L. J. McNAIR
Brigadier General, U.S.Army
Commandant