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EFFECTIVE USE OF ORGANIC ANTITANK  
WEAPONS IN THE DEFENSE

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PREFACE

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The point of view expressed in this paper is that of the author - not necessarily that of The Infantry School or the Department of the Army.



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## INTRODUCTION

"...There is, in general, little chance of success in a tank attack over country where the enemy has been able to take up defensive positions...."

Field Marshall Rommel

This statement, by a man who is considered to have been one of the greatest leaders of armor of all time, may seem extreme and even paradoxical coming from him. It was, however made at a time when he saw one of his last chances for success in Africa go up in the smoke of his burning tanks before El Alamein late in October, 1942. (29:310) It is, of course, like other flat statements, subject to exception. The attacker, given enough strength can penetrate any defense. He can, however, be made to pay a price so terrible that even the most sanguine of commanders would refuse to risk it.

Even though we emphasize the offense as the only way to win a war, our situation at present is such that our initial engagements will be defensive in nature. After we take the offensive there still remains a great deal of defending to do. Most modern powers are strong in armor and believe that employing it in mass as a key part of the attack. An antitank defense which is strong because of good weapons and techniques can stop or, at least, reduce the effectiveness of such an attack. If we separate enemy tanks from their infantry our whole defense will be much more effective. Therefore it behooves each commander and staff officer to gain and maintain a clear understanding of the hows, whys and wherefores of antitank defense.

The purpose of this monograph is to examine the effectiveness

of some antitank weapons and techniques of employing them so that we may increase our understanding of this subject.

The scope will be limited to present organic antitank weapons and those past weapons that had enough in common with today's weapons so that inferences may be drawn from their employment. I do not intend to go into new developments. The technical discussion of the weapons and ammunition will be limited to that which is necessary for a basic understanding of the capabilities and limitations of the weapons involved.

I intend to bring out several truths in this work. Among them are these: The inherent capabilities of antitank weapons may, if properly employed, offset their weaknesses relative to tanks. The major antitank weapons of a battalion should be employed in mutually supporting positions along the front. The overall antitank defense of a battalion should have depth. Tanks are strong, but they can be stopped if the antitank men and weapons are good enough, and the defense is well coordinated.

I intend to open my discussion with definitions and descriptions of various antitank weapons and tactics. There will be a short discussion of the characteristics of armor and how they are countered. What the mission of antitank weapons and units is and is not will be discussed. Then, with the foregoing for a background, several combat examples will be presented to bring out my points. These examples will be analyzed and conclusions drawn therefrom.

I encountered certain limitations in preparing this paper. None of them, however, detracted seriously from it. To begin with, some of the data about current weapons is classified. Many of the latest combat examples dealing with antitank defensive action are likewise classified. There are, of course, no

combat examples dealing with the 106-mm Rifle. The unclassified examples concerning the employment of the 3.5- inch rocket launcher are of a very general nature. All of my examples are drawn from World War II in Europe, because this was where most of the tank and antitank action took place. I also found in the combat examples that were best for my purpose that the author's maps, not necessarily being drawn to bring out the antitank aspect of the action, were often not as detailed as I liked. I have referred to the AMS maps of the area whenever possible and have also added detail on some of the maps. I think they will be adequate for the reader to follow the action. As I said before, however, none of these difficulties was insurmountable, and I don't believe there is any inaccuracy or lack of information which will detract from the work to a serious extent.

## DISCUSSION

The mission of the various antitank weapons formations in the infantry battalion is to provide antitank protection for the battalion. (1:2,3) What are these weapons and how do we accomplish this mission with them?

The most powerful antitank weapon organic to the battalion is the 106-mm Rifle, M40, with spotting rifle Cal .50 M48 on  $\frac{1}{4}$ T Truck. There are six of these weapons found in the antitank platoon of the heavy weapons company. (1:3) Use of the spotting rifle for ranging and sighting this weapon greatly increases the probability of first round hits. (25:83) Some of its characteristics are:

Weight:	472 lb (weapon and mount, less vehicle)
Operation:	Manual, single shot, breech loading
Rate of fire:	Max, 10 rd/min; Sust, 1 rd/min
Max range:	8400 yd
Max eff range:	1500 yd (stationary target) 1000 yd (moving target)
Weight of round:	33.5 lb
Penetration:	Classified

(The data found in this and the following tables of characteristics are found in Table 20, pages 66 and 66A of Reference Data Infantry Regiment, TIS, July, 1955)

Although the penetration data for the 106 are classified, we can say that these projectiles can defeat the armor of any known tank. (25:83)

The 106's are employed laterally along the battalion front line to take full advantage of their range. They may be employed

laterally and in depth when no tanks are available. (1:3)

Next in the antitank weapons system of the infantry battalion we find the 3.5 inch rocket launcher, M20A1 & M20A1B1. These weapons are used to provide close-in antitank protection for the troops and installations of the battalion. There are twenty-one of these weapons in the battalion, one in each rifle platoon for a total of nine in the rifle companies, five in headquarters company, and seven in the heavy weapons company. Some of its characteristics are:

Weight:	14 lb
Operation:	Manual, single shot, breech loading
Rate of fire:	Max, 18 rd/min; Sust, 4 rd/min
Max range:	900 yd
Max eff range:	300 yd (stationary target) 200 yd (moving target)
Weight of round:	9 lb
Penetration:	11 in, homogeneous armor

Even the rifle squad leader, the junior link in the chain of command, has his own organic antitank weapons. There are three grenade launchers for the M1 rifle found in his squad as well as in other formations and headquarters. When the Rifle Grenade M28 is used there is a capability of penetrating eight inches of homogeneous armor plate at a maximum effective range of 100 yards. Although the individual soldiers armed with these launchers have other primary missions, there remains the capability of very close-in antitank protection which can go anywhere the individual rifleman can go. There are 168 grenade launchers in the infantry battalion. This means that almost no area within the battalion need be without some antitank protection.

The above three weapons constitute the antitank weapons

organic to the battalion. There are of course other weapons which have an antitank capability and can be used in an anti-tank role, although this is not their primary function. Indeed, a coordinated antitank plan includes the use of all available weapons including small arms and artillery to cause the tanks to button up and to separate the infantry from the tanks. Weapons which have a definite antitank capability are the Machine Gun, Cal .50 M2 HB, which penetrates one inch of homogeneous armor at 90° at 200 yards; and the 57-mm Rifle M18A1, which penetrates three inches of armor plate at up to 30° at from 500 to 1200 yards depending on the mount and the state of the target. Although these weapons have other primary uses and their use in an antitank role is not usually discussed, their capabilities along this line should be borne in mind, for they can be very useful in harassing the enemy's heavier armor and even in knocking out his lighter armor and reconnaissance vehicles.

When discussing antitank defense we must not overlook the passive means, namely antitank mines and obstacles both natural and artificial. I will not enter into a detailed discussion of this subject here. I will simply mention that they are a key part of our coordinated antitank defense plan. Antitank mines give us a good means of channelizing the enemy's armor into areas where our antitank weapons can deal with it. We must also remember to cover our minefields with antitank and antipersonnel weapons.

Improvised and standard antitank weapons for extremely close range use such as the Molotov cocktail and the sticky grenade are useful on some occasions and should not be forgotten, but since they are not organic to the battalion I shall not deal with them here.

Rocket-firing aircraft are another effective antitank weapon, but they are beyond the scope of this paper.

Of course, the tank itself is one of the best antitank weapons available to the battalion commander, while it is not organic to the battalion the regimental commander will usually attach one or more sections to each front line battalion. These tanks are employed laterally and in depth. The tank may be employed dug-in in a position, or it may be held in mobile reserve to counterattack infantry or armor penetrations. (1:2) Although this latter use may result in some enemy armor being knocked out, I consider only the first use as the antitank role. The 90-mm Gun Tank, M48 currently in use in the infantry regiment mounts two machine guns in addition to its main armament. The 90-mm gun, which is semiautomatic (self-ejecting) fires two antitank rounds. The HVAP-T M304, which can penetrate 7.9 inches of homogeneous armor at 30° at 1000 yards, has a maximum effective range of 4000 yards. The APC-T M82, which can penetrate 4.8 inches of homogeneous armor at 30° at 1000 yards has a maximum effective range of 2400 yards. Its long range and armor protection make the tank one of our most valuable antitank weapons.

Among its drawbacks as an antitank weapon, however, must be reckoned its great size and weight, which make it incapable of going many places a smaller weapon can; the noise it makes moving; the great logistic effort needed to supply and maintain it; its restricted vision when hatches are closed; and its cost. (It would be possible to buy at least ten jeep-mounted 106's for the price in money and industrial potential of one tank). (25:83)(16:46) (3:3) Although this monograph is limited in scope to the antitank weapons organic to the battalion, the fact that tanks are usually attached to a battalion in the defense will necessitate my dealing with them in relation to coordination of our other

weapons.

In World War II in the latter stages of the European campaigns the principal antitank weapon organic to the battalion was the 57-mm antitank gun (British, 6-pounder). There were three of these guns found in the battalion antitank platoon of Headquarters company. In addition there were three identical antitank platoons found in the regimental antitank company, giving each regiment a total of eighteen 57 guns. This gun was towed by a  $1\frac{1}{2}$  ton truck, weighed 2750 pounds, and had a crew of ten. It fired AP, APC, HEAT, and Sabot ammunition. Its maximum effective range was about 700 yards, and it could penetrate the armor on most of the German medium tanks. (26:passim)

Also in use in World War II was the 2.36 inch rocket launcher, which was similar in use but not as effective as the 3.5 of today.

Another development of World War II was the tank destroyer. There were towed 3-inch and 90-mm guns, 75-mm guns mounted on half tracks, and self-propelled guns mounted in an open topped turret on a tank chassis. The three most used self-propelled TDs were the M10, mounting a 3-inch gun; the M18 mounting a 76-mm gun; and the M36, mounting a 90-mm gun. The motto of the Tank Destroyer Command was "Seek, Strike, Destroy." Their mission was not quite the same as that of antitank weapons whose mission was to provide antitank protection for their units, that is, to keep the tanks off. The tank destroyer's prime responsibility was to kill tanks. Sometimes, as will be seen in the combat examples below, TDs were used in an antitank role similar to that of tanks today. (26:33 et passim) We should bear in mind today that our antitank weapons are not tank destroyers and that their mission is to give us antitank protection and not necessarily to destroy tanks, although the one is often incidental to the other.

The characteristics of armor are, firepower, battlefield mobility, armor protection, and shock action. (3:2) These are the things that give attacking tanks an advantage over the infantry they attack. These are the things that antitank weapons must destroy if they are to accomplish their mission. The armor protects the firepower and enables the tank to keep its mobility on the battlefield where other vehicles cannot move for fear of enemy artillery and small arms fire. Mobility, of course, also depends upon the engine and suspension of the tank. The firepower, speed, and physical mass of armor gives it a tremendous potential for demoralizing the troops it attacks. Because it is a product of the other three characteristics, shock action can be reduced or nullified if any one of these advantageous characteristics is removed. In other words, a tank which cannot move or fire has lost most if not all of its shock action.

The ideal antitank weapon, generally speaking, is one which, when it hits a tank, penetrates the armor, kills the crew, wrecks the engine, knocks off a track, damages the weapons and equipment, and sets the tank on fire. Since we have no such weapon at the present time and are not likely to get one in the foreseeable future we must make do with what we have. Besides, it is not necessary to do all these things to any one tank to knock it out of the fight.

Before I go into the various ways a tank can be neutralized I will state briefly and generally the various types of ammunition which tanks and antitank weapons can use against tanks. A knowledge of the capabilities and limitations of the various types of ammunition will help in determining when and where to employ certain antitank weapons. (See Annex A)

Most basic of antitank projectiles is the armor piercing in its various forms. There is armor piercing (AP), sometimes

called shot. This is merely a piece of metal which depends upon its terminal velocity, hardness, weight, diameter, length, and shape. Of these factors, which also apply to the other members of the AP family, terminal velocity is most important. Another type of AP projectile is the armor piercing capped. This is similar to the straight AP except that its effectiveness has been increased by the addition of a hardened cap and a ballistic windshield. The hardened cap strains and damages the armor, allowing the undamaged projectile with its hard nose to complete the penetration. A third form developed from the simple AP is the hypervelocity armor piercing (HVAP) projectile. This consists of an extremely hard core of tungsten carbide steel in an aluminum alloy carrier with a ballistic windshield. Its high velocity and hard core combine to give it great armor penetration. (13:28,29) These projectiles are fired from tank cannon and high velocity guns. Sabot, a British development, was a type of armor piercing round used in our 57-mm AT guns in World War II.

The other major type of armor penetrating projectile does not itself go through the armor. Utilizing the shaped charge principle the high explosive antitank (HEAT) projectile concentrates a jet of explosive gases on a small point of the armor from a certain standoff distance. This jet melts the armor and projects molten metal and hot gases into the interior of the tank. This type of projectile includes the AT rifle grenade, the 3.5 inch rocket, and the HEAT rounds for the various recoilless rifles and some antitank guns. It should be noticed that these projectiles do not depend on terminal velocity for penetration. Therefore they can penetrate armor just as well at their extreme range as they can at close range. It can also be noticed from the data in the first part of this discussion that the fin stabilized rockets and grenades get much greater penetration than do the spin stabilized rounds from weapons with rifled bores like 57s.

The rotation of the spin stabilized projectile scatters and diffuses the blast. (13:29) The M28 rifle grenade has a further advantage in that it has a hard steel tip which tends to dig into slanted armor. This not only keeps the grenade from sliding off due to the slant, it also reduces the thickness of armor to be penetrated because the grenade tends to right itself and become perpendicular to the armor.

Some of the newer ammunition cannot be described here because of security classification. Concerning the 106, suffice it to say that it has several kinds of ammunition capable of penetrating the armor of any known tank at the maximum range of the weapon. (25:83)

An AP round which penetrates the armor of the fighting compartment may ricochet around inside killing or wounding crew members, setting off ammunition, and damaging weapons, radios, and optical equipment. An AP round which goes right on through may get somebody on its way or possibly cause the crew to abandon the tank in panic. When a HEAT round shoots its jet of flame and molten metal into the tank it also causes casualties and damage. Both AP and some forms of HE can cause spalling to take place, and the resultant chips of armor can damage equipment and personnel. (See Annex A) A penetration of the engine compartment by either type projectile will usually rob a tank of its mobility by damaging the engine. A hit in the track or suspension system can also immobilize the tank. This is in effect what happens when a tank runs over a mine. The result of losing mobility by any means is that the tank loses its shock action and also becomes a stationary target for antitank weapons. Occasionally a tank can be set afire by a HEAT or WP round, especially if there is any fuel or lubricant on the outside of the tank, as, for instance, when auxiliary gas tanks or gas cans have been punctured by small

arms fire. The resultant fire will set off ammunition inside the tank and the heat itself will damage the tank and cause casualties in the crew. Generally speaking, a tank is most surely knocked out of a particular fight when all the crew has been killed. These iron monsters are good, but they can't run themselves. The tank may have to be more completely destroyed later, to preclude the possibility of the enemy sneaking another crew into it to continue the fight.

It will be noticed that one thing all of these antitank projectiles have in common, except perhaps the white phosphorous, is the fact that they must hit the tank directly to harm it. On the other hand, we find that the antitank weapon can be knocked out by a near miss from an HE shell or by small arms fire.

Antitank weapons, however, can take advantage of their smaller size and the fact that they are easier to dig in and conceal to escape the notice of attacking tanks and infantry until the enemy armor is within sure killing range. A limited amount of battlefield mobility can be achieved by antitank weapons if they use stealth to move from one position to another taking advantage of all cover, concealment, and the "fog of war." Even after it has fired the antitank weapon may remain undetected. The backblast of recoilless weapons and rocket launchers is no worse than the muzzle blast of conventional weapons of comparable size. Besides this, it is quite often lost in the confusion of battle. (28:87)

The following are some of the combat examples concerning antitank defense. Unsuccessful as well as successful defenses are illustrated. I believe the reader will be able to see as he follows them through that where the antitankers did not accomplish their mission their failure was either due to overwhelming odds or to improper employment.

## KASSEL

This example concerns antitank defense efforts of the 1st Battalion, 318th Infantry (80th Infantry Division) during the capture of Kassel, Germany on 2 and 3 April, 1945. The 80th Division was engaged in the capture of the city and environs of Kassel during this period. The examples deal with US defense against German counterattacks with tanks and with German anti-tank defense. (See Annex B)

The 1st Battalion was continuing the attack north toward Kassel which they had begun the day before. The battalion CP was located in a barracks just north of Oberzwehren. The battalion antitank platoon was set up around the CP to protect it and its satellite installations. (The narrative does not say whether these guns were dug-in or not, I assume they were not. DEW) The forward rifle companies had reached the factory buildings between the two railroads shortly after daylight on 2 April. At this time a coordinated German counterattack consisting of infantry supported by about a dozen tanks about half of which were "Tiger Royals" (See Annex E) went by the lead companies and attacked seven tank destroyers which were following the attacking echelon of the battalion. In a brisk fire fight the German tanks disabled and set fire to six of the tank destroyers. The seventh, a command vehicle, withdrew from the action.

Company C, taking cover in the factory building, engaged the German infantry in a fire fight and, after killing and capturing about 100, completely separated them from their tanks. The enemy armored elements continued south along the main road, fanning out to cover a wider frontage.

As the leading tank approached the battalion CP, the anti-

tank gun nearest the road opened fire and fired six rounds before it was jammed by a defective shell casing. The gunner, in an attempt to seat the round, picked up another round and started hammering on the defective round stuck in the breech. The point of the projectile hit the primer of the jammed round, causing it to explode. The explosion killed the gunner and disabled the gun.

The approaching enemy tanks disabled both the remaining guns with direct hits.

The battalion command group and some of the 81-mm mortar platoon took cover in the basement of one of the buildings. As the tanks got to within 50 yards of the building, the order was given to open fire with all available weapons. One member of the group had a 2.36-inch rocket launcher and four rockets.

Three rounds were fired at the advancing tanks with little apparent effect except to keep the tanks buttoned up. A little later, however, one of the "Tiger Royals" was observed being towed by another tank. It was therefore believed that one of the rockets had damaged the suspension system of the tank.

With the help of the 317th Infantry the counterattack was broken up and the 1st Battalion was ready to move out again by 1500.

The Germans launched another tank-infantry counterattack at 1600. This one was broken up by artillery and other fires. At this time the battalion had no major antitank weapons.

The Germans held up the continuation of the attack by this same unit on 3 April by employing a self-propelled antitank gun in a position to fire through the underpass where the northern track crosses the main road. This weapon was protected by infantry dug-in along the railroad embankment.

The operation was completed on 4 April.

(31:10-15)

#### Analysis

Although at first glance it might seem that this example shows the futility of relying on antitank weapons to defend against enemy armor a closer examination will reveal that this is not so. Of course no combat action is undertaken in a scientific manner under controlled conditions, varying only one thing at a time, and keeping all others equal. Here a relatively weak antitank defense was matched against what were then the most powerful tanks on the Western Front. The antitank defense was not only weak in numbers of weapons, the weapons the US Forces did have were certainly not employed to take advantage of their best characteristics. This failure can perhaps be partly explained by the fact that this unit was concentrating on pressing an attack and did not want to take time to keep its guard up. Certainly the TDs would have fared better had they advanced by echelon with one section overwatching the other. Even the best antitank guns and units cannot do their best when clustered around a battalion CP for protection. Of course some of our own tanks would have been nice to have, but they might have met the same fate as the TDs if they were used the same way. The Germans, on the other hand, picked the best position for their one antitank weapon and effectively slowed the attack.

## NOVILLE

This example concerns some incidents of antitank action during the defense of the town of Noville, Belgium north of Bastogne during the Battle of the Bulge. The unit involved was the 1st Battalion, 506th Parachute Infantry, (101st Airborne Division) and attached tank and TD units. The Germans were attacking south with armor and infantry during their Ardennes offensive. Their objective was the communications center of Bastogne. The actions related here took place 20 December 1944. I will recount only the various incidents of antitank action. The weather during this period was cold and foggy. (See Annex C)

About 0730, 20 December " two German tanks came roaring through the fields along the HOUFFALIZE ROAD entering NOVILLE from the north, spraying the area with fire as they came. Both tanks stopped to look over the area near the first building of the village. Due to the fog, they did not see a bazooka team only ten yards away. The bazooka team opened fire and set the first tank ablaze. The second tank was taken under fire by an alert American tank commander and had been hit before the crew realized what was happening. A third German tank which was out of sight in the fog, fired several rounds into the village and then disappeared.

"This was the beginning of a desperate attempt by the enemy to drive the 1st Battalion from NOVILLE. For the next two hours the enemy kept the perimeter under continuous attack with small groups of tanks and infantry teams. These attacks were held off, by rifle and bazooka fire until tanks or tank-destroyers could go into action in threatened areas and repulse these assaults. Heavy fog, mixed with the smoke from the burning buildings, made it almost impossible for the forces on either side to see

what was developing.

"Tank-destroyer crews could hear a large number of enemy tracked vehicles moving in their direction. Unable to see them the tank-destroyer crews fired for two hours in the general direction of the noise.

"About 1000 hours, the fog suddenly lifted and the sky was almost clear. Looking out 1000 yards toward HOUFFALIZE, fifteen enemy tanks could be seen moving toward their own lines. Four of the tanks had been hit and disabled. The German tank crews were fired on with .50 caliber machine guns as they fled across the fields. The tank-destroyer crews were certain that their blind firing had disabled the four enemy tanks.

"Just prior to the time the heavy fog lifted from the area, a lone German Tiger tank charged through the perimeter defense into the heart of NOVILLE without being fired upon. Visibility was so poor the tank was not seen until it stopped in front of Company B, 20th Armored Infantry Battalion's command post. The enemy tanker evidently suspecting the building a good target, trained his gun on the door. The occupants of the CP, seeing the tank was going into action, said a quick prayer. One of the men quipped:

" 'Don't look now, but there is an 88 pointing at you.' In the fog, the German tank had failed to see an American tank which was only twenty yards away. The American tank crew immediately fired three quick rounds from their 75mm gun without doing any apparent damage to the Tiger tank. The German tanker quickly put his tank in reverse trying to escape from the close range, direct fire. As the tank moved to the rear it backed over a jeep causing the left track to be fouled and thus beached the tank. The driver still trying to escape, kept pushing to the rear dragging the jeep with him. At this time the tank ran

into a parked half-track which caused the tank to roll over on its side. The German crew had enough. They jumped out of their tank and disappeared into the fog. As far as it is known the crew ran through the American line without being fired upon."

(32:17-19)

#### Analysis

Here we see an example of available antitank means being used to good advantage. Antitank weapons were placed upon the front lines to slow and hold enemy armor until heavier antitank weapons could be moved into the danger area. Even though antitank weapons are by nature defensive they can, as was demonstrated here, be used aggressively. There are also a couple of examples of the relative helplessness of a buttoned up tank in close-in fighting. Of course the fog contributed to this, but it was foggy to the bazooka men, too. They, however, were not 10'x20' x8' in size, nor did they need a roaring engine and clanking track to move around.

## DOM BÜTGENBACH

This example concerns the antitank defense of the sector of 2d Battalion, 26th Infantry (1st Infantry Division) during the Ardennes campaign. This unit had the mission of defending the village of Dom Bütgenbach, Belgium, near the German border. The actions recounted here took place from 19-21 December, 1944. During this period the 2d Battalion, with elements of the regimental antitank company attached and with tanks and tank destroyers supporting, defended this area against repeated attacks by elements of the 12th SS Panzer Division. (See Annex D.)

2d Platoon, AT Company had just gone into position in the 2d Battalion sector on 19 December when, at about 1300, a German reconnaissance vehicle mounting a 50-mm antitank gun, followed by a Mark V tank, approached the 2d gun squad's position. The squad held its fire until the vehicles were within 100 yards of their 57-mm gun. Then it fired three quick rounds, one hitting the recon vehicle and two penetrating the tank. Even though both vehicles were knocked out, the recon vehicle got off one round which killed the gunner and assistant gunner of the 57. German armor attacked no more that day in that sector.

At 0600, December 20, after an intense barrage, about twenty enemy tanks attacked. Because it was still dark, the battalion's mortars fired flares. The tanks were close when they manned the guns. In the light of the flares the first gun squad saw two enemy tanks approaching its position. Sending a bazooka team to his right, the squad leader, Staff Sergeant Stanley Oldenski, took over the job of assistant gunner and ordered Corporal "Red" Warner, the gunner to commence firing. Enemy tanks to their left front were firing on the battalion CP. Cpl Warner put four rounds into the nearest tank, setting it afire and putting it out of

action. A second tank appeared out of the mist in an attempt to overrun the MLR. Warner fired at it. The tank must have been surprised to find an antitank gun on the MLR. Three more rounds knocked it out.

On the last round the breech block failed to close. A minute later a third tank appeared from the right shooting its machine gun at the antitank gun. All the crew but Warner, who remained at the gun, went for cover. The tank swung left and attempted to overrun the emplacement. When about ten feet away the German tank commander stopped his tank and stuck his head and shoulders out of the turret to direct it. Warner, still trying to clear the stoppage, drew his pistol, fired at the tank commander, and quickly ducked down in his gun pit. As he crouched there, waiting to be run over, Warner heard the tank gun its motor and move toward him tracks clanking. As it was about to hit the gun the tank reversed itself and began to move back toward its own lines. A quick look by Warner revealed the tank commander slumped out of his hatch, evidently killed by the .45. The crew must have become confused by the loss of their commander and decided to play safe. With the help of artillery, TDs, and tank fire, the 2d Battalion finally repelled the attack and the enemy moved back to his own lines.

That afternoon another platoon from AT Company was put in 2d Battalion's sector. It was decided between the AT Company commander and 2d Battalion commander to emplace this platoon on the front line, too. The antitank guns were to establish the first echelon of defense, stopping enemy armor before it could chew up our front line troops and at the same time point out targets to the M10s and tanks sitting 300 yards back. This latter mission was necessitated by the early morning fog which

reduced visibility to 200 yards in some places.

The next morning, 21 December, at 0530 another preparation by all available German weapons began. At 0700 a coordinated attack by more than thirty tanks and two battalions of infantry was launched. By this time the rifle and antitank troops on the MLR had suffered 50% casualties many of whom were still in their holes.

The attack came from the woods on the right and down the road from Büllingen. All gun squads were heavily engaged and fired their small arms at the advancing infantry when there were no tanks to knock out or when their own gun had been knocked out.

On the right Pfc Rose, Sgt Collier's assistant gunner dropped his carbine and loaded a round of Sabot (British HV 57-mm round) when he saw a Mark VI tank. Cpl Schwartz, the gunner, sighted and fired, and knocked the left track out of action. As the tank attempted to back up it swung around to the right because of its bad track and Schwartz fired into its side. It began to burn. Schwartz and the others continued to alternate firing their small arms and engaging tanks. This squad got a Mark IV with three direct hits, stopping the tank attack in this sector.

Sgt Kolar's gun was put out of action while engaging a tank. A burst of machine gun fire damaged the recoil cylinder.

Farther to the left Cpl Harris was covering the fronts of the other guns with flanking fire to the right. He knocked out a 150-mm SP gun, but while doing it his own gun was knocked out by an AP round from a Mark IV which came up from his left.

Warner, 50 yards on to the left, saw this. His assistant being wounded, he loaded his gun himself and fired. The round hit just in front of the rear idler. Warner was killed by a

burst of fire from the tank while he tried to load another round. He was later awarded the Medal of Honor, posthumously.

Although nine of the enemy tanks finally penetrated the front and did some damage and harassment behind the lines and around the battalion CP, their attack had been blunted by their encounters with the antitank guns, and their infantry had been separated from them. They were engaged by our own tanks, M10 TDs and towed 90-mm TD guns. These weapons employed in depth behind the antitank guns on the MLR, were able to reduce the penetration and the position was held.

(21:19-22)

#### Analysis

Above is an example of an exceptionally well conducted anti-tank defense. The defense was coordinated. Individual guns covered one another, and diverse units worked together to stop tanks. There are several incidents which point up the fact that it is not necessary to completely destroy a tank to knock it out of the fight. On the other hand, there are a few cases where it was shown that a tank is not out of the fight when it has merely been immobilized. Still another instance, however, shows how immobilizing a tank sets it up to be knocked out. Although this example can hardly be considered typical; the unit was a 1st Division unit and one of the participants received the Medal of Honor for his part in it; it does serve to show what can be done when antitank weapons are employed effectively. In this example, full use was made of the advantages afforded by the terrain and weather and those inherent in the antitank weapon. As a result an antitank unit armed with a weapon not nearly as powerful compared to the enemy tanks as those we have today was able to stop some tanks and blunt the attack of the others.

## CONCLUSIONS

1. Antitank weapons have certain inherent capabilities which can be exploited to offset their limitations.
2. The major organic antitank weapons of the infantry battalion are best employed in the forward areas of the battle position.
3. These weapons should be mutually supporting whenever possible.
4. The antitank defense of a battalion should have depth both as to positioning and type of weapon.
5. The antitank defense should be coordinated with obstacles and other weapons both antitank and antipersonnel.
6. Present United States tactical doctrine is sound.

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Annex A ( Information concerning antitank projectiles  
and armor)

Adapted from Ives (13:29)

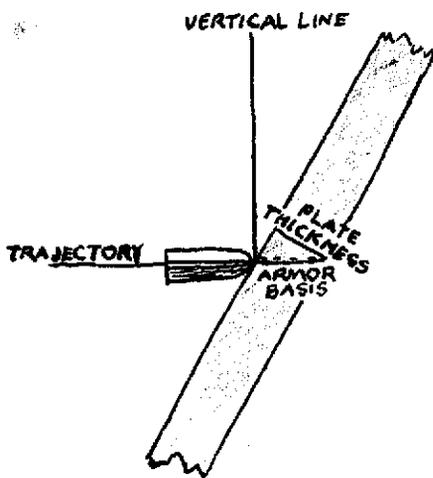


Figure 1. An armor plate, tilted away from the vertical, has a greater "armor basis" than one mounted vertically.

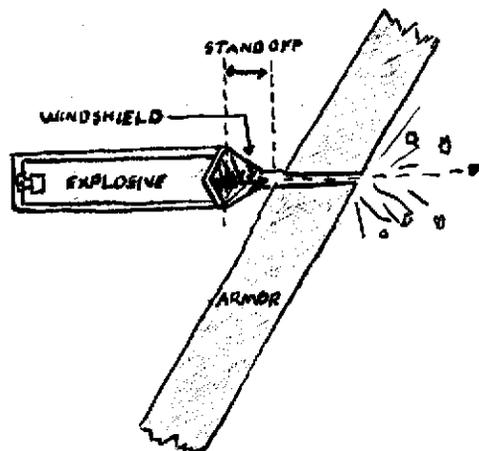


Figure 2. The HEAT projectile has a shaped charge that is detonated when the ballistic windshield strikes the armor.

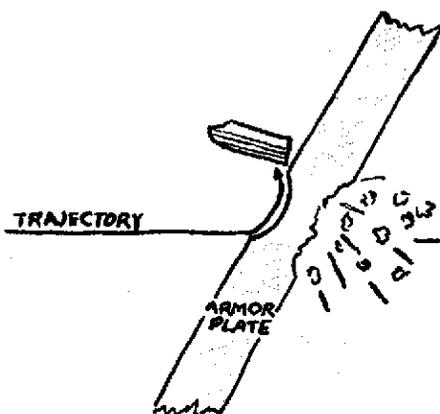


Figure 3. "Spalling" -the tendency of armor plate to be chipped away even when not penetrated by the projectile.

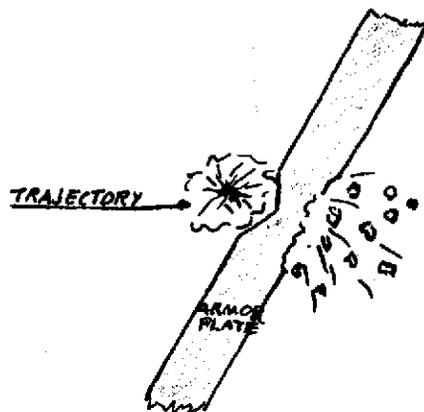
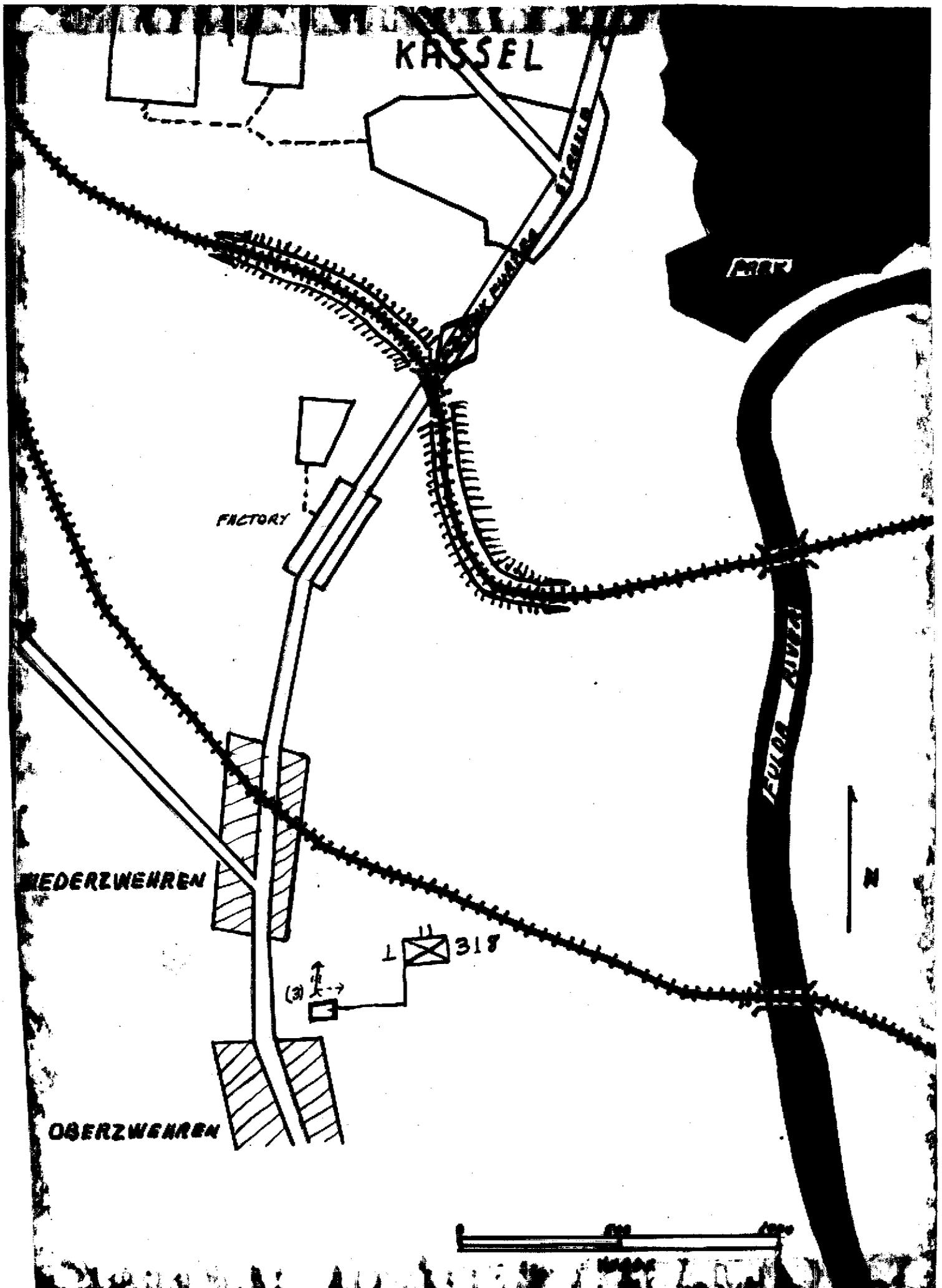
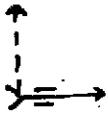


Figure 4. Spalling caused by a high explosive burst.



Annex B

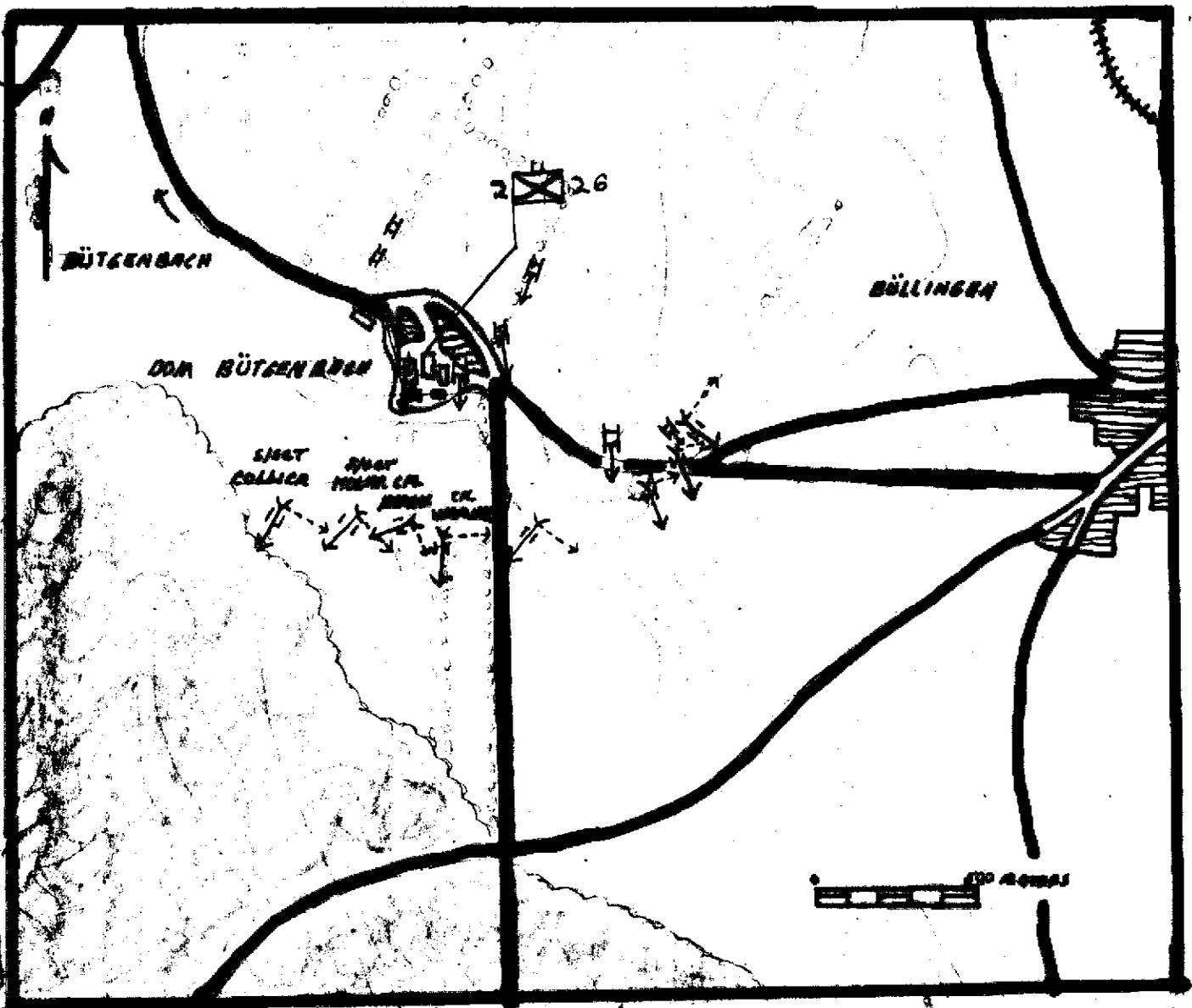




57mm ANTITANK GUN



M4TK, MOUNTING 75mm GUN  
OR M10TD MOUNTING 3" GUN



Annex D

ANNEX E (Some characteristics of German armored vehicles referred to in combat examples)

Designation	Main Armament	Armor
Mark IV Medium Tank	High Velocity 75-mm	2.36 in
Panther (Incorrectly called Mark V) Medium Tank	High Velocity 75-mm	3-4 in
Tiger (incorrectly called Mark VI) Heavy Tank	88-mm	4 in, front 3.25 in, side
Panzerjaeger (Tank Hunter)	47-mm	0.60 in
SP How	150-mm	light

(27: 207,208)      (26:21-31)

The designations given here are the ones which were current among our troops in Europe in 1944-45 when my combat examples took place. "Panther" and "Mark V" were often used interchangeably as were "Tiger" and "Mark VI", although the Germans had two different medium tanks designated Mark V and VI. It seems likely that the tanks in use in 1944-45 were more probably Panthers and Tigers than Mark V's or VI's.

The German model numbers were preceded by the letters PzKw as in PzKw IV. We took the British model designation, "Mark" and referred to the same tank as a Mark IV. PzKw is the abbreviation for Panzerkampfwagen, meaning "armored battle vehicle".