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MILITARY MONOGRAPH

TITLE: The Employment of Tanks in Mountain Operations

SCOPE: A comparison of the employment of tanks in mountainous terrain and in favorable, level terrain. Recommendations for the general use of tanks in mountains and their employment in the attack and defense, with illustrations of the several principles from combat experiences.

42-35

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One often hears the statement, "This is not tank country", applied to rough or mountainous terrain. Tanks can be used in any terrain if the need for them is great enough to make the expenditure of time and labor profitable. The tank can be maneuvered into some position from which it can fire into almost any spot on the earth that an enemy would elect to defend if sufficient time is allowed for reconnaissance.

The basic concepts and principles of the use of armor, speed of maneuver, tremendous fire power, violence, and shock action are the same whether in rough, mountainous country or level and gently rolling country. The differences are minor changes in technique of employment dictated by the terrain and the fact the officers probably fight the terrain harder than the enemy.

The limited space that is passable to tanks generally reduce the number that may be employed. An armored division would look quite ridiculous strung out along a mountain road fighting on a one or two tank front. One company of tanks with attachments on a given route or road is, ordinarily, the best employment. A company gives good tactical and administrative control and provides as many tanks as can be used in most circumstances.

Tanks should not be assigned the dominant offensive or defensive role in mountainous areas. This role should go to the infantry with tanks attached for support. This support may include their use as a major striking force for limited objectives when the opportunity presents itself but the infantry must be prepared at all times to press on alone when difficult terrain delays or temporarily halts the progress of the tanks. Infantry

must seize a bridgehead across serious obstacles. Engineers can then prepare a crossing for the tanks.

Mountains offer a great variety of natural obstacles and numerous places where movement is restricted to such an extent that effective man-made obstacles can be prepared. Major G. J. Madden, commander of the armor attached to the 10th Mountain Division during the attack on Mt. Belvedere in Italy,<sup>states,</sup> "As usual, aside from the eternally restrictive terrain, the armor was delayed by mines and demolitions".(\*1) This calls for extensive use of engineer troops. Since the demand on divisional engineers is always heavy, it is advisable to obtain these troops from corps engineer units.

The 760th Tank Battalion operated for about two months in 1944 with a company of the 19th Engineer Regiment attached. An engineer platoon was sub-attached to each medium tank company. The engineers were parceled out in this manner because the battalion had the three medium companies attached to different regimental combat teams with the battalion headquarters and light tank company under division control. The medium companies attached their tankdoser to the engineer platoon which greatly increased the platoon's efficiency and furnished direct radio communications. This set-up materially speeded up the advance of the tank companies and enabled them to give more continuous support to the infantry.

Most of the work done by the engineers for the advancement of armor will be of value in the movement of supplies. On the other hand, the movement of large numbers of tanks over narrow and often thinly surfaced

\*1. Major G. J. Madden, "Report of Action - Mt. Belvedere Attack", USA-1653

mountain roads often weakens these roads so much the movement of supplies is impeded.

Civilians can sometimes be used to good advantage in combat areas. The road between La Spezia and Genoa, Italy winds long the coast through jagged, barren masses of igneous rock that rise several thousand feet abruptly out of the Mediterranean. Through a number of fortunate circumstances, the German Army was not able to defend these hills with any strength and <sup>a</sup> hastily organized team of one tank company and a motorized battalion of infantry was able to make the entire distance in two days. About 1500 hours the first day, the force was halted by a large crater in the road. The crater was approximately fifty feet long and thirty feet deep, and on one side of the road the mountain ascended in a vertical cliff, on the other side was an almost equally abrupt drop of one hundred feet. It was near a small town and not covered by fire, so many civilians came out to see what would happen. The one tank-dozer was incapable of doing anything about the crater, which was blasted out of solid rock, and the engineer bulldozers had been far outdistanced. The task of filling the hole by hand looked like a hopeless job but about one hundred civilian men, women, and children and as many soldiers were put to work carrying the blasted-out rock back into the crater. In an hour the first tank tried it and made it. Before dark the engineers had the road passable to trucks.

The Germans were continually surprised at the places the American tanks could get to in World War II. This failure to anticipate and prepare adequate defense against armor in these places cost them at least one major defeat when General George S. Patton made his classic break-through the

Eiffel Forest and many minor and local defeats.

One notable example was the battle for Terracina during the 5th Army's "march on Rome". The mountains come out to meet the sea at Terracina and drop precipitously from a height of 650 feet to the water's edge at the eastern extremity of the city. The road entering from the American side or eastern side was cut into the cliff. On top of the hill, Mt. Teodorica, which overlooked the sea, was Palazzino Teodorica, which the enemy used as an artillery OP; and rising behind that, the mountains stretched higher and higher. Northwest of Terracina about twenty miles <sup>was</sup> the southern end of the Anzio Beach-head and the Germans elected to hold here to prevent the main body of the 5th Army from joining with the Anzio forces. They put a deep crater in the road at a point where it was impossible for tanks to bypass it and covered it heavily by fire. They put a strong infantry force on Teodorica and the surrounding hills and sat down in their holes to wait for us.

The infantry and tanks reached the road block at approximately 0100 on 22 May 1944. Not an enemy shot had been fired since the previous afternoon. Quite a large group of tankers, infantrymen, and engineers assembled around the crater to see what could be done about it and then the enemy opened up. When dawn came it was found that the road was covered by snipers in the hills for two miles back. On the other side of the road was the sea. Attempts were made to fill the crater during the day of the 22nd but to no avail. Two tanks that tried to cover the engineer's efforts were *knocked* blocked out in the road which further blocked it. On the morning of the 23rd, two determined infantry attacks on Teodorica were repulsed.

In the meantime Lt. Col. Swift of the 48th Engineer Battalion discovered a stretch of the ancient Via Appia that lead up to the top of Teodorica. The ancient Romans, without dynamite, found it easier to build their roads over the mountains than through them. This old ruin of a road was not on the map and was barely discernable on the ground. A light tank company equipped with M5 tanks was alerted to attack up this road and capture the mountain. Terracina lay directly at the foot of this mountain and beyond that were the Pontine Marshes and the beginning of the flat land similar to the Anzio beach-head area.

The engineers commenced work immediately clearing and improving the old Roman road. The tanks started up after about four hours of bulldozer and demolition work by the engineers. The lead tank threw a track at a point where it was impossible to by-pass it so an engineer bulldozer, which was still ahead, pushed the tank almost over the cliff. At about 1700 on 23 May the tanks finally reached the top.

This turned out to be a small plateau with two large, strongly constructed, stone houses on the palacial order and a cemetery, la Delibra. One of the houses was Palazino Teodorica which was on the highest part of the mountain at a point where it dropped very abruptly into the sea and directly above the road block on the modern road into Terracina. The other house was La <sup>Casina</sup> ~~Casina~~ and sat on the Via Appia Antica which was quite distinct on the plateau and was directly in front of the tanks.

The first platoon fanned out and formed a base of fire. The other two platoons moved to the left and right spraying the rocks with machine guns. The 1st Platoon moved up to La Casina. The small arms fire from there was heavy and the 37mm guns, which were the heaviest armament

Carried on the M5 tanks, did no apparent damage to the heavy walls. A platoon of M4 tanks reached the top at this time and their heavier 75mm guns knocked great holes in the walls of La Casina and quickly silenced the opposition there. The M4 tanks then turned their guns on Palazzino Teodorica while the light tanks sprayed the rocks and countryside in general.

Within an hour the mountain was completely secured. After such a stubborn defense, a counterattack was expected and as it was nearly dark, the infantry dug in and reorganized. The enemy put an intense artillery concentration on the hill during the night but the counter-attack did not materialize. Under cover of darkness and the artillery, the enemy all withdrew from Terracina and the next day overland contact was made with the Anzio Beach-head.

The Germans were so certain that tanks could never get at them on Mount Teodorica that they did not have their individual antitank weapons, bazookas and panzerfaust, with them. They failed even to get artillery support in time. As a result, when tanks did get on the mountain, they faced only small arms and mortar fire which did no damage. The mountain was captured without the loss of a tank or infantryman except for those casualties suffered in the two previous all infantry attempts.

Tremendous casualties can be inflicted upon the enemy when he is surprised and caught off guard. An interesting example can be found in the attack on Albanete House near Cassino, Italy. At the height of the attacks on Cassino in February 1944, a British Indian Sapper unit built a road under cover of darkness part way up Monte Cassino, overlooking the town. A plan was developed to send an infantry force reinforced by a light tank company

up this route with their objective, Albanete House.

Colonel Devore reports the experiences of one tank crew of this force in detail. (\*2) He attributes them with killing 50 to 75 enemy. The tank commander, Sgt. Lawrence M. Custer, states, "..... just as I got to the top and could look down the way for maybe seventy five yards, I ran over a mine..... when the smoke and dust cleared away, I had my head out watching and saw a mule train coming up the trail. There were a lot of Germans with the train and I let loose with the machine gun and also with the 37mm. They were all standing still looking at the tank, apparently with lots of surprise and it took them awhile to realize we were their enemy. By that time I had gotten at least 15 of them and 5 or more of the mules."

Sgt. Custer stayed with the disabled tank despite the fact that an enemy artillery battery was in position only 300 yards away and continued firing until his ammunition was exhausted. He and one other member of his crew were successfully rescued by another light tank.

This attack was repulsed and one of the principle reasons was the inability of the M5 light tanks to negotiate the rough terrain without throwing off tracks. Ten of the seventeen tanks that made the attack were lost, five threw tracks, two became stuck, two hit mines, and one was knocked out by an antitank gun. The present track with center guides has proven much more effective and efficient. If this attack had been made with M24 tanks, which had not then been developed, it is possible only three tanks might have been lost and the superior fire power of the 75mm gun might

\*2. Col. Devore, AGF Observer, "The Attack on Albanete House", USA-385.



have turned the tide of the battle.

Another outstanding, although not typical example of what can be gained from surprise comes from the attack of the 1st Battalion, 6th Regiment, 1st Brazilian Infantry Division along Highway 62 against Fornova, Italy. Fornova lies in a small valley opening into the Po Valley with mountains on either side about 1000 to 1500 feet high.

One platoon of medium tanks was attached to this battalion for armor support. The attack commenced on 28 April 1945. Antitank, 20mm, mortar, and artillery fire held up the advance of the tanks and infantry along the road and mines greatly limited the opportunities for deployment of the tanks. The drive was stopped at Galano.

The tank company commander lead another unattached platoon without infantry support into the high ground southwest of Fornova. This encircling movement apparently caught the enemy completely unaware and about twelve trucks were destroyed by fire from the high ground. It was impossible to get down into Fornova from that point. The enemy began milling about in complete confusion and the tanks fired 500 rounds of 76mm and 10,000 rounds of 30 caliber ammunition into the positions in the valley before dark.

The enemy, thinking he was completely cut off, sent emissaries that night to the tanks to negotiate a surrender. The emissaries were conducted to the Brazilian Command Post. The next day, 29 April 1945, 13,879 enemy troops, including 820 officers, with over 4000 horses and 1000 assorted vehicles surrendered to the Brazilian forces. (\*3)

\*3. After Action Reports, 760th Tank Battalion: "Report of Action from 1 April Thru 30 April 1945".

One tank of the encircling platoon was destroyed by an enemy bazooka.

The surrender of so large a force to so small a unit is not typical; it happened at a time when resistance was beginning to crumble all over Italy. The enemy commander probably grasped at the first half-way honorable opportunity to surrender.

Tanks are primarily an offensive weapon and in the defense, their offensive qualities should be utilized to the utmost by holding tanks in reserve to be used as a counterattacking force. The tanks' mobility enables them to reach any threatened point quickly and they can be employed in mass only when so held in reserve.

Mountain terrain may place such limitations on the mobility of tanks that it will be impractical to use them for a counterattacking force due to the lack of suitable routes to all points on the front of the supported unit. Their fire power may still be utilized to great advantage by placing the tanks in selected firing positions on the infantry front. Reconnaissance for positions should begin as soon as the ground is captured to give sufficient time to maneuver the tanks into position. This operation should be a part of and coordinated with the infantry's organization for holding the ground.

This type of employment will fall into two classifications; one, tanks outposted and protected by infantry to form strong points, and two, tanks used merely to reinforce and add volume to the fires of the infantry. Strong points are only <sup>of</sup> value when placed in likely avenues of approach.

Speed of movement is one of the chief protective means of the

American tanks; but in this type of employment, movement must be kept to a minimum so special emphasis must be placed on camouflage and concealment. Alternate positions nearby should be prepared. The enemy will make every attempt to bring antitank guns to bear on the tanks if they locate them.

The 88th Division, with a tank battalion attached, was advancing slowly and with great difficulty through mountainous terrain south of Bologna, Italy in October 1944. The division's boundaries lead it along the route Mt. Grande, Monte Calderaro, Mt. Vedriano, then several miles of diminishing foothills and the Po Valley. Capturing the Po Valley would deprive the enemy of a valuable source of supply as well as excellent routes of supply and communications, therefore it was the objective of the entire 15th Army Group in Italy. Moreover, to the mountain weary soldier in Italy, the flat land of the Po Valley seemed like the Promised Land. Everyone from generals to privates earnestly desired to get there quickly. The Germans on the other hand desired desperately to hold it.

The division's attack on Mt. Grande was made with very little effective support from tanks since there were no roads, and the terrain was too rough and steep, and the ground too soft for tanks to negotiate it. Initially one medium company was employed along an unimproved road on the division's right flank, one medium company plus one platoon fired indirect fire reinforcing division artillery, and the other medium company less one platoon did practically nothing.

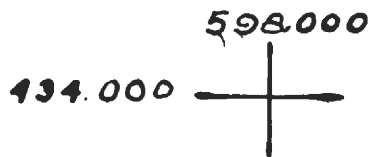
The mountain was captured and at dawn on 21 October 1944, a

medium tank company, less one platoon, (eleven tanks) and a tank recovery vehicle started up the mountain by a very round-about, previously reconnoitered route lead by a bulldozer. The mission of the tanks was to take positions on the mountain to support the infantry. The lead tank belonging to the company commander rolled into a ravine when the newly made trail gave way on the outside edge.

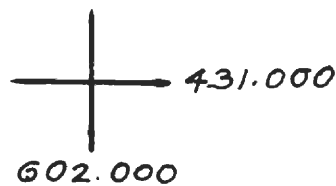
The tanks proceeded on and reached the crest of a ridge leading into Mt. Grande by mid-afternoon. There was a cart trail along the top of this ridge. The infantry was dug in on the reverse or south slope of this ridge and the cart trail generally marked the line of outposts. The plan required the tanks to proceed over this trail to Mt. Grande.

A heavy rain commenced just as the tanks reached the crest of the ridge and the trail. The lead tank slipped off the trail and became stuck in the mud 1000 yards west of Farneto (see accompanying map). Attempts to pull it out with other tanks were unsuccessful. The tank recovery vehicle had stopped to retrieve the company commander's tank without success and had been caught by the rain and could not climb the slick mountainside. Two more tanks were stuck in by-passing the one west of Farneto.

It was now night, and to complicate matters, the rain had changed to a heavy fog. Visibility was zero. The lead tank of the column ran off the road at <sup>Farneto</sup> Farneto and rolled on its right side. An inspection of the trail ahead, made on hands and knees, indicated that it had become too narrow for a tank to negotiate in the daylight and certainly too narrow for a foggy night.



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Another by-pass was attempted and four more tanks were stuck; two got through.

These two tanks successfully reached the side of Mt. Grande and backed a short distance up a trail leading to the top. Visibility improved at dawn and the platoon leader with the two tanks attempted to move them fifty yards to a more concealed position. The lead tank threw a track, hopelessly trapping a second tank behind it. Of the eleven tanks, none now remained mobile.

With dawn came more rain.

Seven of the tanks stuck along the <sup>Farneto</sup> ~~Parente~~ ridge trail were recovered with the help of an engineer bulldozer but one became mired in the mud again on the way to Mt. Grande and could not be retrieved. The remaining six were assembled in the only available concealed place on the side of the mountain.

Two of these tanks assisted in the capture of Monte Calderaro by firing from the road. They remained in position just north of Casa la Costa.

The attack on Mt. Vedriano began next. Two tanks got as far as Casa Cola but, after one entire infantry company was lost, a withdrawal was ordered by night to Casa il Vezzola. One tank slipped off the road, becoming hopelessly stuck, and was destroyed to prevent capture. There was room for only two tanks at Casa il Vezzola so the remaining three were sent back to Casa la Costa. The trail caved in under the last tank out and the two tanks in Casa il Vezzola had no means of withdrawal. Four tanks were now operative, two sealed in at Casa il Vezzola and two at Casa la Costa.

Two nights later at 1830 hours an enemy battalion attacked Casa il Vezzola but the attack was repulsed by a company of American infantry supported by the two tanks there. The enemy battalion commander was killed by one of the tank commanders as he was trying, apparently, to get on the tank. Rocket anti-tank weapons were fired at the tanks from a building twenty feet away but none scored hits. It is doubtful if the position could have been held against such a superior force of enemy without the fire support of the two medium tanks.

The two tanks at Casa la Costa fired on enemy positions around Monte Calderaro whenever they could be located and when visibility permitted.

The action described here illustrates how tanks can be used for defense under the most unfavorable conditions of terrain and weather. All but three of these tanks <sup>were</sup> recovered by Ordinance when spring came.

This operation lasted from 21 October to 8 November 1944 and it was never possible for wheeled vehicles to reach the tanks. Resupply was accomplished by mule train.

Radio communications in armored units equipped with SCR 508 series radios were seriously affected by mountains. It is frequently possible to transmit and receive messages clearly for ten to twelve miles between two stations if they are both on high ground with no intervening land masses; however, a platoon leader will not be able to reach all of his platoon if there are hills between him and some of his tanks. For this reason command tanks and command posts should keep on the highest ground possible.

It is hoped it has been shown here that armor can be used effectively in mountainous terrain despite the great difficulties. We hope the United States Army will always be victorious; therefore we must assume it will be on the offensive. The choice of where to fight generally goes to the defending army. High ground and mountains are the easiest to defend so we must prepare to fight in this kind of terrain and we must make the best possible use of every weapon available to reduce the resistance quickly. It is essential that we overcome the pessimistic attitude that tanks are of no use in mountain country.



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