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MECHANIZED CAVALRY.

By

Brigadier General Adna R. Chaffee,
Commanding, 7th Cavalry Brigade.

Lecture delivered at
The Army War College,
Washington, D. C.,
September 29, 1939.

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MECHANIZED CAVALRY

I have been asked by the Commandant of the War College to express my views on the subject of the present and future development of mechanization. My most intimate experience has been with that element or branch of it known as mechanized cavalry, and I shall confine what I have to say largely to that element, although of necessity I must also show you what I consider its proper combination with other forces and other forms of mechanization.

In order to understand where we are today in the development of mechanized cavalry and why, it is necessary to state a few highlights in the history of that development.

The British, I believe, coined the word mechanization in its military sense in connection with their earliest efforts about 1925.

General Summerall, when he was Chief of Staff, started the thought in our service by one of his little pink slips which said "Organize a Mechanized Force. C.P.S." This slip went to the Organization Branch in G-3 of the War Department General Staff. No previous study of role, mission or organization had been made there, but there was soon assembled at Fort George G. Meade a heterogeneous assemblage of everything in the East that had a motor in it - some Renault tanks, some 43-ton Mark VIII tanks, some 75's porteed in Liberty trucks, some infantry in more Liberty trucks, and some 3" anti-aircraft. After about a month the force made a march from Fort Meade to Annapolis and was disbanded.

The G-3 Division then threw the matter into the training branch where a very wise step was taken. They sat down and studied the possible role and mission of such a force in connection with the latest mechanical development of that day, which was in our country the T1E1 tank, and abroad the little British Carden-Lloyd machine gun carrier. This study established one principle which has not varied; that the tanks alone cannot be used independently. They are noisy and blind and their capacity for prolonged defense is limited; they might be used as the backbone of a mobile force but other vehicles would have to be added to supply the deficiencies inherent in the tank. The radius and speed of action of such a force, also, was conceived at that time to be the limited radius and speed of the T1E1 tank.

This study was approved in principle by the Secretary of War, and a board of officers was appointed which elaborated upon it to some degree, made some tables of organization, and drew some estimates which some years later resulted in a little experimental money being appropriated to build some pilot models.

The War Department intended to have another small, temporary assemblage of what it had, in the summer of 1932, and to incorporate these pilot models for trial, when, just before he left office, General Summerall, for reasons of his own, gave one last directive. He said, "Assemble that mechanized force now (October 1931). Station it at Fort Eustis. Make it permanent, not temporary."

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In the meatine the automotive world had not been dormant; neither had G-3. The Christie tank had appeared. It could march far and run fast across the country after it changed from wheel to track. The Ordnance did not want it. The Infantry at that time did not want it. But the G-3 Division saw its application to their conception. It definitely allowed that conception to take on the cavalry character. General MacArthur therefore approved a memorandum assigning this mobile mechanized force to the Cavalry for development. The word "combat car" was coined to make his decision legal.

The role prescribed by the directive of 1931 was: "Mechanized cavalry will be organized to fulfill the normal cavalry role, substituting the vehicle for the horse."

This meant that mechanized cavalry must be able to undertake the following normal cavalry missions:

Mobile Offensive Combat;
Long Distance Strategic Reconnaissance;
Fighting for the Theater of Reconnaissance;
Seizing Points of Strategic Importance;
Tactical Reconnaissance;
Pursuit;
Delay of Hostile Advance;
Exploitations to Take Adventage of any Break or
weakened Portion of a Hostile Battle Line;
Reserve for a Large Force Strategically or Tactically;
Operations on the Flank;
Operations against Enemy Rear Installations.

Throughout the development of mechanized cavalry it has been borne in mind that, like other cavalry, good commanders would use it on those missions for which its characteristics fit it, and never on those missions which other arms - infantry and tanks particularly - can accomplish more readily.

It can be stated that this directive of 1931 has been constantly kept in mind by successive Chiefs of Cavalry and successive commanders of the Force in the field over the past eight years. Every change in organization, every improvement in equipment has been measured by it.

The mechanization of one regiment was stated by the directive to be the first step in determining the application of modern machines to cavalry missions in war and in developing tactics and technique.

The first regimental table was much limited by fiscal restrictions; so that from the start true tactical requirements were impaired. The remnants of the Fort Eustis detachment and the personnel of the First Cavalry were assembled at Fort Knox as the First Cavalry (Mechanized) in 1933.

A battalion of two batteries of the 68th Field Artillery was added in the fall of 1934.

The 13th Cavalry was mechanized in 1936 and two more batteries added.

The 12th Observation Squadron (less one flight) was attached to the Brigade in June 1937.

The 19th Ordnance Company was an attached unit from the start; and a year ago, Company E, 5th QM Regiment was incorporated in the brigade for quartermaster motor maintenance.

The existing organization of the 7th Cavalry Brigade (Mechanized) can best be shown by a series of charts.

(Slide #1) BRIGADE HEADQUARTERS TROOP

Brigade Command Group operates from six scout cars. Each of these is equipped with SCR 193. The cars are fully armed. The troop commander, in the leading car, is charged with the movement, deployment, concealment and protection of the command group. The Brigade Commander and staff are appropriately distributed in these cars. Six solo motorcycles and two sidecars accompany the command group. Passenger cars are brought up when necessary for administrative purposes.

The rear echelon, troop headquarters with administrative personnel, mess and baggage, marches with the trains of the brigade.

(Slide #2) CAVALRY REGIMENT (MECZ)

The Cavalry Regiment (Mecz) is the basic unit both in administration and tactics. It is a complete team that should not be broken up. To split it means to certainly lose efficiency. Its troops are not homogeneous units. Each is organized and equipped to perform a certain definite tactical function.

The Headquartrs Troop contains a Troop Headquarters, the Staff Platoon, the Signal Personnel for Regimental Headquarters, and the Mortar Platoon. It was originally contemplated that the command group of the regiment should use scout cars to form their mobile command post, but the practice in both regiments now is to use a mixture of scout and combat cars to give the regimental commander, or a portion of his staff officers, the ability to cross any terrain with the greatest rapidity, or to cross fire-swept zones.

The motorcyclists are used as messengers, scouts, agents and patrols. Each is armed with a .45 caliber sub-machine gun as well as with his pistol.

Each cavalry regiment has a platoon of six (6) 4.2" chemical mortars included in the Headquarters Troop. The mortar rides in the back of the carrier and to go into action is simply pulled out of the rear end of the vehicle, the base plate falling to the ground. It can go into action very quickly, firing directly over the vehicle, or the vehicle can be uncoupled and driven to nearby cover. The vehicle carries sufficient ammunition for three regimental smoke missions. The 4.2" mortar up to its range of 2500 yards is, in my opinion, the most efficient smoke weapon existent. It will not handle high explosive, but it will handle white phosphorus. Its use in the regiment to blind hostile observation or to screen a deployment of combat cars is habitual. I would favor the substitution of the 81mm mortar if its range, with heavy shell, could be increased.

I will describe the communication set-up later.

The Reconnaissance Troop consists of Troop Headquarters and four platoons of four cars each. Radio is provided down to include the section of two cars.

The Machine Gun Troop consists of troop headquarters and four platoons of five cars each. Each car is capable of operating from the car two caliber .30 and one caliber .50 machine guns. This with the car concealed in woods or brush or with flash defilade is the more usual method of employment. The guns are capable of anti-aircraft fire. However, the crew may quickly dismount their guns and emplace on the ground either the two caliber .30 guns or the caliber .50 gun. A platoon of riflemen is distributed throughout the vehicles of the troop.

The backbone of the regiment, for which all other troops are auxiliaries, lies in the two combat car squadrons. Each consists of two troops of 13 combat cars each and a squadron command car. These with the two command cars is regimental headquarters make a total of 56 combat cars for the regiment.

Each troop has four platoons of three cars each and a troop command car. Radio is provided to include the platoon leader.

The combat cars have been successively changed and improved. Recent tests at Aberdeen have shown that the combat car is not stopped by .30 or .50 caliber ammunition. The Brigade, at Knox, habitually conducts demonstrations with its combat cars moving in the midst of .30 caliber fire. Each car has a crew of four men. They operate one caliber .50 and two caliber .30 machine guns. An additional caliber .30 machine gun is mounted on the outside of the turret for antiaircraft defense. Inside there are a Thompson sub-machine gun and four pistols for the close defense of the car. The single turret provides fire in any direction.

The squadron commanders and each troop are provided with a complement of motorcycles. Each troop has the usual ration, baggage and kitchen trucks and a small maintenance echelon. In my opinion, a gasoline kitchen truck is an absolute necessity. The Quartermaster gasoline ranges proved very satisfactory at Plattsburg.

The Service Troop of the regiment contains a troop headquarters, a transportation platoon and the regimental maintenance platoon. It is primarily equipped with $2\frac{1}{2}$-ton 4 x 4 trucks.

The principal loads of the transportation platoon are rations, ammunition and gas. Gas is carried in 10 gallon containers and by this means it is possible to gas the entire regiment on the march in twenty minutes. I will speak later in more detail on the work of the regimental maintenance platoon.

(Slide #3) <u>68TH FIELD ARTILLERY BATTALION</u>

The 68th Field Artillery Battalion consists of a headquarters, a combined headquarters and service battery, and four firing batteries of 75mm howitzers.

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The headquarters battery and two of the firing batteries are now equipped with scout cars for the battalion and battery details, and with half-track unarmored prime movers for traction of howitzers, crews and ammunition. The other two batteries are equipped with four-wheel drive trucks, as substitutive vehicles, for battery traction, while the expensive and extensive radio equipment for the battery details is carried in unprotected station wagons. The differential in cross country mobility results in an almost habitual attachment of the two half track batteries to the two cavalry regiments when such attachment is demanded, and the reservation of the 4 x 4 truck drawn batteries for the missions of general support of the brigade.

Radio is the primary means of communication and wire the secondary means. The use of the radio permits a remarkably flexible and rapid system of observation and adjustment of fire.

Kitchen, ration and baggage, ammunition and gas trucks are of 1½-ton capacity and do not carry a pay load considering road space and maintenance involved. Bigger loads, less trucks, and less road space would be far preferable. The supply trains of the brigade should be uniformly of 4 x 4 2½-ton trucks. At present with the reduced peace strength in trucks, the battalion combat train is practically nonexistent.

12TH OBSERVATION SQUADRON

The Twelfth Observation Squadron, less one flight, is attached to the brigade. Its present equipment consists of five O-47's and four O-43's, with a BT-2 and two B-10's for training and administrative purposes. It is deficient in ground airdrome radio equipment. The training of this squadron with the brigade is constant, and very specialized. We found conclusively at Plattsburg that the present quota of airplanes and crews is not adequate to carry out the missions of the brigade.

19TH ORDNANCE COMPANY

The 19th Ordnance Company is a self-contained, mobile maintenance company with the usual artillery and small arms repair sections but especially equipped to handle the third and fourth echelons of Ordnance automotive repair of scout, armored, and combat cars and of half-track vehicles of the present brigade. It has thirty-three trucks of varied types ranging from light repair trucks to heavy parts trucks, power units, machine shop trucks and 10-ton wreckers. It has performed most satisfactorily on all the maneuvers and extended marches of the brigade.

COMPANY E, 5TH QM REGIMENT

Company E, 5th Quartermaster Regiment, has a similar equipment for the third and fourth echelon repair of motorcycles, trucks, station wagons and passenger cars. Of course its equipment is lighter and not so extensive as that of the Ordnance Company.

Some other statistics may be of interest to you. The Brigade has 614 vehicles, of which there are:

112 Combat Cars
18 Armored Cars
74 Scout Cars
12 Mortar Mounts
29 Half-track Machine Gun Carriers
28 Artillery Combat Vehicles
109 Motorcycles, sidecar and solo
171 Trucks
43 Station Wagons
16 Passenger Vehicles.

In armament the brigade contains:

666 cal. 30 machine guns
216 cal. 50 machine guns
266 cal. 45 sub-machine guns
29 cal. 30 automatic rifles
87 cal. 30 semi-automatic rifles
2310 cal. 45 pistols
16 75 mm Howitzers
12 4.2" mortars

The present cost of operating the Brigade per mile is $72.07 Ordnance maintenance; $10.49 Quartermaster maintenance; $12.13 gas and oil; total $94.69. Marching on one road at 25 miles per hour, the combat echelon with normal distances is 10.7 miles long; the trains are 9.3 miles long. Closed and halted with normal distances the combat echelon is 3 miles; trains 2.5 miles long.

VEHICULAR EQUIPMENT

If any one thought can be said to have guided the design and construction of the vehicular equipment of our mechanized cavalry, it was the requirement that the vehicle be built to fit the mission. By keeping the mission well in mind - those of the normal cavalry role - the armored car, the combat car, the scout car, the half-track, and others were all designed and constructed from the ground up to perform these very definite cavalry missions. In this way, we have been able to avoid some of the mistakes made abroad in early design. For example, we have not had to waste valuable time and money experimenting with a two-man tankette which is manifestly not suited to cavalry missions.

It is generally accepted throughout the family of nations that the tactical doctrines for cavalry are based on the characteristics of mobility, cross-country maneuverability, independence of action, effective observation, fire power, and shock action. Let us see, then, how it was possible to include these characteristics in the equipment of mechanized cavalry in order that it could follow the well-established tactical doctrines for cavalry.

First - Mobility. This was attained by demanding and securing the maximum possible speed, power and mechanical reliability in all armored vehicles and by refusing to overweight them with armor plate and heavy guns.

Second - Cross-Country Maneuverability. This was provided to the greatest extent, in the combat car, the half-track and the four-wheel drive vehicles. Remarkable progress has also been made in developments along these lines since the first models, by continued improvements in track, and running gear.

Third - Independence of Operation. This was secured, to a large degree, first through the correct organization of the regiment and then the brigade to insure independence of action. The cruising radius of the vehicles was an important factor and is constantly being improved until ultimately it will, of necessity, equal the length of a day's march. Large, unwieldy and vulnerable supply elements separate from the regiments were avoided in order to facilitate this independence.

Fourth - Effective Observation. This vital characteristic has been cared for in the cavalry combat car by the installation of a single turret in which are provided an ample number of ports to permit observation during the assault. In the brigade it has been provided by including units of fast wheeled vehicles, with more limited cross country mobility, but with freer vision.

Fifth - Fire Power. In the foreign tank, fire power with a free gun mostly to the front is a major consideration, while, in the American cavalry combat car, accuracy of fire and all around fire at the halt as well as in the assault are secured by installation of a turret which can be traversed rapidly and which is equipped so as to admit of both fixed and free fire from all guns. This turret and its weapons constitutes one of the major advantages of the American combat car over other designs.

Shock Action. This characteristic which is so essential to closing with the enemy was insured by giving the combat car a weight, speed, armor and armament, compatible with this and other requirements.

Thus it is seen that the fighting vehicles of mechanized cavalry were specially designed and built to meet a definite tactical use on cavalry missions. As a result of practical experience, at Fort Knox, continued improvements are made to keep these vehicles always in the forefront. As an illustration of this, the last combat car delivered to the 7th Cavalry Brigade embodies more than fifty improvements over the original vehicle delivered three years ago. Similarly, the new scout car is the ninth type to be developed for cavalry reconnaissance in the last ten years, each one a decided improvement over its predecessor.

COMBAT VEHICLES

(Slide #4) **THE COMBAT CAR**

The combat car, which is the same as the infantry light tank except that the cavalry turret permits all around fire of the .50 and .30 caliber machine guns mounted therein, furnishes the striking power of mechanized cavalry. There are 56 of these combat cars in the mechanized cavalry regiment. The combat vehicle is assembled at Rock Island Arsenal. It is motored with a 7-cylinder Continental Aircraft Engine capable of developing 250 H.P. Two platoons are now powered with Diesel engines. It is armor plated. The combat car is equipped with the following maching guns:

1 .50 caliber machine gun in turret
1 .30 caliber machine gun in turret
1 .30 caliber anti-aircraft gun
1 .30 caliber bow gun
1 .45 caliber sub-machine gun for close-in vehicular defense.

A new design of turret will be embodied in the next model. A certain number of the next replacement will contain an improved Diesel engine, and a continuous band track is in process of development. This indicates the policy which is generally admitted - that the using arms must make a practical test of any vehicle before it can possibly be acceptable for combat purposes. With reference to our combat car, a well-known foreign staff officer for mechanization not long ago said:

> "I know well and have ridden in all foreign tanks. Your cavalry combat car has more speed, more power, and is easier riding than any European light tank. I consider it the equal of the best in Europe."

It has a top speed of about 45 M.P.H. The gasoline driven car has a radius of about 90 miles while the Deisel driven car has a radius of about 275 miles.

(Slied #5) **THE ARMORED CAR**

The 1st Cavalry regiment is equipped with nineteen of these for reconnaissance purposes. The present armored car is manufactured by the Cunningham Factory and is equipped with a Cunningham V-8 engine capable of developing 135 H.P. and a maximum speed of 55 M.P.H. It travels five miles on a gallon of gas and weighs 9985 pounds. It is driven on the four rear wheels only. Its armament consists of the following:

1 .50 caliber machine gun in turret
1 ..30 caliber machine gun in turret
1 .30 caliber anti-aircraft gun
1 .45 caliber sub-machine gun for close-in vehicular defense.

Ammunition for this vehicle is carried in racks in the firing compartment. The tires have sponge rubber fillers.

(Slide #6) THE CAVALRY PERSONNEL CARRIER

The 1st Cavalry regiment has twenty-five of these personnel carriers. The vehicle is manufactured by the Cunningham Factory and is powered by a Cadillac V-8 engine capable of developing 115 H.P. with a maximum speed of 45 M.P.H. The cars run 3½ miles per gallon of gasoline, weigh 6900 pounds, and are equipped with four vehicular machine gun, caliber .30 and .50. This "half-track" as it is called, carries a machine gun squad of eight troopers who operate two .30 caliber ground machine guns, or one .50 caliber ground machine gun, or they may be fired from pedestal mounts on the vehicle. The fourth is a caliber .30 which remains mounted in position for anti-aircraft fire. The vehicle is obsolete.

THE SCOUT CAR

To date there are three types of scout cars in general use in the Regular Army, the M-1, M-2, and M-3. A modified scout car, T-13, without armor plate, is being issued to National Guard cavalry regiments.

(Slide #7) SCOUT CAR M-1

Each regiment of regular army horse cavalry is equipped with six of these for reconnaissance purposes. This vehicle is manufactured by the White Company and is powered by a Hercules 6-cylinder engine capable of developing 75 H.P. and a maximum speed of 50 M.P.H. It will run seven miles on a gallon of gasoline and weighs 9000 pounds. This vehicle is driven on both front and rear wheels and is equipped with sponge rubber tires. It carries the following armament:

1 .50 caliber machine gun
2 .30 caliber machine guns
1 .45 caliber sub-machine gun for close-in vehicular defense.

(Slide #8) SCOUT CAR M-2

The scout car (M-2) which is a later model than the M-1, is the artillery scout car. It is manufactured by the Corbitt Factory and is similar to the M-1. However, its greater engine power (94 H.P.) gives it a distinct advantage.

(Slide #9) SCOUT CAR M-3

The 13th Cavalry is equipped with this car. It is used for the reconnaissance troop, as a personnel carrier in the Machine Gun Troop, as a command car, and as a mortar carrier. It is manufactured by the White Company and is powered with a 6-cylinder Hercules engine, developing 95 H.P. Its maximum speed is 60 M.P.H. It runs 9 miles on one gallon of gasoline. Its wieght fully loaded is 10,000 pounds. This vehicle is driven on both front and rear wheels and is equipped with puncture sealing rubber tires. It is provided with a rail running just inside the top of

the armor except at the front where it is raised to allow fire over the windshield. This rail permits of 360° traverse of the guns mounted on it in skate mounts. It carries one .50 caliber machine gun and two .30 caliber machine guns, and one Thompson sub-machine gun, caliber .45 for close-in vehicular defense.

(Slide #10) THE SCOUT CAR M3A1

The scout car M3A1, which will appear this fall, embodies many improvements. By extending the armor out over the fender well the capacity of the body to carry crew and service loads of ammunition and equipment has been improved. The seating of the crew has been better arranged for normal fire positions while the center of gravity has been lowered. It has better driving visibility. This car has 110 horse power, a cruising range of 267 miles and a maximum speed of 64 miles per hour.

(Slide #11) THE MORTAR CARRIAGE

There are six of these mortar carriages in the 1st Cavalry regiment. They are manufactured by the Mammon-Herrington Factory and are powered by the Ford V-8 engine capable of developing 85 H.P. and a maximum speed of 50 M.P.H. They travel five miles per gallon of gasoline and weigh 5750 pounds. They are driven on both front and rear wheels. Besides the 4.2" mortar mounted on the carriage, each vehicle carries one .30 caliber machine gun for protection of the crew. It is unarmored and obsolete.

(Slide #12) MOTORCYCLE

The present motorcycle equipment consists of standard commercial vehicles which are not sturdy enough for our use. A specialized military motorcycle of more rugged construction is now in development.

(Slide #13) ARTILLERY HALF-TRACK, T-5

This Artillery Half-Track, T-5, used in two of the firing batteries, was built by General Motors and, powered with a 120 H.P engine, attains a speed of 45 M.P.H. with its towed load. Future procurement provides for a half track which drives also on the front wheels and will have armor and armament similar to that of the scout car.

(Slide #14) 75 mm HOWITZER

The 75 mm howitzer is the artillery component of the brigade. Its light weight flexibility of fire and the rapidity with which it can be placed in action and concealed make this an excellent weapon to support our rapid actions. One of these howitzers is now being mounted experimentally on the combat car chasis to test its suitability as a self-propelled mount in close support of combat cars and as a mobile anti-mechanized weapon.

(Slide #15) 2½-TON TRUCK

The 2½-ton, four wheel drive truck of commercial design is, with the exception of the artillery, the standard cargo vehicle within the brigade.

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(Slide #16) KITCHENS

On the 2½-ton truck chasis is mounted the unit kitchen, capable of preparing hot meals while in motion.

(Slide #17) ORDNANCE WRECKERS

Designed by the brigade especially for this service, two of these Ordnance Wreckers perform many and varied salvage operations.

(Slide #18) ORDNANCE MACHINE SHOP

This Ordnance Machine Shop and many other specialized vehicles of the Ordnance, Quartermaster and Signal Corps are designed to maintain and repair the equipment of the brigade in the field.

THE RECOMMENDED MECHANIZED CAVALRY DIVISION

As I stated before, the Brigade, although existing as such for only a few years, has had a lot of practical work. It is one of the attractions of service with the brigade that change and improvement are constantly taking place. Nothing is stable and I hope nothing will be until war starts; only in that way can we go to war best prepared, best equipped and best trained.

Organization in the past has been necessarily limited by availability of personnel and funds, and to a certain degree by divergence of view and skepticism of actual tactical value. The German campaign in Poland should certainly have removed the last.

Now, I am happy to say, there is considerable unanimity of view as to the deficiencies in organization of the brigade, and no one is more cognizant of these deficiencies than the men who, for the past few years, have handled and commanded the brigade and its principal units. These deficiencies can be briefed as follows:

The brigade as it exists is not the largest and most powerful striking force which can be controlled and handled by one command. It can be increased in power and maneuverability without a corresponding increase in train if that enlargement is embodied largely in existing units.

The Brigade is in dire need of its own reconnaissance elements, separate and distinct, and over and above that of its regiments.

It is in need of additional holding power and of supporting power in the form of additional machine gun and rifle units.

The need of some riflemen, who are securely mounted and as mobile as other elements of the brigade, has been demonstrated time after time. These not only piece out the holding power of the brigade but they are available to reinforce its reconnaissance, to help in mopping up, to handle prisoners, to form outguards, and for the many other tasks that the riflemen can do. Prolonged defense must be taken over by infantry or horse cavalry, but these riflemen will be most useful in the temporary halts.

It needs more motorcycle scouts in all its units. Many times these men will save its reconnaissance from unnecessary loss, will outflank small resistance, and will facilitate communication.

The question of adding an additional cavalry regiment has been discussed. I am against it for it brings a corresponding weight of train and overhead. I would prefer to increase the combat car strength of each regiment by an additional squadron of two troops and within each troop to add some scout cars for liaison and communications on the battlefield so that the full strength of the troop, 1st sergeant, clerks, artificers and all may be present as agents, aids and liaison groups for the troop commander. With four combat car squadrons there is no readily available brigade reserve. With six squadrons the main attack may be weighted more than the secondary attack and a squadron still be held for eventualities.

The gun power of the artillery should be increased by 50%, giving 24 howitzers to the support of the division rather than 16. I am very much in favor of trying the 6-gun battery to start with. I believe it will give increased fire power with a minimum increase of train and overhead. Further reasons are economy of radio frequencies, which are not numerous enough at present; and the simplicity of the single battalion tactical control. The headquarters and service batteries should be separated. There is no place in the combat echelons of this organization for the unarmored prime mover, crew vehicle, or liaison vehicle; all should have protection from small arms fire to the same degree as the scout car and all should have the traction of the half track vehicle.

The Division has need of an engineer component. It is not sufficient that these engineers be of the ordinary truck carried combat engineer type. They should have good cross-country traction and they should be provided with special mechanical means particularly for the quick strengthening of bridges and for the quick placing of obstacles. Water supply and purification is needed as well as some quick map making means.

The Brigade is now authorized a medical troop which will be formed this winter and which should be incorporated in the Division. The special problem of evacuation of a force of this character has never been adequately studied, much less practiced.

Even the present Brigade has need of a full observation squadron as a minimum. A reconnaissance, a liaison and two artillery planes, each with three in the crew, in the case of the O-47, are not too many to be in the air at a critical time. The zone of reconnaissance is not limited as in the infantry division and corps but may well extend to the entire depth of the Army zone, and more, in the matter of a few hours. Because of the special nature of its observation and liaison the squadron should be a definite part of the division or have a semi-permanent attachment.

The staff of the present brigade is totally inadequate. Such as it is, it must be taken from the regiments. In my opinion it has a more difficult task than that of the Infantry or Cavalry Division. Because of the potentialities of speed, staff control must be more rapid. More supervision on the spot, on the roadside is required. Staff officers of all echelons

must carry brief orders and supervise for the commander. More armored vehicles must be provided for them. The Mechanized Division may easily require information, not of a division zone of action but of an army zone. It has a complexity of supply which, in the matter of fuel, is vitally tactical.

The supply of gasoline within such a unit is a matter closely related to command. Certainly its own trains should carry sufficient for a full day's operations and this must be measured in hours, not miles. The unit should, within itself, be able to fight from sun-up to sundown without looking for the arrival of gas from any higher source or administrative agency. It has a tactical staff supervision of maintenance in every echelon which is too great to be combined with supply. With a proper provision for the staff should come a signal organization separate and distinct from the brigade headquarters.

These matters have all been presented to the War Department within the past year. The soundness of each has, in my opinion, been again demonstrated in the recent army maneuvers. While the late chief of staff disapproved the formation of the Cavalry Division Mechanized, his decision did not preclude the obtaining of the equipment necessary to remedy the known deficiencies in the present brigade and I hope they will soon be so remedied.

(Slide #19) RECOMMENDED MECHANIZED CAVALRY DIVISION

(Slide #20) RECOMMENDED MECHANIZED CAVALRY REGIMENT

(Slide #21) COMPARATIVE INCREASE OVER PRESENT AUTHORIZED STRENGTH

TACTICS AND TECHNIQUE

Mechanized Cavalry, whose development started only ten years ago, is the newest fighting service in the Army. All in all, I think our development in tactics and technique has been commendably rapid and has led, or certainly kept pace with, any similar development abroad. In the Seventh Cavalry Brigade we have never waited for full complements of equipment in order to develop tactics. The 1st Cavalry went to the Riley maneuvers in 1934 with its combat cars represented by four Christie tanks and numerous 1½-ton trucks with yellow bands on them to show that they took up the space of combat cars. And even these maneuvers were profitable.

Since its inception, besides its constant training at home, elements of the brigade, or the brigade itself, have participated or been handled in numerous Corps Area maneuvers, two maneuvers with cavalry forces at the Cavalry School, two Army maneuvers, a GHQ CPX and two Army CPX's. There has therefore been a great deal of the most practical training available to us in peace with which to work out our ideas of tactics.

MECHANIZED CAVALRY ADHERES TO CAVALRY ROLE

Since its initial conception, the Seventh Cavalry Brigade has adhered to its cavalry role. To illustrate what is meant by this, we once rejected the suggestion that mechanized cavalry be equipped with an intermediate caliber anti-tank weapon, because such a weapon is only usefeul to combat medium or heavy tanks found only in the infantry fight. Certain considerations of the Plattsburg maneuvers and German operations have led me to believe that we should change our view on this matter. Again, we have avoided increasing our armor because such an increase would decrease our mobility as cavalry. Also in spite of considerable opposition we have been able to avoid introducing a large holding force into the mechanized cavalry brigade since normally cavalry is not given the mission of holding for any length of time, and should mechanized cavalry be given such a mission on occasion, GHQ or the Army could certainly provide the necessary holding force for attachment at this particular time.

While experience has shown it to be desirable to provide some ground support in the attack, an endeavor has been made to keep this ground support down to the minimum in order to avoid immobilizing the command or any part of it. To increase unduly this ground support element might possibly result in a prolonged engagement in which the advantage of maneuver would be surrendered entirely. As is the case in horse cavalry, any tendency toward premature dismounting immediately results in the sacrifice of mobility and may even lead to a complete loss of contact with an enemy less willing to be tied to the ground. The basic principle involved, insofar as cavalry is concerned, would appear to be the necessity of limiting the ground elements to those essential to the support of the mounted attack, rather than permitting the ground elements to become so numerous, and so unwieldy as to constitute the main effort, with the mounted units relegated to the role of supporting elements.

MOBILITY

The ability to cover ground is an outstanding characteristic of mechanized cavalry. It can march 25 to 35 miles an hour on good roads, covering 180 miles on an average day's march. At night, without lights, it marches from 10 to 18 miles per hour varying with road surface and weather. Since this very mobility is one of the chief justifications of mechanized cavalry, and therefore to be carefully guarded, it should be remembered that mobility is not effective unless it is continuing. Therefore, prompt and quick decisions must be made; and to develop this faculty one of the greatest problems which confronts us is making the mobility of the mind equal the mobility of the machine.

METHOD OF EMPLOYMENT

On the march, the uninterrupted advance, and therefore the mobility, of the mechanized cavalry brigade can be conserved, by pushing the air and ground reconnaissance elements well forward, and by utilizing all available facilities for rapid communication to inform the commander of the terrain and hostile situation. As a result, the hostile situation

is so constantly unfolding during the commander's approach to the field of combat as to have enabled him to estimate his situation enroute, and to make his decision and subsequent plan with limited personal reconnaissance. In planning his line of action and making it known to his subordinates, the commander must of necessity use short cuts as time savers in both thought and action, and avoid the issuance of voluminous five paragraphed orders, resorting to fragmentary orders instead.

As the mechanized cavalry, coveredby its own advance guard or security detachment, closes with the enemy, the reconnaissance elements withdraw to the flanks where they function as combat patrols and remain in observation. The combat elements then move to the attack, supported by the machine guns, artillery, and smoke. Assembly points are designated. In an effort to cut down to the minimum the time between the issuance of the attack order and the execution thereof, all steps must be taken to insure a constant flow or movement, in passing from the march through the approach to the attack. This transition must be a continuing process thoroughly coordinated, smoothly executed, and practically automatic in its operation, although it is realized that such continuity of motion, without a stop for a more detailed but ordinarily unnecessary reconnaissance, might lead to unproductive results even approaching the delivery of a blow in the air. Although there may be some criticism of these methods, in answer thereto, attention is invited to the fact that cavalry has always been a weapon of opportunity and therefore must take chances. Mobility of this type comes high. It must not be frittered away.

MECHANIZED AND HORSE CAVALRY SIMILAR IN EMPLOYMENT

Thus the employment of mechanized cavalry differs very little, if any, from the employment of horse cavalry, except as might be expected to result from the substitution of the machine for the horse.

RECONNAISSANCE

The reconnaissance of the brigade, provided by the Observation Squadron and the two regimental reconnaissance troops, operates well out to the front and flanks of the brigade. Two hours in advance is not too much to allow for the reconnaissance troops to develop the hostile outline. They may well cover a front of twenty five miles. The platoon is the reconnaissance unit. They subdivide into sections when necessary, but never less than two cars should work together. At present armed motorcycle scouts supplemented by dismounted patrols from the reconnaissance cars themselves are the only means to prevent surprise and ambush or to work around small isolated resistances or defiles in rough, close country. Every effort is made to train the reconnaissance troops to utilize their speed and mobility, stealth, and field glasses to gain information. When held up they employ their powerful and protected machine gun fire combined with encircling movement to overcome isolated resistance and proceed on their missions. The observation squadron not only helps to paint the developing picture, but its information, given to the reconnaissance troops, permits economy of force and decisive direction to be applied to their efforts.

The Brigade Commander ordinarily places a radio set in the reconnaissance net of one or both regiments. He is thus informed of the developing situation as quickly as the colonel.

THE MARCH TO COMBAT

As the situation develops, the combat column is separated from the trains and service elements. The latter are left in concealed positions well back. They provide their own close defense and anti-aircraft defense.

The approach march is usually made in two or more columns, each preceded by an advance guard of combat cars and machine guns. The balance of the machine gun strength, the regimental 4.2" mortars, and at least part of the artillery is marched well forward to facilitate their entry into action before the attack of the combat cars is disclosed.

The combination of fire and movement is a traditional principle of cavalry tactics and in this brigade we endeavor to insist on it throughout, from the attack of the platoon to the attack of the brigade. There should be no unsupported charges of combat cars. If a platoon of three combat cars attacks a small resistance one should halt in a covered or concealed position and take the objective under fire - it in itself cannot be hurt by small arms fire - the other two cars should maneuver to take advantage of the best available ground protection and concealment to get as close as possible and then should attack from a decisive flank or rear direction. The combat car troop commander employs his platoons in the same manner. The squadron commander utilizes attached machine guns and mortars to form a pivot, while the regimental commander in his place brings into play further means of this character and artillery.

Since the penetration of mechanized cavalry is capable of being rapid and deep, phase lines are usually assigned. Here the regiments automatically secure a position momentarily, reorganize, and report their situation.

Because of the mobility of the attack, the artillery must be emplaced well forward initially and must be kept echeloning forward.

With the reconnaissance troops of the cavalry regiment go the reconnaissance officers of the attached and general support batteries; with the combat car squadrons go the liaison officers; with the regimental commanders go battery commanders, and the battery O.P. is capable of being established separately in any part of the regimental zone. Similarly while the Battalion Commander is with the Brigade Commander, the battalion O.P. and those of the general support batteries are pushed forward. Since radio is the primary means of communication, almost any of these officers in position to see a target can adjust the fire of any battery which is in advantageous position to fire on it. Wire is used for short distances only.

DEFENSIVE COMBAT

Like horse cavalry, the defensive combat of the mechanized cavalry brigade is necessarily characterized by a shallowness as compared to infantry and should be characterized by its mobility. Its powerful machine gun troops are able to occupy and defend a front of some 4,000 yards with a succession of mobile and protected machine gun nests, while its combat car squadrons are advantageously located for counter attack. It has a howitzer in proportion to each 250 yards. Its reconnaissance troops afford front and flank observation. A portion of the combat cars themselves may be placed in defensive localities where they serve as concealed (armored) pill boxes each containing three machine guns and each protected to a great degree from small arms fire. Like all cavalry, the defensive fight sacrifices the most valuable characteristic of mechanized cavalry - its mobility in offense. Just assoon, therefore, as its objectives have been reached and movement has stopped, it should be relieved by troops of better defensive characteristics or those able to exert a slow and steady pressure rather than a quick and driving attack. Particularly at night, if it is at all possible, mechanized cavalry should leave only observation in contact and should use its mobility to withdraw to a distance, refuel, refit, and return to the action fresh next day. The same principle operates to some degree with horse cavalry in the matter of water and feeding. Neglect of these matters, or too prolonged engagement, causes rapid deterioration of these mobile arms.

COMMUNICATIONS

Rapid and efficient communication in a unit of this character is of course a prime necessity. The brigade employs, in the order of their importance, radio, motorcycle messenger, visual, panel, drop and pick up messages, pyrotechnics and lights in its system, with a very limited use of wire in the artillery when conditions permit.

During the Plattsburg maneuvers, 158 radio sets were employed. Three or four standing signal plans control the distribution of these sets within the many nets of the brigade. As an example of one plan - a plan suited for tactical rather than administrative movement: The car of the Brigade Commander, moving second in the command group, is the control station in the command net which includes also the vehicles of the executive officers of the 1st and 13th Cavalry and 68th Field Artillery. The third car, carrying S-2, is in the reconnaissance net with the reconnaissance troop in contact. The fourth car, with the air liaison officer, is in the air-ground net with the airdrome and the reconnaissance and liaison airplanes in the air. The fifth car, with S-4, is in the Administrative net with the Train Commander, the Ordnance Company and the QM motor repair company. The set of the sixth car is in the Corps or Army Net. Two other sets are spare and available to be placed in any net by the brigade commander or a staff officer detached from the command post. Inter-car communication while moving is afforded by motorcyclists - it takes but an instant for the brigade commander in the second car to send a message to the trains via the fourth car. The Artillery Battalion Commander's car is in the

net with the Battalion executive at the head of the Artillery column. A system of inter-car, short distance radio has recently been tested with quite a degree of success. Similarly each regiment has its command, reconnaissance, and administrative nets, and a set in the brigade net. Squadron and separate unit commanders are tied in to the next higher commander, and to their immediate subordinates.

The artillery nets are of three characters, command, battalion fire direction, and battery fire control, and tie in the battalion commander with battery commanders, batteries, O.P.'s and liaison officers.

Careful inspection and a well equipped mobile radio repair section are required to keep these many sets in constant operation with the rough usage which they get.

The radio operator is an important man. Besides great skill he requires endurance and intestinal fortitude of the highest order to maintain his station hour after hour under difficult conditions of ground, movement and weather. I take off my hat to these soldiers.

The Brigade in a major maneuver has successfully employed a special brigade code, a special prearranged message code, a geographical code, a coded map, a stationary panel code, a telephone code, a night driving code, a pyrotechnic code prescribed by the Corps, the Division Field Code, and the Air-Ground Liaison code.

One hundred and twenty motorcycles were employed in the Plattsburg maneuvers; about eight percent of the authorized number, and this number is far short of what it should be. Their use as road messengers is well known, but the cross country ability of the well trained motorcycle rider is not so well appreciated. Some of their performances are amazing. They take an awful beating to carry through at times, but they are fast and this speed makes them poor targets when they do appear in view. They are valuable scouts and combat patrols.

(Slide #22) THE BRIGADE AS A PART OF A HIGHER COMMAND

This slide shows a radio net in which the Cavalry Brigade is a part of a Higher Command, such as Division, Corps or Army. Other stations, shown by broken lines might well be the other major units of the higher command. The Brigade Executive Officer normally is in a brigade command group vehicle. This slide shows the Provisional (Blue) Corps Net of the 1st Army Maneuvers, 1939.

(Slide #23) CAVALRY BRIGADE COMMAND NET

The Brigade Command Net, the Brigade Commander is in a vehicle of the brigade command group. The Executive Officer of the 1st and 13th Cavalry, and the 68th Field Artillery are in the vehicles of their respective command groups. The broken line shows the Advance Guard Commander, or other vital commanders, as the tactical situation dictates.

(Slide #24) CAVALRY BRIGADE RECONNAISSANCE NET

This brigade reconnaissance net is the one employed where the brigade marches in two columns; other nets are used where the brigade marches in one column, and another where the brigade details a brigade reconnaissance force. The brigade S-2 rides in a brigade vehicle and the Reconnaissance Troop Assistant Executive Officers are in the other vehicles.

(Slide #25) CAVALRY BRIGADE AIR-GROUND NET

The Brigade Communications Officer is in the brigade vehicle. The 1st and 13th Cavalry sets are silent sets which copy all traffic and send it to their respective commanders.

(Slide #26) CAVALRY BRIGADE ADMINISTRATIVE NET

A brigade administrative staff officer is in the brigade vehicle. The commander of the brigade consolidated trains and the commanding officers of the 19th Ordnance Company and Company E, 5th Quartermaster Regiment constitute this net and it is a very important one and carries a large amount of traffic.

(Slide #27) REGIMENTAL COMMAND NET

This slide shows a rather crowded net. Of course all of the stations are not vital at the same time. This is about the minimum number of sets you will find in a Regimental Command Net. Sometimes it is increased by at least eight more sets. The regimental commander has direct contact with and control of, his combat organizations.

(Slide #28) RECONNAISSANCE TROOP COMMAND NET

The troop commander has his platoons and sections sending in direct to him the result of their reconnaissance. He in turn summarizes this information and the Troop Executive Officer, over another set, sends this summary to the regimental S-2.

(Slide #29) BATTERY FIRE CONTROL NET

This is the simplest type of a battery fire control net for a Mechanized Field Artillery Howitzer Battery. This is one of the two systems in common use in the battalion.

(Slide #30) MECHANIZED FIELD ARTILLERY BATTALION FIRE DIRECTION NET.

This shows a battalion fire direction net where two batteries are being used in general support. This is one of the many radio nets used for the adjustment of fire of the battalion.

MAINTENANCE

It is a principle that the marching column never stops for a disabled vehicle. It pulls to the right of the road, halts, and the driver prepares it for inspection.

Up to the moment of actual contact each troop is followed by its light maintenance group - a staff sergeant and the troop mechanics. These are capable of second echelon maintenance, that is, inspection and adjustment, and the replacement of the minor parts which they carry. The troop maintenance vehicle pulls in ahead, diagnoses and repairs the trouble, and both vehicles pull into the first gap in the column to rejoin their troop at the next halt. Or, unable to affect the repair, the troop maintenance vehicle drives on.

At the tail of the regimental column comes all or a portion of the regimental maintenance platoon whose means are more extensive, enabling it to replace more important assemblies or effect greater repair. If it cannot effect the repair it, in turn, leaves the disabled vehicle for the Ordnance or QM repair companies at the tail of the brigade. These units fix it on the road or tow it to a point where it can be fixed. At night, in bivouac, the regimental platoons and these companies set up their mobile shops. During combat these shops are combined into a service park a long distance back, while reconnaissance forward for disabled vehicles is conducted by the light repair units under direction of the Brigade Motors Officer. It is a matter of pride in the brigade that every vehicle shall move under its own power when the brigade marches next. At the conclusion of the three day Army maneuver at Plattsburg, every vehicle which left Fort Knox was in condition to continue operation except one motorcycle, and it was running the next morning.

ARMY MANEUVERS AT PLATTSBURG

The Seventh Cavalry Brigade has just returned from most interesting and instructive army maneuvers, those of the First Army held in the region of Plattsburg, New York, in August.

On August 1st, for reasons of economy in the maneuver funds, the brigade loaded three trains, totalling 83 flat cars, containing all of its combat cars, half-track machine gun carriers and half-track artillery vehicles. In addition, it loaded the howitzers pertaining to two half-track batteries.

(Slide #31) ROUTE OF MARCH

The next day, the 2nd, the Brigade started overland for the Plattsburg area with all of its wheeled combat vehicles and with the personnel of its track and half-track organizations carried in trucks. It marched 1,020 miles in six marches, following a route through Ohio, Northern Pennsylvania, and Northern New York. It arrived at Black Brook in the Plattsburg area on the 8th of August and unloaded its track and half-track vehicles the following day. Thereafter the

brigade participated in exercises prescribed in the Army Maneuvers, which closed on the 25th of August.

After three days of preparation to put it in parade condition, the entire brigade, including its track and half-track organization, marched 350 miles to New York City where it was in camp just outside of the World's Fair. Enroute it passed through and was reviewed and inspected at West Point.

The entire column of over 600 vehicles was received in New York by the Mayor and General Drum, was marched down the west side of New York and then north up Broadway and Fifth Avenue and over the Queensboro Bridge.

Leaving the camp at the World's Fair at 1:00 A.M. the morning of the 8th, after again loading its track and half-track vehicles, the brigade reached its home station, Fort Knox, on the 13th of August.

During the last 36 hours the brigade marched 390 miles, and this included a short bivouac at Hamilton, Ohio and a five hour halt in Jeffersonville to unload its track and half-track vehicles and reorganize, the last 40 miles being again made by the Brigade with all its vehicles.

MAINTENANCE FIRST ARMY MANEUVERS

When the brigade was notified that they were to attend the First Army Maneuvers, immediate steps were taken to place all vehicles in the best possible condition in order that all vehicles would be able to perform the tasks required of them. Preventive maintenance was stressed. The march to the maneuver area was uneventful as far as maintenance was concerned. The usual amount of repairs was made; however, when the number of vehicles making the march was taken into consideration, the maintenance required was negligible.

Upon arrival in the maneuver area and upon receipt of track-laying vehicles, all vehicles were serviced and the brigade was ready for maneuvers. All combat cars, scout car, armored cars, mortar mounts, half-track cars and half-track trucks performed remarkably well.

All vehicles were driven from the maneuver area (Black Brook) to the New York World's Fair. No trouble of any consequence was encountered. Several of our combat car engines, which had passed their required number of supposedly satisfactory operating hours, continued to operate very satisfactorily.

On our return trip to Fort Knox, in addition to all wheeled vehicles, four combat cars equipped with Diesel engines were driven back. These cars performed very satisfactorily and the only trouble encountered was the breaking of a small gear in the accessory case.

This failure was due entirely to the lack of sufficient metal where the gear is attached to the case. Two of the engines have been completely disassembled since our return to Fort Knox and show very little wear.

Due to the fact that more preventative maintenance is being performed by all units of the brigade, less maintenance is required from other echelons. This has been a great factor in decreasing the maintenance required during the last year.

(Slide #32) MANEUVER AREA

Three-quarters of the Plattsburg Maneuver Area was heavily forested and much of it mountainous. Three river valleys - Saranac, Salmon, and AuSable - cut the area from east and west. It can be said that this country, with its limited amount of free maneuverable area surrounded by dominating mountains, rivers and lakes, was about as difficult a terrain as could have been logically selected to test the mechanized cavalry brigade. The Brigade's initial problem therefore was always to use its mobility to effect an entrance into the maneuverable terrain.

While this was the largest and least restricted maneuver area yet encountered by the brigade, "Off Limits" areas did restrict maneuver to a considerable extent. Also, it was necessary in every operation for the brigade to move at least in part off the 450 square miles of maneuver area.

(Slide #33) CORPS EXERCISES

The Army Exercise was preceded by two distinctly separate Corps Exercises held simultaneously on August 21st and 22nd; one exercise being confined to the western half of the maneuver area and the other to the eastern half. The Mechanized Brigade was divided and detachments participated simultaneously in both problems.

IN THE WESTERN PORTION

The 18th Brigade, with the mission of preventing the advance of the 1st Division (highly motorized) into the Saranac or Salmon Valley, was opposed to the 1st Division as shown at 9:00 A.M. Immediately it was heavily pressed. At 10:00 A.M. the 7th Cavalry Brigade (less the 13th Cavalry reinforced), on being made available to the Commanding General, 18th Brigade, made a rapid 18 mile march from its assembly area via Elsinore and attacked and secured the high ground north of Redford, closing the Saranac Valley to the hostile advance. Two or its batteries were attached to the 25th Field Artillery to further support the 18th Brigade at the outset. Mechanized reconnaissance only had been dispatched to observe to the south of the 18th Brigade. During the afternoon the main hostile attack developed in the south and broke into the Salmon Valley. The Mechanized Cavalry command was directed to leave a strong detachment in the Saranac Valley to hold the line Clark Hill - Picketts Corners and move rapidly with the remainder of the command to oppose the hostile advance down the Salmon River.

After initial successes around Peasleyville, the situation stabilized on the south as shown. About midnight, persistent infiltration of enemy columns through the wooded, rough slopes flanking the valley threatened our artillery position and the Brigade, by daylight, had withdrawn four miles to the east to the delaying position occupied at the termination of the exercise. From here it was prepared to counter attack to the south.

IN THE EASTERN PORTION

During the same period the 13th Cavalry with one battery of artillery, engineers and air, maintenance and medical service of the Brigade attached, was operating with the II Corps against the I Corps; the mission of both Corps being to secure a bridgehead over the Saranac River.

The 13th Cavalry, with the 101st Cavalry (horse) attached, was released from the assembly area shown one hour after the infantry was allowed to move. It quickly overran hostile advance motorized elements, seized the high ground northwest of Beckwith School and held this dominating terrain against an advancing enemy regiment until relieved by friendly infantry sent forward in trucks. The cavalry then side-slipped to the northwest and operated against an enemy in force supported by tanks in the vicinity of Woods Mills.

Withdrawing after dark into night bivouac, the regiment again moved north at dawn and located the enemy main effort advancing southwest against the II Corps which had secured crossings over the Saranac River and was marching north. One squadron was immediately dispatched toward Woods Mills to assist friendly infantry in delaying further hostile advance at that point. The remainder of the Cavalry, consisting of 27 combat cars, 100 machine guns, 6 mortars, 4 75-mm artillery pieces and a regiment of horse cavalry (less a squadron) made a coordinated surprise attack against the exposed west flank of the hostile marching column as the exercise terminated.

(Slide #34) ARMY EXERCISES, 23 AUGUST

General Situation: Without going into all the background, the general situation of the Army Maneuver was as follows.

A Black Army of two corps which had penetrated to the west shore of Lake Champlain was preparing for further advance to the west. The Blue 18th Brigade which had been gradually falling back in front of the Black force, keeping contact, was reinforced by the highly motorized 1st Division and formed into a provisional Corps. At the start of the problem the 18th Brigade was near Saranac, the 1st Division in the region south of Redford. The Corps decided to march to the east and attack to gain the high ground on the line Woods Mills-Mount Etna. The corps moved out at 12:00 noon. Elements of the 1st Division in motors were soon near Peasleyville.

Under the problem, the 7th Cavalry Brigade arrived at Black Brook at 12:00 noon.

Mission: "March to Northeast, prepared to attack the hostile left flank or rear."

The Brigade was confronted with most formidable defiles at Ferrona, Harkness, Clintonville and Keeseville.

Decision was made: To advance rapidly with left regiment (1st Cavalry), successively seize the high ground at Arnold Hill and Calkins School, establish contact with the right of the 1st Division and push toward Peru to develop the hostile situation. To initially hold the right regiment (13th Cavalry) in concealed bivouac just north of Au Sable Forks.

At 1:00 P.M. the 1st Cavalry moved out and by 3:39 P.M. had secured the high ground at Calkins School overlooking Peru, established contact by armored cars with the left of the 1st Division and had reconnaissance as far north as the 3rd Phase Line. In about 2½ hours this regiment had advanced13 miles (its reconnaissance 16 miles) through the mountainous gateway into the maneuverable area by side-stepping, attacking or turning out of position from the rear - hostile anti-mechanized detachments found in depth and extending south of the 1st Phase Line.

The 1st Cavalry, by dispatching a force from Harkness to operate against the rear of hostile resistance in the Cold Mountain area and around Keeseville, facilitated the advance of the 13th Cavalry in its zone of action.

By 5:00 P.M., the two columns had joined north of the hill-mass and the Brigade, by coordinated attacks supported by artillery and smoke, reached the final phase line by 8:30 P.M.

Orders were issued to withdraw under cover of darkness to concealed bivouacs in the vicinity of Arnold Hill and Clintonville, and under cover of outpost along the general line: Keesville - Calkins School, which positions were reached about 10:00 P.M.

(Slide #35) <u>24th AUGUST</u>

As the regiments were moving into bivouac areas about 10:00 P.M., telephonic orders were received to march around the rear of the corps and operate against the right (north) flank of the Black Army to reduce increasing pressure on the 18th Brigade.

By 11:30 P.M. that night the Brigade was marching in one column without lights on Dannemora. At Hawkeye, it was contacted by the Brigade Train which refueled the vehicles and served a hot meal.

By 6:30 A.M., the advance of the south column (13th Cavalry), after 52 miles of marching, was materially delayed by active anti-mechanized measures encountered in the rough wooded terrain just west of Rand Hill School.

The north column, after marching 66 miles around the Dannemora Mountains, arrived in rear of the hostile opposition holding up the 13th Cavalry the assisted in reducing it.

Throughout the day, detachments operated against located hostile anti-mechanized units, while the brigade pushed south on the front: Morrisonville - Plattsburg. Its artillery from positions west of Rand Hill School fired on columns of the 43rd Division crossing a pontoon bridge at Cadyville under cover of smoke. The Saranac River was forced in the vicinity of Morrisonville when the appearance of a strong flank guard of the 43rd Division threatened the gasoline and ration section of the Brigade Trains at West Redmantown; this necessitated turning the 13th Cavalry around to fight north and reduce that threat.

In the middle of the afternoon the Brigade broke off contact and retired to West Chazy to reorganize and rest after 29 hours of continuous operations, during which time the combat echelons covered over 125 miles and the men had but one hot meal and no sleep.

(Slide #36) 25TH AUGUST

Oral orders were received at 5:30 P.M., 24 August, requiring the Brigade to march south on the 25th, cross the Saranac River, change direction to the west and attack the Black force which was driving back the Provisional Corps.

The 11-mile march south to the Saranac River had to be made down a five-mile wide corridor suspected of being heavily held by all types of anti-mechanized measures. It was therefore decided to march on a broad front with reinforced advance guards supported by reconnaissance elements on exterior parallel roads prepared to quickly turn by flanking action hostile resistance encountered.

At 2:00 A.M. reconnaissance moved south and by 4:40 A.M. had secured two crossings of the Saranac. Detachments were rapidly dispatched from West Chazy to relieve the reconnaissance elements at the crossings. At 5:00 A.M. the advance guards of the regimental columns moved out.

By 7:00 A.M. all combat elements of the Brigade, except the combat car troop in Brigade Reserve which was covering the crossing of the Brigade from the northwest, were south of the river, and moving west; one regiment advancing on the line Woods Mills to a point three miles south thereof, and the other regiment moving fast on Peasleyville, where an enemy reserve brigade had previously been reported in bivouac.

It seems reasonable to believe that had the exercise not been terminated at this time, the action of the Seventh Cavalry Brigade, which had completely severed the enemy's lines of communication and was rapidly closing in on the rear of an army engaged in the front would have materially affected the result of the main battle.

LESSONS BROUGHT OUT BY THE EXERCISES

Mechanized Cavalry is a highly technical weapon requiring experienced, well trained personnel to function efficiently. Due to its high mobility and great radius of operation, troops which support mechanized cavalry must be familiar with its tactics and technique by constant joint training.

Mechanized Cavalry is a powerful unit capable of operating effectively in strategic directions even over very difficult terrain.

A Mechanized Cavalry Brigade should be employed as a team to permit full play of its air service, ground reconnaissance, and combat car, machine gun and artillery resources. It is a mistake to split the Brigade. It is a greater mistake to split the regiment, which is the basic combat unit. This was done in the Provisional Corps Exercise where endeavor was made to protect both flanks of a small brigade of infantry, resulting in what was left of the mechanized brigade being forced by terrain restrictions to operate in narrow channels against heads of columns only.

Mechanized Cavalry should be assigned the mission of mobile combat most important to the success of the Army. Its success or failure is capable of affecting the operations of the entire Army.

Mechanized Cavalry is capable of making long strategic moves rapidly under cover of darkness without lights.

Mechanized Cavalry must be preceded by adequate reconnaissance, both ground and air, to locate obstacles, ambushes and anti-mechanized weapons, and be covered by security detachments.

Mechanized Cavalry must leave roads and move cross-country when within hostile artillery range.

Mechanized Cavalry is not suited for holding extensive sectors during darkness, particularly in terrain which severly restricts vehicular maneuver. It should be relieved at dusk, withdrawn for refueling, feeding and refitting, and be moved under cover of darkness for an offensive blow at daylight. The personnel, rather than the mechanical factor, controls the limit of endurance.

Mechanized Cavalry gains surprise by:

- Secret marches at night without lights;
- By the use of feints and demonstrations while the main effort is kept concealed;
- By rapid movement; even though observed, time and space factors are often beyond the capability of the enemy to counter.

Mechanized Cavalry, due to its great fire power, surprise effect and crushing ability, has a decided adverse morale effect on other ground troops.

Not only infantry regiments and divisions, but the rear areas of corps and army must be protected by adequate anti-mechanized defense. To supply this deficiency against the threat of the mechanized brigade in the recent maneuver the hostile Army lost the supporting fire of many battalions of Field Artillery sorely needed to support front line units.

Infantry adequately protected with anti-mechanized weapons to ward off a large force of mechanized cavalry is in danger of losing its mobility and becoming defensive minded, and in my mind the same is true of horse cavalry.

Infantry tanks lack the auxiliary means of reconnaissance and support to successfully oppose a strong force of mechanized cavalry.

The best defense against a powerful mechanized cavalry is a force of similar attribute.

Movement of troops by motor transportation is desirable, but troops are helpless when so mounted and should not be moved unless adequately protected.

Reconnaissance from unarmored vehicles is of doubtful value and very liable to be most costly in men and vehicles.

The majority of road blocks encountered, although defended, were not extensive enough to be more than temporarily effective. The bulk of mobile anti-mechanized units should be centrally located to permit rapid dispatch and employment in previously reconnoitered positions upon receipt of timely information from air and ground reconnsiasance.

Both horse cavalry and motorized infantry are useful in supporting or taking over mechanized cavalry operations; horse cavalry is more rapid when the march involved is short; motorized infantry when the march involved is long.

The mechanized cavalry should have a stronger holding component, incorporated within itself, than exists in the present brigade or has been recommended in the proposed mechanized cavalry division.

The combat car elements of the proposed division should include a certain number of vehicles mounting a gun capable of penetrating 1-inch armor.

(Slide #37) POLISH CAMPAIGN, SEPTEMBER 1-18, 1939

The successful campaign waged by the Germans against the Poles during the first two weeks of September 1939 has brought us face to face with the realization of the tremendous power and possibilities of the modern weapons of warfare both in the air and on the ground - especially when employed in sufficient quantities and according to a well founded plan against an enemy not so well equipped.

At the outbreak of War, the Germans were mobilized and ready for action. During the period of their rearmament they had devoted considerable effort to the development and training of an efficient air corps and their mechanized Panzer Corps. Consequently, at the opening of hostilities they possessed a great superiority in mechanization over the Poles who placed their main reliance on their horse cavalry, which experience in former wars had proven to be most effective in operating swiftly over the broken ground of Eastern Europe.

What occurred is now a matter of history. In a period of seven days the mechanized German army drove 200 miles into Polish territory. This unprecedented advance was achieved primarily by the use of the tank. Mechanized divisions consisting of hundreds of tanks smashed through the Polish defenses outflanking such resistance as they encountered and advanced to distant objectives where they stopped just long enough for horse cavalry, infantry in trucks, anti-tank guns, and artillery to be brought up to hold the captured ground while they pushed on to the next objective.

The strategic plan of the Poles had been to retire slowly to positions in the rear in order to conserve manpower and shorten their lines. They would then be in a position to counter-attack after the Germans had extended their lines of communication. However, the speed and power of the pincer-like German advance exceeded all expectations. Lacking sufficient mobile mechanized and motorized units, tank mines and anti-tank guns with which to meet and stop these lightning-like thrusts, the Poles found themselves continually outflanked at every turn. Forced to retreat, they found the railroads and bridges in the rear areas already destroyed by German planes.

One German Army advancing to the east in the direction of Tuchola seized Bydgoszcz (bid-gosh), cross the Vistula (vees-wa) and effected junction with a force moving to the southwest from Grudziadz (groo-jaj). This isolated the Polish forces in Gdynia and in the corridor.

Although Polish resistance was somewhat stronger in the southern industrial areas, the Germans quickly broke through the pill-box defenses on the Silesian front, worked up the fortified Jablonka Pass and arriving southeast of Breslau outflanked the defenders and passed through Cracow and Tarnow toward the rich oil fields of Galicia. A part of this force together with the force which had taken Czestochowa (ches-to-ho-va) then moved in tanks, trucks and armored cars toward Kielce and Lodz while the army which had pinched off the corridor moved south on Poznan (posh-nine). At the same time another force operating from East Prussia moved south from Allenstein, and taking Mlawa (wa-va), continued to outflank the Poles until on the eighth day after the war started it arrived at the Polish defenses behind the junction of the Vistula (vees-wa) and Bug Rivers near Warsaw.

While the fighting continued around Warsaw, the fast moving German flank armies continued to move through Eastern Poland until on September 16 they were besieging Brest-Litovsk (brest-lye-tofsk), Lwow (voof) and Wlodaimiesz (vla-je-myezh). On the following day Brest-Litovsk, Lwow (voof), Deblin (der-blen) and Kutno fell, and the Russians commenced their advance to the West. Organized Polish resistance was at an end.

GERMAN ORGANIZATION

Throughout the campaign in Poland, newspaper reports have referred continually to the German Panzer Divisions in describing the extensive mechanized operations which so characterized that campaign. It is to be regretted that there is at hand no very recent information concerning the organization and equipment of these divisions. The latest available data on this subject is contained in a Military Attache report reproduced by the Command and General Staff School, January 24, 1938, which shows the organization and equipment of the Panzer Divisions as they existed at the close of 1937. While no doubt numerous changes have taken place since that time, it is thought that the organization and equipment of the present divisions will not differ too radically from those of the divisions shown in the above report.

(Slide #38) GERMAN ARMORED DIVISION

Recent reports show that at least six such divisions were employed in the Polish Campaign.

(Slide #39) PROPOSED AMERICAN DIVISION

It is desired to point out that the American Division likewise has a reconnaissance echelon, a combat echelon and a supporting echelon.

When we analyze the organization and equipment of the two divisions we find the following:

(Slide #40) TABLE OF COMPARISON

The American Reconnaissance and Supporting Squadron compares most favorably with the German Reconnaissance Battalion in combat vehicles and weapons. It will be noted that the American Squadron will have eighteen armored cars and twenty-one scout cars; the Germans 48 armored cars. The eighteen armored cars belong to the reconnaissance troop while the scout cars are distributed as follows:

1 to squadron headquarters
2 to the reconnaissance troop
18 to the rifle troop

The inclusion of a rifle troop and machine gun troop in this squadron is the first step towards the building up of the supporting elements of the division and it is thought that this unit should receive further increases. Some thought has been given to the possible inclusion of a

motorcycle troop in this squadron. Whatever the increase, it is considered that no integral organization of this unit should be transported in anything except cross country vehicles.

The number of weapons pertaining to each echelon as shown on the slide are in addition to the vehicular weapons of the armored cars and scout cars. Assuming that the combat vehicles of the two echelons possess approximately the same number, it can be seen that these echelons are approximately equal in weapons throughout.

In the combat echelons the American division will have a total of 170 tanks as compared to approximately 448 for the tank brigade of the Panzer Division. However, 148 of these German tanks are of an extremely light type and are used for command and reconnaissance purposes. These light tanks are offset in a large measure by the 100 scout cars used for the same purposes by the American division.

It will be noted that the German division has 60 medium tanks. It is only logical to assume that these tanks on account of their slower rate of speed, would not operate ordinarily with the lighter, faster tanks of the brigade; but would be used primarily to protect the artillery and to operate in support of the infantry component of the division. Therefore they might well be considered as part of the supporting echelon.

Deducting the 148 command and reconnaissance tanks and the 60 medium tanks, leaves a total of 240 light battle tanks in the brigade which, compared to the 170 light tanks in the American division, shows the latter to be somewhat lighter in tank strength.

In comparing the supporting echelons of the two divisions, we find that the chief difference lies in the infantry regiment which is part of the German Division. The artillery strengths can be considered as equal, while the division chemical company, and the two regimental machine gun troops and mortar platoons offset the remainder of the German supporting troops to a reasonable degree.

Thus it may be seen that if it were found desirable to form a counter-part of the German Panzer Division it would be necessary only to attach a motorized infantry regiment, and possibly a battalion of medium tanks to the proposed American division as it now stands.

It is thought that the resultant unit, although somewhat lighter in tank strength, would be reasonably comparable to the German Division. While the inclusion of a motorized infantry unit as an organic part of this division is not considered necessary at the present time, the attachment of such a unit in certain situations might be most desirable.

In this connection it might be stated that the Schutzen Brigades of the first Panzer Divisions to be organized each contained three infantry regiments and three motorcycle battalions instead of one infantry regiment and one motorcycle battalion as at present. It is

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reported that the reason for the reduction was due to the fact that the recently motorized infantry divisions were found to be capable of performing the role for which the larger Schritzen Brigades were intended.

GENERAL CONCLUSIONS

We have examined the proposed mechanized cavalry division in comparison with the German armored division and found that it contains all of the essential basic elements of the latter. Numerically, it is not as strong, either in tanks or in the holding and supporting elements, as the German armored division, but in the quality of its armor vehicles, on the average I believe it excels the German armored division, and in proportion it has more gun power. Under our conception I believe it to be a more mobile and easily directed organization than the German armored division. It is organized along traditional American concepts.

We have examined the Plattsburg maneuvers, in which a small and incomplete brigade participated, and have seen that even this small and incomplete brigade was a decisive force acting against an ill equipped Black army.

The lesson of the German campaign in Poland is that the Germans magnified this force many times and used the basic idea in war so successfully and so decisively that a valiant Polish army of a million men, also ill equipped in mechanization, was destroyed and a country conquered and reduced to subjection in the amazing time of two weeks. There is no longer any shadow of a doubt as to the efficiency of well trained and boldly led mechanized forces in any war of movement that they cannot be combatted by infantry and horse cavalry alone.

The late Chief of Staff said in his last annual report: "As experience mounts with this yet incompletely war-tested mechanized force, our training indicates too great emphasis on detached and independent missions with a consequent disregard of hard-hitting supporting missions which have a direct influence on battle. There should be available for those missions a powerful mechanized organization to be used, when opportunity offers, as a decisive attack element. Tendencies to date are leading toward a dispersion of effort with a consequent loss of equipment and a probable absence of this arm from the field at critical times. Present tactical doctrines should receive intensive study from this viewpoint.

I cannot agree altogether with this statement. In the first place, the idea has now been war tested and has produced amazing results. Secondly, we have had to operate in the field with what we had - a small and incomplete brigade. Nevertheless, as shown by the Plattsburg maneuvers and in the Second Army CPX, the idea of those of us leading this brigade has never been to waste mechanization on detached and independent missions but to use it on those missions for the army as a whole where a hard-hitting blow struck in a decisive direction will produce the greatest results. On the third day at Plattsburg, in my opinion, when the mechanized cavalry brigade streamed

across the communications and the lines of supply of the whole Black army, the channels of command of that army were lost and the greatest assistance possible had been rendered to the bulk of the Blue Corps. I am perfectly in agreement with the thought that a more powerful and a more numerous mobile mechanization should be built up in our army. In fact, I think it is imperative that we do so without much delay, but I do not believe it absolutely essential that we follow either the German, the French or the British in the details of organization.

Yet this expansion is a problem which the War Department may possibly have to face on short notice. What have we got and how should we go about it?

To me, the basic determination of the War Department to develop the mobile mechanization as cavalry and with cavalry conception and leadership, and to develop the immediate tank assistance to assaulting infantry as infantry and by the infantry tank service - which basic determination was not long ago confirmed by the Gruber study in G-3 of the War Department - has been again shown, both by the Plattsburg maneuvers and by the German operations in Poland, to be an essentially sound solution under our law and should be continued. I believe the tank service to have a continuing and important role in the close support of assaulting infantry, a role which is separate and distinct in thought, conception, method and equipment from the role of mechanized cavalry or mechanized forces. Mechanized cavalry or Panzer Corps do not take the place of properly supported battle infantry which is needed in quantity in any army.

I believe that we should have at least four mechanized cavalry divisions, one in each of our armies, in the near future. They may prove to need a greater immediate support force than we have contemplated. The mechanized cavalry brigades are not separate from these but expanded they in themselves should form the mechanized forces of which the former Chief of Staff spoke. There is no need for both and it is all mechanized cavalry on an increased scale.

What have we to start with - one brigade and the experience of a very few other officers who have passed through that brigade.

Mechanized cavalry, to justify its existence must be highly trained. In its operation are intimately combined air and ground reconnaissance, artillery, machine gun and mortar supporting fires, assault with armor protection which may penetrate deep and fast at one point and be suddenly stopped at another and require rapid reorganization and re-direction; the rapid bringing up of immediate support; these have a complicated maintenance and supply and must be bound together with the best of communications. Its medical and engineer services are as yet unexplored, in our service, both as to method and equipment. It cannot be properly served by an Air Service unfamiliar with it, its methods, and its composition and equipment. The enlisted man is not only a mechanic, as he primarily is in the Air Corps, but operator, fighting man, and in many cases a leader.

There are very few officers, indeed, who have passed through the brigade and who are available and competent at this time to command regiments, squadrons, troops and batteries in this sort of combined operations. I think its training to be much more difficult, in an expansion, than that of infantry or horse cavalry, and it should require a longer time. And yet we may require all we have on M day. I do not believe the National Guard can give sufficient time, nor has it the maneuver space available, to develop efficient mobile mechanized troops.

These considerations lead me to the belief that the Regular Army - the professional army - should supply the quota of these technical troops, or at least their peace nuclei, and that the National Guard and Reserves should be looked to for the more quickly trainable and procurable infantry and horse cavalry.

I believe it is vitally necessary for us to expand our mechanized cavalry and through it our mobile mechanization very quickly, and if it were to start tomorrow, this is what I would recommend:

1. That the tables submitted for a Mechanized Cavalry Division be approved without delay. If peace remains, changes will naturally appear with further experience; but they do give us something to go on and to procure on.

2. That all materiel included in the F.Y. 1939 and F.Y. 1940 appropriations applicable for mechanized cavalry be expedited and concentrated and be assigned to this purpose and the balance needed for the equipment of the initial division be supplied from early emergency appropriations. If any light tanks are surplus to the infantry, through its trend towards the medium tank, they also might be used.

3. That a full officer and enlisted complement, together with a 50% surplus in both, be supplied at the expense of existing horse cavalry and possibly some infantry, if it is not practicable to obtain this personnel from an immediately available increment to the Regular Army.

4. That regular cavalry and field artillery officers, particularly of command rank and capabilities, be withdrawn from existing units and assigned as above and their places be filled by Reserve Officers on extended active duty who have had horse cavalry and field artillery training. That a proper proportion of the junior officers needed as in par. 3 above be Reserve Officers on extended active duty.

5. Expand our existing Brigade schools at Knox for the intensive training of radio personnel, mechanics, and other specialists.

In this manner we could quickly form, equip and train the First Cavalry Division (Mechanized); operate it with a portion of motorized infantry and medium tanks; continue our study of organization and at the same time train intensively on the same materiel the officer and enlisted cadres of two other mechanized divisions until their own equipment could be manufactured.

Record of Discussion, if any, filed in Record Section, A.W.C.

G-3 COURSE NO. 12,
1939-1940.

mec

Notes of Discussion following Lecture
by Brig. Gen. Adna R. Chaffee, Comdg.,
7th Cav. Brigade, Sept. 29, 1939.
Subject: Mechanization.

Q. (Maj. Coffey) What is the marching road length of this proposed division, including all its administrative vehicles, etc.?

A. In my judgment it would be around 30 miles.

Q. (Maj. Coffey) That appears to be quite a lot and it would seem that we have a sort of paradoxical situation; on the one hand we find the infantry cutting down its war establishment, its big shock division and streamlining it. On the other hand we now have the cavalry increasing its division. From what you said, I gathered that one of the reasons you favor it is that you get a greater proportion of combat strength as compared to administrative strength. Assuming that we have these two tails with the administrative echelon and could cut them down, would you rather have two smaller divisions, or one of these larger divisions, or two small brigades and one of the larger divisions for operations in the western hemisphere - not in Europe, where this division might have been drawn up for specific purposes?

A. General Herr and I were discussing that yesterday. There is the danger of getting too much length in the column and therefore, in organization. I favor every means, in organization, that I could recommend for inserting that fire power at the expense of latent power. For instance, six gun batteries is a distinct step in getting strength. The addition of combat cars without the regimental overhead is another step, etc. If we put the Panzer Division strength into an American organization and marched it on one road, I am sure that column, running at 25 m.p.h. would be around 40 miles or more and that is a very long

column. However, the length of the column is not entirely a question of miles, it is a question of the time it takes to close, or break up and deploy into smaller columns, and you can, by your communications, cut your column off and divert it to use other roads to shorten up your column, which you always do when you can. I am not afraid to try a division of this caliber, which with its trains, etc., would be about 40 miles long. I am sure your combat elements alone would be about 25 miles, with the trains about 15 miles and that would mean your combat elements could close on the head of the column within an hour. I believe you have to have a good deal of strength in this mechanized unit; you have to have weight and numbers, so I would be in favor of getting all the weight I could and having a try at it, anyhow.

Q. (Lt.Col. Goodman) Have you given any thought to defense by airplanes against these mechanized troops of yours? I watched you up in Plattsburg and while that was hard territory and there were a lot of defiles in it, it seemed to me if the higher commander would attempt reconnaissances on your movements and try to hit you a long way off, with some such gun as the 37mm mounted in an airplane, that might be one way of stopping you?

A. It is true that in the bulk you would think these units offer a pretty good target on the road. However, when they are moving you have about five yards of vehicle and then 50 yards of road, then five yards of vehicle again. Those vehicles themselves have 30 caliber AA protection, probably in a more readily accessible, quickly operable shape than have troops of any other category. On the road the guns are always in AA position. The combat car, of course, cannot be damaged by small arms fire; what it fears most is the small bomb. As to this

One pounder, you know that an attack airplane is coming in and moving at the rate of about 250 m.p.h. and that is a whole lot of yards in a second and when he shoots that one pounder at that rate his shots will be very much distributed, so that the effect of the individual plane, I think, will not be great. I don't think we are much more vulnerable than other types of troops. The best chance in my opinion that the air people have to delay or damage mechanized troops is to bomb or destroy a bridge or crossing in front of them, throw them into confusion, make them stop short on the road when they don't expect to be caught on the road and then catch them in a hole. A nice point occurred in the Plattsburg maneuvers about observation. On that night march when we were back of the Blue tower and went up to the north flank of the army, Black aviation searched for us all night and never found us. Why? Colonel Long told me it was because they were always looking about eight or ten miles behind our tail. They figured our rate of march as about eight miles an hour and we were marching 18 miles an hour. They never found us until daylight and by that time we were in contact on the north flank. A year ago at the Riley maneuvers, we were marching from the north at the entrance of a problem, on a night march. You know how those section line roads are in Kansas. The 13th Cavalry was on one flank. I was marching the whole 1st Cavalry in column and an airplane came by and searched repeatedly with flares on the section line road a mile to the east and never saw the 1st Cavalry. They have their troubles as well as we do.

Q. (Lt.Col. Hudnutt) What in your opinion should be the proper field artillery weapon for employment with the mechanized cavalry brigade and should it be a towed weapon as at present or on a self-propelled mount?

A. First, the present weapon is the 75mm howitzer, towed. I think, for the force which we have had up to now, that is a very satisfactory artillery piece. It is mobile in towed traction compared with any other artillery piece; it has a high speed carriage, highspeed traverse and elevation, and is an exceedingly good little gun to shoot at moving targets. I guess it is almost asgood as any M-1 75mm in that respect. It has howitzer advantages. It possibly might have more weight in caliber when you think of the 105mm, because our artillery does have to undertake counter battery fire. However, I don't believe that the 105mm howitzer, in traction, would be sufficiently mobile for our purpose in this division. If they had, as the Panzer Division has, a heavier supporting element, then it is quite possible we might well take in there, behind that supporting element, a battalion of 75s and two battery battalion of the 105mm howitzer. Then, of course, the other point about the organization of the 75mm howitzer now is that we have that and nobody has the 105mm. We have been thinking and talking about it a long time but I haven't seen them in service. Let's talk about the self-propelled gun. I was one of the earliest advocates of it. I first saw it embodied in the combat car platoon itself. The gun I selected in my mind was the Navy three pounder. I put it there because I saw the need for an accompanying gun with the combat cars. At that time the 37mm was not a capable anti-tank weapon. It was the old gun and had too low a velocity. The Navy had some surplus of these quick firing three pounders, and they were light enough to be mounted on the combat cars. I advocated the self-propelled gun in that team. Afterwards, through evolution, in organization they dropped that and put in this mortar, thinking it was a better neutralizing affair for the protection of the combat cars than the precision weapon.

Certainly this smoke mortar is efficient for blinding observation and allowing a combat car attack to jump in with a reasonable degree of surprise. We have just initiated a project with the aid of the Chief of Cavalry and with the cooperation of the Chief of Field Artillery for the 75mm howitzer mounted on a combat car chassis. There have been two lines of thought. One is that a battery of these guns would have the same cross-country ability as the combat cars. You would normally expect to employ them, not as an accompanying gun but as in the war, we knew the close-up infantry battery, knew the battalion commanders; they would be emplaced, we will say, close to where your attack started and by the time the combat cars have gone about a thousand yards in their advance and the observation begins to fade, you could step on the accelerator and go across country at the same speed as the combat cars. They are a displaceable battery; you don't have to unlimber or bring up limbers from cover; there are no long communications. As such that battery would have been able to fire only the howitzer on the light combat car chassis. You might have a shield in the car for some protection, but if you put a tank housing on that what have you got? You are right in the realm of the heavy tank and there is no place for that vehicle in mechanized cavalry because it has lost its mobility. Further, you would have lost an artillery piece, four of them, fought by a captain, and you would have gotten a tank piece, a 75mm gun, fought by a sergeant closed up in a vehicle. I am not thoroughly sure of my ground now but I am afraid we are going to lose some of the ballistic qualities of the 75mm howitzer when we put it on that chassis. Maybe a plus and minus ten elevation in depression, which materially displaces its range. That will put it in the category of a

close support weapon rather than the main weapon of the brigade or divisional artillery. For that, I think you must have artillery of the character that we have now. I have just forwarded to the Chief of F.A. my ideas on a regiment of four six-gun batteries.

Q. (Lt.Col. Howell) From what I have been reading on this subject, it seems there is a tendency to get just a little beyond the cavalry mission in this motorized force and take on somewhat of an infantry mission. Do you think in our organization there is room for this light cavalry brigade, reinforced, or the cavalry division, and also a heavier mechanized division for the accomplishment of a purely infantry mission?

A. No. As I said in my lecture, this thing started out and its purpose has always been to be the mechanized unit in the army to carry on mobile combat and mobile combat of this character, in my mind, is essentially cavalry combat. Cavalry no longer means horsed cavalry. It means the mobile arm of an army, the arm specifically organized and equipped for fast, moving combat, whether on machines or on horse. So, to me, this is the cavalry, and it is the mobile mission of the army and I see no other arm properly chargeable with it. It was for that reason, as I outlined in this lecture, that it was assigned because of that similarity, to the cavalry for its initial development. If you remember, the National Defense Act said, at that time, that tanks would be operated by the infantry. The reason those words are in the basic law of the army, was to put an end to the Tank Corps. Those were the words that killed the Tank Corps. When we said we would have a Mechanized Force in the army, we might have gone to Congress and taken two years - with all the Army politics - to get about four words out of

the National Defense Act and we would have been held up in development. So, the Chief of Staff said that the better way was since this is cavalry in its conception, it is the force organized for fast moving combat by machines, we will have to charge the Chief of Cavalry with it primarily. How are we to do it? We coined the word "Combat Car" ourselves. The Cavalry operates combat cars and the Infantry operates tanks. But that was entirely for legal purposes. I don't believe there is a place for any other force. If you expand this brigade into a mechanized cavalry division, call it what you please, but that is the mobile mechanization of the army, and I believe it is an entirely different branch of mechanization, with entirely different conception than the mechanization which supports and must support the big infantry formations in the attack of organized positions and over the ground of the numerous accessory defenses. I was talking with General Marshall yesterday and he gave as his opinion that it was not the mechanized Panzer divisions which made the first breakthrough on the Polish front. Apparently they hit with the infantry and tanks and made the hole first and then the Panzers came along and streamed through. I don't see us with it as a branch. I rather see two forms to mechanization and this one certainly is able to undertake now all those missions of mobile combat formerly assigned to the horseman in war and at times he has had a very decisive part in the battle.

Q. (Maj. Matchett) I would like to have you discuss your conception of the support that might be given a mechanized force by combat aviation, evidently as they did in Germany with the Panzer division.

A. In my report on the Plattsburg maneuvers, I made the suggestion that possibly a small formation of attack aviation might be included

within the command of the brigade. I presume that for purposes of training, administration and Air Corps supply that it would not be an integral part, but it might be placed directly and teamed up, as observation is, and operate with the brigade or with the mechanized cavalry division. Beyond that, with these formations able to cover the ground to the depth and width these big formations can, I think that the cooperation of the bomber, pursuit and attack aviation must be handled in the Army and in G.H.Q. They know where these operations are going, where the bridges ahead are that ought to be destroyed, and certainly they, I think, could plan better than the immediate commander of one of these units. Again, however, I think defensively, as brought up by a previous question here, there is a nice team play, that the commander of such a force ought to be alive to the capabilities of protection which friendly pursuit aviation might offer to a certain movement. He knows what area he is going to, whether he is going to use two main arteries over there and probably going in in the early dawn when pursuit would be effective, and let the Army put pursuit in those areas, then the attack planes would not be so numerous. It seems to me the coordination of the heavier forms of aviation is above, and not within any such command we are thinking of here.

Q. (Maj. Lentz) You said the Germans got their initial impetus into Poland from infantry supported by tanks. Weren't those tanks out of the Panzer Tank Brigade and used for the double purpose of the infantry mission as well as the wider separate cavalry mission?

A. I am not sure whether they used possibly some of the medium tanks back there, or whether they had numerous separate tank battalions for the support of the infantry. Not all of his mechanization is in those Panzer units. However, I know no more about it than just the thought

which General Marshall threw to me yesterday, that it was a breakthrough battle and of very limited duration, the hole made by infantry and tanks and then the mobile divisions were socked through.

Q. (Capt. Ferenbaugh) I would like to get on the other side of the fence with respect to anti-tank defense, particularly from the standpoint of ground troops and get your impression on what types are the most efficient and available to ground troops against a force such as you command. I recall the 27th Division at Plattsburg, where they used 155mm howitzers to block roads against you and the psychological reaction of the troops in that division. I would like to find out something which the division might use both as an organic part of the organization and possibly as a separate organization in repelling your attacks.

A. I think now that the streamlined division has thirty-six 37mm guns on the new mount. You have there, I think, a fine weapon, accurate and hard hitting, but I think it is a weapon which is not yet sufficiently mobile to be handled by foot troops and you haven't the transportation to leapfrog it, to keep it up. Of course, our problem of mechanized cavalry, or anybody conducting an attack of this kind, is to endeavor first of all to find that and not close with it but to neutralize it, smoke it, sock it with artillery, or in some way effect an entrance by movement. We may lose and probably will, some vehicles going in, but if you have a lot of vehicles some will get through and get in among troops that are only armed with small arms. I don't know of anything better right now and certainly the War Department's judgment on this 37mm gun is that it is a fine weapon. I think the 75mm howitzer is a pretty efficient weapon. I do make the point that you must look farther than the regiments and divisions, you must not leave the back

door open to corps and army because this mechanized stuff has mobility, and if they are blocked off at one place they will keep edging in and get in there. At Plattsburg they distributed about five battalions in rear of the army at crossroads. There, I think, they did the worst thing because that was where we were looking for them. If they had been placed in the bushes off on the side of the road it would have been a lot harder for us to find them. But the observation aviation came back in a few minutes and painted the whole picture for us. You have to have something that can be emplaced sufficiently quickly so that the infantry can march and move forward and at the same time be protected on its flanks.

Q. (Capt. Sturgis) I would like to ask what contribution to the successes of the mechanized forces invading Poland do you attribute the work of the German air corps, in completely disrupting the lines of supply the first few days by first knocking out all the railheads so they could not operate toward the front or rear, and second, the important rail centers, such as Warsaw and Lodz and towns of that nature, which prevented rail movements forward, and also, I would like to ask what weight or credit you give the German air forces in support of the mechanized forces after the breakthrough and when they were out of artillery range, in breaking up the Polish attempts to stop them by hastily organized attacks?

A. We don't know. I haven't had much access to the details on the tactical handling of these operations. I wish I had. But it was apparent that the German forces used its air force the first couple of days to entirely put the Polish air force out of commission. The first attacks, if I remember the reports rightly, were against the

enemy's airdromes and he thus disposed very largely the opposition in the air and, of course, that was a contribution to the later ground operations. It kept the Poles in ignorance and whatever attack aviation, etc., they might have had in the later days was quickly destroyed. After the first two days, in which as I remember, his targets were primarily the airdromes, he turned his attention to the communications back to the Army. I think every time he destroyed a bridge or important rail junction back there he made an enormous contribution to the affair. I think that is what the air corps is for. I don't think you can shoot or bomb a determined people into submission; I don't think you can shoot a determined enemy out of position, you have to go and get that enemy, and I think in bombardment aviation that is exactly the proper way to use it and undoubtedly it was a big contribution to the entire German Army in Poland.

Q. (Lt. Col. Bandholtz) Thus far we have considered the use of mechanized forces in cases in which the enemy had no similar forces. How do you visualize the use of an outfit like that against the enemy who also has mechanized forces? Would you go after the mechanized forces, or hold the other off?

A. I think it would be just as natural a mission as the attraction of the bombardment for the pursuit airplane. I think it would be just as natural to dispose of those mobile threats to the army, and in my opinion these mechanized defenses that we have, General Drum said that was his opinion too, that our 37mm guns, etc., should be organized not to drop down at particular places in advance in a passive defense but should be held mobile and ready to go to a threatened area and should be accompanied by reconnaissance for that purpose. If they are that mobile, you are building back into mechanization, and I believe the way

to fight mechanization is with mechanization.

Q. (Maj. Parks) May I ask what has been done to improve the marksmanship of the individual gunner in these fast moving vehicles? Have you any machines for teaching that without teaching it in the vehicle itself?

A. No, we haven't. There has been talk of the development of a machine that would teach that gunner, give the turret some motion, without having to run the combat vehicles. We have found that the best results in our combat cars are obtained when the gunner is safe and secure in there. We have a little device where we put him in a little seat with a safety belt over here (pointing) to hold him down and a safety belt to hold him rigidly in back so that he can get to his gun but he cannot be thrown around. We think that is improving our marksmanship considerably. But in moving fire you don't expect your vehicles to hit individual targets at three or four hundred yards. I have always said in the cavalry, to my mind the pistol range in the cavalry was just six inches longer than the bayonet range. The same way in this development. The real range for those guns from the moving vehicles is about 200 yards. There they get good effect because they have a volume fire and up to that point they have the protection, if they have been properly managed. They have had the protection of the supporting fires of many other machine guns in position, of smoke and artillery, and the supporting effect of the armament. Its punch comes right down to the last 200 yards and we ought to try every time we can never to jump farther than that in the open, to always work to get concealed approaches to that distance. That's our thought about it.

Gen. DeWitt: General Chaffee, we want to thank you for a very interesting, full, complete and instructive morning.

aem

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