

MILITARY MONOGRAPH

TITLE: Command and Communication.

SCOPE: A study of the development of military communication and its effect on command. The historical background of military communication is cited in connection with tactical and strategic doctrine, and communication is depicted as a critical element in the trend toward open warfare which culminated in the powerful offensives of World War II. Communication is considered as a balancing factor between the offensive and defensive climaxing in the Ardennes Campaign of 1944. The lessons of the Ardennes are indicated in connection with implications as to the future of command, particularly in view of the manpower differential between the United States and our probable opponent. It is concluded that successful command will be dependent upon communication based upon proper organization, training, and supervision.

41-86

Prepared by:

Ralph E. Kuzell
Major, Cavalry

COMMAND AND COMMUNICATION

"In a proper study of military history, it is not sufficient to memorize a number of dead facts. They may be interesting, but the advantage gained from such knowledge is solely cultural and not at all military. Nor is it sufficient to study only the strategy and the battlefield tactics. They are the most interesting subjects, and are the most often discussed in books, but they are by no means the only important ones. Students of military history should learn what brought about the results."¹ In a study and determination of the decisive factors in many important battles it is strikingly significant that the means of communication available to the commanders, as well as their use of these communication facilities, often decided not only the outcome of the battle but established the strategy and tactics of the day.

A leader's capability as a commander is definitely limited by his skill in determining a basis for action and his ability to transmit to his subordinates his orders for implementing his plan. He must be able to decide what is best and he must be able to act. In deciding what is best, the commander must possess the maximum of information about the enemy and his own troops that science, discipline, and training will allow. Only when satisfied that he possesses all information available under the circumstances, will he be able to make a sound decision. In order to obtain this information, the commander must have a reliable system of communication, a system capable of operation under adverse conditions and capable of keeping abreast of the timing of his attack or of operating efficiently in spite of the disruption

1. William A. Mitchell, Outlines of the World's Military History, p. 13.

and chaos created by a rapid, powerful enemy attack. If the leader is to command his troops, if he is to transmit his decision, if he is to implement and supervise the execution of his plan, and if he is to handle his reserves in a manner that will be favorable to him; in short, if he is to control the battlefield, he must possess a system of communication that will transmit his orders in a timely and secure manner to his subordinates. He must control a system of communication that will provide instant warning of an enemy attack or counterattack, of an enemy withdrawal, or of a change in the enemy action which may affect his mission. He must be capable of instantaneous communication with his reserve so that he can commit it to take advantage of the situation as he knows it. A brief review of military history will serve to illustrate the influence of communication on strategy and tactics as well as its profound effect in determining the efficacy of command.

During the period from the beginning of authentic history to the wars between the Greeks and Persians and even for years thereafter, commanders did not hold out reserves to meet emergencies. Dispositions were determined and the outcome of most battles was decided before the troops were joined in combat. The successful commander placed his troops in formations designed to be most effective based on the intelligence he had developed concerning the enemy prior to the battle. Troops were instructed to operate in accordance with a preconceived plan and, once the actual battle had begun, the commander had practically no way of influencing the outcome if the enemy failed to develop according to expectations. To be sure, Alexander understood the value of reserves and frequently disposed his troops with provisions for reserves,

but their use had always been predetermined by the dispositions of the enemy, and the reserves could not be controlled to meet an unforeseen emergency. Had ancient warriors understood the potentialities of communication in control, the value of training messengers and liaison officers, the use of visual and sound signals, they would have increased immeasurably the combat capabilities of their troops. It was not until much later, however, that the significance of these means of communication was understood.

Development of arms, machines of war, and the adaptation of transport to the soldier's needs have all had a marked effect on warfare. Warriors first fought in closely knit groups, and victory was determined primarily by physical strength and numerical superiority. It was found that certain formations were adapted to particular weapons, and as these weapons of war were perfected it was discovered that weapons of propulsion, such as bows and arrows and firearms, were most efficiently used in open formations. Variations in formations, however, demanded additional control measures, the first of which were rank and command. Along with the need for rank and command came the need for means of communication. As the slower more unwieldy formations succumbed to mobility and firepower, the need for improved methods of communication increased, and indeed determined, the ease with which the transformation to mobile warfare could be made. The transition from the use of crude methods of visual and audible signals to modern radio and telephone was long and difficult, and fraught with many hard-earned lessons for military commanders who failed to properly understand the value of good communication.

Hannibal, one of the greatest commanders of all time, won his famous

victory at Cannae through superb handling of his troops. Yet Hannibal's control was based primarily on the dispositions of the enemy before the battle and the enemy's lack of mobility, not upon a superior system of communication in Hannibal's army. In fact, not long after Cannae, Hannibal suffered a crushing defeat that can be attributed primarily to poor communication.

Hannibal was at Canusium, near Cannae, awaiting news from his brother (Hasdrubal), when a group of six messengers sent by Hasdrubal were captured by the Romans. They bore Hasdrubal's complete plan of operations, calling for a junction of the two Carthaginian forces near Narnia.

The consul, Caius Claudius Nero, one of the most alert Roman generals, was commanding the army facing Hannibal at Canusium. When he received Hasdrubal's message, he at once made plans to prevent the junction of the brothers. Leaving the bulk of his army in front of Hannibal, he marched with 6000 foot and 1000 horse to join Livius, the other consul, who was facing Hasdrubal south of the Metarus River. Hannibal was kept in complete ignorance, not only of his brother's movements, but of Nero's departure to intercept him. . . .

Nero sent messages ahead to Livius, and was received so secretly in the camp of Livius that Hasdrubal knew of little of his arrival as Hannibal did of his departure, although the two armies were encamped only half a mile apart. . . .

Practically the whole Carthaginian army was killed or captured. The Roman loss was about 8,000. Cannae was avenged, and Hannibal's last chance of conquering Italy was gone. . . .

Creasy places the Metarus as one of fifteen decisive battles of the world. Had Hasdrubal won, it is possible that Hannibal would have conquered Rome, and destroyed it, as Rome later destroyed Carthage.²

The Romans with their well-trained, mobile legions dominated their enemies for centuries. With the advent of cavalry, however, mobility was an even more significant factor, which was not fully apparent until the eleventh century when the European world was startled by the Mongol invasion of

2. William A. Mitchell, Outlines of the World's Military History p.97.

Hungary, a striking example of open lightning-like warfare made possible by superior command control. Indeed, we may see in Mongol strategy the precursor of the armored blitzkrieg of World War II. European methods of combat did not apply to the rapidly moving, well-coordinated Mongol forces. The Mongols advanced against the European stronghold in three widely separated field armies, their right flank protected by a covering force which moved rapidly and with unbelievable success against numerically superior enemy formations. The mongol armies were quickly concentrated on the Danube near Gran, and after a retrograde movement, conducted in a manner which has not since been duplicated from the standpoint of control, crossed the Sajó River in the face of the enemy, and enveloped the Hungarian army in a battle of annihilation, leaving 70,000 dead on the field.

Although we know little of the Mongol means of communication, the control and synchronization of the movements of their armies, which was evident in their campaigns, can be attributed to superior use of liaison officers and mounted couriers. Tactical control on the battlefield was obtained through the use of signal flags, which obviated delay necessitated in transmission of verbal or written messages and orders. Indeed, it is not likely that many of the Mongol officers could read or write.

With the development of printing in Europe, however, the general level of education was improved, and officers learned to read and write. Written orders were therefore more practical, and the military staff was no longer limited to liaison. During the Napoleonic Era, the semaphore was used in conjunction with mounted messengers and liaison officers. Napoleon himself,

nevertheless, failed to perfect adequate control due to lack of a good staff system with communications support. Faulty control and poor communication contributed to Napoleon's downfall at Waterloo even though he had personally made a sound estimate of the enemy situation and decided on a plan that would have defeated the enemy if properly executed.

On June 16, 1815, Napoleon launched an attack on Ligny against the forces of Blucher, who in attempting to envelop the French left had weakened the center of his line. Napoleon saw this mistake of his opponent and prepared an assault on the enemy center. Napoleon had detached D'Erlon's corps from Ney's force, which was advancing toward Brussels; and Napoleon waited for D'Erlon before launching the attack on Blucher's center. D'Erlon's corps did not arrive, however, so Napoleon attacked without it and drove Blucher from his positions, but was unable to press his advantage by following up Blucher's troops. As a result Blucher was able to retire and reform his Army. Analysis shows that Marshal Ney, who was making the secondary effort, had met increasing pressure and was about to reinforce with D'Erlon's corps when he discovered that a liaison officer from Napoleon had ordered D'Erlon to Ligny without informing Ney. Ney quickly ordered the return of the corps. The result was several miles of marching and countermarching for D'Erlon's corps which did not participate in the battle. The fact that the Prussians under Blucher were not routed by Napoleon made it possible for them to play a decisive part in his defeat at Waterloo on the 18th. Had Napoleon been able through an adequate system of communication to commit D'Erlon's corps at the critical time, he might have routed the Prussians and eliminated them

permanently. Even though Napoleon through extreme personal exertion was able to observe the conduct of the battle and determine the point of decisive action, he was not able to carry his plans to a conclusion for he did not possess adequate control. A well organized staff supported by reliable communication might have saved him from defeat.

Lack of a satisfactory staff system was again evident in the plight of the Mexican Army, which during our campaign of 1847 had no organized staff or systematic means of intercommunication. Even though fighting on familiar soil, the Mexicans were unable to bring their superiority in manpower to bear at the critical time and place.

Prior to the American Civil War, the possibilities of military communication had been explored and developed by Lieutenant Meyer of the Army Medical Department, but little interest had been taken in his inventions. Moreover, the military implications of the development of the telegraph were not understood by military commanders generally. The changes in tactics during the American Civil War, however, were significant of the adaptation of these new means of control to military use as the war continued. By the end of the war the telegraph was used extensively, but required permanent type installations and presented problems in installation and extension which prohibited its use as a means of control with rapidly moving troops. The Meyer signal system, which involved transmission of code by flags and torches was used first by the Confederates and later by the Federal troops. By the end of the war, this method of visual signalling, as well as the telegraph, was in widespread use. However, since staff organization depended

upon the whim of the commander, the most effective use was not made of these excellent means of communication for rapid transmission of information and orders. As a result commanders, with the exception of Grant and Jackson who were able to visualize enemy weakness and disregard their own, continued to be perplexed by their own disorganization while failing to discover the enemy's weakness. This is illustrated by Ewell's failure to take Cemetery Hill at Gettysburg because he waited for his rear division over which he had no firm control. Although his own forces were disorganized, the Union forces were far more disorganized, and he could have won the battle of Gettysburg had he been able to exercise better control over his divisions through proper use of the means of communication available.

During the Civil War, nevertheless, new methods of communication, while not developed to the maximum, did lend strength particularly to the defensive. Hasty field fortifications were used extensively by both the Northern and Southern forces. The forces under Lee at Richmond were particularly adept at the technique of throwing up hasty entrenchments and holding them lightly, warding off attempts at penetration and envelopment through the rapid movement of local and general reserves. Communication was adequate for the defender and enabled him to commit reserves as desired. The attacker possessed no means of disrupting communication within the battle position; the artillery used was relatively ineffective in this respect and quantities of ammunition consumed were small. The defender was able to maintain tactical unity within the battle position through verbal transmission of orders and instructions in the small units and the use of messengers,

liaison, and visual signals within the battalion. The telegraph, visual signals, liaison, and messengers established control and coordination of battalions and larger units and permitted the employment of general reserves. The attacker, on the other hand, was plagued with the inability of communication to keep up with attacking troops in large formations. The trend toward stabilization of warfare was definitely established and foreshadowed the conditions which were to exist during World War I.

Although the telephone had been invented before our participation in the Spanish American War, we must look to the Russians for the military application of its use and the resultant additional strengthening of the defensive. During the Russo-Japanese War, the Russians adapted the telephone to use in front line defensive units. Here again, as in the American Civil War, we see the communication lag on the offensive. The Russians were unable to adapt the telephone to offensive usage, but employed instead a system of flags to point out positions of advancing troops, and in the lower echelons, markers were affixed to the backs of attacking men to indicate their positions.

During World War I, Russian developments in the use of the telephone were generally adopted. The general staff system which had been developed during the Franco-German War by Von Moltke, who incorporated the principles of Scharnhorst, provided a workable means for exercising command of large bodies of troops and was used in all large headquarters. Under staff control, telegraphic traffic was enormous, and radio made great strides, but was generally used only between large headquarters. Although the status of communication as a means of control had increased immensely, installations were

still cumbersome and adapted to static or slowly moving situations. Only short advances could be supported, and rapid coordinated movements of large armies against enemy opposition were out of the question.

Open warfare in the west was effectively terminated in the Battle of the Marne. Moltke, in failing to follow the Schlieffen Plan, weakened his right flank and was, therefore, unable to envelop the Allied left as planned. Quite significant, as well, in his failure was the inability of the Germans to maintain liaison and contact between their armies as their weakened right met increasing enemy pressure. This was evidence of failure to adapt communications to mobile warfare; it was reminiscent of the age-old tendency to base control on planning designed to overcome initial enemy dispositions, but inflexible and unable to adjust to the unexpected. It foreshadowed the stalemate on the western front.

As World War II opened with the German war machine rolling through France and the Lowlands, the world was startled by the speed of the attack and the ease with which well-prepared defensive positions were overrun. This time, however, the German forces in the west were strong enough for their task; they had not been weakened as Von Moltke had weakened his right wing before his ill-fated advance to the Marne. The bold movements of the invading columns, their coordination, their timing and magnificent power at the critical points were reminiscent of the Mongol invasion of Hungary. The German success, upon analysis, was not all that it appeared to be. The German General Staff had perfected victory based on an undreamed of detail in planning, but therein lay their weakness. This weakness was not to become fatal until the battle of

Stalingrad, nor was it to be really evident until we swept across France from the beaches of Normandy.

Although the Germans had made progress in the development of communication, control of their forces was due more to adherence to planned timetables, discipline, and the use of conventional means of communication than the adaptation of radio to synchronization of the air, tank, infantry, artillery team. As long as battles progressed as planned, the German commanders in the field were able to bring their strength to bear decisively. With the first strong blows of adversity, however, on the Eastern front where timetables had not been worked out so accurately, the dreaded German war machine lost the initiative for that short but fateful period which determined the difference between open warfare and siege warfare. At Stalingrad the Russians exhibited a tenacity that seems remarkable, but which upon analysis is really quite simple when we consider the weakness of communication within and between the German divisions and the fortuitous position of the Russians. With unexpected reversals, German field commanders were not able to regroup rapidly enough to prevent the Russians from stabilizing the front, while from the Russian standpoint, adversity had finally been blessed with makeshift communications which were able to withstand even the heavy shelling of modern warfare.

Urban wire installations adapted to military needs were generally proof against the German onslaught for two reasons:

1. German lines of communication were over-extended, and with adverse weather conditions supply of artillery ammunition was at its

best meager, while support by aerial bombardment had been crippled.

2. Whereas wire systems had heretofore been generally of the field type, installations at Stalingrad were protected and in many instances underground. Runners were shielded by buildings and rubble.

The Russians with their communication were able to mass effectively their heavy artillery, which devastated the attacking formations and provided the defensive with a truly irresistible strength.

Once the German fortress had been breached in Normandy, the German weakness in communication and control, evident at Stalingrad, was nakedly revealed, but unfortunately generally misunderstood. Herein lay the seed for the stunned plight of our own troops in December of 1944 when the Germans struck terror into the hearts of the Allies. After the breakout in Normandy, our troops, spearheaded by armor, moved violently to exploit enemy confusion and spread chaos across western Europe as they advanced with incredible speed.

Why was the proud German army which had itself swept over Europe in 1940 unable to stem this avalanche? Many people have attributed the inability of the Germans to counter our movements to the great Allied air superiority which enabled us to blast German rear areas and routes of communication, thereby prohibiting concentration of ground troops. It is utterly fantastic to believe that such is the case. To be sure, our air attacks were decisive, but in a different manner indeed. Air attacks, together with extremely heavy concentrations of field artillery initially reinforced by naval bombardment, so effectively cut the enemy wire communication systems in forward areas that he was stunned and unable to react. He failed

initially to strike our beachhead in strength even though it is known that several divisions were available, and he was actually unable to intercept the movement of our armor across France until we halted for consolidation. It is sheer naivete to believe that air power virtually alone and by its interdiction of roads and canals and the destruction of bridges and railroads prevented the Germans from resisting our advance or properly withdrawing their forces. A modern army is not limited to roads nor is it impeded by blown bridges, and it certainly is not dependent on railroads and canals for effective withdrawal. The loss of all these facilities affected the enemy seriously, but the difficulties presented were not insurmountable. The German was confused. His units in contact failed to provide the necessary combat intelligence, and he did not know the locations of his own divisional troops--his communications were inadequate.

On the other hand, our own advance would never have been possible without direction and coordination. Our methods differed somewhat from those used by the Germans in the invasion of France in 1940. Although our plans for the initial amphibious assault were extremely detailed, their execution involved intricate systems of communication. Our later plans were based on battlefield developments, and the resulting combat intelligence. After the breakout planning was necessarily abbreviated and dissemination of orders rapid. The development of intelligence and the direction of troops is not possible in a rapidly moving situation without effective communication. Communication was the key to the success of our advance. Radio and radio relay provided the flexible system of information and control so necessary to the commanders in

the field. Radio relay carried great volumes of traffic with an astonishingly low demand on personnel and with a minimum of logistical support.

The great advantage of radio relay over wire circuits which could carry equivalent traffic is shown best by figures. Material for a 100-mile wire line with four wires weighs ninety-four ship tons, whereas radio relay for that distance weighs only twenty-five ship tons. The construction of such a wire line would take four battalions, or 1,820 men ten days, while forty-four men can install the equivalent radio relay and put it into operation in two days or less. Moreover, after the wire line has been constructed every foot of it is vulnerable to bombing, sabotage, demolition, accidents from vehicles; even buried cables were cut by bulldozers, graders, etc., whereas a radio relay system is subject to trouble at only the two terminal stations and the two or three relay stations and there are always alert men at each of these points to prevent or to correct immediately any interruption.³

As our troops moved with increasing speed across France from the Normandy beaches, long circuits were required "faster than any type of wire circuits could possibly be installed."⁴ Radio relay, although widely used forward of army group headquarters, was even with its great advantages unable to satisfy the initial demand. Radio relay equipment could not be provided in the necessary quantity. Sufficient long range radios were not readily available, and improvisations, such as General Patton's use of the Sixth Cavalry Group as a Third Army communication agency, were unable to fill the gap completely. Field wire was used in enormous quantities; over 900,000 miles were consumed in the European Theater during eleven months of operations.⁵ Logistical support was not sufficient to provide such quantities initially to our rapidly moving armies. Communication suffered; as our formations were

3. Major General W. S. Rumbough, "Radio Relay, the War's Great Development in Signal Communications", Military Review (May 1946), p. 7.

4. Ibid. p. 4.

5. Ibid. p. 4.

extended, control was weakened. Regrouping was necessary and our troops were halted in the shadow of the German homeland, while the Germans were able to gather their scattered elements into a semblance of organization. Although they had left behind in their confusion many service and supporting troops which had been out of contact with headquarters, they were able to maintain their major combat grouping for a later defensive thanks to the time offered by the halted Allied advance.

Even though American troops had successfully used radio in offensive operations throughout the war, and even though it had been adapted to joint operations and integrated through radio relay into multi-channel speech and teletype circuits capable of being connected directly into telephone and teletype switchboards to handle voluminous traffic, it did not meet completely the needs of open warfare in Europe. Radio relay had been used in Africa, Sicily, and Italy, but was not provided in sufficient quantity to meet the demands of our rapid offensive. Our operations, of course, could never have proceeded successfully if it had not been for the communication provided, and in the face of our successful offensive, it is difficult to criticize our communication. In the shadow of our success, nevertheless, lay a basic weakness in communication and control, which although it had helped to set the stage for our most serious reversal of the war, the German winter offensive in the Ardennes, was not evident until that surprise attack had effectively split our forces and caused serious losses. The Germans, with the time which we had allowed them when our forces ground to a halt after the dash across France, not only reformed but actually launched a major counteroffensive.

Out of the early morning haze on December 16, 1944, this German thunderbolt, which had been forged from adversity, struck the U. S. First Army with the terrible force of surprise and violence which staggered the V Corps and sent the VIII Corps reeling in confusion. V Corps in the Monschau area was able to hold after its southern flank had been refused. VIII Corps, which bore the brunt of the attack, was so thoroughly shaken that chaos reigned throughout the vast undermanned Corps sector. The 14th Cavalry Group on the Corps' north flank was brushed aside by "Kampfgruppe Peiper", the lead tank infantry team of the 1st SS Panzer Division, the elite Liebstandarte Adolf Hitler, and then ground between that division and the German 18th Infantry Division as it skirted the northern shoulder of the Schnee Eifel, successfully cutting it off in conjunction with its sister division of LXVI Corps, the 62nd Infantry Division, and isolating two American infantry regiments. Farther to the south, the German LVIII Panzer Corps smashed against the southern 424th Infantry Regiment of the 106th U. S. Infantry Division, and after battering itself against unexpectedly strong resistance, as the 424th Infantry was bolstered with a strong counterattack by OOB of the 9th Armored Division, the LVIII Panzer Corps veered to the south in its efforts to reach Houffalize and by 18 December, in conjunction with the XLVII Panzer Corps, had effectively disrupted communications within the 28th Infantry Division, opening a route to Bastogne and the west. The German attack had effectively broken through VIII Corps north of the Schnee Eifel in the sector of the 14th Cavalry Group and to the south in the sector of the 28th Infantry Division.

VIII Corps had lost control of the situation. Forward battalions

and even regiments were out of contact with their division headquarters, available reserves had been committed and piecemeal reinforcement was made without proper orientation and without information of the enemy so necessary to their sound employment. Communication had been destroyed within the two key defensive divisions of VIII Corps, and this corps, which had operated effectively during the invasion while on the offensive, was now suddenly ineffective as a command agency. The basic cause of this reversal is obscured by the overwhelming enemy force which was brought to bear all along the corps front, but cannot be discounted in spite of the odds; this cause was inadequate communication. This is significant because it points to a general and critical weakness of our American Army. If we are to avoid such situations in the future, we must study the communications employed in the Ardennes Campaign, which is one of the few instances in which our late army fought defensively against initially superior forces on a large scale, and it must necessarily, therefore, set the pattern for the future.

It has been said that the student of the art of war should not criticize the decisions of officers in the field, upon the basis of knowledge that was not available to these officers.⁶ This dissertation is in no way an attempt at criticism, but an effort to show the importance of communication and its effect on decisions and actions. Commanders must have timely information in order to make sound decisions. In the future information will not be available and decisions will not be properly conceived or executed unless we heed the warnings of military history and their climax in the

6. William A. Mitchell, Outlines of the World's Military History p. 12.

Ardennes. Communication is the key to command. I have gone to considerable length in outlining the history of military communication in its effect on commanders, their strategy, tactics, and upon the technique of warfare. The full import of this study, unfortunately, is felt only by the man who has found himself in a position of command and great responsibility without the means of either contacting his own troops or locating the enemy. I will now turn to a more detailed study of command and communication in the Ardennes to show our shortcomings to those who aspire to lead American troops in combat with the hope that they will realize the importance of communication.

Let us begin our study with the individual soldier in a front line unit. The unit I have chosen for purposes of illustration is the 106th Reconnaissance Troop of the 106th U. S. Infantry Division. On December 16, 1944, the 106th Reconnaissance Troop was attached to the 424th Infantry and occupied the village of Grosslangenfeld, Germany, between the 424th Infantry and the 423rd Infantry to the north. I have purposely selected the 106th Reconnaissance Troop as the small unit for discussion because it possessed excellent means of communication and lay in a position between two regiments where contact was critical. The infantry rifle companies along the line had no better means of communication than the troop in question. In fact, infantry units of company size were generally limited to wire and a few very poor short range radios. The 106th Reconnaissance Troop was tied in by wire communication with the unit on its right, the Cannon Company of the 424th Infantry, and by patrols it contacted Troop B of the 18th Cavalry Squadron on its left next to the 423rd Infantry in the Schnee Eifel. In the 106th

Reconnaissance Troop were 13 radios, SCR 506, which were capable of providing reliable communication for a distance of at least 25 miles in the rugged terrain of the Eifel. Not one of these radios was effectively operated on or after December 16, 1944. The 106th Infantry Division was on radio silence prior to December 16, and the reconnaissance troop had failed to provide a listening watch for even one of its radios. After other means of communication had been destroyed and contact with adjacent units and higher headquarters by patrols or messengers was virtually impossible due to enemy activity, it was apparent that radio was the only means of communication available for calling for artillery support, supplies or instructions. The pertinent extracts of the SOI, however, were not available, and the radios could not be netted in the regimental or division nets.

The individual soldier in the 106th Reconnaissance Troop found himself, therefore, shortly after the start of the battle in a small unit which was completely isolated from all other American troops. Wire communication had been destroyed by heavy enemy shelling and messenger communication was prevented by the physical presence of enemy troops who had by-passed the position and cut the wire remaining untouched by artillery fire. Even though individuals in the 106th Reconnaissance Troop obtained significant information of the enemy and made observations of the movements of large bodies of enemy troops, they were unable to report to higher headquarters and, unfortunately for them, they were unable to call for artillery fire on the enemy troops which were attacking and by-passing their strongpoint. The individual in the troop had one comforting advantage; he was able to

talk to his companions, to communicate by voice, and to maintain visual and physical contact with the members of his unit, for the troop was concentrated in the small village of Grosslangenfeld. As he saw the adjacent position of the Cannon Company of the 424th overrun in the dim distance and as he heard the fellow troopers that Troop B of the 18th Cavalry Squadron was withdrawing on the other side of Grosslangenfeld, he was scared, utterly and completely scared. Soon his mind was intent on only one thing, self-preservation. All thought of previous training had been abandoned. Fear had driven from the soldier's mind his will to fight, and this fear was based on tactical ignorance--loss of communication, the foster parent of rumor, despair, and chaos. The troop commander in this case was no more effective than chaff before the wind. As the fog of war swirled and eddied about him, he surrendered, formally relinquishing the command which he had effectively terminated when he had failed to provide adequate communication.

The 106th Reconnaissance Troop had been eliminated, yet it had provided the next high commander with not one bit of information upon which he could act. Units all along the line were in the same predicament; with wire communication cut off they were unwilling to expend men on missions of liaison and contact, and in many cases such a course was virtually impossible. As communication was destroyed, the situation became increasingly obscure. For every report received, at least ten were not. Communication in forward areas had been quickly and easily destroyed. In this confused situation, higher commanders found themselves frantically grasping at bits of information, forcing themselves to make decisions based on assumption. Battalions in many

cases quickly lost control of companies when open wire circuits were cut by the initial artillery preparation. Regiments were in intermittent contact with battalions and the longer lines to division were effectively destroyed by sabotage, artillery bombardment and the movements of vehicles in the heat of battle.

The 106th U. S. Infantry Division had inherited from the 2nd Infantry Division, which it had relieved before the battle, a wire system of long standing which had been developed over a period of weeks into a complicated maze of wires. After the enemy attack had begun to affect the wire system, wire teams were unable to decipher the maze and were slaughtered by the enemy as they valiently laid wire into the very face of advancing enemy tanks. The 422nd and 423rd Infantry Regiments of the 106th U. S. Infantry Division were cut off in the Schnee Eifel and two of the infantry regiments of the 28th Infantry Division were cut off from communication with their division headquarters. Much has been said about the plight of the 422nd and 423rd Infantry Regiments which succumbed quickly to the enemy after they had been cut off in the Schnee Eifel. It is not commonly understood that these regiments were unable to call for artillery support. They could not do so because communication had been severed. The regiments had been thinly spread, for the 106th Division had occupied a front of approximately 28 miles. In such a situation, the most effective initial resistance that can be offered is through the employment of artillery fire directed by observers in front line strongpoints, and the next course of action is the transmission to the rear of information that will enable the commander to gauge the enemy attack so

that he can dispose his forces to meet it. Neither of these courses was open to the two infantry regiments in the Eifel.

It is interesting to compare the situation of these regiments of the 106th Infantry Division with that of the 101st Airborne Division at Bastogne. When it looked as if the 101st Division was going to be surrounded at Bastogne, a complete radio relay terminal set was mounted on a truck and sent into Bastogne as the last vehicle to enter the town before the Germans completed its encirclement. Through this set Corps had telephone and teletype communication with the division, whereas wire communication would have been impossible.⁷

Although the commander of the 106th Infantry Division promptly committed his meager reserves on 16 December, reserves under Corps control did not arrive in time to save the thinly spread troops of the 106th before the Schnee Eifel had been cut off by the German LXVI Corps. Time was of the essence and communication was necessary to make the most of the time available. Delays in the commitment of reserves were due not to poor intelligence but to poor communication which failed to transmit timely information, and apparent reluctance on the part of the Division Commander to present to Corps a dark picture of the situation until it had been established by reports. The 106th Infantry Division, although new to combat, was well trained from the standpoint of intelligence, but friendly as well as enemy dispositions and movements were obscured due to unforeseen communication difficulties. No infantry division in the U.S. Army possessed a radio communication system adequate for control in the mobile defense of large areas.

7. Major General W. S. Rumbough, "Radio Relay, the War's Great Development in Signal Communications", Military Review (May 1946), p. 11.

The advantage of a strong radio system is evident when we consider the excellent intelligence initially furnished by the 14th Cavalry Group, a unit organically dependent on radio communication, as opposed to the infantry regiment whose tactical doctrine relied on wire as the principal means of defensive communication. The 14th Cavalry Group, attached to the 106th Infantry Division, was able to produce timely intelligence early in the attack due to its organic communications advantage. Radio functioned under the battering of artillery bombardment and withstood the forays of enemy troops and tanks; wire did not. The S-2 of the 14th Cavalry Group, basing his estimate on reports received from front line cavalry units, correctly evaluated enemy strength and accurately located the 1st SS Panzer Division during the morning of 16 December. Later developments were to show, however, that the organically sound communication system of the cavalry group failed to function properly under stress, primarily because of personnel failures, failures which produced significant time lag in the transmission of messages. In one instance the group liaison officer at division reported the group locations approximately nine miles forward of actual positions. The discrepancy in this case was due to bungling and delay in deciphering slidex code by the liaison officer.

Since reserves could not be committed in time to halt the German attacks in the forward areas, the enemy was able to provide the necessary momentum to his two initial penetrations in the VIII Corps sector to drive deep into our rear areas cutting communications as he went. Wire communication was destroyed and service units were thrown into confusion, with the exception of those organizations which were able to rely on radio for control.

During the critical days of the "Battle of the Bulge," radio played what was probably its most important role in First Army Ordnance Service. . . . Two battalion headquarters and approximately twelve ordnance companies (52d Ordnance Group) were located in the path of the advancing German forces. All these units, with the exception of one ordnance medium maintenance company were withdrawn without loss of personnel or materiel. One battalion headquarters, the 86th, and several of its companies, located in Malmedy, were ordered by telephone to withdraw on the afternoon of 17 December. This was the last wire communication that the 52d Ordnance Group had with any of its units located in the sector of the German attack. All other units of the 86th Ordnance Battalion and the entire 83d Ordnance Battalion were alerted by radio and, as the necessity arose, were ordered to withdraw along specified routes.

During the next two or three days, Army Headquarters moved twice and 52d Ordnance Group Headquarters moved twice. During this time Group Headquarters was in continuous radio communication with Army Ordnance and with all its battalions. . . .

The attention of the reader is invited to the fact that with the exception of a few telephones, a small amount of wire, and a few switchboard operators, all the personnel and equipment of the First Army Ordnance Communications System was in excess of appropriate T/O&E, and was obtained by special authorization. It is earnestly hoped that, in the adoption of future tables of organization and equipment for ordnance units, serious consideration will be given to this vital accessory to ordnance service -- communications -- and that adequate personnel and equipment be provided therefor.⁸

As the German spearheads were driven through the army maintenance area, the command channels of our major headquarters were destroyed. Open wire circuits and buried cable were effectively cut and finally the radio link system between Army Group and Army was over-extended.⁹ Although personal liaison could still be maintained and roundabout communication was improvised through commercial lines, communication was one of the considerations in the shifting of command of First Army to 21st Army Group

8. Colonel J. D. Sams, "Communications In Army Ordnance Service", Military Review (May 1947), p. 53.

9. Robert E. Merriam, Dark December, p. 123

control. We see, therefore, that communications had a major influence on the tactics and command employed in this great battle.

Now what lessons are to be derived from the Ardennes campaign?

It seems to me there are at least the following:

1. Radio is fundamentally the principle means of communication on the mobile defense. Wire, although more secure from the standpoint of counterintelligence, is not dependable when subjected to bombing and heavy artillery concentrations.

2. Radio link is definitely advantageous for handling large volumes of traffic but alternate or mobile relay stations must be provided in quantity sufficient to allow regrouping, shifting of troops, and large-scale retrograde movements.

3. When defending wide areas, we must of necessity hold lightly and rely on air and artillery support and counterattack as our principle defensive means, and these means can be employed only through a flexible dependable communication system.

4. During World War II, radios of adequate range were not available in sufficient quantity in infantry divisions to allow employment of the divisions defensively on wide fronts. Adequate radio systems were not provided for supporting service units.

5. Even though sufficient radios of proper range be provided, they will not provide command control unless operating personnel is trained to use them efficiently.

6. Although radio communication is possible when equipment

and trained personnel are provided, commanders of all echelons must make communications systems workable through personal support and supervision.

In general terms then, we can say that during World War II communication, principally radio and radio link, made possible the command and coordination of our field armies, and that while these means of communication were capable of supporting a successful and rapid offensive of combined arms, they must be provided in greater quantity before we can obtain maximum speed and momentum in our attack. Moreover, the allocation of equipment should include that designed to meet the needs of the defense as well as the offense. Less reliance should be placed on defensive wire communication. We should devote more time to the training of personnel in the use of communications, and we should spare no effort in developing an awareness of the significance of communications in officers of all ranks.

We have traced the development of communication and its effect on command from the beginning of history until the end of the recent war. Combat has been marked throughout the ages by a constant struggle for dominance by increasing offensive power which, although it has usually been met by an increase in defensive strength, represents a definite trend toward open warfare. This trend has been dependent upon development of means of communication and control. Early commanders were restricted to struggles based primarily on physical and numerical superiority on the immediate battlefield. Once battle had been joined, troops could not be manipulated and reserves could not be controlled. After the commander had made his plan and committed his troops, he had little influence on the outcome of

the battle. Later developments in control permitted flexibility, and the Romans were able to employ mobility to defeat the Carthagenians who had failed to perfect the technique of coordinating the movements of large forces. Europe was unable to produce a system of control whereby her larger armies were able to meet the rapidly moving Mongul columns to destroy them in detail before their juncture at the Danube. Even Napoleon was not able to handle his reserves as he desired for his means of communicating orders were faulty. During the later stages of the Civil War and during World War I, the trend toward open warfare was blocked because communications had been adapted to the defensive in such a way that the slower offensive could be countered with reserves and artillery. Wire communication had provided the defensive with great strength by the end of World War I, and the balance did not swing in favor of the offensive until the widespread use of radio made possible adequate control on the offensive in World War II. Just as radio has strengthened the offensive, however, it promises great strength to the defensive if employed along the lines indicated by our lesson in the Ardennes. The future of the defense is even stronger when we consider the possibilities of employment of long range guided missiles directed by observers from lightly held forward areas.

The capabilities of an organization to conduct a mobile defense against tanks and infantry, with air and artillery support, depends on the following factors, as well as the mobility and strength of the enemy force:

1. Width of sector to be defended
2. Artillery, guided missile, and aerial support

3. Available reserves and their mobility

These three factors are all dependent upon the control which the commander is capable of exercising.

In the first instance, the width of the sector determines the nature of the composition of garrisons in forward positions. If the sector is wide, garrisons must of necessity be small and widely separated, and their mission must be that of reporting enemy dispositions and directing artillery and long range guided missile and aerial attack upon the enemy formations. It can be assumed that in the future the manpower differential between our country and our probable opponent will dictate such a defense, based on holding wide sectors lightly, with forward elements located along important terrain features and avenues of approach. The tying-in of this forward line will be, in most cases, dependent upon radio communication which is the only means upon which the commander can depend for control.

In the second instance, the commander can support the holding garrisons only in proportion to his ability to control communication with these elements in order to direct fire and bombardment upon the enemy.

Considering the employment of reserves in the third case, it is obvious that the commander can obtain accurate and timely enemy information, upon which to base his decisions for employment of reserves, from his forward elements and supporting aircraft, primarily through radio communication. Moreover, as has already been indicated, manpower considerations can be assumed to be such that the commander cannot afford to make any error in judgment in committing a reserve that will be extremely difficult to replace.

Since his communication must be positive, rapid, secure, and flexible enough to stand up under the pounding of enemy attack, it must of necessity be built around radio.

In the final analysis, therefore, command in the conduct of the mobile defensive type of warfare which may be expected in the future, will be dependent upon communication based on the intelligent use of radio in all echelons.

Any offensive action that we may adopt in the next war must inevitably consider the manpower differential also. Intelligence will be vital to the commander, who cannot embark upon an operation without assurance of success with minimum losses. Control must extend from airborne troops to guided missile and rocket support operated from rear bases. Communications must provide this flexible control, as well as the means for transmitting intelligence. As in the mobile defense, the system must depend on radio.

In order to insure successful command of our troops in the future, we must provide radios of appropriate ranges in all echelons. We must make all personnel communications conscious. Each commander must consider communications as a potent weapon, which requires his personal attention and supervision.

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