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HOW MUCH IS ENOUGH?
The Requirement for Increased Infantry Dismount Strength
in Heavy Divisions

by

Major Douglas D. Brisson
Infantry

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School of Advanced Military Studies
U. S. Army Command and General Staff College
Fort Leavenworth, Kansas

4 December 1987

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REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED			1b. RESTRICTIVE MARKINGS		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.		
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE			5. MONITORING ORGANIZATION REPORT NUMBER(S)		
4. PERFORMING ORGANIZATION REPORT NUMBER(S)			7a. NAME OF MONITORING ORGANIZATION		
6a. NAME OF PERFORMING ORGANIZATION School of Advanced Military Studies, USAC&GSC		6b. OFFICE SYMBOL (if applicable) ATZL-SWV	7b. ADDRESS (City, State, and ZIP Code)		
6c. ADDRESS (City, State, and ZIP Code) Fort Leavenworth, Kansas 66027-6900			9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION		8b. OFFICE SYMBOL (if applicable)	10. SOURCE OF FUNDING NUMBERS		
8c. ADDRESS (City, State, and ZIP Code)			PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.
			WORK UNIT ACCESSION NO.		
11. TITLE (Include Security Classification) How Much Is Enough?: The Requirement for Increased Infantry Dismount Strength in Heavy Divisions.					
12. PERSONAL AUTHOR(S) MAJ Douglas D. Brisson, USA					
13a. TYPE OF REPORT Monograph		13b. TIME COVERED FROM _____ TO _____		14. DATE OF REPORT (Year, Month, Day) 87/12/4	15. PAGE COUNT 55
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Mechanized Infantry heavy division technology and manpower		
			Panzergrenadier armored division combined arms theory		
			Motorized Rifle armored infantry dismounted infantry		
19. ABSTRACT (Continue on reverse if necessary and identify by block number)					
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20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED		
22a. NAME OF RESPONSIBLE INDIVIDUAL MAJ Douglas D. Brisson			22b. TELEPHONE (Include Area Code) (913) 684-3437	22c. OFFICE SYMBOL ATZL-SWV	

Block 18: Army of Excellence AirLand Battle doctrine
infantry strength armored warfare theory
attrition

Block 19: The monograph concludes that the weight of evidence indicates not only a shortfall in requisite numbers but inherent and tangential degradation of the ability to perform combat missions. Moreover, this situation reveals flaws in the force structure that affect the ability of the division to employ combined arms doctrine.

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Accession For	
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Justification	
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Date	
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School of Advanced Military Studies
Monograph Approval

Name of Student: Major Douglas D. Brisson
Title of Monograph: How Much Is Enough? The Requirement for
Increased Infantry Dismount Strength in Heavy
Divisions

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Advanced Military Studies

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Director, Graduate Degree
Programs

Accepted this 14th day of December 198 .

ABSTRACT

HOW MUCH IS ENOUGH? THE REQUIREMENT FOR INCREASED INFANTRY DISMOUNT STRENGTH IN HEAVY DIVISIONS by MAJ Douglas D. Brisson, USA, 55 pages.

The reliance on technology to replace manpower is a dominant aspect in the development of U. S. Army force structure and organization. The decreasing numbers of infantry dismounts in U. S. heavy divisions, especially under the Army of Excellence AOE's, is one symptom of this approach. However, has the capability of the division been degraded as a result of diminishing the human portion of combined arms? This monograph examines the impact of decreased infantry strength on the effectiveness of a heavy division.

This monograph relies on five sources to gain data in order to evaluate this issue. The sources are theory, historical examples, current U. S. doctrine and force structure, the structure of other nations' heavy divisions, and casualty loss planning data. This information is then measured against four criteria that relate to the ability to accomplish a mission.) The criteria are, in essence, combined arms warfare capability, sufficient strength to perform tactical missions, staying power, and doctrinal consistency with Airland Battle.

The method of gathering and evaluating data resulted in a common basis upon which to compare and contrast structures, missions and capabilities over time. The monograph concludes that the weight of evidence indicates not only a shortfall in requisite numbers but inherent and tangential degradation of the ability to perform combat missions. Moreover, this situation reveals flaws in the force structure that affect the ability of the division to employ combined arms doctrine.

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I. INTRODUCTION

The Army of Excellence (AOE) is a marketing slogan adopted by the Department of the Army to express both a capability goal and a force structure concept. The goal is to "maintain a high state of readiness, mobility, and flexibility... in order to support national strategy."¹ The concept is to field more combat power while operating with a fixed active component end strength. What remains untested and, therefore, unanswered is how effective the concept is toward attaining the goal.

The Army attempted to answer this question in the FY 88 Posture Statement by asserting:

We have a warfighting doctrine that employs maneuver and firepower to defeat the enemy. We are fielding, within resource constraints, the most advanced weapons into the hands of the highest quality soldiers in our history. We are capitalizing on our qualitative advantage to use a competitive strategy that pits our enduring strengths against enduring Soviet weaknesses.²

However, encompassed in this statement are two important clues to the driving forces behind AOE.

The first is the matter of resource constraints. Personnel costs are a big ticket item in the budget, and the decision to fix the end strength of the Army at 781,000 was both a political and economic move more than a doctrinal statement of sufficiency. Shortly after assuming command of TRADOC, General Maxwell Thurman stressed,

The Army doesn't need a strength increase. First of all, we can't afford it. There is a finite amount of money, and all you have to do is look at the budget numbers. To modernize your equipment you have to take some appetite suppressant.... So there is a fiscal reason for limiting the growth of manpower in the Army. ³

The second is an inherent reliance on technology to replace manpower. The FY 88 Posture Statement underscores this: "In response to a broadening spectrum of threats, today's Army has been

restructured to capitalize on technology and to operate effectively in diverse and distant geographic settings." 4 In fact, the reliance on technology is also manifest in the modernization strategy associated with AirLand Battle doctrine.⁵

Although there is nothing inherently wrong with a concept that stresses maximum modernization for the dollar coupled with a lean structure that emphasizes combat power, it is essential that platitudes are not allowed to pass for substantive analysis. Army Chief of Staff, General Carl Vuono championed the value of AOE:

We changed the design to support our AirLand Battle doctrine, to meet the requirements we knew we would face in various theaters. We improved the capabilities, I believe, of our heavy divisions (emphasis added). We improved the capability of our corps by adding combat capability.⁶

Despite such assurances, the fact remains that one aspect of AOE was the reduction in size of heavy divisions in order to free manpower for the creation of two new light divisions.⁷ The restructuring of the heavy divisions under the J and L-series TOEs is supposed to have a salutary effect on combat power, but no change comes without some cost attached. For the heavy divisions, one cost was the reduction in the size of the mechanized infantry squad from 11 men under the H-series TOE to 9 men under the new.

On the surface, this reduction appears to be a small sacrifice to make for the advantages of two additional infantry divisions. But the reduction in squad strength coincided with the introduction of the Bradley Fighting Vehicle which required a crew of three and could only dismount a maximum of 6 soldiers if the squad was at full strength. Therefore, while AOE points to the increase from three to four maneuver companies in each maneuver battalion (up 33 per cent), the former commander of the 2nd Armored Division, Major General Richard Scholtes complained about the shortage of infantry dismounts.⁸ A

heavy division of roughly 16,000 soldiers dismounts either 960 or 1200 infantrymen when configured as an armored or mechanized infantry division respectively (counting platoon leaders, squad leaders and RTOs).⁹

This small dismount strength raises doubts about the ability of a U. S. heavy division to accomplish the missions expected of it. However, in order to evaluate how serious a problem, or if it is a problem at all, this aspect of AOE presents, it is necessary to measure what requirement exists for dismounted infantry in a heavy division against specific criteria.

This paper will focus on four criteria as they relate to dismounted infantry strength. First, does the current TOE meet the requirement for combined arms warfare? Second, does the TOE provide sufficient strength to accomplish the tactical tasks associated with expected missions? Inherent in this criterion is whether or not the increased firepower and technological improvements of a modernized heavy division compensate for a decreased infantry strength. Third, given probable attrition rates, does a heavy division have sufficient staying power? And fourth, is the TOE consistent with the tenets of AirLand Battle doctrine?

Since the U. S. Army has no recent combat experience for its heavy divisions, this analysis will rely primarily on five sources to reach conclusions based on the stated criteria. The sources are theory, historical examples, current structure and doctrine of the U. S. Army, comparisons of infantry dismount strength in other armies, and planning factors for attrition.

Theory is an important source because it provides the basis for doctrine and hence for force structure. This paper will briefly examine the initial theories on armored warfare that appeared during

the inter-war period. Building on this will be a discussion of the views presented by some contemporary theorist-commentators on the role of infantry on the modern battlefield.

Historical examples will be drawn primarily from World War II and the recent wars in the Middle East. World War II provides the baseline of data for the experience of armor and mechanized infantry operations. The U. S. experience is particularly relevant, but this study will examine German and Soviet actions as well. The Arab-Israeli Wars are also valuable because of the use of armor and mechanized formations and the presence of relatively modern technology. Additionally, the Korean and Vietnam Wars, although not case studies on heavy division operations, provide information on the value of technology over manpower.

The next section of the paper will present contemporary theory on the role of mechanized infantry. In addition, the question of doctrine and the role of heavy divisions within the overall force structure will be examined. With these ideas as a basis, the subsequent section will compare and contrast the infantry component of the heavy divisions of Britain, France, the Federal Republic of Germany, and the Soviet Union with that of the United States.

Finally, the paper will consider the impact of attrition on the infantry strength in the heavy division. Besides relying on some reference to historical examples, the main analysis will focus on predicting attrition in various types of missions using a planning model taught at the Command and General Staff College.

II. ARMORED WARFARE THEORY AND THE ROLE OF THE INFANTRYMAN

One dynamic in the history of warfare has been the search for the correct combination of tactics, force structure, and weapons. This

quest has been manifest in the debates over whether offense or defense was the stronger form of war and whether maneuver or firepower was predominant. Force structure saw the phalanx versus the legion and later the cavalry versus the hollow square. Weapons witnessed the triumph of the longbow over the armored knight and, finally, the rise of gunpowder.

Most of this change was evolutionary, although at times the application in a given battle seemed to have revolutionary or decisive results. But the advent of the Industrial Revolution impacted on this process by accelerating the rate of change and facilitating the fielding and supply of mass armies. These two effects in turn had countervailing influences. While the speed with which technology changed threatened defeat to those armies that did not modernize, the economic cost associated with updating the equipment of a mass army every few years became prohibitive. By the end of the 19th century, these factors, coupled with the increased lethality that new technology brought to the battlefield, caused some such as I. S. Bloch to conclude that war had become impractical if not impossible.¹

Although the stalemate and slaughter predicted by Bloch occurred in World War I, nations sought ways to overcome the impact of firepower on the battlefield in order to restore maneuver. Most military theorists heralded the tank as the solution to trench warfare; however, there were opposing schools of thought on how it should be employed. One, epitomized by the French General Staff, viewed the tank as an infantry support weapon, mobile artillery that would neatly fit into the scheme of the Great War battle that it planned to refight.² The other school, led by Liddell-Hart, J. F. C. Fuller and Heinz Guderian, saw the tank as the symbol and instrument of a completely new, revolutionary form of warfare.³

Motorization or mechanization was a logical outcome of the application of technology to the problems of warfare. The tank represented an attempt to solve the dilemmas of the battlefield by incorporating firepower, mobility and protection into one weapon system. One concomitant of this approach was a deemphasis of the role of man on the battlefield. Technology was viewed as a combat multiplier that allowed fewer men to exert more combat power. Machines could do the job better and incur fewer friendly casualties. Moreover, the lethal environment on the modern battlefield made questionable man's survivability when separated from the protection of the machine.

Thus, the place of infantry on the battlefield was called into question by the "armored warfare" theorists. Liddell-Hart saw the only future use for infantry and artillery as the stationary defenders of fortified airbases.⁴ For him the tank held a clear "superiority.... over an amalgam of infantry, cavalry, artillery, and infantry-bound tanks..."⁵ Infantry could exert a small role in the offense, travelling in armored transporters behind the tanks ready "for 'ferret work' against suitable objectives."⁶ Although he modified this view over the next decade to credit dismounted "light" infantry with a critical function in creating conditions for successful exploitation by mobile forces, he continued to view mechanized forces as the decisive arm.⁷

Fuller wrote, "In battles between armoured machines infantry can play no part worth their risk..."⁸ He considered their role to be confined to mountainous or forested terrain or to occupation duties in enemy territory. At the same time, he argued for the motorization of cavalry, which in effect would be mounted riflemen or dragoons, in order to accomplish the deep and high speed reconnaissance and raids beyond the capability of tanks.⁹

Although Guderian believed that tank forces should not be designed for direct support of the infantry, he stressed not only the necessity for cooperation in the attack but also variety of methods that could be employed to achieve cooperation.¹⁰ He cautioned,

Rarely, if ever, will the tank attack completely wipe out the resistance of the hostile infantry. Individual machine guns will remain undiscovered or come to life again. Tanks can materially facilitate infantry action and in many cases, will be indispensable in preparing the infantry attack, but they cannot take over the infantry's role in combat. The infantry's job lies in an immediate exploitation of the tank attack by a rapid advance.¹¹

Guderian's thoughts evolved toward the necessity of combined arms. He credited Liddell-Hart for the suggestion of a new type of division containing both tanks and armored infantry.¹² But, he later wrote, by 1929, he had become convinced that tanks working independently or in cooperation with infantry could never achieve decisive results. It was key to form armored divisions that included all the supporting arms if "tanks were to fight with full effect."¹³

The views of these "capitalist" pioneers of armored theory were studied with much interest but commented on with much skepticism by leading Soviet military writers and theorists of the period. V. K. Triandafillov, though not repudiating the tactics, vehemently disagreed with the force structure conclusions: "It barely is possible to take seriously these individual assertions of some foreign and Soviet military writers. The idea that small, albeit motorized, forces can conquer modern states is naive." Rather, he argues, mass armies have the capabilities "not only to drive out, but to isolate and destroy small motorized units..."¹⁴ He concludes,

The best conditions for free maneuver, for extensive tactical and operational art, will be achieved not through a return to the small armies of the armchair warriors, but by the corresponding increase in the mobility of modern million-man armies by improving the technology of transportation assets [emphasis in the original]...¹⁵

Writing in 1937, Marshal M. N. Tukhachevskiy agreed with Triandafillov's criticism of Liddell-Hart, et.al. and goes on to discuss the importance of combined arms. He is critical of those that "saw no possibility of organizing coordinated action between tanks and artillery in any new way in the combined arms operations of rifle units [the Russian term is soyedineniye which is normally applied to divisions or corps]." ¹⁶ In this aspect, Tukhachevskiy was very close to the opinion of Guderian.

These theories provided the foundation for the force structure and organization adopted by the major European powers prior to World War II. Some argued for infantry supported by tanks, others for combined arms in varying ratios, and still others for independent armor fleets. But these were theories; it remained for war to prove which, if any, was valid.

III. HISTORICAL EXAMPLES

World War Two

Germany

The term blitzkrieg and the image of armored formations slashing deep into the rear of enemy defenses are a legacy from World War II. But they are also part of a myth. The war in the European theater of operations was fought primarily by infantry armies with varying degrees of motorization.¹ The success of armored formations depended in large measure on how quickly supporting infantry could consolidate the gains of the tanks. This fact is important to consider when evaluating the relationship between armor and infantry during the war.

The German Army, most noted for its forward thinking concerning motor/mechanization, remained predominately an un-motorized infantry army throughout the Second World War. The irony in this condition was that the German General Staff, headed by General Ludwig Beck, had

entered the 1930s convinced that all infantry should be motorized.² Unfortunately, Hitler's decision to expand the army rapidly coupled with an economy unprepared to turn out large quantities of military vehicles forced the General Staff to make hard choices about the number and structure of motorized formations.³

The result of this decision, despite Guderian's claim of bringing the German Army into the age of armored warfare, was that Germany entered the war with only 14 panzer and panzergrenadier divisions vice almost 90 infantry divisions. Nor did this situation improve markedly in relative numbers as the war progressed. However, the importance of increasing the amount of motorized infantry was one lesson that was drawn from the experience in France.

Although much attention has been focused on the panzer divisions during the spectacular breakthrough in the Ardennes, infantry divisions made four of the eight key bridgeheads across the Meuse River. Moreover, the crossings made by the panzer divisions were initially made and secured by the in-house panzergrenadiers of those divisions.⁴ General Erich von Manstein considered that the results of the campaign in France demonstrated a need to motorize more infantry in order to exploit success.⁵ His view is particularly interesting because he saw the solution not in adding more tanks but in motorizing the infantry so it could better support and take advantage of penetrations.

The German General Staff was unable, however, to implement the changes called for as a result of the experience in France. The Army desired to have time to build the divisions up to a common standard, but the preparations for invading the Soviet Union precluded any controlled, across-the-board modernization. To be able to meet the minimum requirements for new divisions, the number of tanks in

existing divisions was reduced and captured French equipment was pressed into service. Consequently, German panzer divisions rolled into the Soviet Union with fewer tanks and fewer infantry. The impact was felt almost immediately.

General von Manstein's LVI Panzer Corps consisted of three divisions, one of which was infantry. He notes that within two days after the invasion the corps was 105 miles deep into enemy territory with the 8th Panzer and 3rd Panzergrenadier but that the 290th Infantry Division was unable to keep pace. By the 26th of June, the two motorized divisions had seized crossings over the Dvina river at Dvinsk, over 180 miles from the border while the 290th was some 80 miles to the rear. Greatly astonished at his success, Manstein also observed that the motorized divisions had insufficient men to deal with all the prisoners.⁶

As the campaign continued, the infantry shortage of the LVI Corps became worse. North of the Dvina, the terrain became more forested and increasingly unsuited to mobile warfare. By the 26th of July, Manstein pointed out that he had suffered 6000 casualties in his mobile divisions alone and that he considered it "essential that infantry be made available...otherwise the mobile divisions would reach Leningrad in no fit state for fighting."⁷

The experience of Manstein's corps was repeated elsewhere. Army Group Center had tremendous success in enveloping hundreds of thousands of Red Army soldiers in pockets at Minsk, Smolensk and Bryansk. However, many thousands were able to escape because the mobile units had outstripped the infantry divisions and there was insufficient infantry in the panzer or panzergrenadier divisions to seal the encirclements.⁸

In early September 1941, Guderian's panzers experienced a setback

when the Soviets counterattacked at the Yelnya salient. The mobile units had been driven hard for over two months without a break. During the ensuing defensive battles, the lack of infantry in the motorized formations became evident as these units struggled to cope with Russian breakthroughs. In the end, only the timely relief by infantry divisions stabilized the front.⁹

Guderian was to suffer a similar fate in early December 1941 as he attacked Tula enroute to Moscow. The Red Army had been able to prepare the defenses around Tula during the preceding weeks. The initial assaults of the weakened panzer divisions could not overcome the strongpoints. Finally, Guderian resorted to attacks by infantry divisions with the aim of clearing a path that the panzers could exploit. Unfortunately, the infantry divisions themselves were too weak at this point.¹⁰

Another example of the importance of infantry is provided by the 19th Panzer Division's action in spearheading an encirclement. On August 22, 1941, the 19th Panzer which was at 67 percent strength in tanks and 75 percent in infantry attacked through a penetration created by three infantry divisions. Supported by the 20th Panzer, the 19th was to drive through the base of a salient held by the Soviet Twenty-second Army at Velikiye Luki. By using its organic infantry, the 19th was able to drive on despite difficult terrain and the lack of success by supporting attacks. In the end, the efforts of the 19th directly contributed to the destruction of eight Soviet divisions and the capture of almost 30,000 prisoners. This operation succeeded because the division had sufficient infantry present at key moments. Early in the operation, the division was isolated from supporting infantry divisions and had to rely on its organic infantry to keep open routes, protect flanks and clear restrictive terrain.¹¹

Finally, the actions of the 17th Panzer Division in the Ukraine near Stalingrad in late December 1942 and early January 1943 underscore the role of infantry in two different ways. In the first operation, the 17th had only one of two tank battalions with a total of 54 tanks and was under 50 percent strength in infantry, having only 2,300 personnel in its two panzergrenadier regiments. Yet, the division was able to enter a fluid situation and, by using the motorized infantry regiments piecemeal at first and later in concert with the tank regiment, was able to secure the flank of the 4th Panzer Army. In the second operation, the 17th had the mission to defend an extended front along a river line. In this instance, the division commander took the risk of using his tanks to strike enemy formations in a series of spoiling attacks. He was able to do this because he had enough infantry to conduct a limited defense of the river line while the tanks were raiding the enemy.¹²

There are numerous other examples of the important, if not vital, role played by organic infantry in German panzer divisions. Likewise, there are some examples of the tanks operating successfully for limited periods without any infantry; but these are usually under ideal conditions. Moreover, the requirement for infantry could arise so suddenly that its absence often was a prescription for disaster.

The Soviet Union

The Soviet Union had a different perspective on World War I than did the nations in the west. Politically, it was a capitalist or imperialist war; and the forces unleashed by the war brought the Bolsheviks to power and the Soviet Union into being. Militarily, the Soviets evaluated the trenches of the Great War through the prism of their Civil War. While the armies in the west theorized about how to

refight World War I, the Red Army was born during the Russian Civil War; and it was that experience--one of flying columns, armored cars and armored trains, sweeping mobile operations on a fluid battlefield --that painted the image of how to fight future war.

The writings of Triandafillov and Tukhachevskiy (see above) conveyed a vision of the battlefield that included mass armies using mobile, combined arms formations supported by aircraft and deep strikes by mechanized airborne forces. These theories were embodied in the early formation of Motor Mechanized Corps based on a principle of balanced forces.¹³ It is interesting to speculate as to who benefitted the most from the military exchanges that occurred in the 1920s and early 1930s between the Reichswehr and the Red Army.

The Red Army entered World War II, despite its initial pummeling by the Germans, with a sound heritage of armored warfare and combined arms doctrine. Unfortunately, the political events that led to a purge of Marshal Tukhachevskiy and most of the other senior leaders of the army set the stage for doctrinal changes which greatly affected the effectiveness of Red armor early in the war. In particular, the mechanized corps were disbanded and armor given the mission to support infantry.

The Soviets quickly relearned the importance of concentrating tanks for counterattacks and breakthrough operations. However, the pendulum had swung too far in the opposite direction; tanks were employed in mass attacks without supporting infantry or artillery. One example of this is the attempt of the Soviet Fifth Guards Tank Army to encircle and capture Kharkov in August 1943. Repeated attacks resulted in the destruction of hundreds of Soviet tanks through the combined efforts of panzers, antitank guns, artillery and entrenched infantry. The success of one supporting attack by a motorized infantry unit in

capturing 12 German artillery pieces gave a small indication of what might have happened to the integrity of the German defense had the Soviets employed a balanced combined arms attack.¹⁴

Until late in the war, the Germans were able to isolate pure Soviet tank columns and completely destroy them through effective combined arms. This resulted from either the German tactic of letting the tanks through and then stripping away the supporting infantry or the failure of the Soviet commanders to keep the tank and motorized forces together.¹⁵ That this latter lesson was not lost on the Soviets as they evaluated their World War II experience is evident in the way their divisions are organized today (see section of foreign armies' heavy division structures below).

The United States

The U. S. Army did not enter World War II completely unprepared. Although the nation had not fully mobilized either manpower or industry, some important steps had taken place such as setting up the draft and inter-staff discussions and planning with the British. Armor division structure and doctrine had also benefitted from the two and one half year preparation time since the outbreak of war in Europe. Army planners watched developments in Europe and gleaned valuable lessons based on others mistakes and successes. The German panzer divisions were the model.

The establishment of the Armored Force in July 1940 provided a focus for the creation of armored divisions. However, when it came under the Army Ground Forces commanded by General McNair in March 1942, there began a long period of negotiation between the two headquarters as to what the structure, doctrine and tactics of armored divisions should be.¹⁶

The initial Table of Organization (T/O) 17 dated 1 March 1942 was prepared by the Armored Force and was essentially a reiteration of the 1940 structure (see Table 1). The division fielded 232 medium and 158 light tanks. However, out of a total personnel strength of 14,620, the dismounted infantry strength was 945 or about 6.4 percent.¹⁷

General McNair viewed this structure as extremely wasteful in both manpower and equipment. He directed the Army Reduction Board to trim the armored division T/O back in line with what had been done to the infantry division.¹⁸ But McNair was not interested simply in the numbers. He also had a strong view about the doctrine of employment and this affected his concept of how the division should be structured.

Essentially, McNair believed that rather than constructing large, cumbersome armored divisions, the answer lay in forming small divisions as well as numerous separate tank and armored infantry battalions. To him, this provided tremendous flexibility since armored divisions could be tailored by adding the separate battalions as needed. Moreover, he argued that all the battalions, whether in or out of a division, should have exactly the same T/O. This would also ease the support of infantry divisions in the same manner.¹⁹

McNair was most interested in the issue of the proper ratio of infantry to armor. In August 1942, he pointed out to General Dever, commanding Armored Force Headquarters, that the Germans had restructured their panzer division significantly since the fall of France and now enjoyed an infantry-armor ratio five times higher than existed in the current U. S. armor division T/O. Not surprisingly, McNair's proposals which were forwarded to the War Department in December 1942 along with Dever's reflected both his concern for armored infantry and separate battalions.²⁰ The result of this debate

was that the War Department instructed McNair in January 1943 to develop new T/Os.²¹

The new T/O 17 dated 15 September 1943 drastically reduced the size of the armored division (see Table 1). The total strength was down to 10,937, a cut of 25 percent. There were now only 187 medium and 77 light tanks. Although the armor component had been significantly reduced, the infantry increased. The armored infantry regiment had been replaced by three separate armored infantry battalions whose aggregate strength was up by 25 percent. The actual dismount strength now stood at 1161, an increase to 10 percent of the division strength. The infantry-armor ratio had gone from 2.42:1 to 4.41:1. Concerning the concept behind this new T/O, McNair wrote, "The fundamental objective is to provide more infantry than at present. However, the organization is such that battalions of either armor or infantry may be added or subtracted from a division at will."²²

The Army did not significantly change the organization of the armored division for the remainder of the war, although there was another T/O in January 1945 (see Table 1). With this background, it is easier to evaluate the role and importance of armored infantry within U. S. armored divisions in Europe in World War II.

The actions of the 4th Armored Division in the Lorraine Campaign provide excellent insights in the importance of having sufficient infantry to work with tanks. The 4th was operating under the September 1943 T/O. The division had adopted the practice of forming task forces under its Combat Command, usually two per CCA and CCB. These task forces each normally consisted of a tank battalion and an armored infantry battalion. This balanced approach seemed to be most effective. The only drawback was that the armored infantry battalions

suffered higher casualties and were always at much lower strength than their tank counterparts.²³

Such were the conditions when the 4th conducted an attack against the town of Singling in early December 1944. It is not the purpose here to retell the battle since that has been done adequately elsewhere.²⁴ What is important is the interaction that occurred between the infantry and armor of Team B as it conducted its attack.

Team B consisted of B company 37th Tank Battalion and B company 51st Armored Infantry Battalion. The tank company had 14 tanks and was close to full strength while the infantry company had 57 dismounts available out of 129 authorized. Since the halftracks were unable to move through the mud, the infantrymen rode on top of the tanks to the vicinity of Singling.

As the action developed, the tank and infantry platoons operated separately from each other and no conscious effort was made to unify the disparate activities. No platoon seemed to know where the others were located except by chance encounters. The infantry were able to infiltrate and clear a large portion of the town and, consequently, developed some good intelligence on the location of enemy armor. However, this information was only passed to the tank platoon that operated within the town and then only by happenstance. In spite of these problems, Team B was able to hold a portion of the town long enough to allow the seizure of the nearby town of Bining. Team B was then relieved in place.

This action demonstrated the need for more infantry. Even with an understrength company, the infantry were able to occupy most of the town. However, complete occupation and clearing was not possible without additional manpower. Secondly, there were not enough infantry to provide support for the tank platoons and clear the town. The

tanks that operated without mutual infantry support suffered the most casualties since they did their own reconnaissance. A destroyed friendly tank was often the first signal that an enemy tank, SP or AT gun had been discovered.

This action at Singling was typical of actions during the Lorraine campaign. H. M. Cole observed,

The relation of armor to infantry altered perceptibly as the Lorraine Campaign progressed and tank going deteriorated. This change was indicated by attempts to convert antitank gunners and other armored division personnel to armored infantry, by numerous complaints that the armored division lacked an adequate complement of armored infantry in the Tables of Organization, by the rising proportion of casualties in the infantry organic to the armored division, and by the continuing demand from armored commanders for close support of the "doughs."²⁵

The Lorraine Campaign had shown the importance of infantry to armor in an offensive operation as well as the compound effects of attrition over time. In a similar way, these lessons were repeated during the Battle of the Bulge. Armor units were among the first sent in response because of their mobility and firepower; but these units were the least designed for fighting in the hilly, ravined and densely wooded terrain of the Ardennes.

The 7th Armored Division was the first to respond and played a critical role in upsetting the timetable of the German counter-offensive. One key feature of the 7th's success was the use of combined arms to overcome German superiority in numbers. This was particularly evident in the defense of St. Vith. Small teams of armor, armored infantry, artillery and engineers, formed ad hoc on many occasions, effectively developed a coordinated defense after tremendous initial confusion. It is doubtful that the tanks of the 7th could have held St. Vith for as long as they did without adequate infantry support.²⁶

Under McNair's guidance, the U. S. Army developed a doctrine and

force structure for armored divisions that emphasized the need for armored infantry. Ultimately, McNair was unsuccessful in retaining the large pool of separate armored infantry battalions. However, events vindicated his vision because the armored infantry became a highly sought after force, a force that always seemed to be in short supply.

The Korean and Vietnam Wars

The United States Army emerged from World War II as a combat-wise, battle-hardened, powerful military force. It had well learned, sometimes at a high cost in lives, the importance not only of combined arms warfare, but also the critical need for the proper mix of both complementary and supplementary arms.²⁵ However, at this pinnacle of success and readiness, all the lessons learned appeared invalid as the Army tried to cope with demobilization, a Cold War, and the impact of the atomic bomb.

Atomic weapons heralded a new age of warfare and, to some, such as Bernard Brodie, actually redefined the role of the military from war-fighting to war-detering.²⁶ The Korean War exploded into the midst of the reevaluation (and deemphasis) of the role of conventional ground forces in the atomic age. Suddenly, nuclear deterrence had little utility in stopping the North Koreans and later the Chinese.

The Army turned initially to its World War II experience and attempted to rely on ground maneuver and air interdiction. Combined arms were present although many of the lessons concerning effective use had to be relearned. As the Korean War progressed, the Army came to rely increasingly on firepower. Moreover, this firepower was to be achieved by weapon systems rather than increasing the number of frontline infantrymen.²⁷

Nevertheless, the experiences of the war reiterated the importance

of large quantities of regular infantry. One study uses one defensive and one offensive battle at the Pusan perimeter to illustrate that despite overall numerical superiority U. S. divisions were often unsuccessful because there was a shortage in foxhole strength that weapons could not compensate for in the Korean terrain.²⁸ In the first battle, the 24th Infantry Division with approximately 14,500 soldiers defended a portion of the Naktong River against an attack by a North Korean infantry division which was at 7,000 man strength (65 percent). Although it included 2,000 untrained recruits, the North Korean division was able to penetrate deeply into the 24th's sector. Only the additional commitment of forces numbering almost the same as the North Korean division prevented a breakthrough and eventually eliminated the penetration. The 25th Infantry Division with 24,000 men likewise met with little success in its attack against a 6000 man North Korean division that was supported by an additional understrength infantry regiment of between 1000 to 1500 men. Failure came although the U.S. division enjoyed a relative superiority of 3 or 4:1 in personnel, massive artillery support and absolute air superiority.

The relevance of this focus on a war not noted for its use of armored divisions is what it reveals about reliance on technology and firepower or manpower. The same study points out that one of the first costs that has come with this philosophy is that the number of fighters decreases. For example, the U.S. motorized division in the Korean War had a strength of about 16,000 and about 4800 vehicles. Add to the minimum of 4800 drivers all the maintenance personnel and others associated with keeping the division mobile and the study concludes that 40 percent of the division is non-combat.²⁹ This figure is even more significant when one considers that, including

tanks, ADA and prime movers for artillery, perhaps 300 vehicles were directly related to combat.

The Vietnam War, much like the Korean, is not associated with heavy division operations. But, by 1967, there was the rough equivalent of two mechanized divisions operating in South Vietnam.³⁰ Contrary to conventional wisdom at the time, armor and mechanized forces proved to be of great worth in the rice paddies and jungles.³¹ Even as the VC and NVA improved their antiarmor capability, the allied armor forces adapted to retain effectiveness and survivability.

One legacy of armor operations that came out of Vietnam was that mechanized infantry should fight mounted.³² Early in the war, U. S. advisors noted that when mechanized infantry dismounted to fight the VC (which was the U. S. Army doctrine at the time), the enemy was able to bring effective fire to bear. Throughout the war efforts were made to improve the capability of infantry to fight mounted. The armored cavalry version of the M113 is an excellent example of this approach. In fact, the study, "Mechanized and Armor Combat Operations, Vietnam," concluded that armored cavalry was the most cost effective force on the battlefield.³³

This deemphasis on the importance of the dismounted infantry in armor operations was part of the broader policy of massive reliance on technology to defeat the enemy. General Bruce Palmer observed that the greatest American successes occurred when the enemy struck dug-in units which were able to bring to bear the "devastating impact of greatly superior U. S. firepower, both ground- and air- delivered."³⁴ Fewer infantry, more technology and an apparent unwillingness to maintain contact for fear of excessive casualties resulted in tremendous expenditure of ordnance but less effective use of combat power.³⁵

The Middle East Wars

1973 was a watershed year for the U. S. Army. In January, a cease-fire agreement was reached with Hanoi that symbolically, if not actually, marked the end of American involvement in Vietnam. Shortly thereafter, ahead of schedule, the end of conscription and the transition to an all-volunteer armed forces was announced. Finally, in October, Egypt and Syria launched a surprise attack against Israel during the Yom Kippur religious holiday. As significant as the first two events were, it is the last that probably has had the greatest influence on post-Vietnam Army doctrine and force structure.

In 1967, while the United States was still embroiled in Vietnam, Israel, in a lightning six-day war, was able to defeat its more numerous and better-equipped Arab neighbors. Such dramatic success caught the imagination of American soldiers slogging through the jungles with no apparent end in sight.

The outcome of the 1967 war had a significant impact on the subsequent structure and emphasis of the Israeli Defense Force (IDF). Although there were important infantry actions during the war, Israel's military leaders began to view the tank and close air support as the key to future success.³⁶ The mechanized or armored infantry in the IDF had 1940s design M3 half-tracks which were hard pressed to keep up with the 1960s technology tanks. Therefore, in the wake of the war, the active components of the IDF were predominantly tank units while the armored infantry were relegated to the reserves.

The surprise Egyptian crossing of the Suez Canal in 1973 quickly overcame the thinly manned Israeli outposts on the Bar-Lev line. Although the line was well suited to an effective protracted defense, the Israeli command, partly because of the religious holiday but also

because infantry defense was not viewed as critical to the defense of the Sinai, decided only to maintain an outpost line. Nevertheless, many of the outpost fortifications, each occupied for the most part by a platoon of 20 reservists of the Jerusalem Brigade on annual training, held out for several days.³⁷

The Israeli plan to rush forward with tank reserves to reinforce the fortifications quickly ran afoul of the unexpected speed with which the Egyptians penetrated. The two "quick-reaction" tank brigades had lost almost 80 percent of their tanks by the morning of the second day. As the seriousness of the Egyptian attack became clear on the 8th of October, General Adan launched the three armored brigades of his division into a counterattack. These attacks were conducted without mechanized infantry support and ran into Egyptian infantry antiarmor ambushes resulting in a repulse of the counterattack with significant losses.³⁸

The Israeli situation on the Golan Heights was similar to that in the Sinai. Two armored brigades with approximately 170 tanks defended 45 miles of border. There were 17 platoon-sized outposts totalling some 350 men. As the Syrian attack by 3 mechanized and two armored divisions developed, the infantry outposts held on while the two tank brigades fought almost to extinction to buy time for reserves to arrive. This battle on the Golan has been viewed as a classic pure tank battle and as evidence that the lethal range of weapons is now so large that the role of close combat in modern warfare has diminished to a secondary role.³⁹

However, a reexamination of the events clearly demonstrates that not only was the role of infantry important but that many of the early crises faced by the IDF stemmed from a lack of infantry. On the Golan, after going over to the offensive, the IDF's 7th Armored Brigade

was ordered to take Tel Shams, which was the commanding high ground along the Damascus road. The rocky terrain made off-road maneuver very difficult and provided excellent concealment for Sagger units. Five separate tank attacks were repulsed. Chaim Herzog reflected:

The ill-fated attack on Tel Shams was considered to have been a mistake, especially as it had not been coordinated by [the brigade commander] with [the division commander]. Indeed it constituted a classic misuse of armour^[sic]. This fact was emphasized when on the night of Saturday 13 October, [the division commander] ordered units of the 31st parachute Brigade to attack Tel Shams. Storming the dominating height at night, these crack units of the Israeli Army, fighting in their element captured the position with a total loss of four wounded.⁴⁰

One cannot but speculate how much sooner and dramatic the results might have been had the counterattacking armor had accompanying mechanized infantry that could have effected the necessary combined arms support.

After the initial reverses in the Sinai, the Israelis began to rely on supporting infantry to provide armor with close-in protection and to secure penetrations of enemy defenses. The failure of combined arms doctrine is particularly evident in the Israeli use of airborne units as improvised armored infantry. The existing mechanized infantry were predominately reservists and were not adept at the necessary infantry close combat skills since IDF doctrine did not rely on their employment. Therefore, the armored commanders turned to the elite infantry units to accomplish these tasks.⁴¹

The combined arms lessons from the Yom Kippur War were reinforced during the 1982 Israeli incursion into Lebanon. The Israelis discovered the absolute necessity for close cooperation between armor and mechanized infantry in the restrictive terrain and city fighting that occurred. The slashing thrusts on the Sinai and the great tank battles on the Golan had given way to the attrition of Beirut and the Bekaa.

IV. CURRENT DOCTRINE AND FORCE STRUCTURE

The 1973 War occurred at a time when the U. S. Army was beginning to refocus its attention on how to fight a war in Europe. Yom Kippur witnessed the clash of modern tank fleets and the emergence of wire-guided antitank missiles (ATGMs). The tremendous influence of this event on the Army is most apparent in the 1976 version of FM 100-5 Operations.¹ In addition, the proliferation of "How to Fight" manuals and the reemphasis on "overwatch" formations signalled the doctrinal acceptance of lessons learned from the war.

The need for combined arms was emphasized at all tactical levels, something the Israelis had relearned the hard way. The appearance of AirLand Battle doctrine in the 1982 and 1986 editions of FM 100-5 was an evolutionary extension of combined arms doctrine into the arena of joint operations.² During this period of reorientation, the Army also began to reexamine its existing force structure. Initially most of this discussion focused on heavy divisions with the light infantry division concept being a relatively recent development.

As the heavy division force structure was developed and shaped toward the Division 86 format, the Army was also seeking to field a new main battle tank (MBT) and a mechanized infantry combat/fighting vehicle (MICV or IFV) to be able to cope with the increased threat posed by modernized and expanded Soviet forces in Europe. This effort clashed with the AOE initiative that sought to field more combat power by adding two divisions to the force structure. The evolution of the plan to make the army lean and mean is a topic beyond the scope of this paper; but ultimately, it resulted in a mechanized infantry squad that could only dismount 5-6 infantrymen.

This development brought the doctrinal/theoretical debate full circle. Just as had been argued in the 1920s and 1930s concerning the

proper ratio of infantry to armor, a new debate began in the late 1970s. This time, however, the visionaries contend that history proves the need for combined arms, particularly, lots of dismountable mechanized infantry.

The late Richard Simpkin was at the forefront of this school of thought.³ Undisputedly an advocate of armored warfare, Simpkin repeatedly sought to demonstrate that the correct mix of combined arms insured adequate infantry to support tanks.⁴ He opined, "With mechanized infantry, the difficulty lies in arriving at a meaningful and lucid definition of the role of infantry in the armored battle and the way it should fight..."⁵ The role, he was convinced, is "to maintain or restore the momentum of the advance when the tanks are slowed down or halted by ground, man-made obstacles or defensive fires planned to exploit terrain."⁶

Finding this definition was important, according to Simpkin, because in World War II, the Arab-Israeli Wars, and exercises in NATO, "the armored commander always seemed to be either crippled by running out of infantry or bogged down by having too much."⁷ The question of what constituted a proper ratio of infantry to armor was one of the central issues emerging from the combined arms debate in the 20s and 30s. For the Germans, it resulted in several different mobile division structures with tank-infantry ratios varying during the course of the war. Panzer divisions went from 2:1 to 4:3; cavalry converted to mechanized with a 1:4 mix; while panzergrenadier divisions began with 1:6 and ended with 1:4.⁸ As has been discussed above, General McNair struggled with this same issue.

Simpkin concluded that a balanced tank-infantry TOE was probably the best structure when the situation became critical.⁹ Western armies had moved in that direction as the result of combat experience.

The task forces of the 4th Armored Division mentioned above are illustrative of the trend. For contemporary force structure, Simpkin offered the case for a seven-man dismount squad for mechanized infantry with one IFV and squad for every tank organized into combined arms platoons of eight vehicles (3 tanks, 3 IFV squad carriers, 1 HQ tank, and 1 HQ IFV).¹⁰ Although the squad size is not very different from what exists for the Bradley, the organization translates into a requirement for 1680 dismounts in a mechanized infantry division and 2016 for an armored division.¹¹

What is striking about Simpkin's formula when applied in this manner is that the dismount strength increases arithmetically with the number of tanks. This relationship contrasts with the current structure which varies depending on the number of battalions (960 and 1200 dismounts for armor and mechanized infantry divisions respectively). It is not the purpose here to debate the merits of combined arms battalions as suggested by Simpkin, but the intent is to highlight the potential impact on force structure and doctrine from a theory of armored warfare based on the role of mechanized infantry. Simpkin's theory, which is supported by the writings of Paddy Griffith and John English, points to a doctrine that requires more infantry dismounts than present in the current U. S. heavy divisions.¹²

There are implications related to AirLand Battle doctrine as well. FM 100-5 states that the Army's ability to fight successfully depends on how well it adheres to the tenets of initiative, agility, depth, and synchronization.¹³ A dearth of mechanized infantry dismounts affects the ability of the heavy division in each of these areas.

Doctrine says that initiative "implies an offensive spirit in the conduct of all operations."¹⁴ Simpkin argues, and history supports the view, that "...the tactical or operational offensive is the type

of combat in which tanks most need infantry support and need it on the largest scale." ¹⁵ With AirLand Battle's inherent emphasis on offensive action, the need for an abundance of infantry should be an integral part of the doctrine.

Secondly, agility demands the ability to act more quickly than the enemy in order to seize and retain the initiative.¹⁶ Formations at every level must be capable of shifting the main effort with minimum delay and with the least possible necessity of reconfiguration and coordination. ¹⁷ Compliance with this enjoinder is at the heart of Simpkin's suggested balanced armor force; but, moreover, he and Griffith both consider that blitzkrieg warfare succeeds or fails, at least in part, on the effectiveness of the doctrine and equipment of mechanized infantry as well as the ratio of tanks to infantry.¹⁸ A lack of infantry impinges on the flexibility of the commander and the speed with which he can react to certain infantry-intensive situations.

Depth is defined as "the extension of operations in space, time, and resources." ¹⁸ Commanders are challenged to use less mobile forces in restrictive terrain to free mobile forces for maneuver.¹⁹ This aspect creates a dichotomy given the structure of the heavy division. Simpkin points out that a tank-infantry team can occupy about 25 km² and influence about 120 km². An infantry company, on the other hand, can handle 1 km² and 10 km² respectively.²¹ As infantry dismounts to perform infantry-intensive missions, its ability to perform in the mechanized role is diminished. Not only are there not enough infantry in the current heavy division structure to overcome this disparity, there exists a broader doctrinal void on tank-infantry integration.

In World War II, the U. S. Army consisted predominately of infantry divisions. These divisions provided the foundation from

which armored divisions operated and the force to consolidate the gains of the tankers. Internally, the World War II infantry division was capable of accepting and supporting the attachment of separate tank, tank destroyer or armored infantry battalions. This capability reflected doctrinal decisions by McNair incorporated into the force structure. It was not unusual, therefore, for infantrymen to work with tanks down to squad level. Today, the Army is struggling to relearn this doctrine. Military journals have been filled with articles musing over how to integrate the light divisions of AOE into the heavy-force environment in Europe.²² However, the logistics base of the light division is not conducive to the attachment of heavy forces. As a result, the constraint on the force, which seems to be reinforced by experience at the NTC, is that light can be attached to heavy but not vice versa.²³

Finally, the tenet of synchronization calls for "the arrangement of battlefield activities in time, space and purpose to produce maximum relative combat power at the decisive point."²⁴ Synchronization is the ultimate purpose of a combined arms doctrine. It is necessary not only to have actions converge in time and space but in the proper quantities as well. Simpkin contends, "Equipping a force with a suitable mix of armored vehicles roughly trebles the fighting power of every first-line combat soldier."²⁵ This remark must be considered in respect to Simpkin's concept of tank-infantry mix. Simpkin is not simply concerned about a ratio of vehicle type, since issue is the ratio of tanks to IFVs that have adequate infantry dismounts. Unfortunately, it is difficult to synchronize what is not there. U. S. heavy divisions are deficient at the tactical level in the infantry component of combined arms. Without sufficient infantry dismounts, the task force becomes nothing more than a mix of light and

heavy tanks.

IV. INFANTRY DISMOUNT STRENGTH IN FOREIGN HEAVY DIVISIONS

The United States Army is not the only army in the world today grappling with the problem of heavy division force structure. Much as was the situation between World Wars I and II, nations have adopted various doctrines and structured their forces accordingly. While what other armies have done is not evidence of error on the part of the U. S. Army, the way in which their forces have been structured provides a frame of reference to measure AOE heavy divisions because these nations are seeking solutions to similar problems. The heavy divisions of Britain, France, the Federal Republic of Germany and the Soviet Union will be used for comparison (see Table 2).¹

The British have only one type of heavy division which they designate as an armored division. In structure it is similar to a American mechanized infantry division with three brigades consisting of a total of 5 tank and 5 mechanized infantry battalions.² The wartime authorized strength of approximately 16,300 is close to current U. S. heavy division strength. The British doctrine calls for the formation of combined arms subunits at the lowest level. The infantry dismount strength is roughly 7.2 percent of the division aggregate and the infantry-tank ratio is 4.1:1 --both figures the same as for a U. S. mechanized division. However, the British order of battle also includes infantry divisions that are equipped with armored personnel carriers. These divisions could be task organized with armored units if necessary, thereby increasing available dismounts.

The French armored divisions are much smaller than the other divisions considered here, being roughly half the size. Under the 1985 reorganization tank regiments are pure while mechanized infantry

regiments have three mechanized companies and one tank company. Infantry dismounts account for 6.75 percent of the 9000 man armored division, and the infantry-tank ratio is 5:1. Though half the size of its American counterpart, the division has two-thirds of the infantry strength. Moreover, the 6,900 man French infantry division, which is equipped with the VAB armored personnel carrier--a vehicle similar to the Soviet BTR-60, has over 13.5 percent of its strength in infantry dismounts. Although this division has no organic armor, the VAB gives it the ability to operate with armor.

The West German heavy divisions are the largest of those examined here. The wartime strength will vary depending on the exact task organization but is between 18,000 and 21,000. The panzer division consists of two panzer brigades and one panzergrenadier brigade. The panzergrenadier division reverses the mix. The brigades are combined arms structures mirroring the divisions. The Marder IFV and the Leopard II MBT are standard in the active divisions.

The infantry dismount strength based on a seven-man squad is some 1470 in a panzer division and about 1840 in a panzergrenadier division. Assuming 18,000 and 18,200 total strength respectively, the infantry dismount strength is 8.2 percent of the panzer and 10.1 percent of the panzergrenadier division. The infantry-tank ratios are roughly 5.4:1 and 8.1:1, respectively. In addition, each of these divisions has a varying number of Jaeger battalions. These battalions are equipped with APCs and add approximately 325 soldiers per battalion to the available dismount strength.

Last, and certainly not the least, is the potential threat that each of the divisions discussed so far would have to face. The Soviet Union currently fields 150 motorized rifle and 50 tank divisions at different levels of readiness.³ The existence of 200 mechanized

divisions stresses the preeminent role given to armored warfare and mass in Soviet military doctrine, just as Triandafillov and Tuckhachevskiy stressed over 50 years ago.

The structure of Soviet divisions epitomizes the combined arms concept.⁴ A motorized rifle division (MRD) has three motor rifle regiments and a tank regiment; a tank division (TD) has three tank regiments and a motor rifle regiment. Both divisions have a full spectrum of supporting arms to include an artillery regiment. The motorized rifle regiment has three motor rifle battalions, a tank battalion, and an artillery battalion. Likewise, a tank regiment has a three, one, and one configuration.

This balance is reflected in the infantry dismount strength available to these divisions. Unlike the mass infantry formation following or riding on tanks in World War II, Soviet infantry today is almost totally mechanized to include the airborne divisions. The MRDs have an infantry dismount strength that accounts for 15.6 percent of its aggregate strength, and the infantry-tank ratio is 9.25:1. The tank division has 10.4 percent of its strength as infantry dismounts and a ratio of 3.7:1. Only the West German figures are comparable either as percentages or in absolute numbers. Even so, the Soviets have many more divisions.

This brief comparison is in no way intended to be either exhaustive or perfect; but it serves to point out that of the major powers fielding armored forces today, the United States approaches the battlefield with fewer infantry dismounts to effect combined arms doctrine than its major allies or its major foe.

VI. CALCULATING ATTRITION

The last issue considered in this paper is at the same instant the most important and the most difficult to determine accurately. How

many soldiers will be lost? This question is particularly relevant in a paper pondering whether or not there are enough infantrymen. Regardless of all the information, theory and arguments presented so far, the seemingly small percentage of infantry dismounts in a heavy division is not a problem if there are enough to do the jobs required. In general, the calculations represented in Table 3 indicate that there are not enough either to begin with or after a relatively few days of combat.¹

The missions that a heavy division is expected to undertake successfully are listed in FM 71-100, Armored and Mechanized Division Operations. These missions were used as a basis for determining the potential battle losses for dismounted infantry. The method is a simple one taught at the Command and General Staff College at Fort Leavenworth to help determine planning figures for expected casualties. Though much of Table 3 is self explanatory, it is worthy to note a few exceptional items. In offensive scenarios, expected dismounted infantry losses rapidly reach a point of combat ineffectiveness. The one day meeting engagement losses are over 20 percent of an armored division's infantry dismount strength and almost 18 percent of the mechanized infantry division's. With over a thousand expected casualties after three days of attack, a heavy division would have to be heavily reinforced with infantry to continue an attack on a fortified zone.

In this latter example, one can argue that a heavy division either would not be employed in such a way or could be expected to break through rapidly. However, such situations do occur as the German experience at Kursk amply illustrates.² The experience of the 4th Armored Division in the Lorraine also reinforces the apparent validity of these figures from a planning standpoint. B Company, 51st Armored

Infantry Battalion had suffered 100 percent officer casualties and received 128 replacements in the period 9 November to 6 December; and the company was still under 50 percent strength in infantry dismounts.³

The planning data used was derived from experience in World War II and Korea. Therefore, its relevance to current losses is not absolute; but the battles in the Middle East indicate that the figures may actually be low. Moreover, the figures in no way reflect what impact chemical weapons might have; one would certainly expect the casualty rates to be higher. Nonetheless, whatever the imperfections, the figures are probably accurate enough to draw valid conclusions. In short, given the expected missions, the available infantry dismount strength in U. S. heavy divisions appears insufficient in light of expected battle losses.

VII. CONCLUSION

This paper has focused on the available infantry dismount strength in the current J- and L-series heavy divisions. The basic question advanced was whether there is sufficient dismounted infantry for the accomplishment of heavy division missions? To be able to answer this question, the paper examined theory, historical examples, doctrine and force structure of both U. S. and foreign armies, and expected battle losses. At this point, it is possible to measure the results of the examination against the four criteria presented in the introduction.

Does the current TOE meet the requirement for combined arms warfare? The term combined arms consists of three elements: concept, organization, and tactics and operations.¹ The present structure of the heavy division, although not bankrupt in this regard, does have deficiencies in all three elements as a result of a small dismount

strength. Inherent in the combined arms concept is balance between the various arms and weapons systems to achieve maximum effect.

Although many theorists advocated the ascendancy of the tank after World War I, experience during World War II and, more recently, in the Middle East caveats the risks implicit in allowing a disequilibrium to occur. The force must be organized in a way to insure balance so that tactics can be employed effectively. The U. S. heavy division structure is so short of infantry that the infantry contribution to combined arms is almost absent. This assertion is further justified by a review of Tables 2 and 3. In respect to absolute numbers, percentage of division strength, infantry-tank ratio, or comparison with other nations, the infantry presence does not qualify as combined arms.

Does the TOE provide sufficient strength to accomplish the tactical tasks associated with expected missions? Although this criterion is related to and dependent upon the next concerning attrition, the real question is one of flexibility. Battles and engagements are the sum of numerous activities and actions which often pull resources in opposite directions. This observation is especially true if events occur simultaneously, but it is also valid during sequential operations when certain resources must be held in reserve. The Singling attack by the 4th Armored Division discussed earlier is an example.

The understrength armored infantry company was reasonably effective in attacking the town. However, there was not enough infantry to both support the tank platoons and to clear and hold the town. Consequently, the tanks operated without support and blundered into kill zones that infantrymen could have identified. Ultimately, the infantry were unable to clear the entire town. The Israelis also

found their ability to accomplish certain tactical missions severely hampered by the shortage of and lack of emphasis on the dismounted mechanized infantryman. The battle at Tel Shams related above was an instance of the difficulty resulting from the absence of infantry operating directly with tanks.

The sixty dismounts available to a full strength mechanized infantry company today barely exceed the number present at Singling. The presence of Bradley IFVs in a similar scenario would hardly compensate for the shortage of riflemen in the restrictive terrain of the town. In fact, the Bradleys would be just that many more "tanks" for the short-handed infantry to support. In Germany, the density of built-up areas makes battles such as Singling or Tel Shams more probable than exceptional.

Does a heavy division have sufficient staying power? Reflecting on the conclusions stemming from the criteria already discussed, it is this author's view that the heavy division will rapidly become combat ineffective for certain types of missions in which dismounted infantry strength is essential. Attacks and defense of specific terrain or positions will require augmentation of infantry. Exploitation, pursuit and delay will suffer the least degradation, but even these missions incur significant infantry casualties. The planning criteria used herein may not be accurate for reasons already mentioned; nevertheless, the figures demonstrate that based on past war data--which is probably applicable--the mechanized infantrymen in American heavy divisions will suffer significant casualties very quickly.

Assuming that there is a minimum strength beyond which the infantry becomes ineffective, it seems prudent that a higher initial strength is required if the division is expected to perform at a

reasonable level of efficiency longer than three to five days. Obviously, there must be some limit to the number of infantry dismounts, but Simpkin's approach indicates a needed increase of 75 percent. At the same time, an examination of attrition rates demonstrates that even doubling the strength would not completely mitigate the loss of combat effectiveness.

Finally, is the TOE consistent with the tenets of AirLand Battle Doctrine? requirements? AirLand Battle doctrine describes four tenets that are essential to success. Within the body of this study, insufficient infantry strength has been shown to impact negatively on the ability to adhere to these tenets. Without revisiting each of these points, it is important to stress the important role infantry support of tank plays in offensive actions and the close relationship this has to gaining and retaining the initiative.

This criterion is an appropriate vehicle to emphasize the related doctrinal void that emerged peripherally to this study. In the the last three major wars of the United States, conventional dismounted infantry actions were the norm. Armor operations in World War II, in particular, though dramatic, were small in number by comparison. This tremendous mass of infantry provided the stable counterweight that gave leverage and balance to the armored thrusts. Moreover, the doctrine existed that permitted the cross attachment of infantry to armor and vice versa. Presently, the Army in Europe still relies on a heavy division solution but without the anchor of conventional infantry divisions. Perhaps this approach made sense during the era when the nuclear battlefield seemed likely. Today, however, totally conventional warfare appears ever more probable, and the World War II method offers alternatives and solutions.

FM 100-5 is curiously short of direct reference to combined arms

warfare or doctrine, although the concept is inherent in much of the discussion and in the tenet of synchronization in particular. At the end of the section describing the leadership dynamic of combat power, it states,

In the final analysis and once the force is engaged, superior combat power derives from the courage and competence of soldiers, the excellence of their training, the capability of their equipment, the soundness of their combined arms doctrine, and above all the quality of their leadership.²

Most of these factors relate to the human element in warfare. The thought arises, how sound can a combined arms doctrine be that shortchanges the human arm? There has been and remains a valid and vital requirement for large numbers of "real" infantrymen in armored divisions. The organization of U. S. heavy divisions does not provide sufficient infantrymen to meet the potential demands of the battlefield. In summation, the current level of infantry dismount strength in U. S. heavy divisions adversely affects the capability of these divisions to execute the missions and doctrine required on the AirLand battlefield.

TABLE 1

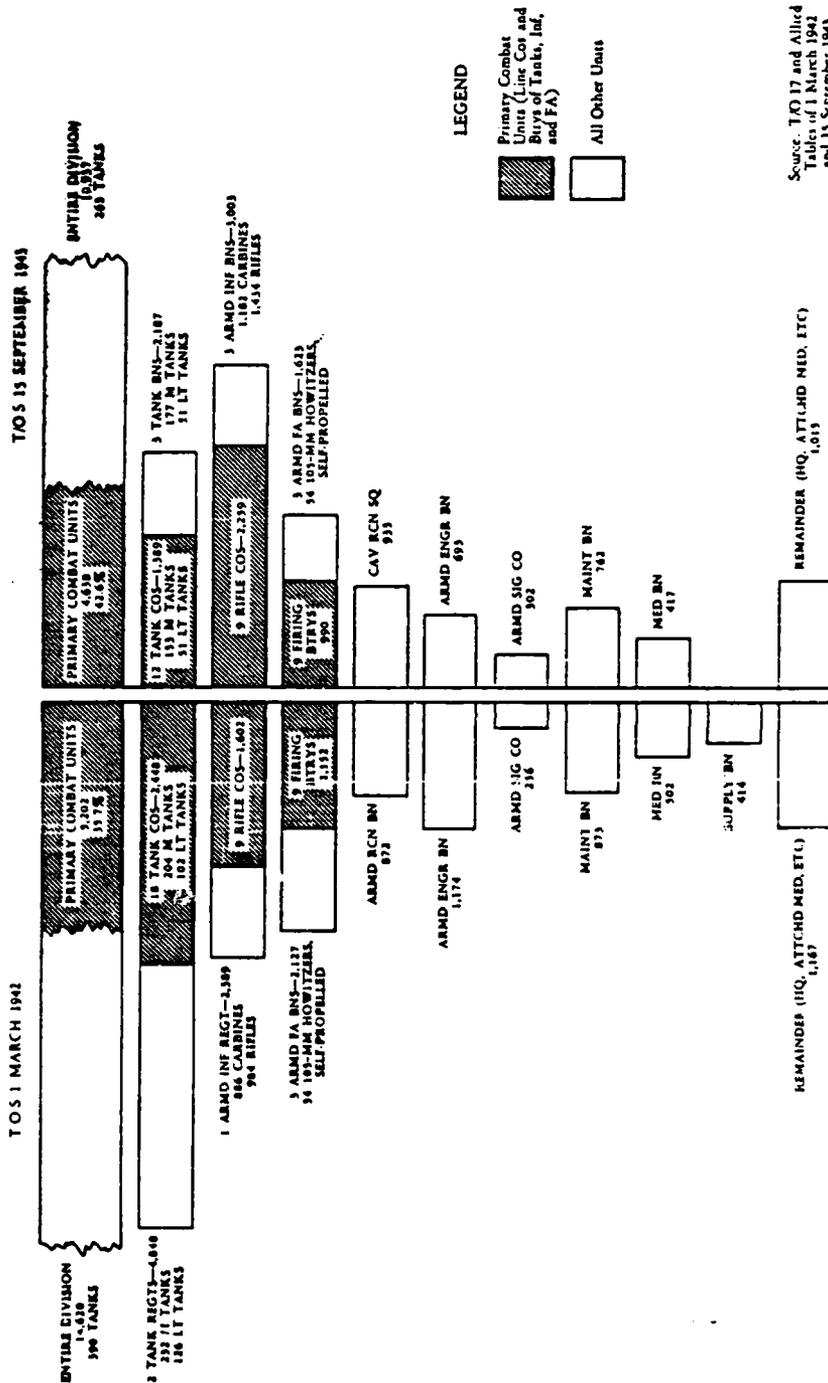
Organic Composition of the Armored Division, 1942-45

(Aggregate Strengths, Principal Equipment)

UNIT	1 Mar 42	15 Sep 43	24 Jan 45	UNIT	1 Mar 42	15 Sep 43	24 Jan 45
Engine Division.....	14,620	10,937	10,670	Auxiliary Units.....	4,521	3,499	3,338
Division Headquarters.....	185	164	174	Division Hq. Company.....	111	138	115
Hq. & Hq. Co., Combat Command "A".....	61	93	90	Division Service Company.....	160	.....	.....
Hq. & Hq. Co., Combat Command "B".....	61	91	88	Band.....	.....	58	58
Hq., Reserve Command.....	.....	8	8	Signal Company.....	256	302	293
Armored Component.....	4,848	2,187	2,100	Reconnaissance Battalion.....	872	935	894
2 Armored Regiments, each.....	2,424	.....	.....	Engineer Battalion.....	1,174	693	660
Hq. & Hq. Company.....	172	.....	.....	Division Trains.....	1,948	1,373	1,318
Reconnaissance Company.....	202	.....	.....	Hq. & Hq. Company.....	159	103	99
Service Company.....	191	.....	.....	Maintenance Battalion.....	873	762	732
Maintenance Company.....	188	.....	.....	Supply Battalion.....	414	.....	.....
Tank Battalion (Medium) (two).....	599	.....	.....	Medical Battalion.....	502	417	400
Hq. & Hq. Company.....	152	.....	.....	Military Police Platoon.....	.....	91	87
Tank Company (Medium) (three).....	149	.....	.....	Attached Medical.....	414	261	254
Tank Battalion (Light).....	473	.....	.....	Attached Chaplain.....	14	8	8
Hq. & Hq. Company.....	145	.....	.....	Principal Equipment:	.....	.....	.....
Tank Company (Light) (three).....	110	.....	.....	Medium Tanks.....	232	186	195
3 Tank Battalions, each.....	.....	729	700	Light Tanks.....	158	77	77
Hq. & Hq. Company.....	.....	147	140	105-mm. Howitzers, self-propelled.....	54	54	54
Service Company.....	.....	119	115	Cal. 30 Machine Guns.....	291	465	434
Tank Company (Medium) (three).....	.....	122	117	Cal. 50 Machine Guns.....	103	404	382
Tank Company (Light).....	.....	97	94	Cal. 45 Submachine Guns.....	2,160	2,803	2,811
Infantry Component.....	2,389	3,003	2,985	Carbines.....	6,042	5,286	5,051
Armored Infantry Regiment.....	2,389	.....	.....	Cal. 30 Rifles.....	1,628	2,063	2,040
Hq. & Hq. Company.....	138	.....	.....	Antitank Rocket Launchers.....	.....	607	609
Service Company.....	151	.....	.....	Carriers, Half-track.....	733	501	466
Armored Infantry Bn. (three).....	700	1,001	995	Vehicles, All Types (except boats and aircraft).....	3,630	2,653	2,276
Hq. & Hq. Company.....	166	173	169	Source: T/O 17 and allied tables, as of above dates.	.....	.....	.....
Service Company.....	.....	75	73	.....	.....	.....	.....
Rifle Company (three).....	178	251	251	.....	.....	.....	.....
Artillery Component.....	2,127	1,623	1,625	.....	.....	.....	.....
Hq. Division Artillery.....	.....	21	95	.....	.....	.....	.....
Armored Field Artillery Battalion (three).....	709	534	510	.....	.....	.....	.....
Hq. & Hq. Battery.....	173	111	106	.....	.....	.....	.....
Service Battery.....	174	95	89	.....	.....	.....	.....
Firing Battery (three).....	128	110	105	.....	.....	.....	.....

GRAPH 1

The Armored Division, 1 March 1942 and 15 September 1943



Source: Copied from The Organization Of Ground Combat Troops, p. 330.

TABLE 2 (1)

COMPARATIVE DISMOUNTED INFANTRY STRENGTHS

<u>Country</u>	<u>Div Type</u>	<u>Div. (2) Strength</u>	<u>Tanks (3)</u>	<u>Dismounts (4)</u>	<u>% Div. Total</u>	<u>Inf-Tank Ratio (5)</u>
Britain	Armored	16,300	285	1170	7.2	4.1:1
France	Armored	9,000	120	608	6.75	5:1
Federal Republic of Germany	Panzer	18,000	274	1472	8.2	5.37:1
	Panzer- grenadier	18,200	228	1840	10.1	8.07:1
Soviet Union	Tank	11,470 ⁽⁶⁾	322	1188	10.4	3.7:1
	Motorized Rifle	12,695	214	1980	15.6	9.25:1
United States	Armored	16,295 ⁽⁷⁾	348	960	5.9	2.75:1
	Armored (WWII)	10,937	263	1161	10.0	4.41:1
	Mechanized	16,597	290	1200	7.2	4.14:1

- (1) Unless otherwise stated information derived from Armies of NATO's Central Front by David Isby.
- (2) Division strength figure is generic since most divisions can be task organized.
- (3) Tank figure excluding tanks in reconnaissance units.
- (4) Dismount strength excludes vehicle crew but includes platoon leaders and RTOs.
- (5) Ratio includes all tanks except those excluded in note 3.
- (6) Soviet figures derived from FM 100-2-3, Organization and Equipment of the Soviet Army.
- (7) Under the L-series TOE, the base strength of an armored division is 16,113. Figures used here represent J-series. Note that a J-series division equipped with M113s were authorized 21 more men per battalion than comparably equipped H-series divisions.

TABLE 3

Projected Attrition For Heavy Division
in Selected Operations (1)

<u>Operation</u>	<u>At Start Strength</u> ⁽²⁾	<u>Total Mech Inf Losses D+2</u> ⁽⁴⁾	<u>Total Dismount Losses D+2</u> ⁽⁴⁾	Division	
				<u>% Total Armor</u>	<u>Mech</u>
Attack of a Position	16,113	741	648	67.5	54
Attack of a Fortified Zone	"	1218	1065	111	88.8
Offensive Meeting Engagement	"	240 ⁽³⁾	210 ⁽³⁾	21.9	17.5
Pursuit	"	385	337	35.1	28.1
Defense of a Position	"	385	337	35.1	28.1
Defend in Sector	"	626	548	57.1	45.7
Defensive Meeting Engagement	"	150 ⁽³⁾	131 ⁽³⁾	13.6	10.9

Source: Planning figures found in ST 101-2, Planning Factors.

(1) Missions were chosen to correspond with those in FM 71-100.

(2) Strength used is that of a base L-series armored division.

(3) These figures represent one day of battle.

(4) Calculations were based on the assumption that replacements would be negligible during the first three days.

ENDNOTES

Introduction

¹ Department of the Army, An Army of Vision: A Steady Path To Excellence, The Posture of the United States Army for Fiscal Year 1988, p. 1. Hereafter cited as Posture Statement.

² Ibid.

³ " 'I Want to Build On His Legacy,' TRADOC Chief Says of Vuono," interview with General Maxwell R. Thurman, Army Times, 14 September 1987, p. 17.

⁴ Posture Statement, p. 11.

⁵ Ibid., p. 17.

⁶ "Strength Hike Not Crucial to New Divisions," interview with Army Chief of Staff, General Carl E Vuono, Army Times, 5 October 1987, p. 12.

⁷ "Army of Excellence Conversion Just Weeks Away," Army Times, 14 September 1987, p. 3. For an in depth discussion of the reasons behind the decision to field the light divisions see Advanced Military Studies Program Monograph "Not Light Enough To Get There, Not Heavy Enough To Win: The Case of U. S. Light Infantry," by Major William B. Caldwell, IV.

⁸ Major General Richard Scholtes, Retd., "Where Have All the Infantrymen Gone?" Armed Forces Journal International (October 1986): 92-97.

⁹ See Army of Excellence TOEs 87000J- or 87000L-series for various division totals based on organization and augmentations. Mechanized infantry battalion TOEs are Army of Excellence 07245J- 07245L-series. Strength figures are determined by calculating six dismounts per squad times three per platoon times three per company times 4 per battalion plus platoon leaders and RTOs. $6 \times 3 = 18 + 2 = 20 \times 3 = 60 \times 4 = 240$. This figure assumes full strength and that one squad member does not remain in the Bradley to help reload TOW missiles. Strength per division equals four battalions (armored division) times 240 equals 960 or five battalions (mechanized infantry division) times 240 equals 1200.

Armored Warfare Theory and the Infantryman

¹ I. S. Bloch, The Future of War, trans. R. C. Long (New York: Doubleday & McClure Co., 1899.), pp. lxxviii-lxxix.

² For the best exposition on this subject see Robert Doughty, The Seeds of Disaster: Development of French Army Doctrine, 1919-1939, (Hamden, CT: The Shoe String Press, Inc.; Archon Book, 1985).

³For example see J. F. C. Fuller, Armored Warfare, (London: Eyre and Spottiswoode, 1943),; Heinz Guderian, "Armored Forces," Infantry Journal Reader, 1937, pp. 460-461; and B. H. Liddell-Hart, "The Next Great War," The Royal Engineers Journal (March 1924): 90-107.

⁴Hart, "The Next Great War," p. 104.

⁵Ibid., p. 107.

⁶Ibid.

⁷Idem, The Future of Infantry, (London: Faber and Faber, Ltd., 1933), p. 34.

⁸Fuller, Armoured Warfare, pp. 21, 95-96.

⁹Ibid., pp. 21-23.

¹⁰Guderian, "Armored Forces," p. 470; also p. 247 in P613 Course Readings, U. S. Army Command and General Staff College.

¹¹Ibid.

¹²Idem, Panzer Leader, (New York: E. P. Dutton & Co., Inc., 1952), p. 22.

¹³Ibid., p. 24.

¹⁴V. Triandafilov, Nature of the Operations of Modern Armies, trans. by William A. Burhans (Moscow and Leningrad: State Publishing House), pp. 26-27.

¹⁵Ibid., pp. 28-29.

¹⁶M. N. Tukhachevskiy, "Development of Weapons and Forms of Battle," Art of War Colloquium compilation, (Carlisle, PA: U. S. Army War College, November 1983), p. 71 for specific cite, pp. 69-74 for full development of idea.

Historical Examples

¹There are several sources that could be cited but the following will suffice to illustrate: Maurice Matloff, "The 90-Division Gamble," in Command Decisions, ed. Kent Roberts Greenfield (Washington, D. C.: Department of the Army); Samuel J. Lewis, Forgotten Legions: German Army Infantry Policy, 1918-1941, (New York: Praeger, 1985), pp. 52-55; also are McNair's views on how many armored divisions should be in a ninety division force. See Greenfield et al., The Organization of Ground Combat Troops, U. S. Army in World War II, (Washington, D. C.: Historical Division, U. S. Army, 1947), p. 334.

²Lewis, pp. 52-55.

³Ibid.

⁴Ibid., p. 103.

⁵Ibid., pp. 112-113.

⁶Field-Marshal Erich von Manstein, Lost Victories, (Novato, CA: Presidio Press, 1982), p. 183.

⁷Ibid., pp. 197-198.

⁸Guderian's Panzer Leader, (New York: E. P. Dutton & Co., Inc., 1952), pp. 140-189 presents several examples of the need for regular infantry to hold the enemy in pockets made by the panzers.

⁹Lewis, p. 143.

¹⁰Ibid., p. 157.

¹¹Manuscript P-143c, Division Operations During the German Campaign in Russia, by the Foreign Military Studies Branch, Headquarters, U. S. Army Europe, n. d. Reprinted by the Advanced Military Studies Department, U. S. Army Command and General Staff College, Fort Leavenworth, KS. pp. 33-41.

¹²Ibid., pp. 81-96.

¹³Richard E. Simpkin, Mechanized Infantry, (New York: Pergamon Press, Inc.; Oxford: Brassey's, 1980), p. 15.

¹⁴Department of the Army Pamphlet No. 20-230, Russian Combat Methods in World War II, (Washington, D. C.: Department of the Army, November 1950), pp. 53-57.

¹⁵Simpkin, Mechanized Infantry, p. 21; F. W. von Mellenthin, et al., NATO Under Attack, (Durham, NC: Duke University Press, 1984), p. 48. All of Department of the Army Pamphlet No. 20-233, German Defense Tactics Against Russian Breakthroughs, (Washington, D. C.: Department of the Army, October 1951); also Major Timothy A. Wray, Standing Fast: German Defensive Doctrine on the Russian Front During World War II. Prewar to March 1943, Combat Studies Institute Research Survey No. 5, (Fort Leavenworth, KS: U. S. Army Command and General Staff College, September 1986), pp. 147-151 illustrates the important role of infantry in defending against breakthroughs.

¹⁶Greenfield, Organization, p. 318.

¹⁷Dismounted infantry strength was calculated from the T/O by excluding the halftrack driver and gunner/assistant squad leader who remained with the vehicle for each squad (6), six motarmen and driver, and the platoon sergeant. All other men to include the machinegun crews and the platoon leader were counted as dismounts. The result was 35 dismounts out of 49 in the platoon, 105 in the company, 315 in the battalion and 945 for the division.

¹⁸Greenfield, Organization, pp. 318-322.

¹⁹ Ibid., pp. 324, 327.

²⁰ Ibid., p. 324.

²¹ Ibid., p. 325.

²² The same method was applied to calculate the dismount strength as used in n. 17 above. Now there were 43 dismounts for the platoon of 56, 129 in the company, 387 in the battalion and 1161 for the division. McNair is quoted in Greenfield, Organization, p. 327; what is particularly interesting and relevant to this discussion is the broader impact of the reorganization beyond the armored division. Each division had given up a net two battalions of tanks. Concerning their fate, Greenfield observes on p. 333,

The net effect of the reorganization of the armored division, aside from making the armored division a more effective team of combined arms, was to shift the bulk of the tank strength of the Army from armored divisions to the support of infantry. Plans at the end of 1942 envisaged, for the end of 1943, 120 tank battalions in armored divisions and only 38 in the nondivisional pool. What the Army actually had at the end of 1943 was 54 battalions in armored divisions and 65 in the nondivisional pool.

This is not at all surprising since McNair desired to go even farther (see p. 334) and reduce the number of armored divisions in the force from 16 to 10 because he saw them as being too costly at a time when there was a shortage of infantry.

²³ War Department, "France: 4th Armored Division at Singling," in Small Unit Actions, (Washington, D. C.: U. S. Government Printing Office, 4 April 1946), n. 1, p. 188.

²⁴ Ibid.

²⁵ Hugh M. Cole, The Lorraine Campaign, U. S. Army in World War II, European Theater of Operations, (Washington, D. C.: Historical Division, U. S. Army, 1950), p. 606.

²⁶ Major Gregory Fontenot, The Lucky Seventh in the Bulge: A Case Study for the AirLand Battle, MMAS Thesis, (Fort Leavenworth, KS: U. S. Army Command and General Staff College, May 1985); also two chapters on St. Vith in Charles B. MacDonald, A Time For Trumpets: The Untold Story of the Battle of the Bulge, (New York: Bantam Books, 1985). Reading these two accounts reinforces the key role of combined arms in strengthening each other. An additional perspective on this issue was provided by Robert P. Kingsbury in a letter to Armor magazine, 5 (September-October 1987): 3-4. Titled "World War II Tank Deficiencies," the letter described the success of the 4th Infantry Division at capturing Ludwigshaven after the 10th,

11th and 12th Armored Divisions had failed to seize it. The infantry was able to overcome the 88mm flak guns that had held the tanks at bay. Moreover, Kingsbury tells how impressed he was with the armored infantry in the capture of a town named Nening when the tanks were not able to make headway.

²⁷Major Jonathan M. House, Toward Combined Arms Warfare: A Survey of 20th-Century Tactics, Doctrine, and Organization, Combat Studies Institute Research Survey No. 2, (Fort Leavenworth, KS: U. S. Army Command and General Staff College, August 1984), pp. 3-4.

²⁸Bernard Brodie, ed., The Absolute Weapon: Atomic Power and World Order, (New York: Harcourt, Brace and Company, 1946), this is his seminal work on deterrence.

²⁹House, p. 150.

³⁰Franz Uhle-Wettler, Battlefield Central Europe: Danger of Overreliance on Technology by the Armed Forces, reprinted U. S. Army Command and General Staff College instructional material, pp. 5-6.

³¹Ibid., pp. 8-9.

³²Department of the Army, Mounted Combat in Vietnam, Vietnam Studies, by General Donn A. Starry, (Washington, D.C.: U. S. Government Printing Office, 1978), p. 84. By 1967, there was one armored cavalry regiment, six mechanized infantry battalions, four separate armored cavalry squadrons, two tank battalions, one air cavalry squadron and five separate armored cavalry troops.

³³Ibid., pp. v-vi.

³⁴Ibid., pp. 23-24.

³⁵Ibid., pp. v, 84-90. The text focuses on the resistance to the ideas coming from combat experience. General Starry appears very critical of a system that refused to see any armor lessons from Vietnam being valuable anywhere else in the world.

³⁶General Bruce Palmer, The 25-Year War: America's Military Role in Vietnam, (New York: Touchstone Book, 1985), pp. 58-59.

³⁷Paddy Griffith, Forward Into Battle: Fighting Tactics From Waterloo to Vietnam, (Chichester, Sussex, UK: Antony Bird Publications, Ltd., 1981), p. 133.

³⁸House, p. 176; also John English, On Infantry, (New York and London: Praeger, 1981), pp. 186-189.

³⁹Griffith, p. 142; and Chaim Herzog, The Arab-Israeli Wars: War and Peace in the Middle East, (New York: Vintage Books, 1984), pp. 242-246.

⁴⁰Herzog, p. 253.

⁴¹Griffith, p. 142.

⁴²Herzog, pp. 296-297.

⁴³House, pp. 176-179; Griffith, p. 137.

Current Doctrine and Force Structure

¹This version of FM 100-5 was somewhat controversial because it departed not only in format but in tone from previous manuals. Although General Dupuy maintains that there is no deliberate bias toward the defense, the manual is associated with the emergence of the Active Defense Doctrine of the late 70s.

²FM 100-5 dated 20 August 1982; FM 100-5 dated May 1986.

³Besides numerous articles, he has written six major works in this field: Race to the Swift, Red Armour, AntiTank, Tank Warfare, Mechanized Infantry, and Human Factors in Mechanized Warfare.

⁴Simpkin, Mechanized Infantry, p. 43.

⁵Ibid., p. 2.

⁶Ibid., p. 48.

⁷Ibid., p. 2.

⁸Ibid., p. 15.

⁹Ibid., p. 59.

¹⁰Ibid., pp. 53-56.

¹¹These figures were calculated by taking the number of tanks in a division minus the company and battalion commanders' tracks and multiplying by 7. An armored division of 6 tank battalions has 288 tanks times 7 equals 2016; a mechanized infantry division with 5 tank battalions times 7 equals 1680.

¹²Griffith and English both view technology with a certain degree of skepticism and continue to see a role for the infantry soldier. Simpkin accepts and is fascinated by the developments in mobile warfare, but he is firmly rooted in combined arms theory. He believes that a balanced structure is best and by this approach, there is a requirement for a 75 percent increase in the infantry strength in a U. S. heavy division.

¹³FM 100-5, May 1986, p. 15.

¹⁴Ibid.

¹⁵Simpkin, Mechanized Infantry, p. 48.

¹⁶FM 100-5, May 1986, p. 16.

¹⁷Ibid.

¹⁸Simpkin, Mechanized Infantry, pp. 23-24; Tank Warfare, p. 75; Griffith, p. 89.

¹⁹FM 100-5, May 1986, p. 16.

²⁰Ibid., p. 17.

²¹Simpkin, Mechanized Infantry, pp. 68-69.

²²For example see the following articles in Military Review: Brigadier General Wayne A. Downing, "Light Infantry Integration in Central Europe," 9 (September 1986): 18-29; John A. Adams, "Heavy versus Light Forces: A Middle Ground," 10 (October 1986): 64-73; and Colonels William W. Hartzog and John D. Howard, "Heavy/Light Operations," 4 (April 1987): 24-33.

²³During a briefing I attended at the National Training Center at Fort Irwin, California on 6 November 1987, the subject of light unit rotation to the NTC was discussed. At that time only a few had been through and some that were scheduled were going to be cancelled. However, the experience at the NTC shows so far that the force can work attaching light to heavy but not vice versa. Moreover, that attachment is as a package not for integration.

²⁴FM 100-5, May 1986, p. 17.

²⁵Simpkin, Mechanized Infantry, p. 69

Infantry Dismount Strength in Foreign Heavy Divisions

¹The primary source for Britain, France and the Federal Republic of Germany is David Isby and Charles Kamps, Jr., Armies of NATO's Central Front, (London: Jane's, 1985). Every effort was made to apply the same counting rules that were used with U. S. divisions, both World War II and current. All these armies, except the Soviet, can have a fluctuating total strength depending on task organization. Therefore, arbitrary notional structures and end strengths were used for consistency and to help insure that the comparisons have some validity.

²British refer to their tank battalions as tank regiments.

³Department of Defense, Soviet Military Power 1987, (Washington, D. C.: U. S. Government Printing Office, 1987), p. 9.

⁴FM 100-2-3 provides the information for the structure

and manpower of the divisions. Same counting rules were applied.

Calculating Attrition

¹The calculations reflected in Table 3 were derived using the planning tables and data on pages 4-24 to 4-27 in ST 101-2. The figure of 16,113, published in the 14 September 1987 Army Times, p. 3, was used as the total strength requirement for a base "L" TOE (AOE) Armored Division. The strength would be about 300 more for a mechanized infantry division. This figure least distorts the imbalance of infantry. Casualties were determined for the first three days of the operation. No replacements were assumed. Sixty-two percent of all armored division casualties are from the infantry arm. Of these, historically, eighty-seven point four percent are riflemen.

²Geoffrey Jukes, Kursk: The Clash of Armour, (New York: Ballantine Books, 1968) gives a good overview of the tough battle by the Germans to break through; for more detail see LTC David M. Glantz, Soviet Defensive Tactics at Kursk, July 1943, (Carlisle Barracks, PA: Center for Land Warfare, U. S. Army War College, February 1985).

³Small Unit Actions, p. 188.

Conclusion

¹House, pp. 2-3.

²DDB-2622-4-83, The Soviet Conventional Offensive in Europe (U), (Washington, D. C.: The Defense Intelligence Agency, May 1983). This study by John Hines and Phil Petersen traces the shift in Soviet military doctrine toward a reliance on conventional warfare in Europe. It is the foundation for several subsequent articles.

³FM 100-5, May 1986, p. 14.

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