

~~RESTRICTED~~  
Security Information  
~~UNCLASSIFIED~~

# FOREIGN MILITARY STUDIES

VOLUME 1

**N17500.9**

NUMBER 10

UNCLASSIFIED

**N17500.9**

## COMBAT IN THE EAST

*FOR  
Command of G. O.*

Foreign military studies, Vol 1, No.  
10. European Command, MS #B-266, 1952.

~~RESTRICTED~~

SECURITY INFORMATION

**This Document**

IS A HOLDING OF THE

~~ARCHIVES SECTION~~

LIBRARY SERVICES

FORT LEAVENWORTH, KANSAS

DOCUMENT NO. R-17500.9 COPY NO. 1

CGSC FORM 160  
13 Mar 51

Army—CGSC—P1-1367—29 Mar 51—5M

**1952**

JUL 9 1952

**UNCLASSIFIED**

*Pol Reg # 1126005*

HISTORICAL DIVISION

HEADQUARTERS EUROPEAN COMMAND

~~UNCLASSIFIED~~

~~RESTRICTED~~

Security Information

**UNCLASSIFIED**

**UNCLASSIFIED**

UNCLASSIFIED  
~~RESTRICTED~~  
SECURITY INFORMATION

MS # B-266

COMBAT IN THE EAST

Experiences of German Tactical and Logistical Units in Russia

HISTORICAL DIVISION  
EUROPEAN COMMAND

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED





~~RESTRICTED~~  
SECURITY INFORMATION

FOREIGN MILITARY STUDIES

Historical Division  
Headquarters European Command

VOLUME I

April 1952

NUMBER 10

C O N T E N T S

CHAPTER I:	INTRODUCTION . . . . .	Page 1
	1. Russian Geography and Natural Resources. . . . .	1
	2. The Soviet Armed Forces. . . . .	3
	3. The Influence of Russian Terrain on Strategy . . . . .	4
	4. Political Factors. . . . .	7
II:	COMBAT EXPERIENCES OF THE INFANTRY . . . . .	8
	5. An Infantry Division in the Attack . . . . .	8
	6. German Defense Tactics at the Division Level. . . . .	19
	7. Retrograde Movements - Infantry. . . . .	32
	8. Winter Warfare . . . . .	42
III:	EXPERIENCES OF A PANZER CORPS. . . . .	46
	9. Attacks During Mobile Warfare. . . . .	46

---

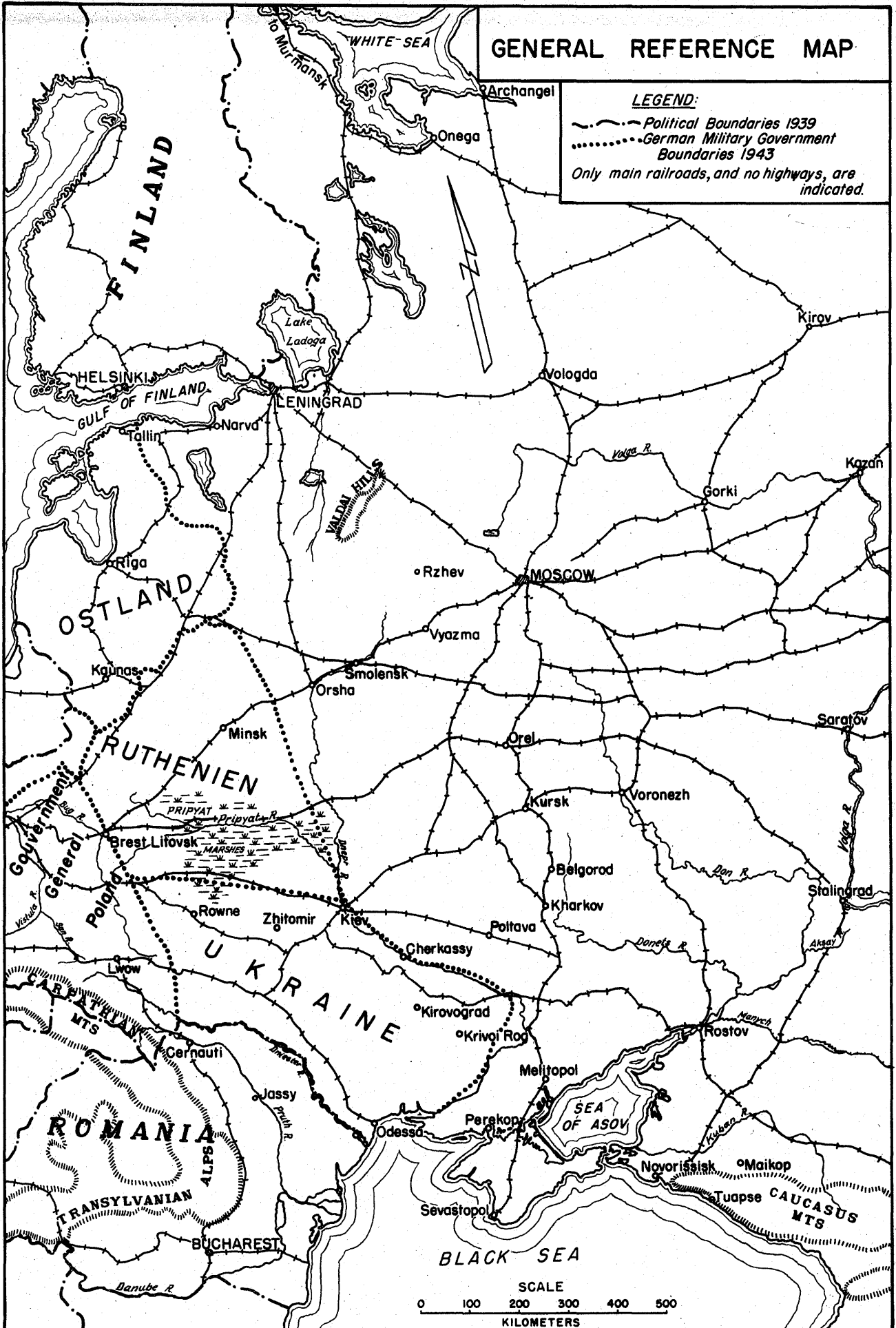
Foreign Military Studies. Prepared nonperiodically by the Historical Division, Headquarters, European Command, for the purpose of increasing the availability of selected special studies and monographs prepared by or under the supervision of this Division and in coordination with other staff divisions of this headquarters as appropriate. The material presented herein does not necessarily reflect official Department of the Army doctrine or accepted practices, but is for information only. Local reproduction may be authorized upon specific request to this headquarters. A limited number of additional copies may be obtained from the Historical Division, EUCCOM, APO 403, Phone Control Officer, Karlsruhe Military 2614.

- 4 -  
~~RESTRICTED~~  
SECURITY INFORMATION

	Page
10. Attacks Against Fortified Positions . . .	48
11. Armor in the Defense. . . . .	50
12. Armored Forces in Withdrawals . . . . .	51
 CHAPTER IV: ENGINEER EXPERIENCE. . . . .	 52
13. Terrain Intelligence. . . . .	52
14. River Crossings . . . . .	53
15. Road Construction . . . . .	57
16. Land Mines. . . . .	60
 V: SIGNAL CORPS EXPERIENCE. . . . .	 61
17. Signal Unit Organization. . . . .	61
18. The Mission of Signal Troops in Combat. . . . .	 63
19. Signal Intelligence . . . . .	67
 VI: ARMY MEDICAL SERVICE EXPERIENCE. . . . .	 69
20. Composition and Chain of Command. . . . .	69
21. Missions. . . . .	72
22. Duties of Various Medical Units . . . . .	81
23. Conclusions . . . . .	87
 VII: EXPERIENCES OF THE SUPPLY SERVICES . . . . .	 88
24. Basic and General Criteria. . . . .	88
25. Railroads . . . . .	89
26. Roads . . . . .	90
27. Rivers. . . . .	91
28. Motor Vehicles. . . . .	92
29. Rations . . . . .	93
30. Ammunition. . . . .	93
31. Supply Bases. . . . .	95
32. Military Government . . . . .	96
33. Prisoners of War. . . . .	96
34. Communications. . . . .	96

# GENERAL REFERENCE MAP

**LEGEND:**  
 - - - - - Political Boundaries 1939  
 ..... German Military Government Boundaries 1943  
 Only main railroads, and no highways, are indicated.





~~RESTRICTED~~  
SECURITY INFORMATION

## CHAPTER I

## Introduction

1. Russian Geography and Natural Resources

Because of its geographic characteristics, Russia is one of the few European countries still possessing excellent opportunities for defense against even the latest offensive weapons. Geographic considerations therefore play a paramount role in all military planning aimed at the USSR, particularly as regards strategy and operations. An enemy attacking from the west or the southwest must give serious consideration to the initial commitment of his forces. Russia's western borders alone are of such great length that even the huge armies of the Axis Powers were, in 1941, unable to cover them adequately. As an army thrusts further eastward, the space on both flanks widens out very rapidly. An offensive supported on both flanks and advancing on a broad front requires such immense forces as no army in the world can raise, unless it foregoes all strength in depth, commits all its reserves, and mans the front itself very sparsely.

The way to the heart of Russia's war potential is a long one. Even the loss of the Dnjepr and Donets industrial regions, as shown by history, did not gravely reduce the Soviet's war industry, the heaviest concentration of which is located on both sides of the Ural Mountains and the Caspian Sea. In view of the immense distances and the wide dispersal of factories, as compared with all other European states, Russia's vulnerability to air attacks is reduced to a minimum -- unless this factor were to be equalized by the results of new atomic research.

Another aspect to be considered is the climate. Although Russia, especially Southern Russia, offers unexpectedly good conditions for vehicular traffic during the summer, the muddy season

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

in the spring and autumn and the severe winter pose tasks which cannot be easily solved by alien troops.

The Russians are well aware of these advantages derived from the nature of their country and of its climate. After losing battles at the frontiers, strong leaders have, as a rule, ruthlessly sacrificed large western areas temporarily, often after tenacious delaying action, in order to launch a counteroffensive with newly activated forces from the rear areas after the invader could no longer cope with the increasing difficulties which faced him. During the past war this strategy was best exemplified in the summer of 1942 when the German armies were lured to Stalingrad and the Caucasus, there to be split up in piecemeal fashion without having achieved any really worthwhile successes.

The Russians have fought with less success when compelled by their enemies to give battle in massed strength at the periphery or outside of their national borders. Napoleon and Hitler, on the one hand, and the Crimean War and World War I, on the other, are perhaps the best historical examples. It may thus be concluded that Russia in the future will repeat the strategy of sacrificing territory or "outpost areas" when facing strong adversaries.

It is therefore likely that Russia will create the required outpost area to the south by a lightning attack beyond its borders, in order to forestall an invasion anchored on Asia Minor, where the situation is less favorable because the vital oil fields, which must be defended at all costs, are located near the frontiers on both shores of the Caspian Sea.

Although aware of Russia's immense material and manpower resources for waging war, the Axis Powers were undoubtedly surprised by the extraordinary powers of resistance with which they had to contend. As experience has shown, this is primarily due to the Soviet-propagated concept of a Communist order and type of government. Aside from the previously-mentioned, favorable location of industry, Russia owes chiefly to its industrial organization and labor system, the fact that the huge material losses suffered in the summer of 1941 could not only be replaced but even exceeded.

Up to a certain degree, the food production problem proved to be a soft spot. Even assuming that in the future the Soviets should cultivate the land stretching in the direction of the Ural Mountains more intensively it is hardly possible that they could survive in the long run without the southern agricultural areas, especially those in the Ukraine.

As the result of manpower control as ruthless as it is systematic, drafted female labor, transfer of inhabitants from

- 2 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION



areas threatened by invasion, the elimination of private business, etc., the Soviets were always in a position to make up for war casualties and also to keep on tap labor reserves as needed.

Because the country's railways were few and far between they were highly vulnerable to air attacks. In spite of many difficulties, the Soviet government nevertheless mastered the transportation problem. A vast program for producing modern trucks, commenced during World War II, will probably remedy this situation completely in the future.

## 2. The Soviet Armed Forces

With regard to the Soviet Armed Forces it may be stated that, at the beginning of the war, the Army was in all branches fully on the way to becoming the most modern fighting force in the world. Although it had not yet reached the climax of its development in 1941, the fact that it was able to recuperate from the frightful losses suffered during the summer of that year and make such rapid progress in leadership and equipment is only explained by the existence of long-range planning and an advanced degree of military preparedness at the outbreak of war.

It may be stated that senior Soviet Army commanders were adaptable and capable of learning quickly. They were past masters of ruthless improvisation in a crisis. When launching major attacks, during pursuits, and in the organization of defense they matched in every way their counterparts in any other modern European army. Their techniques proved superior during retreats. They borrowed heavily from German doctrine. Their strategy was based on the use of armor. Their employment of artillery improved continuously and became more destructive.

The subordinate commanders and the soldiers are courageous, tenacious and inured to combat and hardships. When attacking they lack initiative and a readiness to make decisions. It may therefore be concluded that even superior Russian commanders are handicapped by the limited initiative which characterizes their troops.

Soviet soldiers show true talent in technical matters and are well trained because of the great progress in civilian technological developments. Motorization stands in the forefront of all their planning for the future.

In spite of the intrepid courage evidenced by every individual flyer, Russia's Air Force lagged far behind the Army until the end of the war. The strategic command of Air Force units revealed glaring defects and the modernization of aircraft types was slow and unsatisfactory. It was only due to the impotence of the Luftwaffe --

which was not the result of Soviet Air Force action — that the latter's weaknesses did not decisively alter the final outcome of the war.

The Soviet Navy played a secondary role but displayed courage and proficiency during minor landing operations.

### 3. The Influence of Russian Terrain on Strategy

The more one deals with the factors of basic strategy previously only alluded to, the more becomes apparent the extent to which strategic and grand tactical space problems outranked all others in importance. In any other European state it may well be possible to reduce its power of resistance to the point of collapse by occupying or by destroying through air attacks certain circumscribed parts of the country. In Russia, however, an invader could not simultaneously try to occupy key areas, commit his air force against the industrial regions and, in addition, wage war victoriously against Soviet armed might. Widely overestimating the value of occupied territory, Hitler primarily came to grief due to the problem of space. He could not free himself of preconceptions based on the decadent Russia of World War I. Moreover, since his personal experience in combat during World War I had prejudiced him in favor of the concept of position warfare, he deliberately surrendered the initiative and left the final decision to be won by the preponderance of materiel and manpower. As the result of a rigid adherence to outworn ideas, the front lines were extended to incredible lengths while the formation of strong points and local reserves was neglected. The so-called defense positions were in reality nothing but thin security lines. In spite of all arguments, Hitler carried on a "strand of pearls strategy," which gradually whittled away the outstanding and successful Wehrmacht of 1941 and brought about inevitable defeat.

Nowhere else has practical experience again so clearly and unequivocally confirmed the old maxim applicable to all good strategy, namely that the destruction of enemy forces and the preservation of friendly forces is the foremost objective. Without the fulfillment of these two basic prerequisites, no decisive conquest of territory and thus no control of the enemy's production potential is possible. The strategic planning of all branches of the armed forces, of their equipment and organization must aim at this. Not the scattering, but the concentration of his forces must be the constant goal of every commander aware of what he is doing. Every attempt to set up an uninterrupted, consecutive front, invariably resulting in wasted effort, rigidity and lack of reserves must be countered with all means. In Russia can at present perhaps be found the only theater of operations in Europe where the high art of generalship can still be exercised in the pure manner customary before the creation of mass armies. The field commander's

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

mind must be so well familiar with the area that he can make it serve his purposes, but it must not lure him to become entangled in the fetters of its demonic forces. The secret of success will be found in strong armies and army groups, which advance separately but all attack together, adroitly using combat tactics with a strategy of annihilation as their objective.

With the previously described, traditional Russian strategy in mind, the invader's plan of operations must aim at destroying large parts of the Russian armed forces right at the beginning and at preventing their escape. The operations must therefore be rapidly carried out on a large scale by building up strong points of main effort, if possible with double envelopments. The air force must be fully employed for the same purpose. The German command, which by and large had followed these precepts, learned in the summer of 1941 that the Russians, in spite of encirclements which cost them bitter losses, still knew how to save such forces as were needed for delaying action as well as for the organization of battle-tested cadres for armies which were being activated in the zone of the interior. The immediate and desperate attempts to break out of such pockets could only be countered by foresight preparations that required the speedy moving up of reserves from the rear. The German troops who rushed forward intoxicated by victory claimed to have inflicted losses which should have been carefully and critically scrutinized by senior general staff officers, who were well acquainted with the implications of Russian size. Lack of realism in judging enemy losses caused the German Supreme Command to commit blunders which decisively influenced the course of the war.

It was further shown that the Russians were soon able to organize partisan warfare. Fugitives from the battles of encirclement, as well as elements who had been newly flown in or had infiltrated, quickly formed behind the Germans' backs into effective battalions which maintained contact with the Supreme Command in Moscow. It is therefore of great importance to organize strong points with units brought in from rear echelons and to protect communication lines by special security troops.

As shown by experience, the time chosen for beginning the offensive in 1941 was too late. It must be selected early in the warm season, that is to say, about the second half of May. The more time is available for the opening battles, the more opportunities become available for eliminating decisive portions of the Soviet forces.

When autumn approaches and the enemy has not yet collapsed, the second part of the strategic maxim comes to the fore. The preservation of friendly forces requires in the Russian theater the

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

most meticulous care and foresight. German experience in the winter of 1941 indicated that unwary troops must under no circumstances be exposed to climatic hardships of the country, particularly the muddy season, while they are in a weakened condition and widely scattered. To do so would be offering a favor to Russia's traditional strategy. Losses which could hardly ever be recouped were the inevitable result. The concentration of forces in areas which can be easily defended, a strong echelonment in depth, the protection of air force installations and of communications, are also of cardinal importance during the interim seasons. If necessary, territory occupied during the summer must be evacuated without further ado to fulfill this demand. (Compare Hindenburg's retreat from the Somme River bend in 1916.) Action will be decisively influenced by the estimate of one's own successes as compared with the resources left to the enemy. It should be emphasized that these resources must never be underestimated. It is during the muddy season and during severely cold weather that the Russians engage in unexpected activities all their own. They realize that such weather conditions are especially effective aids. They take delight in forcing through with great energy and against all expectations the type of undertaking that other troops consider unfeasible. The Russians are masters of camouflage and infiltration on any scale. To guard against surprise requires continuous reconnaissance by the air force over large operational areas and enemy communications and by specially equipped, selected and trained elements in the intermediate and outpost areas.

No information is available on large-scale offensive operations during the depth of winter. If decisive successes have not been obtained during the preceding summer, and if, moreover, winter equipment and supplies are not in excellent condition, it does not appear practicable for troops without local experience to try to accomplish more than a defensive operation or a tactical exploitation of minor opportunities. In general it will be better to keep cool, to make good use of the time available to refreshen and train the troops and to complete repairs on all materiel. Of paramount importance is the ability to meet a pursuing enemy during winter battles on favorable terms and to insure certain prospects of success at the return of the warmer season. The possibility must be taken into account that the war may last several years as a result of the determination and resoluteness of the Russian government and high command.

The wartime organization of units, the tables of equipment, the preparation and execution of logistical plans which a war against Russia requires, are not within the scope of this study. It hardly needs special mention that their importance is far more decisive here than in any other European theater of operations. Since the Russians prefer to operate and attack during the winter,

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

the foremost problem is to procure the type of equipment which insures winter mobility and which protects men, animals and instruments on land and in the air against cold. With regard to strategy and operations, the following requires mention:

As was demonstrated during the summer of 1941, the above-mentioned missions of a proper strategy could only be fulfilled through the continued maintenance of a high degree of mobility. Without strong motorized or mechanized units, without a good motorized supply and maintenance organization and dependable railway transportation, the outcome of such a war is very doubtful. This should not imply that marching infantry divisions are obsolete. During bad weather, in large forest and swamp areas, they often proved more useful than motorized divisions. During a halt in operations, the infantry was indispensable for releasing the mechanized combat units for other assignments.

The creation of a strong air force capable of handling all technical and weather problems and so numerically large as to absolutely guarantee domination over all essential areas is as important as are the motorized and mechanized units. Bearing in mind the lessons learned by the German Wehrmacht on the capability of the Russian armament industry, one should not count on the Soviet Air Force continuing for any length of time to remain as backward as it was during the 1941 - 45 campaign.

#### 4. Political Factors

In conclusion it should be mentioned how German statesmanship might have aided the armed forces. When German troops marched into Russia they met a population which at first was in a peaceful, cooperative and even partly expectant mood. Communism had not yet so far taken hold of their bodies and minds that it had extinguished all desire for property and religion. Aided by good propaganda, the initial measures of the German military administration to meet these desires were quite successful. Impressed by German military successes, the number of Russian deserters and undercover collaborators increased considerably. The German government failed to draw the logical conclusions from this and to put them ahead of all other considerations. If the recommendations of the German theater commanders had been heeded to a larger degree, the conciliatory measures suggested by them would undoubtedly have exerted steadily greater influence upon the morale and attitude of the Soviet troops and the population beyond the Russian lines. This in turn would have contributed considerably to the weakening of over-all enemy resistance.

CHAPTER II

Combat Experiences of the Infantry

5. An Infantry Division in the Attack

(Area: Grodno - Smolensk - Vyazma - Vilna;  
Time: 1941 and 1943)

a. German Tactics in the Original Attack. The campaign in the summer and autumn of 1941 was a struggle between two forces in the vast Soviet Union in which the Russians were superior on the ground in numbers, materiel and motorization, while the Germans excelled in leadership techniques and in air power. The campaign took the form of a war of movement in which stationary fronts existed only at a few places and for short periods. The attacks were not carried out after long and careful planning and huge accumulation of materiel but were conceived on the spot and executed with the materiel on hand. The Germans strove for victory through enveloping attacks by tanks and motorized divisions, frontal attacks by infantry divisions, and vertical attacks by the Luftwaffe. The lessons learned in combat by infantry divisions are incomplete as concerns the support activities of armored, motorized, and Luftwaffe units as well as the strength and plans of the enemy, about which the author has no material or data on hand.

The infantry carried out the attacks with artillery support. It was generally recognized that infantry should also be supported by tanks and assault guns, but production of these items did not keep up with the demand. The tanks and some assault gun batteries were assigned to the armored and motorized divisions, while only a few were assigned to the infantry divisions, so that their employment was restricted to the most important points. On the basis of its experience in the Polish and French campaigns, the High Command customarily made great demands on the infantry's



UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

strength and initiative while attacking. Since it counted on a brief campaign in 1941, the problem of conserving strength was ignored.

The maps available on Russia proper (as distinguished from the former border states) proved to be of poor quality. They were mainly reproductions with German overprint of the Russian 1 : 125,000 maps already obsolete in World War I, which gave an inadequate picture of terrain features. Roads, vegetation and localities had undergone great changes since their original publication. Aerial photographs, which were only rarely issued to the troops, proved very useful, particularly in forest and swamp areas.

The infantry divisions had to advance and attack quickly to support the armored and motorized divisions sent to the enemy flanks and rear, for after reaching their objectives the latter were usually engaged in heavy fighting with a stronger enemy. The infantry divisions were assigned sectors eight to ten kilometers wide, in which they had to move, reconnoiter and, as a rule, also fight. Tactical reconnaissance generally provided no information about the location and the strength of the expected resistance. The lack of definite information was typical for a war of movement. The division reconnaissance battalion — consisting of one cavalry troop, one bicycle troop and one heavy weapons troop with heavy machine guns, mortars, light infantry guns, antitank guns, one scout car platoon and one engineer platoon — was frequently sent ahead in order to seize important terrain features and hold them until the division's arrival. For this purpose it was reinforced by artillery, infantry moving in trucks, and antitank vehicles. In other cases it was employed as flank cover. For modern conditions it was neither fast nor strong enough. The previous campaigns in Poland and France demonstrated that an infantry division needs a strong mobile unit. Because of personnel and materiel losses, the division reconnaissance battalions were disbanded after the winter of 1941 - 42, although, as a mobile division reserve, they would have given a good account of themselves in active defense.

In Central Russia the bicycle is of little use as a means of locomotion and reconnaissance. With expert riders, horses inured to Eastern terrain conditions are valuable. Armored scout cars require a high degree of cross-country mobility, achieved through four-wheel drive or caterpillar tracks. A light, all-wheel drive car with oversize tires, such as the Russian-built cross-country Ford or the German Volkswagen, proved best for the purpose of mobility and liaison.

The division advanced in developed formation, led by one or

UNCLASSIFIED

95  
~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

two infantry regiments which had been reinforced by artillery, engineer and antitank units. The advance in leapfrog formation was covered by the artillery. Horse-drawn artillery proved too slow for this purpose. Horse-drawn medium artillery battalions proved so lacking in mobility in Russia that the divisions would motorize them as soon as possible with captured material. Soviet air attacks were not feared, since the Luftwaffe dominated the skies. It was also not considered likely that enemy tank and motorized units could penetrate into German gaps or cover our marching columns with fire, although occasionally such ambushes occurred.

The German advance was hampered by the poor road system and the lack of suitable crossings over the numerous swampy lowlands. The infantry with its light vehicles was best able to move forward. At the beginning of the campaign each company was equipped with three additional panje\* carts which proved invaluable. An excellent light cart was developed in the Russian collective farms. Attached to the infantry regiment for march movements, the artillery was given no march security supervisory missions; its primary duty was to maintain contact at all times.

The enemy screened his positions by means of advanced motorized infantry units supported by artillery. If a German division's advance elements met resistance, it was usually not clear whether the resistance was of a temporary nature or whether it would result in a decisive action. With one infantry regiment forward, the division was able to secure a larger freedom of action and more tactical mobility. However, if two regiments were engaged forward, it was possible to clarify the enemy situation more rapidly, inasmuch as such information could only be gained by action on a broad front.

Soviet infantry units, which were always well camouflaged, permitted the attackers to approach within 300 meters or less before opening fire. Usually they revealed no more of their positions than was considered necessary. They let patrols either approach very closely or enter their positions, whereupon the latter were destroyed. By means of personal conferences with the forward infantry regimental commanders and the artillery commanders, the division commander obtained data for planning an attack, which almost invariably proved to be frontal. The enemy camouflaged soft spots so efficiently that they were not recognized by our reconnaissance patrols in time to permit the division to direct its advance accordingly. During the time required for moving up the third

---

\* Farm cart peculiar to Eastern Europe and Siberia.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

infantry regiment and for displacing the artillery forward, the Russians had brought up motorized artillery and infantry on trucks to launch a frontal attack of their own. Early in the War Soviet infantry units paid little attention to securing their flanks; later on they were more careful. Isolated elements attempted to regain their units at night.

The attack began when the artillery was ready. Until then the infantry remained inactive. Binoculars were mostly used for reconnaissance. Only exceptionally was information available concerning depth of enemy positions, tactical grouping, and artillery. Our own intentions and the terrain determined the selection of the point of main effort and of the breakthrough points. For these the infantry preferred the type of terrain which, by means of many small patches of cover facilitated approach, even though it did permit the enemy artillery to observe our movements and actions. Tactical cooperation between adjoining regiments and battalions was secured by means of assigned zones of action and objectives. These objectives were important features in the terrain or sectors in the depth of enemy positions, generally in the presumed enemy artillery area. Their occupation insured a certain initial success and was valuable in securing a jump-off point for continuing the attack.

At the start of an action it was impossible to calculate its outcome. The division commander had to keep the forward regiments in check. Despite their reckless impetuosity, they had to remember to act as a part of the over-all division plan. The battles were so full of surprises that it constantly proved disadvantageous if the regimental commander had no more reserves on hand. The reasons were to be found in Central Russia's terrain which was often difficult to keep under surveillance and in the fact that patrols on horse or foot were too slow. The infantry lacked efficient radio instruments for patrols.

The division artillery commander had to move the bulk of his unit in such a manner as to allow the division commander as much time as possible for determining the main point of attack, and quickly put the artillery in a position to fire. The artillery's battalion and regimental commanders rushed forward and personally informed themselves about the terrain, maintaining contact at the same time with the commanders of forward infantry regiments. The artillery was commanded from the forward lines, not from the rear. All battalions had forward observers with the infantry. Artillery liaison teams kept ready to go to the infantry commanders, if necessary, whenever the battalion commander was unable to do so himself. It remained standard operating procedure that, to promote mutual support, infantry and artillery commanders should set up their command posts in close proximity. The artillery gave its

UNCLASSIFIED

- 11 -  
~~RESTRICTED~~  
SECURITY INFORMATION

full support to the infantry regiment which was making the main effort of the attack. The other regiment retained its battalion and was, if necessary, reinforced by a medium battery. The artillery commander had to keep in mind, however, that any successes gained by the regiment which was not attacking at the point of main effort might necessitate a shifting of artillery fire.

Neither targets nor ammunition were available for the kind of concentrated artillery fire that preceded a prepared attack in position warfare. The artillery fired on predetermined targets with observed, concentrated fire. Through constant contact with infantry commanders, the artillery commanders promptly complied with the formers' requests regarding choice of targets, the beginning and duration of fire, expenditure of ammunition and change of positions, and thus they guaranteed proper artillery support for the infantry attack. This close collaboration between both arms was the basis of victory.

The infantry attack was preceded by a sudden artillery concentration of a few minutes duration, which had to be prolonged if unexpected enemy reinforcements or obstacles (mines) impeded the infantry's advance. In this war of movement neither the infantry nor the artillery could expect to carry out a fixed plan of attack which moves like clock-work. The division's normal ammunition supplies usually sufficed the artillery. Economical use of ammunition in hitting the main target of the attack, accurate artillery fire, no excessive requests by the infantry, all were necessary. The supply of smoke ammunition was inadequate. Smoke shells were useful for rapid adjustment because no large amounts of ammunition could be directed on the target.

The infantry regiment customarily attacked with two battalions forward, the battalion with one or two rifle companies. Disregarding of the official organization, the company was organized into four assault detachments which were led by three platoon leaders and the company commander whose leadership and military skill provided the driving force of the attack. Immediately after the artillery preparation, narrow, deep infantry spearheads penetrated the enemy's positions. The assault groups were closely followed by the infantry heavy weapons. As the result of mutual support and well-coordinated collaboration with infantry heavy weapons, it was possible to overpower enemy emplacements and strongpoints, or else to by-pass them through shrewd utilization of terrain. The Russian was a tenacious but not a flexible adversary. He was crafty, permitted himself to be overrun and then fired from the rear on the attackers. He rarely counterattacked.

The battalion commander followed his forward companies with the battalion reserves, to provide flank protection and contact

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

with adjacent units. He made sure that, in the heat of battle, the troops did not lose their sense of direction and that there were no gaps in the front line. By personal leadership he kept the attack moving when its momentum appeared diminished as the result of losses.

The regimental commander intermittently shifted his command post so as to keep it directly behind the advancing battalions. Close contact with them enabled him to give timely information to the artillery and division commanders about his plans, the situation, and initial successes or difficulties, and thus to provide the basis for continuing the attack. He was responsible for providing continuous artillery, antitank and engineer support to his attacking battalions and that they would not be unprepared when meeting strong enemy resistance. The better he succeeded in providing support the less likely our troops were to encounter any surprises which would impede the forward movement. The infantry was trained to thrust ahead regardless of enemy elements remaining on its flanks. If the attack came to a halt, it could only be continued with strong artillery support. A too rapid advance was therefore disadvantageous.

At dusk the infantry usually discontinued the attack, because of physical exhaustion, the necessity to supply, regroup, and rest the troops for a continuation the next day. In some cases the infantry pursued the retreating enemy at night. Thus, in July 1941, during the battle of Smolensk, a German infantry regiment pursued the fleeing enemy for more than ten kilometers to important heights north of the city where he was about to prepare defense positions with fresh reserves. A similar night advance was unsuccessful in October 1941 in the battle of Vyasma. When the infantry attack was repulsed, it took up an all-round defense position at night, in which it was attacked at daybreak by numerous Soviet tanks. After suffering heavy casualties the German infantry withdrew into a forest without being pursued by the tanks. The decision to continue an attack at night was, as a rule, made by courageous forward commanders who wanted to exploit an apparently favorable opportunity. Such an action will usually be under way for quite some time before reports about it reach superior commanders. They will find it difficult to make decisions because they lack adequate information about the situation and further developments. It will usually be correct for them to approve of their troops' aggressiveness and to do their best to further the progress of the attack. Great success will result from a planned continuation of a night attack. For this purpose the timely supply of fresh replacements, tanks, engineer troops, as well as signal and illumination equipment is essential. In night combat, the proficiency of the troops is of utmost importance.

- 13 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

In 1941 the Russians employed tanks mainly against German armored and motorized divisions so that our infantry divisions rarely encountered them. Eighty percent of the division antitank unit equipment consisted of 37-mm guns, the rest of 50-mm guns. The infantry carried antitank rifles and relied in close combat on antitank mines and concentrated charges. These weapons were effective only against the weak tanks which the Soviets still used in large numbers in the summer and autumn of 1941. Many reverses would have been suffered without the support of the Luftwaffe, and of advanced artillery and anti-aircraft batteries and assault guns. Not only the effectiveness but also the mobility of our antitank weapons was insufficient. Antitank guns, drawn by tractors, especially tractors with wheels, are unsuitable for march security and for supporting attacks.

In October 1941 during the battle of Vyasma, an attacking division was opposed by tanks on a broad front which the Russians had set up and secured by infantry through a shrewd exploitation of such features in the terrain as the edges of woods, hedges and the tops of hills. According to standard Russian procedure, their tanks remained silent during the infantry's advance. Assault guns, brought up in support of our infantry, were soon destroyed. Artillery fire concentrations proved ineffective since neither accurate reconnaissance information nor large ammunition stocks were available. The division temporarily had to discontinue the attack and wait until the pressure had been relieved by action of adjacent units.

The attacker faced great difficulties in dealing with such a defensive position composed of tanks because its great frontal fire power made reconnaissance difficult and because it was hardly vulnerable to the fire of light and medium caliber guns nor even to that of heavy ones. It had the advantage over the attacker of utilizing cover and camouflage and it permitted the defender to shift forces rapidly and switch to the offensive. The attacker will try to envelop such a defense line by means of a frontal containment. All weapons may be used, such as large-caliber bombs, fire concentrations of heavy batteries with large expenditure of ammunition, and attacks by heavy tanks under smoke screens.

From the year 1944 onward the Russians also formed defensive fronts with the aid of 76.2-mm antitank guns. They possessed heavy frontal fire power but were relatively inflexible and vulnerable to bombs and artillery fire. Their immobility facilitated our flank attacks.

Combat in woods was rare since the German command tried to bypass large wooded areas. A prepared defense in woods was difficult to overcome. The attacking infantry lacked tank support. The

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION



UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

occasionally expressed opinion that tanks had no business in woods was refuted by the Russians' frequent and adroit use of them. To drive a tank through Russian forests proved to be an art that had to be learned. Infantry protection was needed. During sudden clashes, the more aggressive side usually won. The infantry was deployed in the usual attack formations. Reconnaissance patrols and covering parties had to provide all-around security. Among the heavy infantry weapons the 10-mm infantry gun and 10-mm antitank gun were especially valuable. In large forests it proved useful to employ "orientation teams" equipped with compass, aerial photos and so forth. Even without encountering extraordinary obstacles, the rate of march generally did not exceed one to two kilometers per hour.

The German attacks in 1943 and later — aside from those in the Kursk area about which no data is available — were attacks with limited objectives for the regaining of lost territory or for the purpose of closing gaps in the front. Very careful preparations and security were the prerequisites of success. Security was hampered less by Russian air reconnaissance than by reconnaissance patrols stationed behind the front where they continually observed railway and road traffic, monitored telephone conversations and captured service troops who usually knew more about the situation than front line soldiers. Tactical procedures and doctrines remained as they were in 1941. In view of increased Russian defensive strength, our attacking forces had to be heavily concentrated.

German attacks were carried out according to the following rules: Short, intense artillery preparation which neutralized the Soviet infantry. Neutralization of the Russian artillery by counterbattery fire or Luftwaffe attacks. Infantry attacks with assault guns or tank support.

It was more important to have effective cooperation among the various arms than specially large numbers of attacking infantrymen. The closer the objective the weaker the infantry could be. The more accurately the location of enemy positions was known, the more detailed could the orders be which were issued to the assault troops, such as the taking of certain parts of positions, pivoting for envelopment, and use of flank protection. The forward assault troops had to reach the objective as soon as possible, without regard for flanks or rear, and to prepare for defense. The Russian positions had, as a rule, an outpost area some 500 - 800 meters deep which was occupied, at strong points, by combat outposts. The positions themselves consisted of numerous trenches and strong points in great depth. The individual positions were well camouflaged and adapted to the terrain but not strong. Many positions were mined.

-15-

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

The attack, when heavily supported by tanks, usually proceeded at a fast pace. As long as it kept moving, our troops had little to suffer from Russian artillery. The assault artillery was given a precise fire plan which was adapted to the planned course of the infantry attack. The artillery preparation rarely lasted more than thirty minutes. Then the various phases of the attack were supported by observed fire. Finally, the largest possible number of guns was concentrated for defensive fire from the captured positions.

The neutralization of the Russian artillery was more important after than during the attack. Success depended on whether it was possible to repel the strong counterattacks which were carried out with larger numbers of tanks and increased artillery support. Large-scale motorization permitted the Russians to rapidly concentrate at menaced positions numerous batteries with large stocks of ammunition and heavy tank units. Often the Russians did not give up for days and repeated their day and night attacks ruthlessly. In preparing the initial attack it was therefore necessary to calculate requirements of replacements, weapons, ammunition and so forth for defense against counterattacks. This defense often required more strength than the initial attack. There was particularly great need for strong antitank defense.

b. Terrain Problems in the Attack. In consequence of unfavorable terrain, deep snow, far-reaching Soviet superiority in materiel, and inadequate friendly tank support, many German attacks were postponed until night. This was advisable, however, only at times when the attacks were not planned to advance too far forward but were to be carried out according to plan.

Combat in the central sector of the Eastern Front, because of its primitiveness and few roads, made higher demands on engineer troops and labor forces than did any central European area. The difficulties were aggravated by unsuitable equipment. The mastering of such difficulties with the simple materials to be found in the country is an art that must be learned. Friendly support by the indigenous population proved valuable.

During advances the engineers were responsible for building bridges, laying and clearing mines and building roads, the first task being the most important and extensive one. The following experiences concern the crossing of rivers:

(1) Crossing of the Niemen, north of Grodno, in July 1941. The far side of the river was occupied by weak enemy forces while more were arriving on trucks. Protected by assault guns and artillery, the first infantry wave, consisting of about 200 men, swam the river which was some 150 meters wide, drove out the shore

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

defenders after a brief battle and formed a bridgehead. The following infantry waves with heavy infantry weapons crossed with the aid of field expedients. Although exposed to increasing enemy resistance, the bridgehead was enlarged during the night and the building of ponton bridges commenced. Casualties during the crossing were small. Neither long reconnaissance nor preparations were necessary for soldiers to swim across. The enemy was caught by surprise. During the course of the war the Russians also made use of this type of crossing.

(2) The Beresina and Dnieper were crossed without meeting resistance in July 1941. During the crossing of the Beresina the building of approach and exit roads across the swampy shores required more time than the bridge construction itself. At the Dnieper the infantry did not wait for the arrival of the crossing and bridge equipment, delayed because of bad roads, but improvised the crossing.

(3) A surprise attack made it possible to capture a bridge over the Vobz intact in October 1941.

On the roads over which the division was to advance, the engineers also had to repair and reinforce a large number of bridges spanning depressions and small waterways. Timber from the nearest forests and villages was used as raw material. More difficult than the construction work itself usually was the transportation of materials since the engineer troops lacked adequate numbers of cross-country trucks.

Roads could only be repaired in exceptional cases. Rains turned unpaved dirt roads into bogs. It was not practical to continue the march until bad road sections had been repaired. No time was saved by a precipitant advance which merely resulted in overstraining horses, engines and vehicles.

The Russians showed ingenuity and craftiness in mine laying. Places which the Germans presumably would enter in order to avoid obstacles or to find protection against inclement weather or enemy fire were mined, as well as weapons, particularly tanks, German corpses, bunkers and so forth.

The type of fortifications against which engineer equipment for forcing was required were found only at the frontier. These reinforced concrete two-story bunkers were often defended for days with utmost tenacity and could only be taken with the most modern engineer equipment.

The tremendous amount of work to be done will always offer great temptation to fritter away the efforts of the engineers.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

Units of all armored branches, including the supply services, should be required to carry out simple construction work for which trained officers, noncommissioned officers and enlisted men should always be available. Such work comprises road improvements, repair or strengthening of bridges across small waterways, mine laying and clearance, the building of wooden huts, etc., in order that the engineer troops may remain available for the big tasks.

c. Evaluation of German Offense Doctrine. In conclusion it may be said of the infantry divisions' attack procedure that it was based on sound tactical principles compliance to which produced the best possible results through mutual collaboration between the infantry with its heavy weapons and the artillery. The infantry's tenacious aggressiveness and defiance of death formed the basis of success. However, the attacks were prepared and carried out too slowly, which would have permitted a more highly motorized adversary to move his reserves to the menaced point in time or to evade action. In the battles of encirclement in 1941 this was not so much the case, which should be taken into account when evaluating the successes then achieved by the German infantry divisions. This fault was especially serious in the pursuit, because the infantry had to depend on slow-moving artillery materiel. The enemy could thus brace himself for new resistance which the infantry had to break day after day, and for which it had to pay a high price in losses. Motorized pursuit would have prevented this, and successes could have been obtained quicker and more cheaply. Night pursuit, which is very effective and which modern illumination techniques will also make possible away from the highways, deserves careful consideration.

Russian commanders have learned a great deal. Nonetheless, their character offers good opportunities of success to flexible and resourceful attackers. In spite of numerous Communist efforts to enliven the character of the Russian people, a certain degree of passivity and ponderousness will remain. The experience of the Soviet command is to a certain extent one-sided, for it never had to face up-to-date armored and air forces comparable to those that operated in western Europe in 1944 - 45.

It proved a sound measure to organize the German infantry division with three regiments. Whether the regiments should have two or three battalions remains undecided. The more fully the air force, armor and artillery support the infantry the less numerous the latter needs to be. If the infantry regiments have two rifle battalions the division should have a seventh battalion at its disposal. Organizing the infantry division with two regiments of three rifle battalions each has not proved sound.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

The division artillery was too weak. It should have consisted of two regiments, one light and one heavy. Events demonstrated that assault guns belong to the artillery. The division needs its own assault gun battery.

For antitank defense, which will always play an important role in any struggle against the Russian Army, tank destroyers and self-propelled guns are needed, the former assigned to divisions, the latter to regiments. I believe that the artillery should have its own antitank defenses.

The engineer battalion should be strengthened by one company, raising the total from three to four.

For defense against low-flying planes the division should possess one light antiaircraft artillery battalion, and each regiment one automatic weapons company.

#### 6. German Defense Tactics at the Division Level

(Gzhatsk - Smolensk - Vitebsk Areas in Central Russia)

a. Soviet Offensive Tactics. In November 1942 the Soviet High Command issued new field regulations for the attack, in essence prescribing the following:

(1) Attacking infantry will advance in close formation with strong tank support. It will advance with large numbers of heavy infantry weapons far forward.

(2) The advance of the troops will be strongly concentrated against the planned penetration points. A division will attack over a width of about three kilometers.

(3) The artillery preparation will be brief and intense.

(4) Local reserves will be kept small; strong reserves will be held, several kilometers to the rear.

(5) As soon as the breakthrough develops, armored units with motorized infantry will be committed against strategic objectives without regard to enemy elements remaining behind.

All preparations for a Russian attack were well camouflaged. Radio silence was observed. New units moved up only at night, and artillery adjustment fire was normally omitted.

b. An Impending Russian Attack was Normally Indicated by the Following:

(1) Increasing activity by combat patrols, which sometimes

UNCLASSIFIED

19  
~~RESTRICTED~~  
SECURITY INFORMATION

began weeks before, to determine weak spots and sector boundaries. Regiment, division and army boundaries were preferred objectives.

✓ (2) Increased entrenching work in forward lines to provide cover for the assault troops.

(3) Air attacks on supply bases, railways, and headquarters commenced several days before the assault.

✓ (4) Increased use of smoke, either fired by the artillery or sprayed by planes to blind enemy observation and to screen their own movements.

✓ (5) Intensified propaganda, calling on enemy personnel to desert.

✓ (6) release of a few PWS (H)

Typical of the Russian conduct of attack was a ruthless employment of their own troops. They appeared to avoid any regular system of attack influenced by season of the year, weather or the time of day.

They attempted to achieve surprise not only in the time of attack but also in its minor tactical details by the introduction of new methods, as for instance:

Artillery preparation against one sector while the infantry attacked another. Opening up of penetration points during preparatory artillery fire by concentrating artillery barrages on them, whereupon the infantry, screened by smoke, advanced toward the enemy positions. Omission of artillery barrages, instead of which many sharpshooters were moved forward at night. At dawn, attacks by tanks with infantry mounted on them. The sharpshooters picked off every target that became visible.

The manner in which the tank support was carried out also changed frequently. At times the tanks led while the infantry followed; on other occasions they stopped 800 to 1,000 meters before the enemy positions, observed the infantry penetration, and then followed.

With the strengthening of the Russian Air Force, the attacking forces were given increasing support by strong units of close support planes, which attacked the enemy infantry and artillery.

c. Development of German Defensive Doctrine. After the winter of 1941 - 42 and the failure of the Stalingrad offensive, the German forces were faced with the difficult problem of defending



~~RESTRICTED~~  
SECURITY INFORMATION

✓ huge areas with small forces and resources. The divisions had to defend sectors twenty and more kilometers in width. After 1942 they had only six, and in rare cases seven, infantry battalions, which together hardly numbered 2,000 combat soldiers.

The defensive tactics were governed by orders from the Wehrmacht High Command demanding that all positions be held. The field command attempted to carry out these orders by the following procedures, each of which is discussed in detail below:

- d. The careful building of strong defense positions.
- e. A systematic organization of defense.
- f. Mobile tactics, insofar as these were possible within the limitations of orders from higher headquarters.

d. Building Defense Positions. In accordance with available time, forces and transportation, the positions were built on approximately the following pattern:

✓ The forward or first trench served simultaneously as the main line of resistance. For lack of manpower, no outpost area was used. Eighty to one hundred meters to the rear was the second trench with most of the living quarters; 600 - 800 meters further was the third trench. Two to three kilometers rearward was the artillery defense position, followed by the artillery area with most of the gun positions.

✓ In the intermediate areas were trenches and strong points for heavy weapons as needed. Command posts up to and including those of divisions, as well as all artillery fire positions, were built up as strong points. The quarters of supply and rear service personnel were also prepared for defense.

The main defensive area was located between the main line of resistance and the rear boundary of the artillery area.

✓ When preparing the positions, cover and concealment were considered of greater importance than strength. For purposes of command and supply it was impossible to do without continuous trenches in the forward part of the main defensive area.

✓ The location of the main line of resistance had to be adapted to the requirements of antitank defense and artillery observation. Positions on reverse slopes were chosen when the forward slopes of a hill could be observed from the rear or the flanks. Forward slope positions were avoided because they were exposed to enemy observation and fire and because of the difficulties encountered in

~~RESTRICTED~~  
SECURITY INFORMATION

✓ supporting and supplying the troops. Forest positions required a great deal of labor and strong infantry forces. For neither of these purposes were sufficient German troops available. Woods close in front of the main line of resistance proved disadvantageous because they concealed enemy preparations for attack, while woods close to the rear of the main line of resistance were preferred by the Russians as points of penetration.

It was considered advisable to include in the main defensive area the brooks and small streams which ran parallel to the front. They were usually cut deeply into the terrain, with very winding courses and bush-covered banks. When located close to the front, such areas were used by the Russians as assembly points before attacks. By exploiting a river bend the Russians usually established a bridgehead and brought tanks over to the other shore. The enemy preferred valleys running perpendicularly to the front as breakthrough points. The valleys therefore had to be effectively blocked not only at the main line of resistance, but also in depth and covered by fire as well. The enemy made a deep penetration south of Orsha on a stormy night in January 1944 on the ice of a small river leading into our positions. The defenders had not sufficiently blocked the frozen river. Observation and artillery were hampered by bad weather and low visibility.

The defensive artillery position gained in importance as it became more difficult to stop enemy attacks before or in the forward part of the main defensive area. It was essential that it remained concealed to enemy air observation by making the best use of terrain features and effective camouflage. No continuous trench was therefore dug. Protection provided by natural tank obstacles was considered desirable.

If the situation and available labor permitted, it was considered vital to build rear positions. Special construction gangs were detailed for this purpose. The front-line divisions were customarily responsible for maintaining their positions, a task causing considerable difficulty owing to lack of manpower. Unoccupied positions deteriorated at a remarkably rapid rate.

e. Organization of the Defense consisted of the following elements, each of which is described in detail below:

- (1) Commitment of troops.
- (2) The plan of defensive fire for all arms before and within the position.
- (3) The antitank defenses.
- (4) The reconnaissance and observation services of all arms.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

- (5) The signal communications.
- (6) The creation of an efficient tactical road net behind the positions.
- (7) Preparations for shifting of forces from other parts of the front for the support of menaced sectors.

W  
(1) Commitment of Troops. Because of the size of the frontal sectors, the divisions were compelled to commit all battalions in the forward lines. Each battalion had to defend a sector from three to four kilometers wide, while the rifle companies had to hold a frontage of from 1,000 to 1,300 meters. A rifle company never had more than seventy men in the trenches, often less. The main line of resistance and the second trench were held like strong points. The heavy infantry weapons were placed in the third trench, in the strong points, and in the fragmentary trench sections in the intermediate area. This created a spotty, emergency-type manning of the main line of resistance up to about one kilometer in depth. The company and battalion commanders had only weak reserves. The men holding the main line of resistance were on the alert all night. They could rest only after the early morning hours.

✓ Thus the infantrymen were under extraordinary strain. They had to build extensive positions in the wide sectors, had to stand guard and be on the alert for many hours. During the six months of winter the men had to stand guard in the trenches for eight to nine hours and could only sleep six to seven hours in two or three shifts. The rest of their time was spent on alert, at work, at maintaining weapons, at training and in eating. The over-all situation on the Eastern Front made the relief of divisions for rest possible in exceptional cases (rehabilitation of decimated divisions) only.

Light machine guns, submachine guns, and hand grenades were the preferred weapons for trench warfare. Magazine-fed rifles were considered obsolete. The semiautomatic rifle with a high-powered telescopic sight was the sharpshooter's weapon. Well-trained snipers inflicted substantial casualties in all combat situations by picking off commanders, observers, and the crews of antitank guns and heavy machine guns. The assault rifle which was issued to the infantry in 1944, Model 43, with a rear sight range up to 800 meters, proved to be a specially effective and efficient weapon.

In close combat and trench warfare, the German infantry was superior to the Soviet infantry. The Russians preferred to employ penal battalions for attacks with limited objective and for reconnaissance in force.

- 23 -

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

If an attack was impending, the weak trench crews had to be strengthened and organized in depth. Widely distributed in the trench and strong point system squatted small groups of from four to six Germans who were on the receiving end of the enemy artillery preparation. Whoever survived it came to grips with the tank-supported masses of Russians who poured over the main line of resistance. The command posts of company, battalion and regimental commanders became the centers of fighting. Nevertheless, thanks to competent artillery support and to the arrival of scanty reinforcements including a few assault guns, this uneven struggle often ended to the advantage of the German defenders.

Disturbing the battalion organizational set-up as little as possible, the artillery was formed into detachments which were attached to the individual infantry regiments and were echeloned in depth in such a manner that the mass of the defensive power was placed behind the expected point of main effort. The entire artillery was under the direct control of the division, the corps retaining control of only certain batteries, such as for instance those which by means of heavy flat trajectory or heavy howitzer fire had to perform combat missions in the sectors of several divisions. To interfere with enemy reconnaissance, positions were changed frequently and much use was made of roving guns and batteries. Whenever sufficient forces were available, batteries were advanced into the combat zone as close-range batteries to protect important sectors of the front; these batteries were to take under direct fire the enemy forces who had penetrated. They performed excellently in this role. The artillery observation posts were organized in depth and reached back to the artillery area. Reserves waiting at the battalion and regimental headquarters were speedily moved up in case of unexpected developments, such as a penetration in an adjacent unit.

(2) The plan of defensive fire developed out of the collaboration of infantry and artillery. It comprised heavy fire concentrations on all important targets, barrage fire, and harassing fire on the enemy rear areas.

Fire concentrations were the main means of combat. They were to strike the enemy decisively during preparations for an attack, particularly by systematic counterbattery fire and bombardment to disperse assault infantry and armored forces concentrated for the attack. All batteries, including those of the adjacent divisions, participated in these fire missions. The main mission of the artillery signal communication system was to make the speedy and flexible control of such fire concentrations possible. The corps artillery commander had to make sure of the concentrated effect of the divisions' artillery against the enemy point of main effort.

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

The resulting high expenditure of ammunition would only be justifiable if really profitable targets were available. The laying of fire concentrations on areas not definitely known to be enemy-occupied was prohibited.

The salvoes fired by the chemical mortar batteries were an effective supplement of the artillery in area fire. Besides the physical effect, the effect on morale was increased according to the number of chemical mortar batteries taking part in the fire concentrations. For this reason, fire was not to be opened by less\* batteries than those included in a regiment (two battalions). In the last year of the war this means of warfare was hampered for lack of ammunition. Heavy infantry weapons took little part in the fire concentrations. Their employment in the main line of resistance suffered during heavy enemy artillery fire, and was frittered away in support of piecemeal infantry attacks. The 120mm. mortar, copied from the Russians, had an approximate range of 6,000 meters. It could have aided the artillery in many missions if it had arrived in adequate numbers at the front.

Fire concentrations were planned in advance against important points in the main line of resistance at which the enemy habitually attempted to penetrate. Since the enemy constantly increased the speed and mobility of his attack, our fire concentrations frequently came too late. The battery commander, who could directly observe the enemy's advance, directed the fire most effectively in such situations.

Barrage fire was of little importance and did not halt enemy attacks. The main weapons used in the barrage fire were heavy machine guns since not even reinforced artillery sufficed in major engagements to cover the entire front. The Russian tactic of employing their assault infantry in line formations with little depth facilitated the advance through barrage fire.

To evade German fire on their troop concentrations before a major attack, the Russians dispersed their preparations as much as possible and moved mostly at night. Consequently, a direct tactical success by means of harassing fire could not be obtained. It was therefore all the more important to inflict heavy casualties on the enemy, which, if it occurred on all sectors of the front, would be bound to be felt in the long run. Accurate firing with every single weapon from snipers' rifles to cannon was therefore the rule, and given good target reconnaissance, it proved effective in spite of low ammunition supplies.

The artillery ammunition supply was always critical. An attempt was made to supply the artillery with one and one half to

- 25 -

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

two units of fire before a major engagement. Additional issues were calculated for each day of combat. Frequently these quantities could not be obtained when partisans interfered with the supply services. As the infantry's fighting power decreased, its demands for artillery support increased. Adequate ammunition supplies were available only as a result of the higher commanders' constant admonishments to the infantry to get along as far as possible with its own weapons and through drastic curtailment of all unnecessary firing.

The backbone of German defense was the artillery. But it was not within its power to make up for the lack of air and armored support, not even if it had possessed more guns and ammunition. In the final phase of the war the artillery's effectiveness declined because it could not be adequately protected against air attacks.

(3) The Antitank Defenses. After the winter of 1941 - 42 the antitank defense of German infantry divisions had to be reorganized because of heavy losses and the appearance of the medium Soviet T34 tank to the exclusion of almost all other types. The tank remained the victor in the race between antitank defense and tank. Although the Germans were able to send a number of efficient defensive weapons to the front, they failed in the most important point, to produce sufficient quantities of effective weapons which could cope with the cross-country mobility and speed of tanks. The course of the war clearly demonstrated that an immobile defense, regardless of its quality, is no match for a major tank attack. The defenders tried to make up for the lack of mobility by a careful organization of the stationary defenses.

It was intended to create defensive zones in the battle position by means of antitank fire correlated with natural and artificial obstacles. The forward defensive zone was located approximately before the third trench, the rear defensive zone before the protective artillery position. This tactical concept was correct, but its execution failed due to the lack of antitank guns and the difficulty of creating enough artificial obstacles. For their tank attacks, the Russians selected the type of terrain offering few natural obstacles. The German infantry division controlled four antitank companies, one of which operated directly under the division, while the others were attached to infantry regiments. Altogether there were some thirty to forty guns which could be towed in a fashion by trucks or light tractors. Three times as many guns would have been needed to provide the necessary depth of antitank defense.

It proved desirable to set up antitank obstacles in the main defense area — except where there were wide expanses of water or

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

swamps — in order to conceal them from enemy observation and protect them against measures preceding the attack. The benefit derived from antitank ditches, was not commensurate with the work required to build them. For antitank obstacles, as for all other battle installations, camouflage and echelonment in depth proved more important than strength. With the protection afforded by his air force and artillery the attacker was always able to overcome linear obstacles quickly. Gaps in the line can do little harm if the enemy can merely guess at the location and nature of the obstacles. Such gaps were often closed by electrically-exploded mines or by dummy obstacles. The gaps were needed by the defenders to launch their counter-thrusts. No large continuous mine fields were prepared, inasmuch as smaller ones were considered preferable for tactical purposes. Mine fields forward of the front positions proved ineffective. It was always difficult to mark mine fields located within the positions in such a manner that our own troops would not enter them at night or in the rush of a major battle while at the same time concealing them against premature discovery by the enemy.

IMPROVED ✓

? The heavy Tiger tank proved to be the best because of its superiority to enemy types and its invulnerability to preparatory artillery fire. Initially it was feared that its weight would restrict maneuverability, but this proved unfounded when careful, long-range reconnaissance was carried out first. Every commander and driver of tanks needed eyes sharpened by experience to negotiate the Russian terrain. Tank units, recently arrived from the zone of the interior and freshly thrown into battle, invariably suffered high losses. In spite of its unwieldiness the 88mm. gun was the most efficient among the self-propelled antitank guns. Thanks to the excellent optical sighting mechanism, enemy tanks could be disabled at a distance of three to four kilometers. Enemy aircraft were more dangerous than tanks to the self-propelled antitank guns. Tanks and assault guns were assembled in the depth of the battle position for the counterthrust which was carried out with artillery support and infantry protection. The lack of tanks precluded stationary commitment in strong points except during periods of deep snow and in the autumn and spring muddy seasons. The self-propelled antitank guns fired from prepared ambush positions. The author possesses no knowledge concerning the destroyer tanks used during the final phase of the War. In 1944, the infantry at last received in the "Panzerfaust"\* an antitank weapon which no longer required close approach to the tank. The lack of high-quality mobile antitank weapons induced the Supreme Command to

\* Recoilless antitank grenade and launcher, both expendable.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

overestimate the value of close combat methods against tanks and to make too great demands on the infantry. In the long run it was expecting too much of the infantryman to allow himself to be over-run by tanks in the full knowledge that his fate was sealed if the antitank defense behind him failed to repulse the attack.

(4) Reconnaissance and Observation. With the given circumstances one could expect to counter a strong attack only if its scheduled start, extent and if possible also its direction could be determined in time. Minute changes in the enemy's dispositions and attitude were recognized and kept under continued observation by means of very careful observation, collection and evaluation of all enemy information, especially the activities of his artillery and assault troops. Such surveys were made at both division and regimental levels. The observation battalion rendered valuable services with regard to the reconnaissance of enemy artillery.

Up till 1943, many deserters crossed over to our lines. Later on, the Russians did not move their assault infantry into position, before the night preceding the attack, having even then kept them under close surveillance. Prisoners from along the regular line troops knew little of value about the attack. A long time before the beginning of the concentration for the offensive the Russians observed radio silence, except for local front communications. Increasing pressure was exercised by the Russian Air Force against German air reconnaissance. In spite of all difficulties we frequently succeeded in gaining information regarding the place, timing and approximate extent of an impending attack.

(5) Signal Communications are discussed in Chapter V of this study (pages 61 - 68).

(6) The Tactical Road Net. The number, capacity and geographic location of the few roads to the rear of our positions in Central Russia were tactically inadequate. The building of the required tactical road net was an important task for the engineer commanders. A road building program was set up, with priorities determined by the tactical situation, logistic needs and the available resources. At least one approach road, from which all other roads branched off, was planned for each division sector. For movements behind the front, lateral roads were constructed, one about three kilometers behind the battle position and one some ten to twelve kilometers distant. They were planned as all-weather, two-lane roads capable of supporting medium, twenty-four-ton loads. The capacity was to be increased to sixty tons on roads where heavy tanks were expected. Local inhabitants were employed for road construction and maintenance. They worked willingly since



~~RESTRICTED~~  
~~SECURITY INFORMATION~~

they were used to doing this to a much greater extent under the Soviet regime and because they were properly treated and fed by the military authorities. Whenever possible, the road net was supplemented by field and narrow-gauge railways. The disadvantage of frequent reloading was balanced by the greater efficiency achieved. The Russians did not destroy the roads and improvements through systematic bombing, but frequently attacked vehicles. During the muddy season in the spring traffic was crippled for at least four weeks. The units had to stock up on all supplies for about six weeks, since the Russians attacked even during this period in the hope of striking an unprepared enemy.

(7) Shifting of Forces. The army commander could generally not rely on receiving sufficient reserves in time to counter an impending attack. The reserves could only be obtained by a drastic shifting of troops from other front sectors which were apparently less threatened. Since there were no relief units it was a difficult and time-consuming procedure to switch complete divisions from other areas. Every division had to make preparations to detach infantry, artillery, antitank and engineer elements. Gaps which developed were temporarily closed by forming supply and rear service personnel, for example from veterinary companies, into improvised combat units and by the commitment of construction battalions. The employment of reserves drawn from assorted troop units had the disadvantage that a great intermingling of different units occurred at the battle front within a short time. No one knew anyone else. Increased friction resulted from attempted coordination. The logistical problem became difficult. The strength of the troops was sapped at a more rapid rate. At the conclusion of a battle even the divisions manning fronts which were not attacked had suffered losses, since during a prolonged struggle (the battle of Vitebsk, for example, lasted from December 1943 to March 1944) all their regiments had participated in the defensive combat.

f. Mobile Tactics. As the result of instructions issued by the Wehrmacht High Command concerning the defense of positions, mobile tactics within the battle position were only possible on a minor scale. As the position was thinly manned, the enemy could penetrate it easily. A rapidly developed counterattack repulsed him again. The more tenaciously the cut off sectors could defend themselves, the greater was the counterattack's prospect of success. Consequently, infantry training was governed by the two mottoes:

✓ "Attack even under the most difficult conditions"  
"Hold out to the end."

~~RESTRICTED~~  
SECURITY INFORMATION

It was due to this ingrained aggressiveness, which the other supporting arms also made their own, that the divisions in the East, which were stretched far more thinly than sound tactical doctrine dictated, could maintain themselves for so long. They collapsed when the demands exceeded human capacity of endurance. ✓

The German artillery protected the area in which the counter-attack took place and slowed down the approach of enemy reinforcements. It could not intervene in the fight directly because of the proximity of both opponents. Under the protection of tanks, especially heavy ones, the counterattack usually brought speedy success. In cases where the resistance of the infantry lagged, the enemy often penetrated at several more points. No real success was assured anywhere when the reserves were committed piecemeal. To clean up the penetration points successively also proved impracticable. }

Even if the first thrust was successful it was still impossible to forecast when and in what condition the reserves would again become available. Drawing on their large pool of reserves, the Russians moved up strong forces into every penetration point. The danger existed that the dented front would be broken through if help were not immediately forthcoming. It was therefore desirable to hold a portion of the available tanks in small groups behind the menaced points in order to stop the enemy advance immediately. The command thus gained time to launch the mass of reserves against the most threatened point and to take measures in support of other sectors. The Russians increasingly learned to protect their attacks against counterattacks by setting up defenses rapidly, by bringing up reserves and by laying a tight fire concentration on the conquered terrain. When attacking they preferred close terrain which would hamper the defender's fire direction and prevent attacks by low-flying planes. The Russian tank attack was carried out not so much in the manner of a powerful mass thrust, similar to those of former cavalry attacks, but more by means of an adroit and fast penetration by tank spearheads into the terrain while exploiting all natural cover and concealment. Such tactics were most dangerous to the German defense, weak as it was in antitank defenses and reserves. }

If their attack were arrested, the Russian commander preferred to switch the point of main effort quickly. The defender then had to regroup his weak reserves just as quickly. An error concerning the enemy's new point of main effort, or the late arrival of reserves, could result in a lost battle. The enemy air force failed to make a concentrated effort to hamper the transfer of reserves. R

g. Evaluation of German Defense Measures. It is impossible to comment on the soundness of German tactical defense doctrine

- 30 -  
~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

GOOD  
QUOTE

because it was never applied. The lack of manpower and modern equipment caused overextended sector widths, lack of depth, lack of reserves and modern counterattack units, as well as tactical immobility. German defense operations in the East clearly demonstrated that an immobile defender in the long run has no prospects of success against a mobile attacker. This applies to strategic and tactical situations alike. The defender must be strong enough in the air to be able to supply his troops and move his reserves in time. The importance of main battle positions has increased; the points of defensive main effort become the battle area of the opposing armored units. The defender tries to balance his numerical weakness by building positions and through support from all arms. The modern main battle position must be of much greater depth than hitherto, at least fifteen or more kilometers. It is crossed by a net of strong points and obstacles which impede the enemy's tanks. It is advantageous to have an outpost area two to three kilometers deep, which is secured by the infantry, obstacles and mobile light weapons. The stationary defense relies on artillery and no longer on the machine gun. As shown by the Russian example, a front consisting of tanks has a great defensive value. It needs infantry only for protection against close combat troops creeping up in night and fog.

At the battle of Kursk at the latest (summer of 1943), the time arrived when rigid defense should have been discarded for flexible defense. The front should have been pulled back, according to plan, to rearward positions before the enemy could thrust forward with his superior materiel. The pursuing enemy should have been met by artillery and his new concentrations hampered by offensive thrusts. In this manner the command could have gained time to bring up further reserves and secured the freedom to decide when it should accept the decisive battle.

Even though the breakthrough was local and minor at the beginning, it immediately put the defenders into a critical position. By making use of poor visibility, artificial smoke or natural concealment, the enemy advanced with surprising speed with strong tank and motorized forces through the smallest front gap into the rear of the German positions. The defender had to strengthen the shoulders of the penetration, intercept the enemy forces that had broken through the lines and, if at all possible, destroy them after closing the gap. The latter was only possible if armored troops with strong artillery and air support could be committed immediately for a counterattack. The Russians protected the breakthrough points by massed artillery, infantry and anti-tank troops. At first, the shoulders of the penetration had to be protected by the artillery, while the local command tried to set up new defenses there. In case no tanks or assault guns were

UNCLASSIFIED

- 31 -  
~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

available, the antitank defense was restricted to close-range action, since it was impossible to shift heavy tractor-drawn antitank guns by daylight. The enemy soon realized how difficult it was for the German defenders to strengthen the shoulders of a penetration quickly, so he immediately fanned out with a part of his reserves. Whenever the defenders succeeded in preventing a further rolling up of the front, it was often due to the fact that the command posts of battalion, regiment and battery commanders, which had been built as strong points, held fast in bitter close combat. Rear positions to halt forces which had penetrated were present at all fronts. They were effective only if adequately manned in time. In the final phase of the war the Russians dropped airborne troops which, together with tanks attacking frontally, destroyed the rear positions. If the defender realized that his countermeasures were unsuccessful, a speedy withdrawal was indicated. In case the Wehrmacht High Command's permission came too late, it was often just those troops who had fought most bravely and defended their positions most tenaciously, who were overtaken by catastrophe.

According to Wehrmacht High Command directive, the forces in politically and strategically important cities had to permit themselves to be encircled and had to hold out after the front had been rolled back. These cities were designated as "fortified places" and transformed into fortified field positions. In the winter of 1941 - 42 this type of defense was successful because the Russians, due to high losses of materiel, lacked adequate resources for attacking, while the Germans were able to relieve the encircled places. After 1942 this situation changed. None of the cities offered particularly favorable local defense conditions. They could not be defended for any length of time against the latest offensive weapons. They lacked Luftwaffe support. The intended strategic effect did not materialize since the encircled troops were unable to tie down such strong enemy forces that their absence would influence Russian operations elsewhere.

7. Retrograde Movements - Infantry

(Central Russia. Division movements from west of Moscow to Gzhatsk in January 1942; from Smolensk to Vitebsk in August - September 1943)

Both of the movements described here resulted from the strategic situation of Army Group Center and could not have come as a surprise to the enemy. Long before their commencement he attempted to obtain an insight in the situation by means of local attacks and reconnaissance in force. Because of previous heavy losses and unfavorable weather, the Soviet Air Force only engaged in minor

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

activities during January 1942, and it thus overlooked preparations for withdrawal. In the autumn of 1943 it had considerable superiority in numbers and possessed full freedom of movement since the weather was generally favorable. The Soviet Command undoubtedly ordered vigorous pursuit in both cases to cut through the retreating German forces, with the aim, respectively, of reoccupying Vyazma by January 1942, and Vitebsk by the autumn of 1943. The German command succeeded in preparing and carrying through both movements according to plans in spite of difficulties. The preparations covered the following:

- (1) Building of rear supply bases, which had to be protected respectively against attacks by Russian ski troops during the winter of 1942, and against attacks by partisans in 1943.
- (2) Movement to the rear of the new position of all vehicles, weapons, trains and columns which were non-essential and difficult to move.
- (3) Reconnaissance and construction work on roads for movement and subsequent blocking and the reconnoitering of the projected lines of resistance.

In 1943 reconnaissance activities were menaced by partisans. They annihilated an entire reconnaissance headquarters, in addition to inflicting minor casualties here and there.

In the winter of 1942, preparations were hampered by snow thirty to forty inches deep. Owing to the lack of snow plows, a special organization was needed to direct the indigenous population in clearing and maintaining the most vital roads. Each division had only one road available since it was impossible to keep more than one free of snow. In 1943 a number of smaller waterways had to be crossed by means of emergency bridges because the military bridge equipment was used elsewhere. The fear that systematic Russian air attacks might cause great difficulties proved groundless.

German tactics were guided by the principle of "delaying action." Shortly before the war the regulations concerning this type of combat were deleted from the manuals. The Army High Command (OKH) espoused the following viewpoint: "The troops must hold their positions; the length of time lies within the discretion of the higher command." During the war it was proven that this principle was too narrow and did not solve the problem of carrying on defensive action for a definite length of time with weak forces. The difficulties of the defender increase in proportion to the superior mobility of the attacker. The defender must maintain his

- 33 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

freedom of action and above all prevent a breakthrough or an envelopment, for this means danger of annihilation. To accomplish this the defender must be able to withdraw in time. During attacks with modern weapons, decisions must be made so rapidly that any waiting for orders from superiors would entail a dangerous delay in carrying out necessary decisions. In the course of the Russian campaign, many situations arose where an inflexible defense failed and where a timely change to delaying action could have prevented catastrophe.

It cannot be denied that this type of combat is likely to tempt commander and troops alike to avoid all risks and difficulties by falling back. The fear that morale would suffer was the main reason why the Army High Command deleted the principle of delaying action from the manuals. However, this fear proved unfounded during the War. The German troops felt themselves to be a match for even a numerically superior enemy unless the latter were also supported by a preponderance of materiel. Consequently, they did not evade battle more often than was absolutely necessary. Their confidence in the command and their fighting spirit was increased by the feeling that they did not have to carry out the kind of defense that was rigid, and difficult, and involved many casualties because of the enemy's superiority in materiel.

On the German side the systematically conducted retrograde movement presented a picture of a flexible front being moved back in a comparatively straight line. It was not necessary for all its units to be at one level at the front, although it was necessary that they all maintain contact with one another to prevent the enemy from finding a gap anywhere through which he could penetrate. Both corps and divisions employed special officer patrols to reconnoiter important points at the front in order to ascertain whether this contact was really maintained.

Success in combat depended on whether the command received timely reports on the information obtained by the reconnaissance patrols with regard to the time and place of impending attacks. In the autumn of 1943 the Russians showed great skill in shifting their point of main effort. The air reconnaissance, and even more so the signal reconnaissance, generally furnished timely clues concerning enemy intentions and his deployment of forces. In January 1942 the Luftwaffe was seriously impeded by the effects of cold weather, and for unknown reasons the signal reconnaissance failed to obtain results, while ground reconnaissance was unable to penetrate through the Soviet ski battalions. The German command was therefore kept in the dark. It was due solely to the inflexibility of the Soviet command at that time that there were no disadvantageous consequences.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

The higher command directed the withdrawal movement by fixing sectors designated for marching, reconnaissance and combat for the divisions, and also establishing lines of resistance with additional orders prescribing the time for reaching and defending them. The command thus provided a long-range plan for the manner in which it desired the movement to be carried out. Sectors and lines of resistance did not form a rigid pattern, for they were subject to change according to the situation.

The location of the line of resistance and its distance from the enemy depended on the terrain and on the plans of the command. In cases where the distance was small, there was reason to fear that the enemy might launch an attack for which the defense was unprepared. The position could only be reconnoitered as to its detailed characteristics and be occupied after daybreak, an extensive mission for which the exhausted troops required a good deal of time. The line of resistance to be occupied should be taken over in advance by a security detachment to receive the withdrawing troops. Because of lack of troops, however, this was not done during the retreats just described. The enemy penetrated twice into the new defense line without meeting organized resistance.

If the distance to be covered during the retreat was too great, the lines of resistance could not be reached under cover of darkness. The retreat in daytime was then exposed to attacks by the enemy's air force, by airborne troops and by motorized forces. In such circumstances retreat was only feasible at all under the protection of a strong air force. The ground troops had to be ready at daybreak to defend themselves in all directions and had to fight their way to the rear.

The distance of the line of resistance from the nearest one held by the enemy was most favorable when it was possible to make full use of nighttime for the rearward march and when it permitted the troops to occupy the new position shortly before dawn. This can hardly be accomplished, however, during the short June and July nights in Russia.

In January 1942 the condition of the troops and their lack of winter mobility made it necessary to move them as rapidly as possible into a fixed position. The withdrawal was therefore carried out rapidly. The lines of resistance were far apart and, except for one instance, were occupied in the morning and evacuated the same night. In the autumn of 1943, retrograde movements took the form of a pivoting back of the entire front from a line facing northward to a line facing east. The directions of the lines of resistance now converged on one pivot point in this movement, so that those forces which were in position nearest the pivot point

- 35 -

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED



~~RESTRICTED~~  
UNCLASSIFIED  
SECURITY INFORMATION

now had little space for operations. It was intended to carry out the entire movement as slowly as possible in order to gain time for the position then being built directly east of Vitebsk. Both command and troops realized from the start that in such an extensive retrograde movement not evasion but combat would bring the desired results, and that the amount of time to be gained could be obtained only by repeatedly repelling the attacker with heavy losses. It was the task of the higher command to select areas for combat offering the most advantages for defense. There our forces would have to carry on as long as our strength and the risk of an enemy breakthrough would permit. This intention determined the selection of the line of resistance.

Orders for building "intermediate lines of resistance" were issued in the course of the retreat. Since the reconnaissance teams which had at first been assigned could not be reached on their missions without loss of time, new teams had to be activated, thus creating a difficult situation for the units in their weakened state. It was desirable to furnish such teams with radio equipment, but this could not be done due to lack of instruments.

By January 1942 the division infantry consisted of only two or three battalions. The artillery was fairly complete, but suffered from lack of ammunition, the antitank defense was inadequate and the engineer battalion had the strength of a company. This made only a loose and thin manning of the line of resistance possible. The Russians, who had superiority and winter mobility, could easily penetrate into the gaps. An attack column comprising several battalions appeared by the morning of the second day of the retreat to the rear of the German artillery. At night the column had crawled through a forest which had scarcely been guarded since reconnaissance had reported it impassable because of deep snow and a dense, jungle-like growth of trees. The German artillery decimated the mass of the enemy moving clumsily in the deep snow with short-range fire, and the survivors surrendered. Such an initial success raised the self-confidence of the defenders and considerably cooled the ardor of the pursuers, whose propaganda often somewhat prematurely spoke of "the beginning of the end" and about the "coup de grace." After this reverse, the Russians pursued cautiously.

In August 1943, shortly before the beginning of the movement, forces were detached from the front for other assignments. The divisions, each with six infantry battalions, were assigned sectors more than forty kilometers wide. Their defensive strength was not commensurate with their missions. On the second day of the retreat two breakthroughs occurred which could only be contained through great efforts by the commitment of troops from headquarters and signal and supply units. Neither the divisions nor the corps had

- 36 -

~~RESTRICTED~~  
UNCLASSIFIED  
SECURITY INFORMATION



UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

any motorized reserves, much less tanks or assault guns. Under these circumstances the retreat took place more rapidly than planned. The army felt it necessary to move up a division rapidly. Although battle-weary, its commitment made it possible to reduce the width of the division sectors to about thirty kilometers. Some time later six assault guns and one light infantry battalion carried in trucks arrived to increase the division's fire power.

The infantry was committed in the line of resistance in such a manner that the rifle companies, reinforced by heavy machine guns and light antitank guns were placed in the forward line. Behind them, at important points, were placed the mortars, infantry guns and heavy antitank guns. The light antitank guns, which were ineffective against tanks, proved powerful weapons when firing high-explosive shells against infantry troops. The battalion and company commanders had small reserves at their disposal, whom they led against such elements of the enemy as had penetrated. The regimental commander created from his engineer and cavalry platoons a reserve which was moved on trucks.

In infantry fighting, preference was shown for terrain that included ditches, hedges, bushes, and small wooded areas, because such terrain impeded enemy reconnaissance but made the transfer of forces close behind the front possible and facilitated counterthrusts and disengagement. This type of terrain was usually found in lowlands which often had dry ground right next to marshy places so that tanks could only operate with considerable risk. Long-range infantry fire was avoided. The attacker was permitted to approach as closely as possible to be ambushed by fire from many directions. The plan of fire consisted of such fire concentrations before the most important positions.

The artillery was organized in groups and ordered to cooperate with the infantry regiments. The command posts of the artillery group commanders and of the infantry regimental commanders were located in close proximity. In most cases the artillery was not attached to the infantry. The authority of the division artillery commander guaranteed a more flexible employment of artillery and fire control. A defensive success could only be expected if the artillery succeeded in assembling the largest possible quantities of guns and ammunition at the decisive point at the right time. The slow, horse-drawn artillery was made more mobile by loading it on trucks. In the type of terrain which the infantry preferred, the artillery met difficulties in procuring adequate reconnaissance information. The fact that many infantry company commanders had learned in the course of the war of position to control single batteries under simple conditions proved useful. The ammunition supply permitted no wasteful firing. The heaviest fire concentration

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

was directed at the destruction of enemy assembly areas. During their approach to the line of resistance, the Russians rarely offered worthwhile targets. Their artillery fire was less systematic and powerful than it had been during preparatory attacks in the war of positions. They omitted systematic bombardment of our artillery by their own artillery and air force.

Antitank defense was again the most critical part of the over-all situation. Individual artillery and antiaircraft guns in forward positions supported the infantry in a self-sacrificing manner. In the course of these battles the Russians committed their tanks in a somewhat piecemeal fashion. They displayed vigilance while driving in strange lowlands, terrain which they disliked. When repeating an attack that had previously been repulsed, they were inclined to reuse the very same tracks. Mines which were laid under these tracks during lulls often produced the results desired.

These battles made great demands on the skill and leadership of the German command and on the tenacity and experience of the troops. Improvised troop units with a brief period of training are not suitable for this type of fighting.

The higher command had to make the decision for withdrawal early enough to enable the division to issue the warning order during the early afternoon, as otherwise it might not have reached all elements in time. Occasionally the fighting became so critical between 1600 and 2400 hours that a collapse of the defense could be expected that evening or certainly the next day. Nevertheless, the command desisted from ordering a retreat the same evening because a belatedly ordered withdrawal necessarily would lead to great confusion. Such an order would interfere with supplies which were in the process of arriving, with the reorganization of units and with the beginning of the regroupment prescribed for the following morning. It might also lead to a partial retreat during the day. Through local withdrawals and reinforcement of the front by artillery, antitank weapons and infantry scraped together somehow or other, the command endeavored to prepare for the next day.

If the order arrived in time, it was possible to disengage from the enemy even if the opposing lines were locked in close combat. In such cases the infantry disengaged from the enemy an hour or two after nightfall, leaving in the evacuated positions weak rearguards, consisting of one and a half to two squads per company. A few hours later, these rearguards were also withdrawn. The infantry withdrew on a wide front and then, as the road net and the situation permitted, assembled in small march units of roughly battalion strength. Good reconnaissance and careful marking

D2226

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

of the roads were important for the success of a night withdrawal. Road improvements could only be carried out on a small scale. It was impracticable to set up time schedules for the various march columns. The division established control points where the commanders of march groups reported when and where their units had last been. The artillery protected the disengagement from the enemy. If the situation permitted, the medium artillery, which frequently had to make detours because of transportation difficulties, was withdrawn from the position in the early evening and moved rearward. A few light artillery guns remained behind for deception and the support of the rear-guards. When engagements lasted until darkness, losses in weapons and equipment became unavoidable. The number of men available was inadequate to move back all the materiel in the position, nor could much time be spent in searching for it because of the enemy's proximity. The wounded had to be recovered. For this type of combat a division therefore needs adequate stocks of weapons, entrenching tools and signal equipment.

The enemy usually commenced pursuit at dawn. The appearance of the first Russian troops before the new position was soon followed by numerous thrusts to probe weak spots. The first attacks generally occurred toward noon and were then repeated in the afternoon. The Russians preferred to infiltrate into hollows and small wooded areas near the German lines, which they felt were concealed from observation and from which they launched surprise attacks. If the penetration were successful, they moved up reinforcements recklessly and tried to widen the penetration points whatever the cost. If the immediate German counterthrusts failed, it often proved necessary to retreat a short distance during the night. For lack of personnel it was impossible to carry out counterattacks, which also prevented the realization of the command's intentions to harass and inflict casualties on the enemy while he was in the process of probing the new line of resistance. Armored forces are most suitable for this purpose. Infantry troops must be rested and must be given opportunities to reconnoiter the terrain for the attack and the following withdrawal.

Pursuit by the enemy could be thwarted by means of obstacles, but this required construction work which had to be planned in time. Since such construction work could not be concealed from Russian reconnaissance troops and partisans behind our front, the higher command had to decide on whether to give priority to the work or to the maintenance of secrecy. The latter course was chosen in the autumn of 1943. The preparatory construction work was permitted to begin only at the last moments, thus enabling the enemy to pursue us in full force and at a rapid rate. It was not until later that tenacious resistance on the part of the German

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

troops provided the time needed to construct effective obstacles.

The work was impeded by the lack of personnel, explosives and mines. It was necessary to concentrate all efforts on a few important strong points. Orders had to reach the engineer commander as soon as possible. His dispositions with regard to labor and materiel had to be flexible enough to allow rapid adjustment if the situation changed. Since engineers on foot were unfit for such mobile operations, they were transported on such trucks as were available. Considering Russian road conditions, this was an emergency solution. Modern engineer troops need vehicles having complete cross-country mobility.

The obstacles consisted of bridge and dam demolitions, the mining of roads and adjacent terrain and the laying of scattered mines in places probably used by the enemy for observation, marching or assembly. There was an unsuccessful attempt to spray flame-thrower fuel on, and ignite a wooded area which obstructed the German positions. Although no rain had fallen for some time, the trees were still too moist. It proved advisable to construct obstacles at the most important places. Macadamized, cobblestone and improved roads of all sorts were always thoroughly blocked in great depth. Unpaved roads, when wet, soon became impassable for a large volume of traffic, and it therefore hardly paid to mine them. The above applies mainly to wheeled vehicles. Much materiel and time was required to hinder the movements of infantry and cross-country motor vehicles. Very effective, according to Russian reports, was the demolition of a causeway across a marsh where as much as 200 meters of the road and its substructure were destroyed. The enemy then shifted his point of main attack, an action which gained several days for the defense.

Experience has proved that the command must carefully plan and coordinate troop movements and intended demolitions, and should bear in mind that such movements rarely adhere to fixed schedules. Infantry and antitank weapons must protect the engineer troops who set up obstacles after the infantry has disengaged from the enemy. During their retreat in the autumn of 1941, the Russians set a large number of demolition charges on the main road between Smolensk and Moscow, the last of which they detonated by remote control in February 1942.

The Russians crossed rivers speedily. They ruthlessly impressed the population within a wide radius for bridgebuilding, using timber from the nearest villages. Mines laid in random pattern inflicted losses but gained no time for the defenders.

Railway engineer troops carried out railroad demolitions under direct command of logistical headquarters. The fastest and most

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

efficient method was a device for ripping out railway ties. However, the Russians quickly restored emergency traffic. They stocked up railway equipment before major offensives.

The described retrograde engagements demonstrate the danger of falling back in thinly-manned lines without depth and adequate mobile reserves. Perhaps the major reason why these movements could be carried out successfully was the fact that the Soviet air and tank arms had not yet become as strong as about a year later. Because by its nature it impeded visibility, Central Russian terrain favored the retreating troops, provided that stern discipline and unbroken lines were maintained. Most troop movements took place away from the roads and thus escaped observation by the Russian Air Force even during daylight hours. Had it systematically attacked crossings over rivers and marshy lowlands, our retreat due to the lack of air cover would not have been as orderly as it was. The low ground favored the defenders. The Russian artillery fire was quick and effective in open terrain. The enemy advanced through forests only when informed, presumably by his intelligence behind the German lines, that he would not meet prepared resistance in them. Such resistance and large-scale construction of obstacles were impossible because the Germans lacked sufficient personnel. The Russians concentrated on the main highways, and shifted their attacks only temporarily even when faced by tenacious German resistance. The local point of main effort was frequently changed. The main pressure was not directed at the road itself, but on points a few kilometers to the right or left of it. The German motorized reserves did not have adequate cross-country mobility and therefore often had to take time-consuming detours and detruck before reaching their destination. Entrucked infantry troops were not able to take their horses and vehicles along because there were not enough trucks. At the detrucking point they were issued some vehicles, kitchens, and ammunition. A modern mobile reserve unit must be a unit made up of elements comprising tank, antitank, anti-aircraft, signal, infantry and engineer troops and must have complete cross-country mobility.

It was surprising that, in spite of occasionally unfavorable situations, a disengagement from the enemy during darkness was almost always successful. Either the Russian Command failed to order night pursuits -- which is unlikely in view of its manifest aggressiveness -- or else the Russian infantry had failed to comply properly with the orders to pursue us. For this reason the lack of positions covering our withdrawal from action had no disadvantageous consequences. In daytime, given favorable terrain and adequate artillery protection, the disengagement of smaller units also succeeded. First the heavy infantry weapons would move back by echelons so that they could still fire on the forward enemy lines, thus forming a covering position. Then the infantry would follow.

- 41 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

It was always necessary to man the most important points of the new line of resistance as protection against enemy troop penetrations and to provide a cover for the withdrawing friendly troops. A withdrawal movement could not have been successfully carried out if the Germans would have had to fight against airborne troops in their rear with the men and equipment available to them in 1942 and 1943. Supply depots would require strong protection against such troops.

#### 8. Winter Warfare

(Central Russia, Winters of 1941, 1942, 1943)

The training and equipment of the Soviet Armed Forces are geared to winter warfare. To a large degree, they have "winter mobility," which means that they can move, fight and remain for considerable periods in deep snow and great cold without having to be billeted in houses. The Russians are aware of this superiority over other military establishments and will endeavor to force a war of winter attrition on their enemies.

Far more than in other seasons combat in winter taxes the strength of the troops, who must be physically and psychologically prepared for it. Quite apart from their morale, the soldiers must be convinced that it is possible to fight and to live for days out of doors without a roof or tent in snowstorms and temperatures down to  $-22^{\circ}\text{F}$ . The highest demands are made on the commander's initiative and ability to care for his men.

German winter clothing proved excellent. The lower part of the felt boot was reinforced by leather or rubber to keep the feet dry. Wet feet in winter invariably result in frostbite. Horses from the eastern areas were well able to bear up under the cold, whereas those from the west were less inured to its rigors.

Without engines capable of resisting winter weather and without careful maintenance no winter warfare is possible. The Soviet Army used very few horses in winter. The reader is referred to German manuals providing detailed instructions on the protection and maintenance of engines in winter.

All echelons down to regiments need motorized snowplows to clear roads and maintain them free of snow. Often different roads must be chosen in the winter than during the summer because of steep grades and possible snow drifts. Suggestions by the local population should be heeded. Roads not lined by trees must be marked by poles. Winter road maintenance service calls for careful organization and equipment including an adequate number of snowplows, sand spreaders and prime movers for towing

disabled vehicles. For movement in the terrain many Russian troops were provided with light skis which were fastened to the boot by means of a very simple binding specially constructed so as to enable a straight run on flat ground. German ski equipment was procured by an improvised collection from civilians in Germany. The main disadvantage of these skis was the fact that their bindings did not fit the regular military boots. German ski troops transported ammunition and machine guns on sleds having the form of boats, the so-called Akjas. The Russians also used motor sleds but no information is available on this subject. Their tanks or large "Stalinetz" tractors towed vehicles and guns across country. In combat, tanks often moved ahead of the infantry, which was trained to march long distances in deep snow without special equipment, preferably in woods, which offered an even layer of snow. For moving supplies they preferred frozen rivers and lakes. The Russians learned from the Finns how to build ice bridges and to reinforce thin ice in order to make it capable of bearing heavy weights.

The Russians preferred to bivouac in wooded areas. They knew how to build windbreaks with the simplest means, how to build smokeless fires and make use of the warming effect of the snow by means of snow holes for one or two men and igloos for several men. The Germans on the other hand, first had to learn all the techniques of winter warfare. The issue of small portable stoves to all infantry units down to squads proved worth while. The reverses suffered by the German Army in the winter of 1941 - 42 resulted not only in considerable casualties to personnel and horses but also in the loss of the majority of its motorized combat and supply vehicles from which it never recovered.

The same tactical principles applied in winter as in other seasons. Unless a reliable weather service exists to issue warnings, the command and the troops will be surprised by sudden, drastic climatic changes which will greatly influence combat and movements. In December 1941, during the advance against Moscow, the temperature which hitherto had been above the freezing point, suddenly dropped far below it. The motorized columns, which had been held up for weeks on the muddy roads, froze fast and had to be cut free by laborious effort. Several days passed before every vehicle was again free.\* Climatic conditions require the following to be taken into account: The winter days are often too short to compel a decision or to effectively exploit successes gained. March movements are difficult to schedule; much time should be allowed for each one, and they should be preceded by detailed reconnaissance. The uniform snow level makes orientation very

---

\* Other German sources report that on this occasion several divisions were forced to withdraw, and lost almost all their vehicles and artillery. [Ed.]



~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

difficult. The infantry can only move slowly in deep snow. They cannot make a hasty dash before penetrating an enemy position. The last two hundred meters before the assault are the most difficult since the artillery is unable to provide fire protection. This must now be provided by the heavy infantry weapons. The best and most effective support is rendered by tanks, some of which move forward while the rest keep the situation under surveillance. The Russians moved up their infantry either mounted on tanks or on tank-drawn sleds. If the Russian infantry lacked tank protection they would crawl through the deep snow toward the German positions. The fact that such crawling took many hours, sometimes even days, did not bother them in the least. They also like to attack during fog and snowstorms, which made a well-camouflaged attacker invisible up to very close range.

Owing to high road clearance, powerful engines, and wide tracks, the Russian T34 and KVI tanks moved freely in the terrain even if it was covered with as much as thirty inches of snow. The Russians selected high ground, woods and the leeward side of woods and villages for their tank movements. In periods of severe cold and deep snow, German tanks had to overcome many technical difficulties, such as having to start with preheaters. They also had to keep to the roads, but even these were often impassable when covered by heavy snow. At times the Germans could not use tanks at all. Lateral movements behind the front were also hardly possible. Russian successes during the winter of 1942 - 43 in the gap between the Second Panzer Army and the Second Army (Orel area) were mainly due to these deficiencies of German tanks and mobile antitank defenses.

It was a disadvantage for the defender that he could only dig into the frozen ground after much time-consuming labor and after applying explosives. The frost penetrated three to four feet into the ground. All service branches found it necessary to train demolition squads, inasmuch as the engineer troops could not satisfy all demands. Deep snow impedes the firing of small arms and machine guns. As the defenders were very much exposed they built temporary snow positions whose forward walls were seven to ten feet in width. These afforded very little protection, however, snow mixed with sand, on which water is poured, produces "snow cement" of fairly high resistance. The snow reduces the effect of artillery shells and of hand grenades. Under snow and ice, especially if they melt, mines became unreliable. Wire obstacles had to be built twice as high in order to remain effective. The obstacles pile up the snow and hinder visibility. This necessitates observation posts located on high ground, which are also useful for seeing the approach of crawling enemy troops. Listening for sounds is specially important as snow tends to reduce them. Unless modern sound detectors are available, the men

- 44 -

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED



UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

assigned as "listening sentries" must keep their heads far enough above the snow so as not to miss any sounds. Severe cold paralyzes will-power and therefore also discipline. Iced snow walls with long slopes proved to be effective tank obstacles because the caterpillar tracks slipped downward, but the slopes had to be built in such a manner as to prevent the tanks from gathering momentum.

Winter combat exacts many casualties. The knowledge that during severe cold a wound will speedily result in death unless aid arrives in time tends to depress morale. The rescue of the wounded during the course of battle itself is therefore of the greatest importance.

- 45 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

### CHAPTER III

#### Experiences of a Panzer Corps

##### 9. Attacks During Mobile Warfare

Only the lighter types of tanks and some KV1 models were initially available to the Russians who recklessly committed their tank brigades in counterattacks. Their leadership was characterized, however, by formality and rigidity for, once an attack was launched, neither mission nor direction was ever changed. This was probably due to the command's inherent inflexibility and its inability to communicate with the tanks, which lacked radio equipment. Owing to the flexibility of the German command, their carefully planned encircling movements and skillful exploitation of local successes, they were able to smash the attacks of numerically superior Soviet tank forces.

The secret of this success in mobile warfare was expressed by the motto: "Ever Forward." As soon as the enemy situation and the terrain permitted, the armored units pushed far ahead supported by artillery, engineer troops and about a battalion of riflemen mounted on the tanks. They plunged recklessly ahead by-passing all opposition, and did not wait for the infantry who followed. It was thus more than once possible to occupy key terrain features intact, such as road crossings, villages and especially important bridges which, if demolished, would have caused long delays.

The direction of tank units exclusively by radio proved outstandingly successful. The commanders at division, corps and panzer group levels were always kept informed of the situation by the forward units.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

To guard against surprise, close contact was maintained between armored points and tank-observation planes which carried out reconnaissance and made timely reports about the approach of enemy tanks. These radio messages were also heard at higher headquarters which were thus continuously informed about the enemy situation.

Careful advance study of all available terrain intelligence on the area to be attacked proved useful and even indispensable. This applies especially to tank mobility away from main highways, capacity of bridges, location of fords, and the existence of useable routes across marshy areas.

After a success was achieved, the tanks pushed ahead relentlessly, even into the night. They could proceed on roads also during darkness, although, of course, at a relatively slower speed.

It was important that the tanks carry along adequate fuel supplies so that they could refuel in the forward combat area. The same applied to the ready availability of repair services to avert a trip to rear areas during the night. The necessary security was provided by a convoy battalion or by riflemen.

Within the panzer division the following supporting arms were attached to the leading tank unit whenever possible:

(a) At least one battalion of light artillery and one medium battery, the fire of which was directed from the armored observation car.

(b) About one engineer company with mine clearance equipment and emergency bridging equipment to cross minor waterways.

(c) One rifle battalion, reinforced with heavy weapons, if possible an armored personnel carrier battalion.

During the advance of the corps, each division was assigned a road. It was immaterial whether or not the roads were widely separated, in fact, a large distance frequently proved advantageous for breaking up local resistance against adjacent divisions rapidly by means of envelopments. Under no circumstances were several divisions moved simultaneously on one road, for this would cause great confusion among thousands of motor vehicles and a delay of several days. Moreover, such a concentration would offer a profitable target to the enemy's air force.

In case enemy resistance could not be smashed exclusively by tanks aiming at a wide encirclement, the entire division attacked as a compact unit. For this purpose the tanks were halted and

UNCLASSIFIED

- 47 -  
~~RESTRICTED~~  
SECURITY INFORMATION

withdrawn to the rear of the riflemen. The attack was then taken up by the rifle regiments reinforced by the entire available artillery, including some tanks used as assault guns (not less than one tank company), to make a breach in the enemy lines. The tanks held ready in the rear immediately rushed through the gap opened by the riflemen and kept the retreating enemy on the move, while the rifle units mopped up the enemy's main battle position.

If no bridges were available for the crossing of a river, a bridgehead was first formed by the rifle units, which would defend it until a bridge for tanks could be completed or the tanks could cross at fords discovered in the meantime. The unit, supported by tanks, now advanced from this bridgehead. If very heavy resistance was met at a bridgehead, it again became the primary task of the riflemen to open up a gap for the tanks through the enemy positions.

#### 10. Attacks Against Fortified Positions

(Kursk, 1943)

The Russians are very skillful and extremely diligent in building positions. They set up positional systems in depth in short order and lay various types of mines very cleverly. Their antitank defense is excellent and distributed in great depth.

Russian infantrymen, while on the defensive, fight excellently and prefer death in the trenches to capture. Survivors, who manage to hide out or to simulate death, soon afterward form the cadres of partisan units behind the enemy front.

The Russians often incorporate a large number of well-camouflaged tanks in their system of fortified positions and they are in fact masters of camouflage.

On the basis of German experience, the attack against the first positions should be carried out by infantry divisions which are supported by assault gun units. In exceptional cases, as when assault guns are lacking, individual tank companies may be attached to the infantry division. These elements then perform the tasks of the assault gun units. Great care should be taken, however, that these tanks are not distributed piecemeal to the individual infantry units, which invariably request them, but that they be employed at least in platoon strength of five tanks. Otherwise the tanks will fall easy victims to enemy antitank defenses and artillery; they will also lose so much in penetrating power that they cannot offer the necessary aid to the infantry for the breakthrough.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

The artillery and engineer elements of the armored division will generally support the first attack launched by the infantry division. The armored division will be committed only after the completion of the penetration. Not until then may heavy tanks, such as the Tiger, Panther and other models be employed, for otherwise most of the tanks would be disabled by antitank fire and mine fields. Whether armored divisions alone are able to overrun rear positions or whether they must first be attacked by infantry divisions, will depend on their relative strength and the degree of success achieved against the first position.

On the third day of the offensive near Kursk in July 1943, the German panzer divisions ran up against a dominating rear position protected by excellent defenses and mine fields. They were pinned down and suffered a decisive defeat. An adequate number of infantry divisions was not available for continuing the attack. This was due to an error in planning and an under-estimation of enemy strength as a result of lack of air reconnaissance.

The above example serves to emphasize that prepared positions should be attacked only after painstaking preparation, including aerial and terrain reconnaissance, heavy concentration on the point of main effort, and heavy artillery barrages.

An adequate number of engineer troops must be assigned to each tank unit. The deeper the enemy position is organized, the more engineer troops must be available from the very beginning.

Repair facilities and fuel must be brought far forward, since tanks returning to refuel slow down the momentum of infantry attacks considerably.

The cooperation of the Air Force is indispensable. Its major mission will be the neutralization of enemy batteries to facilitate the artillery's observed fire in support of the infantry. From the beginning of the attack, therefore, bomber units should be kept over the enemy artillery as continuously as possible. The Russian artillery was usually inactive when German aircraft flew overhead. Fighters should protect friendly bomber units.

Experience proved that the tank units should be assigned long-range objectives, as otherwise an attack might easily slow down or the exploitation of a success be missed. For this reason very close contact was maintained with the Air Force. Air liaison officers, assigned to the lead tanks, were charged with using their own communication channels to report the situation and the objectives reached by the tank units to higher echelons and, if

- 49 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

necessary, to forward requests for adequate air support quickly in order to keep the attack moving. By a timely bombardment of newly-forming enemy resistance groups, the Air Force could often take credit for a decisive share in the great successes scored by panzer units.

During every attack carried out by mobile troops, senior commanders remained far forward so as to receive reports rapidly and to dispatch orders to the troops quickly. Since the situation changed constantly in operations by mobile units, successes could only be fully exploited when the commander was far forward in the very center of action and if he assumed personal command.

11. Armor in the Defense

(Defensive Combat Northwest of Orel in the Summer of 1942 and North of Poltava in the Autumn of 1943)

Due to a shortage of infantry divisions, armored divisions were employed as forward defense forces during the two combat phases described here. This was an emergency measure contrary to German doctrine, which provides that during defensive combat the armored divisions, like all mobile units, should remain as strategic reserves behind the front. They should be employed for counterattacks only in cases when a substantial enemy penetration has taken place which cannot be eliminated by the local reserves. The exploitation of such attacks for an improvement of local positions is desirable, but the distance separating the assembly area from the front must be such as to enable the reserves to advance for an attack easily within one night. If, in exceptional cases, armored divisions are committed in the forward lines, the mass of the tanks should be retained in the rear as division or corps reserves if at all possible, together with infantry reserves (preferably armored infantry battalions).

} IMPROVING

The Russians never attacked without tanks, usually twenty to fifty at one time. In the beginning they attacked recklessly in coordination with the infantry, but at later stages, the tanks served more as supporting artillery, which was probably due to improved German antitank defenses, for they attacked German strong points from a considerable distance and moved up for close combat only after infantry had penetrated the positions. As a rule these tanks stopped when they reached the forward trenches where they flattened everything out and killed the men who remained alive in the strong points. The Russians thus employed their tanks in a manner somewhat similar to current German doctrine for the use of assault guns. German antitank defense was therefore organized in depth by means of emplacements in such a manner that they could direct fire chiefly at their own forward trenches. Enemy tanks

R  
A. J. D. P.

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

which had penetrated into the main line of resistance were usually very successfully pursued and destroyed by German self-propelled antitank guns or tanks. If several tanks of a Soviet Unit had been disabled, it was customary for the entire unit to turn back and send the antitank elements forward for reconnaissance.

Bombers and antitank fighter planes, which attacked and smashed enemy tanks while they were still approaching, proved very effective for the defense. Liaison with the Luftwaffe for this purpose always functioned very well. As a rule, the Russians operated successfully in this corps sector only when the Luftwaffe was grounded.

## 12. Armored Forces in Withdrawals

*withdraw  
or  
order  
→*

German experience confirms that the mobility inherent in armored units can be exploited even more fully during withdrawals than in other types of combat. In such operations the enemy's direct pressure against decisive points can be prevented or at least delayed through counterthrust or counterattack with limited objective. During withdrawals, armored forces should not be employed in piecemeal fashion; on the contrary, combat groups consisting of about one tank battalion and one artillery battalion with adequate infantry and engineer support should be assembled at decisive points as reserves. These groups should be committed in combined action to throw back or destroy any enemy forces that have carried out an encircling maneuver or have effected a penetration. If possible, these attacks should be launched against the enemy flanks. Enough time can be gained in this way to move back the less mobile units (infantry divisions and so forth) with all their equipment into the new positions. (See also Chapter II, Section 3.)

UNCLASSIFIED

- 51 -  
~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

## CHAPTER IV

### Engineer Experience

(Period: Eastern campaign 1941 - 42. Area: that of a panzer corps under Guderian's Second Panzer Army.)

#### 13. Terrain Intelligence

During the Eastern campaign it was important for engineer commanders to study the military geography of western and central Russia as published by the Terrain Intelligence Section of the German Army High Command. Of cardinal interest was information bearing on hydrographic and road conditions.

Knowledge of these special subjects proved valuable for the planning, preparation, and completion of engineer operations. The combat units were provided special hydrographic maps on various scales indicating the width, depth, and velocity of rivers, characteristics of river beds, high and low water marks, ice conditions, suitable crossing, bridging and fording sites, the location of sawmills and factories as well as sources of wood, iron and other building materials.

Of all maps the Russian General Staff map with a scale 1 : 100,000 was the best and was preferred because it came closest to actual conditions.

Russian rivers were generally not regulated by means of dams, embankments, dikes, weirs and so forth. For long distances they were left in their natural state and exposed to fluctuation by rain and floods. The engineer officers always carefully noted these changes in river conditions as compared with the map data.

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED



UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

Accurate reconnaissance of terrain was absolutely essential for obtaining up-to-date information on water and bank conditions, as well as on the roads leading to the river.

What has been said about rivers logically applies also to the Russian road net. It proved useful to observe the terrain, especially that which was enemy-held, with binoculars from high lookout posts, church steeples, or the like.

The timely interpretation of aerial photographs was of the greatest value in aiding the Engineer Corps to master impending missions in Russia.

#### 14. River Crossings

This section deals with lessons learned during operations involving in one way or another the crossing of the following rivers: the Bug, northern tributaries of the Pripet, Niemen, Beresina, Dnjepr, Desna, Oka and Don. Strong engineer forces were needed in the Russian theater of war for overcoming the numerous and diverse difficulties posed by river crossings, bridge and road building and mine clearing.

According to experience, a German armored corps needed the following minimum engineer strength:

For each tank or motorized division, one armored engineer battalion with a special bridge construction detachment (for building so-called fixed "K" bridges by means of small box girders) and one engineer train.

In addition, the following were necessary as corps reserve:

At least one, though preferably two, motorized engineer battalions, two to three road and bridge construction battalions, two motorized or bicycle-mounted construction battalions, two or three bridge trains for constructing bridges with a minimum capacity of sixteen tons, two to three truck columns, each with at least thirty tons capacity, for the transportation of construction materials and equipment for bridges and roads.

Strong engineer forces, as described above, were assembled in one panzer corps of a panzer army and partly distributed to the divisions and partly kept in corps headquarters itself. They were employed for offensive objectives which would require several days of fighting, as, for example, the advance of about 400 kilometers from the Bug to the Niemen River. The engineer forces were incorporated into the march groups with strong elements accompanying the advance detachments and the advance guards. This measure

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

proved wise, as it enabled the armored spearheads to speedily remove all obstacles impeding their advance. During the process of readying the equipment it was important that such equipment (wire cable tow ropes, trestles, planking) as was needed for the speedy building of emergency bridges for light and medium tanks be carried far forward by the armored points, inasmuch as emergency bridges could be built and used much quicker than regular bridges. The tank divisions frequently improvised and used such emergency bridging equipment.

Light stream-crossing equipment, such as all types of pneumatic boats and hasty bridge equipment proved effective for surprise attacks across rivers, and assault boat battalions even more so. The latter made possible the rapid passing of water obstacles and the transfer of more troops with each succeeding wave.

The reconnoitering of assembly areas and assembly positions, and especially of the intended main attack sectors, should be carried out at night by small patrols who are well concealed against enemy observation. Troop movements into and within the assembly areas should likewise be postponed until darkness. These measures are essential for the success of later attacks. In addition, strict control should be exercised over daylight marches and over the reconnaissance of rivers and river banks.

Of great significance was the condition of the approach and exit roads leading to and from the crossing and bridge sites, or in other words the stretch between the paved road and the river, and from the enemy shore to the paved road again. Experience demonstrated that most congestion occurred on these stretches.

If the opposite shore were occupied and defended, timely and accurate road reconnaissance was frequently impossible. In Russia especially great contrasts in the terrain must be expected. It was quite likely that swamps and bogs would alternate with generally dry, sandy soil even along steep river banks, as was the case along the Bug. Such unevenness in terrain conditions created difficulties in covering the distance on the enemy shore between the bridge and crossing sites and the paved roads. The importance of these stretches to the movement of march columns and to battle success must not be underestimated. Consequently road building materials should be loaded on trucks and kept ready as early and as close to the front as possible. Because it was the best and speediest solution, the Germans occasionally used steel road mats. Before the troops marched across the Bug bridge, about 400 meters of this steel road equipment was laid on the far shore. The unfavorable conditions across the river, were recognized from high lookout posts on the friendly side and about 800 meters of the

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

equipment was immediately loaded on trucks. Once the bridge was completed these trucks were the first to cross over to repair the bad exit road.

All engineer reserves (whenever possible 100 percent motorized) were assembled in such a manner that they could be speedily employed and moved across the river at places which offered the most favorable conditions and where the attack on the other shore was progressing most successfully. German doctrine locates engineer reserves well forward: if placed to the rear they always come too late. In the course of a rapid advance by the armored points, the engineer troops were needed close at hand to rapidly remove every new obstacle. Only thus was it possible to continuously exploit the first successes. As a part of the concentrated attack the engineers also committed their personnel and equipment to form their own points of technical main effort and thus created the preconditions for best supporting the combat troops.

Plans for the speedy completion of a bridge played a cardinal part in the preparations for an attack across a river. It proved of utmost importance to set up a one-way traffic loop for the engineer vehicles near the prospective bridge site, since the faster and more smoothly the trucks arrived at their destination, unloaded, and returned to their dispersed areas, the sooner could the bridge be opened. Such one-way traffic was specially important in the case of motorized columns.

This important consideration led three days before the Bug attack to the above-mentioned renewed reconnoitering of crossing and bridging sites. The late decision had momentous consequences, inasmuch as a few days before the attack both shores of the river were heavily flooded, necessitating the construction of numerous corduroy roads and bridges in this vitally important first assembly area of the campaign.

It proved highly practical to immediately begin operating heavy ferries for special-purpose vehicles beside the bridge in order not to slow down the troops marching across. German assault guns, because of their great width, had to proceed very slowly across the sixteen-ton bridges in order not to damage the lateral supports. Thus they retarded the advance of troops which were urgently needed for the exploitation of the initial success. After a number of accidents occurred, assault guns were taken across on heavy ferries. Approximately one and a half armored divisions were delayed for about eight hours on the Bug because one assault gun, veering from its course on the far landing stage, caused the collapse of a trestle and then dropped against the side of the bridge in the shallow water. The ensuing damage required the rebuilding of the

- 55 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~  
UNCLASSIFIED  
SECURITY INFORMATION

landing stage, after the assault gun had been removed by a tractor. The loss of eight hours proved to be irreparable.

Like the combat engineers, construction troops for the building of roads and emergency bridges were also assembled close to the front and assigned to march groups well forward. On the far shore it was absolutely essential to build and to keep in repair an exit road leading from the bridge or crossing sites to the paved road (see above). The bridge itself, provided it was still required at that site, were replaced as soon as possible by an adequately heavy semi-permanent emergency bridge, since the military bridge equipment were usually needed by the assault groups and consequently had to be dismantled and brought forward quickly. On 13 July 1941 south of Orsha, a corps engineer battalion built a twenty-four ton emergency bridge across the Dnieper in thirty hours without the aid of any construction equipment. This time included the hauling of building materials.

It was found to be a good idea to build emergency bridges with a greater capacity than needed for combat vehicles alone, provided it was contemplated to use the bridge permanently. Then the passage of the heavier tanks of units following later or of special vehicles of other arms and service would be assured.

An assembly for attack across a river naturally constituted a heavy concentration of forces and supplies in a small area, and therefore a profitable target for enemy ground and air attacks. The protection of such assembly areas required strong antiaircraft defenses.

It was of equal importance to have efficient covering parties ready to protect the bridgehead positions at ferrying and bridging sites. In Russia, raids by enemy cavalry and motorized forces upon these key points could always be expected. Ferries and bridges were bottlenecks requiring constant vigilance on the part of security troops. For example, strong enemy motorized battalions successfully raided a particularly important bridge on the Dnjepr south of Orsha, suddenly appearing out of nearby woods. As a result, the bridge was damaged, the Germans suffered heavy losses, the crossing operations were impeded and delayed for several hours, and the attack had to be postponed for a considerable length of time. Since engineer troops were not available for such security tasks, mixed security detachments, especially those with antitank weapons, should have been employed.

To prevent traffic jams, march discipline and bridge crossing control were strictly maintained by a special bridge traffic officer in cooperation with the unit traffic control officer.

~~RESTRICTED~~  
UNCLASSIFIED  
SECURITY INFORMATION

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

Time and again it proved advantageous to assign strong and fully equipped engineer forces to advance guards or advance detachments, which made possible the rapid crossing of narrow bodies of waters up to forty meters in width. The equipment used for this purpose included trestles, iron and wood box girders and heavy planking with a capacity of twenty-four tons. Larger spans could thus be bridged with a minimum of props.

While the troops were crossing the bridge numerous construction troops were stationed along the approach and exit roads to be on hand for repairing bad stretches and thus to eliminate delays immediately. It was also not at all unusual that a road was constructed in the form of a ramp by piling up soil or by cutting earth away on both sides. Such a road needed constant maintenance. All this gave the German forces a wealth of experience. The approach and exit roads were marked carefully to guide individual drivers in reaching their destinations. Although the length of the approach and exit roads and the scope of the ensuing missions determined the strength of the road maintenance force, it was always at least one to two construction companies on each shore.

With regard to the mobility of the bridge and other columns it might be mentioned that the Russian roads were so poor that high-powered, cross-country tractors were urgently needed so that the bridging equipment would be ready for use in spite of the bad conditions.

Scouts searching for ferrying and bridge sites in Russia always carried along mine detectors since mines were frequently laid at suitable points near the shore and along both sides of roads leading thereto.

In concluding this section it must be stressed that quick and accurate engineer reconnaissance was always necessary, since written data (geographic publications, maps and so forth) could not always be relied upon.

The air situation at river crossings was approximately the following: The Germans dominated the air over the entire area of operations, and only at rare intervals did Soviet flights or squadrons interfere with the crossings. The few bombs dropped on the bridges missed their targets. Enemy fighters failed to appear.

#### 15. Road Construction

Russian roads must be personally seen to properly estimate their inferiority, especially for use by motorized units.

UNCLASSIFIED

- 57 -

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

The so-called main roads generally had no road bed but only a thin rolled layer of gravel which was quickly destroyed after the passing of a few motor vehicles. Then no great resemblance to a road existed any longer.

The poor quality of Russian roads was a direct result of the long distances to be covered in a huge country and the generally small requirements of the populace. Tank units were faced with a special problem in moving on the highways and even more so on ordinary country roads. This is why there could never be too many troops assigned to maintain the main advance and supply routes, including the various bridges en route. Specially valuable for this purpose were bicycle or fully motorized road and bridge building battalions with light columns of cross-country trucks. To be really useful, these units had to be mobile and possess organic transport capacity (each battalion at least thirty tons) for regularly transporting construction materials and building machines, such as pile drivers, wood and iron processing machines and light motorized steam rollers. Temporary borrowing of vehicles from field units was usually impractical because they needed their transportation themselves.

The poor road conditions, together with autumn rains, changed the roads into a sea of mud. During the autumn of 1941, several columns comprising many thousands of motor vehicles were stuck in the mire. For days they could move neither forward nor back. At the time the only possible solution for this catastrophe — and this is the proper term for it — consisted of having strong details equipped with heavy cross-country tractors tow the columns from the mud by working day and night. The absence of Soviet air attacks was specially fortunate. Subsequently, as the weather gradually improved, one-way corduroy roads with sidings for bypassing were built on top of the former roads. Stretching for countless kilometers, the corduroy roads were built by all available construction troops reinforced by combat troops and their trucks. But the catastrophe was finally resolved by freezing weather, which slowly brought about dry climatic conditions and thus continuous improvement in road conditions.

Because they are unlined by trees, the real course of roads, especially in southern Russia, is not clearly discernible. This difficulty is increased to an extreme as soon as winter covers the country with deep snow. It is therefore advisable that both sides of traveled roads be well and permanently marked (so as to withstand storms) before the arrival of freezing weather and snow. If this is not done the large number of drivers of convoys and single vehicles, who are unfamiliar with the locality, will frequently get lost and be exposed to ambushes. The inevitable consequence will be a critical deficiency in supplies.

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

Russian roads are marked by a large number of bridges of various types, length and height, most of which are wooden. Few of them were intact as most had been blown up or burnt. In dry summer weather it was generally possible to detour close to either side of the bridge, but in winter the frequently steep approach slopes of these detours were icy and slippery and made traffic very difficult. It was important to rebuild such destroyed bridges as quickly as possible as two-lane permanent bridges with a capacity of at least twenty-four tons. It should be mentioned here that most places offering good prospects for detouring near destroyed bridges were heavily mined. For reconnaissance in such areas it was therefore advisable to use mine detectors to prevent casualties.

It ought to be mentioned that, with the exception of the main highways, Russian roads are only in rare instance so located that they follow a course in which the grades are moderate. The road course usually ignores the contours of the terrain. The resulting grades, frequently very steep, are a great disadvantage for all vehicular traffic during the winter. The vehicles compress the snow, making it as slippery as glass, whereupon wheels and even tracks are likely to skid, with the result that all highway traffic is stopped. Supplies of sand for spreading over such stretches should be distributed near the roads in time for ready use.

The construction troops operated a systematic "winter road service" on the main supply routes throughout the cold season. Well-equipped road maintenance and traffic control services were set up very close to the roads at regular intervals in order to handle the aforementioned difficulties. It proved practical and effective to employ companies or battalions reinforced with anti-tank weapons and to render them capable of resisting enemy raids. Ski detachments for inter-unit patrol service were incorporated in these road construction forces. When possible, the winter road service units were equipped with every type of snow removal equipment from shovel to motorized and rotary snowplows. The shelters for these units were built up as all-around defensive strong points, that is to say, the actual shelters were surrounded by firing positions and obstacles at an adequate distance, perhaps two to three hundred meters away.

In view of the huge expanses of the Russian theater of war and the widely dispersed, extremely poverty-stricken settlements, all these highly important measures called for very large resources of men and supplies and also for the timely setting up of such an organization in the field.

- 59 -

~~RESTRICTED~~

UNCLASSIFIED

SECURITY INFORMATION

16. Land Mines

The Russians were past masters in the use of mines. Their mines were surprisingly simple, reliable and could be laid quickly in large numbers. It was quite usual that they were most effective where least expected. The Russians used very simple wooden box mines, equally simple mines encased in tar paper, and a detonating mechanism of similar simplicity, all of which were produced on a large scale because of the abundant woods and asphalt supplies. For quite some time these mines had the advantage that the German mine detectors only reacted against metal and failed to register the wooden Russian mines. Later on improved German mine detectors registered these mines also.

Since the Russians did not spend time on preparing mine plans (terrain maps of mine fields), they preferred to lay mines at random. Consequently irregular mine fields were the rule and areas mined according to a symmetrical pattern were rare. This fact made mine clearance far more difficult and also required more mine detector equipment.

With primitive cunning the Russians preferred to lay mines where not immediately suspected. For instance, single mines were often placed in closest proximity to demolished bridges at both abutments, within their debris, on the sloping roads leading to a bridge, at river banks or under and to the side of a bridge. Undoubtedly the mines were supposed to detonate only upon attempts to inspect and repair the destroyed bridge or to clear away the rubble. However, not along established bridge sites were heavily mined but also those sites considered most suitable for building a new bridge.

During German attacks, on the other hand, it proved highly effective if engineer troops attached to advance detachments carried along large quantities of mines. Mine laying was of value when far advanced armored points, during halts in all-around defensive positions and especially at night, needed additional protection against surprise armored attacks. It happened frequently during such minor combat phases that the mines contributed their share to the holding of the objective reached because the enemy tanks fell victim at night to quickly sown and well-camouflaged mines. In such cases it proved advisable to coordinate the mine obstacles with the plan of fire for antitank defense. In case the attack or the march was continued next day, the mines which were still usable could be picked up again and carried along.



~~RESTRICTED~~  
UNCLASSIFIED

SECURITY INFORMATION

CHAPTER V

Signal Corps Experience

17. Signal Unit Organization

During the 1941 offensive, signal troops were assigned as follows:

a. Signal Corps Units.

Per army: One army signal communication regiment (mtz), consisting of one operations and two construction battalions.

Per corps: One corps signal communication battalion (mtz), consisting of one telephone company, two field telephone companies, one radio company and one light signal supply detachment.

Per division: One division signal battalion (mtz), consisting of one telephone and one radio company and one light signal supply detachment.

b. Organic Signal Units of the Field Forces.

Per infantry or artillery regiment: One regimental signal communication platoon.

Per infantry or engineer battalion: One battalion signal communication section.

Per artillery battalion: One artillery battalion signal communication platoon.

Per battery: One battery signal communication section.

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

The German Signal Corps had to overcome great difficulties in regard to telephone communications in Russia for the following reasons:

- The huge size of the country.
- The lack of permanent interurban lines in many areas.
- Heavy destruction of existing lines and poles by the retreating Russians.
- Partisan sabotage.

As a result, the Germany Army in the East had to rely almost exclusively upon its own communications resources.

This meant that the army speedily had to extend its permanent telephone wire trunk lines forward, which made it absolutely essential to have the construction units very far forward.

It was necessary for the corps to have field trunk lines level with the forward regiments and for divisions to have heavy field wire lines with the forward construction elements level with the forward battalion.

Rapid laying, a very versatile utilization and a prompt extension of lines were the prerequisites for the fulfillment of this mission. This was possible, however, only if excellent collaboration existed between the signal commander, his tactical commander and subordinate tactical commanders, as well as between infantry and artillery.

The dismantling of rear lines or line sections which were no longer urgently needed, had to be carried out in a drastic manner in order to salvage construction materials.

Since, because of the large distances, only a few transposed wire trunk lines could be moved forward, the multiple use of the few available wire channels through the employment of carrier frequency instruments was especially important, proving very valuable for communications between army and corps, and also between corps and divisions.

The utilization of the cable lines of various types (bare wire, field trunk wires, heavy field wires), built during an advance, was regulated to conform with the orders of the tactical commander. Examples would include the number and location of telephone stations, who have to make reports; or when and from which station reports are to be made. Only then was it possible to properly utilize to the fullest extent the telephone lines which had been built at the price of much labor and material. It was never forgotten, however,

- 62 -

~~RESTRICTED~~

UNCLASSIFIED

SECURITY INFORMATION

~~RESTRICTED~~

UNCLASSIFIED

## SECURITY INFORMATION

that the main effort as regards telephone communications must always be concentrated on the field of battle. The responsible signal commanders never failed to take measures to ensure that, at the beginning of a battle, adequate quantities of wire were available in order to build up the necessary combat nets (see remark above concerning "drastic dismantling").

In contrast to infantry divisions, motorized and armored divisions were controlled by means of radio during an advance. But the rule to use radio as little as possible was observed also in this case, since the danger of interception was always taken into account. When motorized and armored divisions were brought forward at a later stage of an operation available lines and telephone stations were used for making reports.

### 18. The Mission of Signal Troops in Combat

It is absolutely essential that the signal commander understand the combat order perfectly, and issue clear well-considered technical orders to support it.

When a battle starts, the combat net must be completed. This applies to motorized and armored divisions as well as infantry divisions. The density of telephone channels depends on the strength of the enemy. Not all units can have telephone channels, but the most important units must get them. It is essential that the tactical commander inform the signal commander of his combat plan in time, for otherwise the lines will not be ready when needed. A well-planned employment of available signal forces for the construction, maintenance and operation of lines, as well as clear orders, are the prerequisite for the functioning of telephone communications in battle.

No ready-made pattern for a combat net exists since signal communications must be adapted to meet every situation, but the following principle should apply: "The more important the mission of a subordinate unit is, the more lines of communication to it." Wire should be supplemented by radio and other means.

Especially important in combat is contact between infantry and artillery, but the latter is frequently unable to establish such contact by its own efforts. Help from the division signal battalion or from the infantry communication units is often necessary. The extent of lateral communications between adjacent forward units is determined by the situation. Telephone connections are always desirable.

~~RESTRICTED~~

UNCLASSIFIED

## SECURITY INFORMATION

~~RESTRICTED~~  
UNCLASSIFIED

SECURITY INFORMATION

The preparation for attack against a strong enemy requires a dense assembly area net. It should be laid according to tactical considerations in such a manner that the telephone lines can be fully utilized by their early extension, even during an attack. This kind of intelligent planning and organizing in advance, and the assembly of signal units for the continued extension of the lines, is always the prerequisite for the functioning of telephone communications during the further course of action. When this is omitted, the lines will always be finished too late, men and materiel will be wasted, and command functions will suffer.

Radio communications supplement the important telephone lines or are, in many instances, necessarily the sole means of communication. As a rule, the German Signal Corps troops filled all requirements for radio communications in the following manner:

(1) By providing radio communications from the army to the various corps, to the units directly subordinate to the army, to adjacent units, to superior headquarters and to the Luftwaffe.

(2) By providing radio communications from corps to divisions, to directly subordinate corps troops, to adjacent corps, to the army, to aircraft, as well as from the corps artillery commander to subordinate artillery.

(3) By providing radio communications from the division to regiments, to artillery, to other subordinate arms, if necessary also to armored and assault gun units, to adjacent divisions, to corps and if necessary to reconnaissance planes. In addition, if a corps artillery commander was attached to the division, direct communication was established between his headquarters and artillery units directly subordinate to him.

For this purpose the following instruments were used:

Army: radio instruments of 5 to 1,000 watt capacity.  
Corps: radio instruments of 5 to 100 watt capacity.  
Divisions: radio instruments of 5 to 100 watt capacity.

A few portable radio sets were also used particularly for artillery communications.

Whereas the army, corps and the divisions themselves provided the receiving stations for answering superior echelons, the divisions had to furnish their own equipment to the infantry regiments in order to maintain communications with them.

~~RESTRICTED~~

UNCLASSIFIED SECURITY INFORMATION

~~RESTRICTED~~ UNCLASSIFIED

SECURITY INFORMATION

Aircraft liaison radio sets (20 watt) were distributed as follows:

- Two sets to the division signal battalion.
- One set to the artillery regiment.
- One set to the medium artillery battalion.

Radio communications with reconnaissance and artillery spotter aircraft generally functioned very well in Russia.

The infantry and artillery communication units had pack radio sets with a generally adequate range. However, the sets were too heavy and their design too complicated. Their operation was simple.

The field radio sets used by infantry companies, with a range up to one and a half kilometers, were frequently inadequate. The choice of sites, which was an important feature even where the pack radio sets were concerned, was of decisive importance in the use of these low-capacity instruments.

The artillery was even more dependent on good communications than the infantry. As fire control was impossible without good and secure connections, the observation posts always had radio in addition to telephone contacts, since the wire lines very frequently were broken during battle by bombs, shell fire, tanks, and accidental interference by friendly troops.

The same applied to artillery contacts from regiment to battalions and from the battalions to the batteries. The radio unit, acting as a receiving station for contact with the observation post, was necessarily within the firing position and the same applied to the ground-air radio set during fire directed by air observers.

The artillery was inadequately supplied with pack radio instruments. Artillery battalions should have had six, and batteries, at least three pack radio instruments.

When the infantry operated jointly with armored or assault gun units, the latter had to turn over one instrument to the infantry headquarters concerned for maintaining contact with the infantry. The signal communications of armored units during combat were exclusively based on radio.

It was of greatest importance to create reserves of personnel as well as equipment, so that the signal commander would be able, during any change of the situation and especially during critical

~~RESTRICTED~~ UNCLASSIFIED

SECURITY INFORMATION

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

situations, to quickly establish the necessary new signal communications. During defensive action specially dense and efficient communication nets were established. At the front, telephone lines were protected against fire as far as possible, for instance, by means of wire trenches. Field trunk wires as well as heavy field wires, when immersed in snow were soon covered by ice and were worthless at the first breakdown since interference elimination was generally impossible. It was therefore necessary to have overhead lines or else to frequently lift the lines and to lay them on top of the snow. Connecting joints were never allowed to remain in the snow. Important headquarters were almost always able to maintain telephone contacts through local circuits over various routes.

The well-planned employment of trouble shooters to maintain the wire-communication net proved important. The construction of metallic circuits up to the forwardmost lines, including the various strong points, was highly desirable because of the danger of enemy interception (see section on communication discipline and signal intelligence).

During retreats, all types of lines were utilized. Important telephone stations remained occupied until the last moment. The various command posts were given definite orders to use only certain specified lines. Those lines which were not needed during the retreat were dismantled as soon as possible for use elsewhere. The lines needed were left intact as long as practicable, although every effort was made to dismantle them. Whatever could not be hauled away was thoroughly destroyed to keep it from enemy hands.

Elements of the Signal Corps and of communication units were quickly ordered into the new rear positions for the building of new nets. When possible they were accompanied by elements of radio units, so that all signal communications could be fully operating when the new positions were occupied. Experience proved that the more confused or critical the situation, the more important are efficient signal communications. During retreats it was therefore particularly necessary to carefully consider what instruments and materiel had to remain and what might, at short notice, be sent back for building new facilities. Even motorized units could only withdraw at a slow pace because of congested roads and enemy action. This point, in particular, was often too little considered, with the result that the withdrawing units arrived too late for setting up their installations and grave difficulties ensued for the command.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

19. Signal Intelligence

a. Long-range Signal Interception. The army groups directed the employment of long-range signal interception companies. Individual platoons were generally assigned to the corps.

Army and corps had no organic signal intelligence units. It was difficult to break Russian codes. When they were changed, it was often the case that no results could be obtained for quite some time.

b. Close Signal Interception. Each division signal battalion had one close signal interception platoon. These platoons were to intercept only clear texts. They were unable to break coded messages since they lacked evaluation data. These units were often very successful in intercepting oral messages, as for instance, tank and artillery radio traffic.

The Russians usually camouflaged all radio voice messages, but partly with such simple code words that the contents of conversations could easily be guessed. During an armored breakthrough (by 28 model T 34s) in 1941 before Leningrad, for instance, they radioed: "I have no more sausages" -- meaning ammunition; "I have only eighteen milk cows left" -- meaning eighteen usable tanks. Later on, the open radio traffic was camouflaged by numbers, a considerable improvement on code words. When reports referred to coordinate map grids, the numbers were switched. For instance horizontal numbers running 1 - 30 were replaced by those running 30 - 1, while verticals were shifted by ten, 40 thus standing for 30.

The case above demonstrates what extraordinary successes could be obtained given proper employment of close intercept, efficient evaluation, and timely relaying of information to the troop units. Even though signal intelligence itself could not disable the tanks, it was nevertheless the constant interception of all tank radio traffic, current intensive evaluation by the responsible signal commander and his immediate telephone reports to the divisions and regiments destined to meet the individual Russian tank groups, which made it possible to destroy all twenty-eight of the tanks and, in addition, to discover in time and repel a night landing operation by 1,100 men in support of the breakthrough. This was accomplished without direction-finder equipment since short-range direction finders were not available.

Russian artillery voice messages were also radioed in code. As soon as an operator became careless, the called station countered with the words: "Any more such remarks and you will be shot." From

UNCLASSIFIED

~~RESTRICTED~~

## SECURITY INFORMATION

some conversations it could be gathered that uncautious remarks actually were punished by death. The same applied to telephone messages. The monitoring of Russian telephone cables was very difficult since none were laid to the forward lines. In one instance an intercept team accompanying a patrol located the most forward Russian line ("commissar line") in a defensive position to the rear of the battalion command post. Successes in this field were therefore very rare. Careless and uncoded talk was in some cases punished by death, as revealed by some intercepted Russian conversations.

In conclusion it may be stated that the Russians observed excellent discipline in telephone as well as radio conversations. However, the meaning of the code and camouflage terms could often be guessed easily. Consequently the close intercept platoons were in many instances able to furnish their tactical commanders with results of greatest importance. Russian radio discipline was also excellent.

The interception of German lines, especially of long-distance circuits, by Russian agents dropped from airplanes and by partisans, was done on a large scale. This was easily possible for the Russians as the lack of troops prevented our guarding the long lines which, for instance from corps to army, often covered more than a hundred kilometers. It therefore had to be assumed that the Russians would monitor any cable they had not cut. Although long distance transmissions made on the heterodyne circuit of the carrier frequency were not absolutely safe from interception, this equipment nonetheless made monitoring considerably more difficult. Its use was therefore especially valuable.

Since they were the targets of frequent attacks wire patrols had to be protected by special escorts.

UNCLASSIFIED

68  
~~RESTRICTED~~  
SECURITY INFORMATION



~~RESTRICTED~~  
SECURITY INFORMATION

## CHAPTER VI

## Army Medical Service Experience

The author of this study served only temporarily on a few sectors of the extensive Eastern front. Moreover, since no written data are available, it is impossible to deal systematically with the functioning of the medical services in all actions which were fought. It is thus only possible to emphasize and illuminate the characteristic organizational and administrative features of the medical service occasioned by conditions in the East. These characteristics are more or less typical for the entire Eastern front if one considers, to select merely a few examples, the great distances, the cold, and the hygienic conditions. This study will first deal with basic information on the organization of high-level German logistical agencies and the duties of the medical service, in order than to discuss the characteristic features of the medical service caused by conditions in the East.

20. Composition and Chain of Command

In all staffs at army group, army, corps and division level there were supply sections directly responsible for all types of supply, including medical. The designations of these sections were as follows:

- (1) At army group and army level: "Oberquartiermeister."
- (2) At corps level: "Quartiermeister."
- (3) At division level: "Ib."

At army group level these sections were formed in 1942, prior to which date the supply section at army group headquarters had only a staff advisory function. Within the sections referred to under (1), (2), and (3), above, all matters connected with medical

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

~~RESTRICTED~~

## SECURITY INFORMATION

services were handled by the IVb, the chief medical officer of the unit. These chief medical officers received tactical orders from the operations sections of their respective headquarters,\* while technical instructions were issued by their superior medical officers. As regards the latter, the army group medical officers were directly subordinate to the Army Surgeon General, who in turn was in the office of the Chief of Army Supply and Administration.

To perform these functions the various major headquarters were assigned medical units as follows:

a. Per army group. According to needs usually one or two military hospital detachments, one or two ambulance detachments, one or two personnel decontamination companies, one prosectorium (anatomical laboratory for dissection), one bacteriological research and one chemical research unit, and one army-size ambulance motor pool. There were no Tables of Organizations or Tables of Equipment for these units.

b. Per army.

(1) One station hospital battalion with a medical personnel replacement depot and four 500-bed station hospitals.

(2) One army medical battalion with a staff of medical consultants, and six field hospitals (motorized). Also two medical companies, partly motorized, and six ambulance platoons. The medical personnel varied in numbers and was controlled by the army medical battalion headquarters.

(3) One evacuation battalion, with three evacuation companies and one motorized ambulance company.

(4) One to two personnel decontamination companies.

(5) One army medical supply depot of three platoons.

(6) One medical examination unit.

(7) One chemical research unit.

(8) One field autopsy unit.

Most of the personnel and equipment listed above were provided under Table of Organizations and Equipment.

---

\* Via the following channels: Oberquartiermeister, Quartiermeister and Ib at division level.

~~RESTRICTED~~

UNCLASSIFIED

SECURITY INFORMATION

SECURITY INFORMATION

c. Per corps. Although at the beginning of the war they had no organic medical troops, after 1943 the corps were assigned the following irrespective of whether they were infantry corps, armored corps or mountain corps:

One horse-drawn medical company and one ambulance platoon.

d. Per division.

(1) At the beginning of the War: One medical company (mtz), one medical company (horse-drawn), one field hospital, two ambulance platoons.

(2) After 1943:

Per infantry division: One medical company, new type, and one ambulance platoon (mtz).

Per armored or panzergrenadier division: Two medical companies (mtz) and one ambulance company (mtz).

Per mountain division: Two mountain medical companies (partly motorized) and one ambulance company (mtz).

Per light infantry division: One medical company (mtz), one horse-drawn medical company and one ambulance company (mtz).

The medical troops were assigned according to the tactical situation by the superior headquarters upon recommendation of the staff medical officer. In addition to this medical personnel, each unit (battery, battalion and so forth) was assigned a physician, medical noncommissioned officers, litter bearers, auxiliary litter bearers, as well as a set of military medical equipment weighing about half a ton and containing selected items for first aid treatment. Units that were an organic part of a division received their materiel replacement from two "Class B" medical depots controlled by the division surgeon. These supplies consisted of forty-eight cases containing medical supplies of every type (ten tons) carried along by the division. During major battles these supplies lasted three days per division.

According to local requirements, additional special medical units such as field optical shops, orthopedic shops, malaria prevention instruction units, laboratory platoons, special tropical hospitals, decontamination platoons and company medical transportation columns, were available.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

21. Missions

The missions of the Medical Service embraced the following:

- a. Medical aid in the field and the employment of medical troops in combat.
- b. Medical treatment of the sick and wounded.
- c. Evacuation with special consideration to the rigors of winter.
- d. Preventive Medicine and general hygiene.
- e. Procurement and distribution of all types of medical supplies.
- f. Scientific research and evaluation of case histories.

The following remarks on the missions of the Medical Service listed above concern medical problems encountered at all levels in Russia. Many of the same problems are treated from a different point of view in Section 3, Duties of Various Medical Units.

a. Medical Aid. Each battalion or other unit set up a dressing station at about one kilometer behind the forward lines. Where the regimental sectors were narrow, several unit dressing stations were combined in one regimental dressing station. Their location was selected for the following reasons: the nature of the approach route, protection against small arms and machine gun fire, availability of water, of natural cover against air observation and if possible also of solid buildings, including cellars, shelters and bunkers. First aid was administered at the dressing station by the medical officer, some medical noncommissioned officer, and litter bearers, using the troop medical equipment.

b. Medical treatment will not be discussed, since this is a tactical and logistical study.

c. Evacuation. The Russian theater of war differed from others in that teams of surgeons from the divisional medical companies were often assigned to unit or regimental dressing stations. This was done because ambulances could not make round trips in time on account of the long distances and because the ground was soaked by sudden rains. After a cloudburst lasting perhaps only two hours it was often twenty-four or more hours before the ground was again passable and then only at the slow pace of about four to five kilometers per hour. A small improvement resulted after logs were placed on the main roads, thus transforming them into corduroy roads, so that vehicles would no longer remain stuck in the mud. However, their speed was by no means accelerated, without even taking the fact into account that the corduroy roads were extremely bumpy and the constant jolting of the ambulances had an injurious effect on the wounded and sick. Corduroy roads were, of course, not available

- 72 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

everywhere; the same applies to the large express routes which, built by the German Wehrmacht, permitted somewhat faster driving.

In winter, motor vehicles, sleds and the like could move faster on solidly frozen ground and in snow, but on the other hand the problem of snowdrifts had to be dealt with. The roads had to be cleared of snow every day. On all main supply routes the following measures were taken for this purpose:

- (1) The appointment of responsible road sector commanders and road commandants.
- (2) The employment of troops and civilians for snow clearance.
- (3) The use of snowplows.
- (4) The erection of snow fences along the roads.
- (5) The marking of the course of the roads by means of signs.
- (6) The assignment of road patrols and road guards.
- (7) Daily unit distribution of road bulletins on road conditions and time schedules, one-way sections, detours and so forth.

All motor ambulances had efficient winter equipment which included snow chains, defrosters, engine preheaters, portable corduroy material, shovels and so forth. Nevertheless, if the wounded were to be saved, a large proportion of major surgical operations had to be performed far forward — often at the battalion aid station. Horse-drawn ambulances were of no use whatever. The distances were too great.

Evacuation During the Winter: The huge distances in the East, the rainy and muddy seasons, as well as the rigors of Russian winters posed specially difficult problems. Particularly the frequent frostbite cases during transport which necessitated amputations especially of the lower limbs called for energetic measures to prevent frostbite cases from the start.

For this purpose the following measures were ordered:

- (1) Distribution of adequate winter clothing.
- (2) No shipping of patients suffering from frostbite.
- (3) No constricting bandages.
- (4) Distribution of fur clothing and fur-lined foot-bags.
- (5) Distribution of chemical heating units for patients in transit.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

(6) Heating of motor ambulances and all other means of transportation, especially on temporary hospital trains. The replenishment of fuel at medical supply points. Attachment of coal tenders for the purpose of heating the temporary hospital trains. Insulating temporary trains through double walls, covering the walls with blankets, installation of permanent stoves.

(7) Distribution of thermos bottles with hot beverages to patients on temporary hospital trains at medical supply points.

(8) The establishment of rest stations for the purpose of affording casualties a break in a warm room during long rides on sleighs with a closed wooden top. It happened time and again that distances of seventy kilometers and more had to be covered between the main dressing stations and the next medical installation. Consequently warming stations were established at distances of twenty kilometers where the sick and wounded could relax for several hours while being given food, new bandages and other medical care.

(9) Frequent inspection of the passengers, especially those being transported on temporary hospital trains, by specially selected medical specialists, in order to remove casualties suffering from frostbite and so forth.

During the rainy and muddy seasons, in particular, many track-laying vehicles were used for moving casualties. The German Volkswagen also proved valuable.

In the vast expanses of Russia the use of special Junkers hospital service planes and "Storch" (liaison) planes as efficient means of transporting sick and wounded proved highly successful. In addition, all transport aircraft, which otherwise would have returned empty, were utilized. Many lives were thus saved, particularly in cases requiring difficult operations which could only be performed in base hospitals equipped with the most modern technical and medical facilities.

One Storch hospital service plane was assigned to each corps in the Ninth Army. The corps surgeon was thus in a position to ship out in three flights daily a total of six serious casualties. All these flights were routed from Rzhev to Smolensk. Men suffering from serious jaw, face, eye, throat or brain injuries were preferably selected for air transport.

As an illustration of the immense transportation problem to be met during periods of heavy fighting it should be mentioned that in February 1943, on a single day, seventeen temporary hospital trains, each with 2,000 wounded or a total of 34,000 men, passed

- 74 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~

### SECURITY INFORMATION

through the Yasinovataya railway station near Stalino. Only an exceptionally large medical organization, with enormous numbers of beds at its command, could hope to cope successfully with such a problem. During the winter of 1942 - 43, a daily average of 6,000 casualties were transshipped at Stalino. This fact characterizes the great work accomplished in the base hospitals. The same applies also to the large hospital centers in Dnieperpetrovsk, Zaporozhiye, Nikolaiev, Kherson, and notably Kiev where 12,000 beds were on hand.

The following table illustrates the various stages and medical facilities used in moving casualties from the front lines to general hospitals in Germany:

<u>Means of Transportation</u>	<u>Destination</u>
Unit aid men and litter bearers	Aid station
1st Platoon of medical company	Dressing station
1st Platoon of medical company; division motor ambulance platoon	Ambulance loading point, or collecting station (for the slightly wounded)
Division motor ambulance platoon	Main dressing station
Division motor ambulance platoon and army medical transportation battalion	Division field hospital and army medical collecting station
Army or army group medical trans- portation battalion	Base hospital
Hospital train or emergency hospital train	Central collecting station at entraining point
Hospital train	Rear hospital center or general hospital in Germany

d. Preventive Medicine and General Hygiene. The Medical Service is justifiably proud that the German Army in the East was spared any large-scale epidemics. Within the staffs of the army groups and the armies the chief medical officers were supported by properly trained medical specialists who handled all matters relating to the maintenance of health. In addition hygienists, most of whom were university professors of repute, served as medical advisory officers attached to the army medical staffs. They worked on all fundamental health affairs and promoted scientific research.

~~RESTRICTED~~

### SECURITY INFORMATION

Every soldier sent to the Eastern front had been vaccinated either once or several times against smallpox, typhoid fever, paratyphoid (types A and B), dysentery, cholera and typhus. The vaccinations were very carefully repeated after specific intervals. It is due to the protection afforded by inoculations that the German Army was spared large-scale epidemics and retained its fighting power during the entire war. Painstaking care was exercised to prevent the spread of typhus. Wherever there is typhus there must be lice. The troops were constantly lectured on this danger and an energetic campaign waged against lice.

#### Measures Against Lice

- (1) Isolation of troops from the civilian population.
- (2) Where the above was not practicable, delousing and vaccination of civilians.
- (3) Treatment of civilians suffering from typhus; issuance of German medicaments.
- (4) Regular inspection of the soldiers to discover lice; delousing of billets, shelters, bunkers and so forth.
- (5) Delousing in various kinds of improvised delousing stations; building of major delousing stations in military transit centers, in all medical installations and in all towns in which troops were permanently billeted; the building of delousing stations at all railway stations near the German borders. Every soldier and every unit crossing the border from east to west was deloused at the latter station in order to prevent the carrying of lice and therefore of typhus into Germany.
- (6) Lice control by means of insecticides, such as "Russla" powder applied to the person and the impregnation of underwear with "Delitia" and "Lauseto" preparations.
- (7) The use of delousing railway trains.

All these measures were obviously successful. The incidence of typhus was reasonably small because vaccinations effectively checked the degree of gravity, duration and resultant mortality index of the disease.

Simultaneous with measures against lice infection were those directed at another contagious Eastern disease, the so-called Volhynian fever. Although more or less harmless and almost always cured, the soldiers afflicted by it were nonetheless unable to perform their duties for several weeks.



~~RESTRICTED~~  
UNCLASSIFIED

SECURITY INFORMATION

Experience with "Russla powder" proved unsatisfactory. Soldiers disliked it because of its odor, and its effectiveness in killing lice and relieving itching was highly controversial. On the other hand, the impregnating agents "Delitia" and "Lauseto" proved excellent. Unfortunately they were very difficult to apply because the necessary tubs and drying facilities were not always available.

Whenever troop movements occurred or it became necessary to order the evacuation of civilians, the spreading of lice and typhus was facilitated. This could be countered only by strictly enforced orders concerning the delousing of civilians, the avoidance of entire towns or of individual houses, or by large-scale delousing by means of "Fonal bombs" or the use of prussic acid.

No less important was the matter of water hygiene which made it necessary to provide the troops with adequate amounts of uncontaminated water. The drinking of unboiled water was forbidden, unless it had been found free of impurities after a bacteriological test. During the summer and the muddy season water was frequently in short supply and impure. Thereupon water was rationed for men and animals, water supply units were employed, as well as Army water purification units and pack-type water purification units. Where technically practicable, water bottling plants with a large daily output were established. New wells were dug and water maps issued. In this manner it was possible to keep dysentery, typhoid fever and paratyphus within reasonable bounds.

Another important field of hygiene in the East was the control of venereal diseases, especially in the cities and to a lesser degree in the country. The following measures were taken:

- (1) Education of the troops.
- (2) Establishment and supervision of brothels; examination of prostitutes and, if necessary, their transfer to civilian hospitals; issuance of medicaments from army depots.
- (3) Prophylaxis for soldiers after each sexual contact.
- (4) Establishment of efficient VD hospital clinics.

If gonorrhoea was given timely and proper treatment, patients recovered within ten to fourteen days in ninety-six percent of all cases. It is important that no ambulant treatment should have been administered before, as this results in the bacilli becoming resistant to medication.

-77-  
~~RESTRICTED~~  
UNCLASSIFIED

SECURITY INFORMATION

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

One disease that had become almost unknown in Germany and that made its appearance in the East was trychinosis. By orientating the troops and by regular meat inspections, made possible by the training of meat inspectors, as well as by the imposing of regulations that pork was only to be eaten after thorough cooking or roasting, cases of trychinosis were reduced to a minimum.

Malaria and the following measures to prevent it became of increasing importance:

(1) Distribution to troops of maps showing malaria-infested areas.

(2) Malaria prevention by means of daily doses of atabrin.

(3) Protection by issue of mosquito head nets.

(4) Providing mosquito screens at windows and of mosquito-proof curtains at the entrances of houses.

(5) Large-scale cleaning up of malaria-infested areas.

(6) Establishment of malaria hospitals.

(7) Establishment of special tropical disease hospitals.

(8) Treatment of indigenous malaria patients, if necessary with German medicaments and prophylactic measures.

(9) Supervision of all malaria measures by employing malaria specialists and malaria instruction units, as well as the laboratory train of the Army High Command.

(10) Establishment of malaria examination stations at all troop units and medical installations. Here it was possible to test the blood for malaria. Because of strictly enforced discipline in regard to malaria the number of cases and relapses was fairly low and thus never endangered the vitality and strength of the troops. It is not intended to discuss in detail the special measures called for in the East by the prevalence of flies, the building of adequate latrines, the disposal of rubbish and sewage, and further the transportation, storage and preservation of food during the hot summer months.

A large percentage of all patients contracting infectious diseases in the central and southern parts of the Eastern front had jaundice or hepatitis epidemica. Men of all age groups were affected, required hospitalization, and were absent from duty for weeks or months. This liver disease was almost always cured and

- 78 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~ UNCLASSIFIED

SECURITY INFORMATION

rarely resulted in acute yellow liver atrophy or liver cirrhosis. According to today's opinion concerning its genesis, the disease is caused by a virus. The carrier is unknown. Prophylactic treatment is impossible. Since hepatitis epidemica was almost invariably preceded by stomach and intestinal disorders resembling enteritis, it must be assumed that the carrier enters the human body along with water, fruit or vegetables. It was the responsibility of the chief medical officer to cooperate closely on all hygienic problems with the civilian medical agencies, doctors, hospitals and laboratories. Especially important was the interchange of information on infectious diseases and their degree of frequency. In consequence, individual houses were declared off limits to troops, and in other cases entire towns were excluded for billeting purposes. The frequent occurrence of diphtheria, dysentery, typhus or typhoid were usually the reason for resorting to such measures.

Food. Major food problems were not encountered. When, especially in winter, avitaminosis made its appearance — leading to gum disorders and numerous cases of parodontitis — the troops were issued cod liver oil and vitamin preparations with obvious success. Various kinds of special diets were always available in all medical installations including those of divisions.

Clothing. What the German Eastern Army lacked was winter clothing that was really warm, particularly during the severe winter of 1941 - 42. The large number of casualties during that winter was partly due to this fact, as the casualties included many men killed and incapacitated through severe cold. Because of this harsh and tragic experience, the situation was thoroughly remedied during the following winters and the Army was prepared for waging winter warfare. It may be additionally mentioned that in all sectors of the Eastern front very efficient hospitals were established, to which only frostbite cases were admitted and the work of which proved signally beneficial.

e. The Procurement and Distribution of all Types of Medical Supplies. The distribution of medical supplies has already been mentioned. It may be stated that, during the entire course of the war, there was never any shortage of medical supplies which would have definitely affected the treatment of the wounded and sick. Although some bottlenecks in individual medicines and bandage materials occasionally existed, notably those which Germany had to import, they were overcome by suitable substitutes. Only temporary shortages arose — due to bomb damage, destroyed railway lines and other transportation breakdowns, which never seriously interfered with the medical service.

Transportation difficulties during the Russian rainy and muddy seasons necessitated the stocking of every sort of medical supply for several weeks in advance, particularly for combat divisions. Also of great importance in the East was the protection of all medicaments especially sensitive to cold, such as ampules and serums, which required storing in heated buildings. Insulated boxes for transportation were also available.

The general medical depot and partly also the army medical depots drew their supplies from certain specified Wehrkreis medical depots in Germany and the central medical depot in Berlin. Optical field workshops were usually attached to the army medical depots. Moreover, the depots of army groups and armies purchased medical supplies from the local economy and also operated huge plants of their own.

The following table illustrates the supply route and the receiving units of medical supplies:

<u>Receiving Units</u>	<u>Place of Receipt</u>
Division units	Division surgical hospitals or main dressing stations (established by the division medical companies) which received two sets of "Class b" medical equipment from the stocks of the division surgeon.
Divisions, division surgeons, corps troops and corps medical troops	Corps medical supply point, usually attached to corps billet hospital, receiving about ten tons of medical equipment which the army medical depot sent only to corps.
Corps, corps surgeon, army troops, army medical troops	Army medical depot or branch depot.
Army, army surgeon, army group troops and army group medical troops	General medical depot.
Army groups and army group surgeon	Wehrkreis medical depots and central medical depot.

In addition to the medical distributing points set up by the general medical depot of army group and the army medical depot there were also separate units of this type that had their own

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

Tables of Organization and Equipment. These medical distributing points should be distinguished from the medical distributing points which individual platoons of the army medical depot could establish at the corps or other supply centers in case of emergency from their own supply resources.

Since distributing points were almost invariably located near medical installations, supplies were practically always drawn in connection with the transportation of the wounded and sick. Only regular medical supply or hospital trains and, in urgent cases, planes, were used to move medical supplies from Germany to the army medical depots.

f. Scientific Research and Evaluation of Case Histories. Due to the lack of records it is impossible to render even a brief survey regarding the extent to which the past war, especially the Eastern Campaign, has enriched medical science. It may be stated, however, that enormous numbers of case histories were constantly under study by prominent German physicians and that the newly-gained information was formulated in regulations for the treatment of casualties, especially as regards surgery and hygiene. The prerequisite for the practical utilization of new medical developments was the constant and advanced training not only of medical officers but of all assisting personnel. Training was furthered by series of lectures delivered by medical advisory officers, regular training courses, scientific discussions aided by demonstrations, and periodicals dealing with the scientific and organizational aspects of medicine.

22. Duties of Various Medical Units

a. Division Medical Units. The divisions, through their medical personnel (one medical company, two motor ambulance platoons, and one field hospital) established ambulance loading posts, main dressing stations, collecting points for ambulant cases, and, according to the situation, a field hospital or, in quiet sectors, a surgical hospital.

A medical company consisted of the following:

- (1) Command personnel.
- (2) 1st platoon, litter bearers.
- (3) 2d platoon, main dressing station.
- (4) 3d platoon, reserves.
- (5) 4th platoon, personnel decontamination.

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

(6) Administrative squad.

The 1st platoon established one or more ambulance loading posts at or in the immediate vicinity of the dressing stations and, if required, assisted the surgical personnel in moving the wounded from the battlefield and dressing station to the ambulance loading point.

The 2d platoon established the main dressing station and, when necessary, a collecting point for ambulatory cases nearby in order to ease the work of the main dressing station.

The 3d platoon constituted a reserve for the other two platoons. Commanded by one or two medical officers, it was authorized to establish a main dressing station of its own.

It was planned that the 4th platoon should decontaminate chemical warfare casualties. The decontamination was to be carried out by means of emergency equipment since special equipment was not available.

The Table of Organization and Table of Equipment of the medical companies enabled them to work with great efficiency. Whenever a division had two medical companies, which was the case until 1943, one company, either in its entirety or minus one platoon which remained in the rear zone at division, corps or army headquarters, was established as a local divisional hospital or convalescent hospital. During rapid advance or during retirements, the main dressing stations were established alternately by the medical company with the division in leapfrog movement whenever the division had two companies. Later, when there was only one medical company per division, the 2d and 3d platoons of this company established the main dressing station alternately, again in a leapfrog movement.

The main dressing station was usually located six to eight kilometers behind the forward lines. A few kilometers more or less was of no consequence where paved motor roads were available. On the Eastern front this was generally not the case, however, so that the location of the main dressing stations had to be selected very carefully with a view to tactical and medical considerations. They were able to function in tents, but if possible preferred to be either wholly or partly in buildings. The main dressing station was the center of medical treatment within the division, especially later on when the divisions no longer had field hospitals of their own. If necessary, all surgical operations, especially those of an urgent nature, were carried out in the main dressing stations. Housing conditions had to be such that patients, if need be, could remain there under the care of doctors for weeks. The division

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

medical distributing points were usually located at the main dressing stations. The division medical officers allotted their two issues of medical materiel (weighing ten tons) to the distributing points for this purpose. Here the unit medical officers received reissue of medical supplies expended in the treatment of the sick and wounded.

A division field hospital could be considered on a par with a peacetime civilian hospital. Situated at least twenty-five and thirty kilometers behind the battle lines, it was always housed in buildings where it furnished 200 to 300 serious casualties quarters and medical care and treatment. These hospitals always had a surgical and internal disease clinic and frequently also eye, ear or skin clinics staffed with specialists. Here it was possible to perform X-rays, as was the case too in the main dressing stations, and to give dental treatment including the making of dentures.

In the East the division field hospitals were often used exclusively for epidemic cases. For instance, three division field hospitals of the VI Corps in the Rzhev sector were reserved for nothing but typhus patients between April and June 1942.

The division motor ambulance platoons, comprising thirty vehicles, transported the wounded and sick from the ambulance loading points to the main dressing stations and surgical hospitals, as well as further rearward to the collecting stations of the army. In specially urgent cases, if the condition of the patient allowed, he was taken to Luftwaffe airfields to be flown to special base hospital clinics. It was also permissible to detail individual motor ambulances to troop units.

b. Duties of Corps Medical Units. From the beginning of the Eastern Campaign until 1944 the corps had no organic medical troops, although it was possible temporarily to assign them division surgical hospitals. After 1944 the corps were equipped with one horse-drawn medical company and one motorized ambulance platoon each. These medical troops were either assigned to one of the subordinate divisions in their entirety or by platoons, as was the case when division sectors were specially broad or when the division medical troops were reduced in numbers because of casualties or vacancies in the ranks, or else the corps headquarters in cooperation with the medical company established in its own corps rear area an efficient billet hospital with anywhere between two and three hundred or more beds. This hospital received seriously wounded casualties who could not be transported and at the same time served to screen out light casualties and

83  
~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

prevent their being sent back to the army and army group base hospitals. This procedure became the rule, for it was in keeping with another requirement, namely to treat as ambulant or stationary cases those troops directly assigned to corps headquarters and stationed in the corps rear area.

The corps motorized ambulance platoon transported the wounded and sick from the billet hospital to the medical facilities of the armies, base hospitals, base dispensaries and collecting stations.

c. Duties of Army and Army Group Medical Units. With their numerous medical personnel the armies and army groups established large and efficient base hospitals within their areas. The number of beds varied, averaging from four to six thousand in the army areas and at least as many and often more in the army group area, according to the number of available base hospital units. The base hospitals, numbering a thousand beds each, all had clinics which were headed by the best specialists, some of whom were university professors. Here was also the main field of endeavor for the medical advisory officers who not only administered purely medical treatment but also worked on scientific problems and evaluated case histories. New scientific information concerning treatment and general medical practice, which resulted from their work, was soon formulated as guides for medical work on all fronts by The Surgeon General after scientific consultation. The hygienic, Bacteriological and chemical testing stations as well as the autopsy units were also located at these great hospital bases. Thus for example, the Ninth Army, which in 1942 was holding the front sector Vyasma - Rzhev - Olinin had its base hospitals in Vyasma and Smolensk, whereas the army group hospitals were in Smolensk and Vitebsk.

Among the medical troops of the armies and army groups there were also one or two ambulance battalions. The duties of an ambulance battalion were extremely numerous and, in the vast expanses of Russia, were especially difficult and heavy. These duties included the following:

- (1) Organization of the transportation of the wounded and sick and their distribution to the medical facilities operated by the army and army group.
- (2) Establishment of collecting points and of facilities for the slightly wounded.
- (3) Loading and unloading of hospital trains.
- (4) Organization, equipment, loading and unloading of emergency hospital trains, shuttle trains, regular hospital trains and of individual medical railway cars.

UNCLASSIFIED

<sup>84</sup>  
~~RESTRICTED~~  
SECURITY INFORMATION



~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

(5) Establishment of medical supply depots at intervals on all railway lines within the army and army group areas. In addition, liaison with the welfare agencies and the Red Cross which were responsible for feeding the wounded.

(6) Control of assigned transportation space, as dictated by daily sick reports from the medical installations of the army and army group.

(7) Liaison with railroad agencies and the emergency hospital train organization of army and army group.

(8) Utilization of railroad cars which were returning empty.

(9) Responsibility for the movement of the wounded across rivers by use of medical ferries, motor and pneumatic boats, in cooperation with the army engineer commander.

(10) Organization of the transportation of the wounded by water in cooperation with the Navy. Use of hospital ships and Navy medical landing craft, as for instance at Kerch.

(11) Transportation of the wounded and sick by air in cooperation with Luftwaffe authorities.

An ambulance battalion consisted of a headquarters detachment and three companies, each with three platoons. Each platoon was able to set up one or two collecting stations. The forward-most collecting stations were usually located at the rear boundaries of divisions, at ports, hospital centers, or railheads. From April to August 1942, for instance, the Ninth Army operated collecting points in Olinin, Rzhev, Sychevka, Vyasma and Smolensk.

The collecting stations had the following mission:

Reception and examination of the sick and wounded. Emergency first-aid treatment.

Temporary board and housing, then routing to other destinations.

If necessary, reception in dispensaries which were attached to every collecting point.

The emergency hospital train, listed under (4) above, was an absolute necessity in the East. By and large, the Army had an adequate number of hospital trains to carry out the transportation of the wounded. This was not possible, however, when the few railway lines in Russia had to be taken into account. The hospital

trains were therefore mainly used for moving other army supplies. These supply trains, consisting chiefly of freight cars, were used when they were empty on their return trip for the transportation of the wounded and equipped with all necessary facilities, such as beds, medical material, stoves, fuel and food. In this way temporary hospital trains were created which were constantly improved in the course of time so as to give excellent service.

d. Duties of Medical Depots. The army medical supply depot and army group central medical supply and salvage depot were charged with the administration and control of all types of medical supplies, some of which they manufactured themselves.

The central medical depots stored supplies weighing more than 2,000 tons, while the medical depots of the armies had stocks totalling between 900 and 1,000 tons.

Because the army medical depot was organized into a headquarters detachment and three platoons of equal strength it was possible to establish several issuing points within the army area. Within the Ninth Army area these issuing points were located in Vyasma, Rzhev and Smolensk, where a headquarters detachment of army medical personnel was also employed. These platoons, on their part, established smaller medical supply issue points, each with a stock totalling about eighty tons, within the corps area operating under an army, whence the divisions, corps troops and the corps medical troops drew their supplies.

e. Duties of Base Hospitals. Despite the large capacity of the base hospitals of armies and army groups, they were unable in the long run to handle the sudden arrival of enormous numbers of sick and wounded. New base hospitals of very large capacity were therefore established to the rear of the army groups within the sector of local territorial commanders.

The following base hospitals should be mentioned:

(1) In the south, the base hospitals operating under the Army High Command, Field Agency South, had 54,000 beds available in the areas Stalino - Konstantinovka - Dnjeperpetrovsk - Zaporozhye - Kiev - Nicolaev - Kherson.

(2) The base hospital of Wehrmacht Commander, Ukraine, with a 10,000 bed capacity in the area of Rowne - Zhitomir - Berdichev - Vinnitsa.

(3) The base hospitals in the Government General (Poland).

(4) The base hospitals of Wehrmacht Commander, Ostland.

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

The number of beds available in (3) and (4) is unknown.

An uninterrupted series of hospital centers was organized as far as the German border. Only thus was it possible to insure the medical treatment of many hundreds of thousands of wounded and sick and to ease the workload of the general hospitals in Germany.

23. Conclusions

The composition and organization of the Army Medical Service, as well as of the equipment used by medical troops proved excellent as a whole, even under the extraordinarily difficult conditions encountered in the East. On the basis of experience the following requirements became apparent and call for serious examination:

a. Field units and medical troops should be equipped with track-laying vehicles, in order to be independent of terrain features, and to insure prompt medical care and the evacuation of casualties.

b. An adequate number of liaison-type and other hospital service planes should be directly allocated to armies, corps and possibly divisions. Great inconvenience resulted because hospital service aircraft had first to be requisitioned from Luftwaffe headquarters. Either the planes did not come at all, or too late, or too rarely, and in the main they were used to evacuate Luftwaffe casualties alone.

c. The corps medical troops should be strengthened by one of each of the following: surgical hospital, motorized ambulance platoon, medical distribution point and hygienic-bacteriological laboratory. The corps would then control one surgical hospital, one horse-drawn medical company, two motorized ambulance platoons, one medical distribution point and one hygienic-bacteriological laboratory. Considering the large distances in the East, a corps should have its own hospital, even though it be a small one. The distances between medical installations of divisions and of armies were often so extensive as to amount to 200 kilometers and more.

d. The Wehrmacht medical service should be simplified, primarily in order to insure cooperation between Army and Luftwaffe and also with the Navy. The first step in this direction was taken by the appointment of a "Chief, Wehrmacht Medical Service," although the practical effect of this appointment never became apparent.

CHAPTER VII

Experiences of the Supply Services  
(Exclusive of Medical and  
Veterinary Services)

The following experiences were gathered between June 1941 and September 1942 on the southern sector of the Eastern Front, particularly the area covered by the Eleventh Army in its campaign from Romania through the southern Ukraine to the Crimea and the conquest of Sevastopol, as well as during the author's trip to the Caucasus front (Seventeenth Army and First Panzer Army) and the adjacent front up to and including Stalingrad (Fourth Panzer Army, Sixth Army) in September and October 1942.

24. Basic and General Criteria

During the entire campaign, supply was handled according to the principles set forth in pertinent regulations (Field Service Regulations: Operations, Part II; and Regulations for the Supply of the Field Forces). Supply operations were determined by the vastness of the country as well as the limited capacity of its few railroads and highways. The entire transportation system was far more dependent on the weather in Russia than in central and western Europe. Mastery of ensuing transportation problems was the major task of the supply services.

Although the Soviet Air Force carried out harassing attacks against railway stations, bridges and supply installations, it failed to make sustained, systematic attacks in concentrated strength against the long and vulnerable German supply routes.

The railroads formed the backbone of supply communications. Water transportation from Constanta to Nikolaiev and Kherson occasionally helped to ease supply bottlenecks, but it was not reliable due to the submarine hazard and the lack of shipping space.

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

Insofar as special requirements, such as aircraft, bombs or special clothing were concerned, supply to the elements of the Navy, Luftwaffe and auxiliary organizations stationed in its area was handled by the army headquarters concerned. The resulting tight control and utilization of transportation facilities was of utmost importance in this vast theater.

Detachments which had thrust far forward in pursuit of the enemy were more than once supplied from the air. The basis for such operations is presumed to be widely known. No new aspects developed which would require elaboration here.

German supply routes had to be protected against partisans only in the Yaila Mountains of the Crimea where the enemy supported guerilla warfare by dropping men and materiel from the air. As a rule, outposts and reconnaissance patrols along the roads used by convoys provided adequate security. Attacks against guerilla nests were only successful after efficient reconnaissance and a surprise concentration of fairly large forces. The partisans were never able to interfere seriously with supply movements.

#### 25. Railroads

Whenever possible, Russian railroads were changed to standard gauge. They usually had to be utilized to the limit of their capacity which, however, was frequently inadequate even for minor supply requirements. Railroad capacity, small to begin with, was still more drastically reduced by damage at defiles and especially at river crossings, as well as by the lack of undamaged repair shops and by water damage to the roadbed.

Although the composition of trains was well arranged at the time they crossed the German borders, the difficulties engendered by the large distances later often resulted in breakdowns of scheduled transportation movements. The locomotives were not equal to the severe cold prevailing during the winter of 1941 - 42. By comparison, interference through enemy bombing and partisan action was of relatively minor importance. During the winter of 1941 - 42, only 4 percent of all railway breakdowns between the lower Dnjepr (at Kherson) and the Crimean front, were caused by the enemy while 96 percent were due to mechanical failure and the weather.

During the same winter, at times more than 90 percent of all locomotives within the area of Army Group South were disabled due to damage caused by severe cold, with the result that railroad traffic was virtually at a standstill. The stockpiling of materiel by the Eleventh Army for the attack on Sevastopol during the summer of 1942 required almost two months because of poor railroad conditions. In the autumn of 1942 the Sixth Army was unable to provide

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

adequate artillery support in the attack on Stalingrad because the railways functioned at only about two-thirds of the minimum capacity demanded.

An efficient railroad system with winter-proof locomotives, sufficient repair shops, and construction personnel is the prerequisite for the adequate supply of troops in Soviet Russia. In case of far-reaching assault operations it will prove disadvantageous, and should therefore be avoided, to have friendly aircraft destroy the railroad repair shops. Considering the vast distances, rolling stock will in any event be scarce. Shipping space must therefore be fully utilized. Soft goods, such as clothing, can be loaded on ammunition trains to fill up empty space. Supply trains should be unloaded quickly to release rolling stock.

Since the transportation situation is almost continuously critical it is necessary that the railway transportation officers at army group and army be energetic men who can effectively represent the requirements of both sides, the tactical commanders and the railway agencies, and who possess the respect of both. Otherwise, friction will appear between the two parties which is bound to hurt the common cause.

## 26. Roads

The roads in the advance sector\* of Eleventh Army were unpaved. They were just dirt tracks, spread out in an unsuccessful attempt to avoid ruts. Not before reaching Simferopol in the Crimea (from Sevastopol and Feodosiya) did the army find a paved highway after leaving Romania. The subsoil of the unpaved roads consisted of clay or sand, sometimes also loess and "black earth." Particularly in the Nogayskaya Steppe, between the Dnjepr and the Crimea, large clouds of dust rise. Here, during dry weather, every motor vehicle leaves behind a dust cloud several hundred meters long.

Dry roads usually made it possible for two-axle vehicles to cover an average of 100 - 150 kilometers per day. Higher averages might have been attained in exceptional cases, but in the long run they rapidly result in the overstraining of drivers and vehicles. For the purposes of planning, 120 kilometers was considered the average daily run of army motor vehicle columns after leaving the detraining point. This figure includes days of rest for individual columns and time spent in making minor vehicle repairs.

---

\* Southern boundaries: Jasy - Chisinau - Tiraspol - mouth of the Bug River - Black Sea - Crimea.  
Northern boundary: Mogilev - Pervomaisk - Berislav - Melitopol - Crimea.

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

Driving conditions deteriorated rapidly in wet weather. Showers made the roads almost completely impassable for two-axle trucks with two wheel drive. Snow chains helped occasionally. One heavy rain per week was the approximate average in the southern Ukraine during June and July 1941. After one or two hours of this almost all truck columns came to a halt which lasted, depending on the volume of precipitation, for between twelve and forty-eight hours, occasionally even longer. A traffic block was thus created at the poorest stretches of the road, and the congested vehicles made easy targets for enemy air attacks. During the muddy season in the spring and late autumn it was impossible to count on regular supply by road before major attacks. In November 1941 the troops could be well supplied because the Russians withdrew rapidly on the Crimea, and consequently no large amounts of ammunition had to be brought forward. In the spring of 1942 the paved road net between Sevastopol and Feodosya on both sides of the Yaila Mountains could be used.

The so-called Greter roads (Greterstrassen) are of special importance in the southern Ukraine. The road between the lower Dnjepr and Perekop, the gateway to the Crimea, was partly a Greter road. This type of road is probably constructed by some sort of road scraper. The loose earth is flattened out and the road surface thus created is then bordered with ditches on both sides. The driving of motor vehicles over it makes the road surface as smooth and firm as one covered by asphalt, thus easily allowing, when dry, a speed of eighty kilometers per hour. Little dust is raised on these roads which are excellent when dry, although rain makes them first slippery and then soft. It is absolutely essential that trucks be prevented from using these roads when they are wet, since heavy traffic rapidly makes them utterly impassable, a state from which they can only be restored with difficulty if adequate machinery is not on hand.

#### 27. Rivers

The route of advance of the Eleventh Army cut across the lower course of four great rivers, the Prut, Dniester, Southern Bug and Dnjepr. The importance of these rivers for moving supplies was great. A considerable part of the army supply columns was continuously needed for transporting timber used in building emergency bridges to replace the military ponton bridges, and was thus temporarily unavailable for supply purposes. As many of the long bridges were one-way affairs, they formed bottlenecks which delayed the supply runs.

In August the Dniester rose seven meters above its normal level and swept away all bridges. Ten days were required to rebuild them. During this period, all supply movements from Romania

- 91 -

UNCLASSIFIED

~~RESTRICTED~~  
SECURITY INFORMATION

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

were interrupted and had to be replaced by shipments from the north where railway construction had progressed to a further extent.

The emergency bridge across the Dnjepr near Berislav became unusable during the winter because of drifting ice. The same was true of the railway ferries used in summer. Consequently, all supplies for the Eleventh Army fighting in the Crimea had to be transshipped across the frozen Dnjepr on trucks or horse-drawn sleighs. Various plans for the building of cable railways were not carried out as their capacity would not have sufficed to move eighty railway cars or so per day.

The foregoing statements concerning roads and rivers accentuate the importance of planned cooperation between the commanders of quartermaster and engineer units at the army level.

#### 28. Motor Vehicles

As a result of the poor and extended supply routes, the condition of motor vehicles was a source of constant apprehension. Of those used in the supply service of the Eleventh Army a regular average of about only 40 to 60 percent of actual strength were in good repair. The large number of different types of motor vehicles greatly impeded their proper maintenance. During 1941 - 42 it was not possible to overcome the difficulties which thus arose in procuring automotive replacement parts.

Before the onset of winter all motor vehicles should receive anti-freeze for their radiators, and be equipped with defrosters and engine preheaters to facilitate starting. Dust storms make dust filters an absolute necessity for motor vehicles during the summer. For efficient motor vehicle operation the standardized production of the fewest possible types and a large-scale maintenance service are even more necessary in a campaign in the Soviet Union than in other European countries. The use of three-axle, all-wheel-drive supply trucks, instead of commercial two-axle trucks, would probably decrease their dependence on weather and road conditions and thus very substantially reduce the chief supply problems. No information on this subject is on hand.

Because of bad roads, fuel consumption was considerably higher in Russia than in European theaters. For wheeled vehicles it was about 150 to 200 percent of the normal rate, while it was frequently still higher for track-laying vehicles. Cold-resistant lubricants were necessary for winter driving. The large number of overstrained engines increased the general oil consumption.

~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED



29. Rations

Bread, meat and fodder\* could easily be procured from the fertile country. The lack of local timber resources hampered the work of bakery companies. Ovens which can also burn other fuels than wood are desirable.

It was difficult to feed horses in areas where little fodder was grown, such as along the southern Crimean coast, which produces grapes, fruit, and tobacco almost exclusively. The same was the case during the winter of 1942 - 43 in the steppes between the Don and Volga, west of Stalingrad. From both these areas most horses had to be moved rearward in marches lasting several days. Only a small number of the horses remained with the units in order to pull the most important vehicles in an emergency.

All Post Exchange items down to sewing needles had to be procured from Germany as practically no European-type consumer goods were obtainable in Russia.

30. Ammunition

Before attacks upon positions, the ammunition supply officers had to take into account the tenacity of the defenders and their skill in building field fortifications. For calculating the probable amounts required when attacking strong field fortifications, the following standards were developed on the basis of experience:

For the first day of attack, for each troop unit involved, roughly one unit of fire\*\* of light artillery ammunition, one and a half units of fire of medium artillery ammunition, one unit of fire for heavy infantry guns and mortars. For each day thereafter on which severe fighting was expected, approximately half of the above amounts was issued, during less severe fighting and during pursuits, one-tenth of a unit of fire per day at the most. Additional amounts had to be allowed for any artillery preparation intended prior to the first day of the infantry attack. Supply requirements in other types of infantry ammunition (small arms, machine guns, hand grenades, etc.) were so small on account of the low numerical strength of the German infantry and the ample supplies of these types of ammunition on hand, that they could be almost ignored in computing transportation space requirements.

---

\* Over-all ration strength of Eleventh Army: about 200,000 men and about 70,000 - 90,000 horses.

\*\* One unit of fire is that amount of ammunition which the division or the independent GHQ unit carries in its own combat vehicles and columns. A German unit of fire for guns consists of approximately 200 rounds for light artillery, such as 105mm. light field howitzers; about 150 rounds for medium artillery 150mm. field howitzers and 100mm guns; and 75 rounds for 210mm. howitzers.

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

The following two examples illustrate German ammunition requirements during major attacks:

(1) Attack on the Parpach position, northeast of Feodosiya, for the purpose of reconquering the Kerch Peninsula in May 1942.

A total of four to five German and one or two Romanian divisions, with tank and heavy Luftwaffe support, carried out the attack. It regained the Kerch Peninsula and defeated strong enemy units totaling seventeen divisions in twelve days of fighting. The enemy had built up the Parpach position during the previous position warfare, which had lasted about three months.

The breakthrough succeeded on the first day. The slightly undulating hilly terrain favored the commitment of tanks. The consumption of artillery ammunition totaled roughly two units of fire, about one unit of which was expended on the first day of attack. Some troop units consumed less.

(2) Attack on the fortress of Sevastopol and surrounding field fortifications during the summer of 1942.

The artillery preparation commenced on 5 June, the infantry attack on 9 June and the city of Sevastopol fell on 1 July. Rear guard fighting continued until 7 July. The entire action thus took 33 days.

The terrain, divided into numerous natural compartments, favored the defenders who numbered about five divisions as far as can be recalled. The real strength of the fortress was not due to its few permanent fortifications -- mainly consisting of Forts Maxim Gorky I and Maxim Gorky II -- but to its field fortifications on which the Russians had worked continuously since December 1941.

Seven German and one or two Romanian infantry divisions, supported by heavy GHQ artillery and the Luftwaffe but without tanks, carried out the attack. It consumed a total of 47,700 tons of ammunition, an amount fully adequate to the situation. The heavy artillery expended approximately twenty units of fire, the light artillery about twelve to fifteen units, while the light infantry weapons consumed barely one unit -- all of which was divided among all infantry units committed. The quantities expended by heavy infantry weapons (infantry guns and mortars) are no longer known. The Luftwaffe dropped a sizeable number of bombs. Fighting was extremely violent. The breakthrough did not succeed on the first day. The summer heat was very oppressive. Enemy resistance was very severe until the end. The attackers lost a total of 24,000 men.

UNCLASSIFIED

~~RESTRICTED~~

## SECURITY INFORMATION

The experience gathered with regard to defensive action was here the same as in other theaters.

### 31. Supply Bases

Since the beginning of the campaign, owing to the special conditions prevailing in the theater, all rear army installations were consolidated into so-called supply bases. The divisions proceeded in the same manner. Such a supply base consisted of one army dump each for rations, ammunition and fuel and, according to need, of bakery and slaughtering companies, automotive and ordnance repair shops, hospitals and veterinary hospitals.

All these organizations were housed, if possible, in or near a large sized and favorably located town. In addition there were security and labor units and army motor columns. Supply bases were usually located at towns with rail unloading facilities.

All supply troops and facilities of the supply base were assigned locally to a so-called supply base commandant, appointed by the army quartermaster. His authority was similar to that of a post commander. He was responsible for carrying out the army quartermaster's orders regarding all supply operations and especially for organizing convoy movements and the utilization of transportation space. Great demands were made on the organizational capabilities of the supply base commandant. The fact that supply bases were established in no way interfered with the channels for technical supervision of all service troops, for instance the supply depot, the bakery and slaughtering companies under the administrative and fiscal officer, the hospitals to the army surgeon and so forth. Telephone communication between the army quartermaster officer and the supply points is necessary; supplementary radio communications to important supply points is also desirable.

The system of operating supply bases proved highly successful. It facilitated the transmission of orders, saved on signal communications, permitted a coordinated functioning of the logistical command and the full utilization of transportation space with increased security against enemy attacks.

During its campaign the Eleventh Army successively established supply bases in or near the following towns: Jassy and Botosani, Chisinau and Belzy, Balta, Nikolaiev, Kherson; later on in the Crimea in Dzhankoi, Simferopol (which was a main supply base) and at the railway fork north of Feodosiya.

- 95 -

~~RESTRICTED~~

UNCLASSIFIED

SECURITY INFORMATION

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

32. Military Government

The administration of the rear army areas was severely hampered by poor roads and the lack of communication facilities, especially in winter. Contrary to expectations, the population proved everywhere cooperative and friendly. The mayors and village elders, accustomed to strict obedience, worked well. The relations between German troops and the indigenous populace were satisfactory throughout.

All agriculture and forestry affairs were managed by a German agricultural organization which collaborated with Russian agronomists. It was important that cattle be only requisitioned from "Kolkhozes" (collective farms) and "Sovkhozes" (state-owned farms) and that a peasant's own cow not be taken from him.

33. Prisoners of War

Most prisoners of war were friendly and cooperative. Their general attitude was passive, in conformity with the national character. The main difficulty with regard to prisoners of war was that their number usually far exceeded the available means of transportation so that most of them had to march on foot to rear areas. Food and shelter had to be provided for them every fifteen to twenty-five kilometers, the distance usually covered in one day. One guard per fifty prisoners sufficed during foot marches.

34. Communications

It proved of utmost importance that efficient and secure, hence direct, telephone lines connect the army supply officer with the supply bases, as otherwise he was unable to perform his functions. Next in importance was that he should have such telephone lines to the forward echelon of army headquarters and to the supply officers of the corps. During pursuits, a fast movement on the part of the command group sometimes lead to its being temporarily separated by large distances from the army supply officer in the rear echelon. This was the case with the Eleventh Army during this campaign, when the intervening distance was at times 100 to 150 air kilometers. It was not sufficient to have a supply liaison officer attached to the command group in such a case; a liaison plane which could land at low speed was a satisfactory solution. This plane could also be used to carry the army supply officer to corps and divisions headquarters or to the forward transshipment points of the army. In the Ukraine the Storch plane was employed to great advantage during the summer of 1941 for ascertaining the speed of movement of supply columns on the muddy roads after showers. Motor vehicles could not have been used for this purpose, or at best many days would have been required for each trip.

~~RESTRICTED~~ UNCLASSIFIED  
SECURITY INFORMATION

Distribution

No. of Copies

20	Office, Chief of Military History
40	Seventh Army
1	Director, Operations, Plans, Organization and Training Division
1	Director, Intelligence Division
1	Director, Personnel and Administration Division
1	Director, Logistics Division
1	Adjutant General Division
1	Secretary General Staff
3	Intelligence School
1	Chief, Engineer Division
3	SHAPE
1	COMNAVFORGER
1	USAFE
11	Military Posts (1 each)
1	USCOB
13	Historical Division

UNCLASSIFIED  
~~RESTRICTED~~  
SECURITY INFORMATION

UNCLASSIFIED

UNCLASSIFIED