

MOUNTAIN WARFARE: THE RUSSIAN PERSPECTIVE

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EXECUTIVE SUMMARY

After attempting to combat the Afghan mujahedin with an army designed to defeat NATO, recent Russian military writings reflect a much stronger emphasis on the unique requirements necessitated by mountainous terrain. This paper summarizes their recent literature and presents the contemporary Russian view of this type of warfare based on perspectives gained in Afghanistan and elsewhere. The primary theme focuses on the current thinking of an army with recent experience in this complicated type of combat and delineates its principal conclusions for use by U.S. experts as a basis of comparison with our own mountain techniques for force-on-force combat.

Russians base their training and theory for mountain warfare partially on Soviet military writings drawn from historical studies of the Great Patriotic War (GPW), but they now attach much more significance to the experience which they acquired in Afghanistan. These "lessons learned" are being coupled with new tactical innovations and integrated with other refinements to military art resulting from ongoing changes taking place within the Russian armed forces. Unit exercises, modifications to equipment, new roles for the military, and continuing operations in the mountains of Tajikistan (where the terrain is arguably as tough as Afghanistan) - all contribute to the current view of combat in mountainous terrain.

An assessment written by General Yuri Maximov characterizes some of their new philosophy:

Surprise, resoluteness, and audacity play an especially important role in mountain operations. ... Even a small subunit can decide the outcome of the whole battle by unexpectedly maneuvering around a defender's flank or capturing a dominating height. ... in mountain combat the subunits should operate independently of the main body. This, to be sure, imposes additional responsibility on the commanders and subjects their subordinates to increased psychological stresses. ... We believe it of paramount importance to train the commanders of motorized infantry companies to control the fire of not only their own subunits but also of attached artillery, tanks, and aviation.

In the foreboding terrain of Afghanistan, commanders such as General Maximov realized the fallacy of ignoring tactical theory. No longer do Russian writings neglect the junior leader skills which earlier resulted in such an inordinate amount of problems. They now look beyond the legacies of the GPW and emphasize such junior leader requirements as the coordination of fire support, the use of maneuver, and the importance of independence and initiative among lower level commanders.

Russian theorists, like their Soviet predecessors, continue to view mountains as an obstacle which they must cross. They recognize the value of special training and special types of troops (airborne, air assault, Spetsnaz, and mountain infantry) to overcome the difficulties imposed by the terrain; nonetheless, based on the types of forces deployed along the Tajik border, they also continue to maintain that motorized rifle units possess the capabilities required to operate in these conditions. In a break with their Soviet past, however, the Russian army now advocates a much more terrain-based approach. Its theorists stress the effective use of helicopters for such diverse tasks as air mobility and assault operations, search and destroy missions, and convoy security; they place increased emphasis on dismounted operations and improved movement techniques; and they accept innovative small unit independent action as the key to winning in this environment.

Contemporary Russian tacticians also stress the importance of analyzing climatic and other geographic factors which impact upon the employment of forces in these special conditions. The environmental challenges posed by the mountains severely strain the operating characteristics of weapons and equipment as well as the limits of human endurance. Difficult terrain, combined with sudden and often unexpected meteorological changes, affects everything from aviation to engineering operations to communications and

unit movements. Prolonged exposure to the elements in these conditions and extended stalemated combat operations (Afghanistan and Tajikistan) sooner or later have a detrimental effect on morale.

The Russians realize, perhaps better than anyone else, that combat in mountainous regions remains a difficult undertaking. It strongly favors a defender who can exploit the rugged terrain and hold key areas with relatively small forces while limiting the effects of heavy armaments. To overcome these advantages, a successful attacker must organize his forces into autonomous groups capable of independent action. Turning movements and envelopments will play key roles in destroying enemy defensive areas.

Finally, Russian tacticians also contend that operations in the mountains require continuous but flexible command, control, and communication procedures. Information dissemination and control measures acquire great significance when advising subordinates of anticipated maneuvers. Experience shows them that the art of being a commander in this environment lies in precisely ascertaining the beginning of a maneuver, its type, the sequence for accomplishing it, the forces used to enter into fire, and the most favorable sector of operations. They stress that when conducting a maneuver the commander must not lose the fire initiative. Equally important, he must disrupt the enemy's counter maneuvers by properly employing reliable engineer support. In short, the commander must make the difficult decision of when to conduct mountain warfare as well as possess the skills required to wage it.

I. INTRODUCTION

After attempting to combat the Afghan mujahedin with an army designed to defeat NATO, recent Russian military writings reflect a much stronger emphasis on the unique requirements necessitated by mountainous terrain. This paper summarizes their recent literature and presents the contemporary Russian view of this type of warfare based on perspectives gained in Afghanistan and elsewhere. No attempt has been made to discern whether these theories have been translated into direct practice, but recent turmoil and lack of resources in the Russian military suggests that implementation of new ideas remains a low priority issue. Rather, the primary theme of this study focuses on the current thinking of an army with recent experience in this complicated type of combat. U.S. tactical experts can then use these principal conclusions as a basis of comparison with our own mountain techniques for force-on-force combat.

A quick scan of the peripheries of the former Soviet Union reveals the continuing importance of mountain warfare to the Russian army. Faced with an Islamic insurgency in the south along the 1400 kilometer border between Tajikistan and Afghanistan, potential involvement in the Nagorno-Karabakh dispute between Azerbaijan and Armenia, the continuing internal conflicts raging in Georgia, and the problems in the Caucasus mountains within their own borders, the Russian military must keep their mountain fighting skills sharp.(1)

Russians base their training and theory for mountain warfare partially on Soviet military writings drawn from historical studies of the Great Patriotic War (GPW), but they now attach much more significance to the experience which they acquired in Afghanistan.(2) These "lessons learned" are being coupled with new tactical innovations and integrated with other refinements to military art resulting from ongoing changes taking place within the Russian armed forces. Unit exercises, modifications to equipment, new roles for the military, and continuing operations in the mountains of Tajikistan (where the terrain is arguably as tough as Afghanistan) - all contribute to the current view of combat in mountainous terrain.

While the Russians presently debate the nature and requirements of future warfare at all levels (strategic, operational, and tactical) and attempt to formulate new doctrinal concepts to deal with these problems, the heart of the dilemma for generating and organizing forces remains the same for the military leadership: i.e. design a force within current constraints capable of defending the homeland and Russian interests in the near abroad. (After all, Russian borders are less secure now than during the Cold War.) Consequently, the army focuses substantial attention on the regional threats noted above where much of the instability in these new contiguous states now occurs within the mountains of Central Asia and the Transcaucasus.

Russian military scientists, like their Soviet predecessors, continue to view mountains as an obstacle which they must cross. They recognize the value of special training and special types of troops (airborne, air assault, Spetsnaz, and mountain infantry) to overcome the difficulties imposed by the terrain; nonetheless, based on the types of forces deployed along the Tajik border, they also continue to maintain that motorized rifle units possess the capabilities required to operate in these conditions. In a break with their Soviet past,

however, the Russian army appears to have learned some new valuable lessons pertaining to mountain warfare. Its theorists stress the effective use of helicopters for such diverse tasks as air mobility and assault operations, search and destroy missions, and convoy security; they place increased emphasis on dismounted operations and improved movement techniques; and they accept innovative small unit independent action as the key to winning in this environment.

II. UNIQUE CONDITIONS AND PECULIARITIES OF MOUNTAIN WARFARE

The salient point of Russian military writings pertaining to mountain warfare, both during the latter stages of Afghanistan and in the present, indicates that tactical observation (and thus terrain) becomes paramount. This new approach to combat actions in these unique areas significantly deviates from former thinking as well as continued standard practice for most types of maneuvers. In the mountains, terrain has become the primary consideration in determining how to destroy the enemy. Normally, Russian analysts relegate terrain to the status of one factor among many in achieving this goal; but based on the experience they acquired in Afghanistan, they now place major emphasis on the identification of key features when conducting combat operations in a mountainous sector. The higher the mountains and the more difficult the terrain the more importance attached to this task.(3)

Russian military thinkers classify mountainous terrain into several various categories depending primarily on elevation. Generally, however, other common characteristics also apply. These include the presence of a large quantity of hard-to-cross natural obstacles, a limited quantity of roads, and unique weather. Many mountainous areas, for example, are subject to a variety of climatic conditions within any given day. These may include a combination of extreme temperatures, fog, winds, and heavy rain or snow. Consequently, the physical obstacles of the terrain, coupled with the unpredictability of weather in the mountains, will exacerbate the difficulty of combat operations in this type of terrain regardless of its specific classification. Most importantly, perhaps, these environmental consequences will pose multiple problems for the ground commander from the point of view of maneuver and security.

Maneuver and Security

The Russians stress that the inaccessibility of most mountain terrain will place severe demands on the maneuver of troops. Coordination problems become substantially more difficult and command and control will suffer. Mountains will likely limit freedom of choice for rapid movement and may preclude concentration of combat power on preferred axes of advance. Conversely, they may also force undesirable clusters of troops on such features as mountain trails when movement parties stop to clear obstacles. Columns of forces will become separated and possibly physically isolated from each other as valleys become narrower and subunits rout their way through lateral and adjacent approaches.(4)

This potential isolation of forces during movement clearly has major implications for security concerns. Flanks, for example, will become increasingly difficult to secure as units on both sides of a formation move farther apart. Likewise, small enemy subunits can easily launch sudden attacks due to the limitations on observation and fires caused by the restrictive terrain. The paucity of roads (and poor off-road mobility) facilitates templating and determining the movements of forces and makes the actions of a motorized force quite predictable. Surprise becomes next to impossible to achieve, and not only can the enemy interdict roads with mines but also natural disasters such as avalanches can make them impassable. Such conditions can result in massive killing zones against an imprudent commander.(5) The peculiarities of mountainous terrain have also caused the Russians to deviate from standard tactical procedures in other ways when conducting and executing operations in these surroundings. As one Russian general with experience in pursuing insurgents in Afghanistan stated:

It is difficult to organize a continuous front line in mountainous areas. Battles here are mainly a struggle for capturing and holding mountain passes, dominating heights, trails and gorges, conducted under the multi-tier fire of the enemy. As a rule, in mountain combat the subunits (podrazdeleniye) should operate independently.(6)

The general's point demonstrates that natural terrain features will lead to a compartmentalization of military actions when accomplishing a given mission. Operations will often assume a piecemeal character since inaccessible terrain will likely separate units approaching an objective. It becomes difficult if not impossible to switch efforts from one axis to another or to offer mutual support between them. Thus, in order to

approach an objective from different routes, Russian tacticians emphasize independent action on the part of small units of company-size and below. Junior officers and sergeants must make basic decisions. This decentralization not only applies to the maneuver unit but also to specialized attachments such as reconnaissance teams, grenadiers, communications specialists, and mortar support.(7) Such thinking represents a fundamental change for the Russians, and it demonstrates that they are capable of flexible organization for tactical combat when required.

In addition to maneuver and security considerations, Russian military writings stress that the unique conditions encountered in the mountains will require adjustments to several other normal operating procedures. The most important of these are delineated below.

Combat Operations

The Russians emphasize that the commander must take into account the unique constraints and opportunities afforded by this environment when planning combat operations. Mountains often do not permit use of adequate troop ratios against a defending enemy on initial attacks and air strikes. Natural obstacles and difficult relief features facilitate all-round defense in multiple layers at all heights. Simultaneously, the terrain offers the defender the advantages of greater surprise and permits him to hide his composition, disposition, and future plans, making the eventual transition to offensive action easier. Furthermore, the defender acquires the capability of using economy of force measures to hold on to tactically important accessible axes to frustrate the movement of the enemy.(8)

The defense, however, faces problems of its own. An attacker, for example, can exploit covert approaches to make it easier to penetrate or envelop his opponents. Such complications, the Russians properly claim, will place a premium on reconnaissance by both sides. As their Afghan experiences so vividly demonstrated, failure to conduct these vital operations usually resulted in disaster. In the mountains, reconnaissance takes more time, demands more physical endurance, and requires additional security measures.(9)

Artillery

While artillery is assigned the same role as during normal operations, trajectory problems caused by the terrain will certainly impact on its use. Additionally, distances become more difficult for forward observers to judge and abrupt changes in the weather can rapidly negate computational firing data. To compensate for some of these problems, the Russians learned in Afghanistan that they must deviate from their typical fire support principles and dispense with their centralized and carefully coordinated pre-planned fire schemes. They continue to believe in extensive artillery barrages prior to offensive operations, but these attacks are more likely to be supplemented by air strikes. Preparatory fires in the mountains may last as long as three to five hours rather than the norm of twenty minutes.(10)

The limited mobility in these areas also requires adjustments to the emplacement of firing positions. When possible, commanders normally establish them immediately adjacent to existing roads and order them dug in or sited in defiles to complicate enemy counter-battery fires. They may also employ certain specialized techniques such as lifting guns to high ground by helicopter. If the units possess adequate communications, batteries on the flanks will provide fire support to further confound enemy efforts to locate the supporting artillery. Forward observers will position themselves either in static observation posts (OP) on the high ground or in helicopters.(11)

Only very limited opportunities for direct fire engagements will likely present themselves in this terrain. Nonetheless, the Russian propensity to use this type of fire when possible will cause them to attempt to move guns to the commanding heights where they can fire down on enemy strongpoints. A clever enemy, however, will conceal his positions in defiles, narrow valleys, and on the reverse slopes of hills. Thus, indirect high-angle fire from howitzers and especially mortars will likely provide the most effective artillery support in the mountains.(12)

Russian artillery planners in this environment decentralize control and disperse their guns forward to provide each maneuver axis with its own fire support. (In Afghanistan, a battalion of artillery sometimes accompanied a battalion-sized maneuver force into battle. Here, the Soviets often attempted to use artillery to compensate for poor intelligence and target acquisition. In normal circumstances, a battalion does not possess the organic combat support required for independent action.) The Russians point out that while mutually supporting fire may be possible in some terrain where valleys and ridges run parallel and close

together, this situation remains the exception. Moreover, in those infrequent cases when this support does become possible, the artillery unit must still overcome such problems as prediction, spotting, and correction of fires.

The inherent characteristics of this type of terrain also extensively limits the use of tactical rocket systems and rocket launchers. Cross-country movement limitations, elevation and trajectory constraints, and camouflage and meteorological considerations all hinder the use of SS-21 and the older FROG-7 and BM-21 weapon systems. However, the psychological and demoralizing effect of these weapons on the enemy make them favorite weapons of choice for the Russians when possible. The geological result of rocks lying just below the surface in many mountainous areas helps to disproportionately increase the shrapnel effects of the bursts from these weapons.(13)

Tactical Air Support

Russian military theorists believe that the proper utilization of tactical air support will rectify some of the fire support problems which plague the use of artillery in the mountains. In this regard, ground forces task both fixed and rotary-winged aircraft to provide far more support than in normal operating conditions where artillery remains the weapon system of choice. In addition, aircraft can help surmount the problems associated with ground reconnaissance and facilitate command, control, and communications (C3) procedures. Helicopters, especially, can deploy airborne and air assault forces to critical points on the battlefield as well as transfer reserves of personnel to appropriate strongpoints or axes of advance. They can also conduct and expedite resupply and other logistic operations to key areas over otherwise extremely difficult or impassable terrain.

Generally, Russian Air Force commentators maintain that ground operations in mountainous terrain will attain success only when they possess air support. Furthermore, the key to providing good air support to the ground component is by training and using good forward area controllers (FAC). In this manner, they can integrate into planning cells and design air operations to engage targets in the tactical and immediate operational depth in close coordination with the ground forces.(14)

Doctrinally, the air theorists recommend three phases to an operation in support of ground troops: air preparation of the assault; assault support; and close air support of troops in depth.

During Phase I, army requirements dictate the conduct of the preparation. Sixty percent of involved front assets and up to forty percent of army aviation should be assigned to the assault. In Phase II, air assets fly close air support only according to the plans of the ground unit commander. The main aviation effort should concentrate on strong points, command posts, air defense weapons, depots, weapon emplacements, artillery positions, and personnel groupings which threaten the advance. During this phase, frontal aviation activates from a ground alert status while army-level aviation assets remain airborne. Finally, Phase III also carries out the plans of ground units and strikes the same types of targets as Phase II. In Afghanistan, the Russians claim that during this phase they allocated the right to call in air strikes to almost any battalion commander through the forward air controller. The aircraft would use a "continuous orbit" tactic and then attempt to attack from the direction of the sun.(15)

Similar to other assets, however, the use of aircraft in mountainous areas does have its limitations. Russian air force officers writing about their experiences in Afghanistan note that relatively few opportunities existed to use modern high performance aircraft. (The SU-25 Frogfoot may be considered an exception.) Especially troublesome to bombing and strafing attacks were the problems caused by terrain relief. Canalized air avenues of approach and the unusual heights greatly reduced aircraft capabilities for penetrating air defenses; weapons became more difficult to detect; and maneuver capabilities deteriorated with altitude and limitations in choice of direction and method of attack.

Surprise and accuracy likewise fell victim to the terrain. Potential targets usually displaced in the crevices of cliffs, the niches of mountain slopes, or on gorge floors. Air crews could detect the enemy only at short distances, and this handicap essentially excluded the possibility of executing an attack without having to swing around and set up a run on the target. Russian pilots felt that they could accomplish effective destruction of targets at altitudes between 700 - 1,000 meters, but their accuracy frequently suffered due to their attention being diverted to flying while simultaneously trying to execute an attack between the slopes of a narrow gorge. Recovering from dives and shock waves in these conditions increased the difficulty of settling the aircraft.(16)

Helicopter gunships (shturmovik) proved themselves as formidable close air support weapons in Afghanistan, but the introduction of the Stinger and other capable systems later neutralized these assets as well. In fact, by 1987 the Soviets did not extensively use helicopters in ground support roles because of the heavy losses inflicted by these weapons. Essentially, their pilots felt that the air defense system in this type of terrain became impossible to predict and the forced low flying of rotary wing aircraft made their survivability untenable.(17)

Air Defense

As the above discussion indicates, mountainous terrain offers some significant advantages to the air defense system. Most importantly, it confines an attacker and limits his air avenues of approach. Such effects greatly increase the vulnerability of aircraft to shoulder fired surface-to-air missiles (SAM), anti-aircraft (AA) guns, and even organic small arms. However, this same terrain can work to the air defender's disadvantage. Long-range radar coverage, for example, will often prove unreliable and will thus affect fire control procedures down to section level. Ground-based air defense units will frequently lack mobility and may simply be forced to displace from high ground to high ground along an avenue of approach. During much of this time, they must rely on aircraft to provide some degree of early warning and anti-helicopter protection. In Russian units, division-level air defense assets will supplement local unit capabilities and will attempt to deploy along the entire route of march. They will also site some assets in depth in order to engage aircraft approaching from the rear.(18)

Engineer Support

Engineer operations in mountainous terrain must overcome substantial obstacles. The Russians point out that much of the heavy equipment which these troops have available to them to accomplish their tasks in flat areas becomes virtually useless in the mountains. Nonetheless, the mobility and counter-mobility missions of these forces remains practically the same. Their tasks will include clearing obstacles on precipitous slopes, constructing crossing sites at fast-moving mountain streams and rivers, improving and repairing roads where necessary, erecting fortifications, and establishing barriers during the conduct of defensive operations.(19)

In such circumstances, combat engineers (sappers) will operate in close support of infantry or airborne/air assault forces to accomplish their mission. Commanders will likely attach them to subunits conducting an attack as well as flanking and security detachments. They must considerably increase their supply of explosives to compensate for the lack of normal equipment, and they should equip themselves with extra pioneer tools and generators. Since both sides will extensively employ mines and booby traps in this terrain, sappers must devote substantial training to the emplacement and removal of these obstacles.(20)

Command, Control, and Communications (C3)

Due to difficulties with communications and restrictions on troop movement, mountainous terrain also immensely multiplies the problems associated with C3. Line-of-sight FM and multichannel radios with relatively short transmission ranges result in a loss of communications as forces pass behind hills and make their way down a turn in a winding valley. The Soviets never seemed to fully resolve this problem in Afghanistan, but their communications specialists had attempted a number of solutions. These included the use of relay and retransmission (intermediate) stations, remoting aerial antennas, laying wire when possible, making widespread use of "runners" on motorcycles or in helicopters, and in some cases, deploying airborne command posts. All of these, however, had their drawbacks and limitations. Relay stations, for instance, frequently were forced to operate from hilltops. Such dispositions not only limited their maneuverability but also made them easy to identify and destroy. Wire, of course, is always an excellent option. However, this type of terrain greatly limits its use; and it normally requires a much more extensive maintenance effort.(21)

Russian experts unhesitatingly admit that technical solutions to C3 problems in the mountains may not yet exist. Consequently, they tend to locate their command elements closer to the forward edge of the battle area (peredniy kray) than they would under normal conditions. They also quickly point out that astute leaders can convert these same terrain features to some advantages. The hills certainly offer a degree of protection to friendly control elements against enemy direction-finding and air and artillery bombardment. Likewise, spetsnaz and other diversionary groups can exploit their full potential by more easily conducting raids against enemy C3 sites.(22)

Effects of NBC Weapons

Russian experts, in general, conclude that mountains considerably diminish the effects of nuclear, biological, and chemical weapons. The aforementioned physical constraints of the distinctive terrain and frequent changes in weather impose severe limitations on the predictions of downwind chemical and biological agent dissemination as well as nuclear fallout. High ridges tend to protect units and equipment shielded behind them, and unreliable shifting wind patterns and fluctuating atmospheric conditions may render advance planning virtually useless. Thus, destructive effects will be distributed nonuniformly and almost impossible to forecast.(23)

Nonetheless, the same NBC officers acknowledge that opportune conditions may sometimes exist for the employment of these weapons. Experts can calculate shock wave propagation from tactical nuclear bursts and channel it down valleys to intensify destructive effects such as tree blow-down and landslides. Colder mountain temperatures can prolong the durability and persistence of various agents, and coupled with the already existing restrictions on mobility, produce a formidable obstacle. Additionally, the air flow through a mountain range during certain times of the day is conducive to spreading ground hugging gases which can permeate into dead spaces.(24)

Logistics

Perhaps logistics will pose the greatest challenges in mountain warfare. A number of factors hinder combat service support procedures and therefore will require significant deviations from the norm. The probable remoteness of the theater of operations will likely limit the rail net into it, the roads in the mountains themselves will be few and poorly developed, units will presumably deploy on separate axes, breakdown rates will increase, and the physical characteristics of the terrain will multiply the required amounts of ammunition, fuel, food, water, and spare parts. Furthermore, as the Soviets quickly learned in Afghanistan, combat service support units must possess the capability of defending themselves.

Other logistic problems will include the increased difficulty of evacuating wounded and the possible need for special types of medicine and better field sanitation while crossing epidemiologically harmful terrain. In addition to increased respiratory problems caused by the changes in altitude, hepatitis, malaria, typhus, amoebic dysentery, and meningitis often occur in mountainous areas. Moreover, minor wounds at high altitudes often prove fatal if evacuation of the casualty does not occur quickly. Medical personnel must acquire skill in this area as well as learn to return light casualties to combat duty quickly due to the difficulties associated with personnel reinforcement. In order to deal with these problems, Russian logisticians recommend allocating dedicated helicopters to medical teams to help them cover a widespread area.

In this environment, the importance of military roads clearly increases dramatically. Only limited possibilities will exist for keeping supply routes separate from those utilized by combat units and civilian traffic. Such circumstances will have significant consequences for mission accomplishment. Engineers must improve the network and, in coordination with other forces, conduct constant reconnaissance to ensure that the ground lines of communication remain open and protected. Narrow roadways, frequent steep climbs and descents, and sharp turns invite both mechanical and security problems. The capture of roads, bridges, and tunnels assumes paramount importance for keeping the supply line flowing smoothly and safe from interdiction.(25)

Not only will additional demands complicate movement routes and deployments, but differences in air pressure and abrupt changes in the weather will also affect equipment, weapons, and personnel. Low atmospheric pressure, for instance, considerably increases the evaporation of water in storage batteries and vehicle cooling systems. It also impairs cylinder breathing. Consequently, vehicles expend more fuel and lubricant and engine power is reduced by four to six percent per 1,000 meters above sea level. Experience gained in Afghanistan and during tactical exercises demonstrated to the Russians that fuel and oil consumption increased by 30 - 40 percent or more. This problem can become particularly vexing in view of the limited possibilities for both refueling and delivering fuel in the mountains.(26)

The mountain environment also exerts a marked influence on helicopters. Terrain requirements dictate extensive use of these aircraft in logistic operations; however, the extreme elevation may force a decrease in their cargo loads by as much as 25 percent. Additionally, they will often be forced to fly at the maximum limits of their operational capabilities. Logisticians expect readiness rates to drop and fuel usage to increase as much as 70 percent.(27)

Russian tactical thinking on mountain requirements also stresses the additional logistic toll which this type of warfare extracts on personnel-related issues. Concerns range from special driver-mechanic training to food supply and the medical concerns discussed above. Commanders, for instance, should increase maintenance time an additional 25 percent to compensate for the greater fatigue experienced in this environment. Likewise, supply officers must distribute extra processed and canned food since field bakeries can only operate at 75 percent efficiency in the high altitudes and acquiring food from indigenous sources appears unlikely.(28)

In recognition of some of these difficulties, contemporary Russian commentators have offered a glimpse of a few of the transportation and supply solutions which they attempted to implement while operating in the austere infrastructure of Afghanistan. After making maximum use of available railroads and airfields to carry bulk supplies as close as possible to the area of operations, they devoted extensive engineering efforts to establishing permanent supply routes. Front-level drivers then attempted to familiarize themselves with these roads in order to reduce travel time to operational units. Additional movement control personnel (Commandant's Service) also deployed to expedite the flow of traffic and reduce treacherous bottlenecks caused by the limited road network. At the tactical level, commanders always included all transport and combat vehicles with front end attachments and special engineer equipment in the security elements and advance bodies of the main forces to help preclude disabled vehicles from obstructing the narrow roadways and inviting an ambush. Recovery equipment could seldom be used due to the impracticality of moving it in the mountains.(29)

Supply planning, especially for mechanized forces, was also an important factor. With the Soviet "push" system of logistics, establishing and then stockpiling the required amounts of materiel became a critical task. As a rule, logisticians maintained all supplies well forward. They then packed such items as fuel, food, and ammunition into fighting vehicles and assigned various logistic tasks to even small formations. Troops frequently accomplished forward refueling with cans since laying field fuel pipelines proved practically impossible and stoppages in convoys while waiting for fuel trucks made them vulnerable to attack.(30)

Training and Other Special Considerations

The Russians and indeed their Soviet predecessors have long been cognizant that personnel require special training in order to conduct successful operations in the mountains. Numerous sources discuss the "brilliant operations carried out by Soviet troops during the Great Patriotic War in the mountains of the Northern Caucasus, in the Carpathians, and in the mountainous regions of Romania, Czechoslovakia, Hungary, Yugoslavia, and the Far East." Well before Afghanistan, individual Soviet specialists realized that the peculiarities of operations in the mountains make high combat skill and "moral, psychological, and physical steeling" of personnel indispensable.(31)

Not only must soldiers adjust to the physical demands of the terrain and become acclimated to the unusual weather patterns but also commanders must make them aware of the increased requirements for security. As noted, legions of opportunities for ambush exist in this environment and danger areas abound. Individual marksmanship requires added emphasis and soldiers may need re-training in learning how to estimate distances.

Most importantly from the Russian perspective, however, the requirement for independent action imposes additional training responsibilities on commanders and subjects their subordinates to increased psychological stresses. Thus, training exercises should include "complicated critical situations requiring resolute and bold actions, resourcefulness, and tenacity" in order to achieve desired objectives. Additionally, even lower level subunits should always contain representatives from attached supporting arms such as artillery and aviation.(32)

Coupled with the need for adequate training is the necessity to deploy the proper force package. The Russian military considers airborne and air assault units as the most suitable for the particular rigors faced in the mountains, and if projected changes do take place within their force structure, these will in fact become the organizations fighting Russia's brush wars on its borders. The army equips these forces with the right types of weapons, and traditionally, they display more initiative than the average Russian soldier. Furthermore, they train to conduct air assaults into the enemy's flanks and rear over difficult terrain and can deploy quickly to repel attacks on critical installations or seal off areas for envelopments and searches.(33)

Motorized rifle troops, long considered the most flexible arm of the Russian military, likewise possess the capabilities suitable for combat operations in the mountains. While they will require additional intensive

training in such areas as dismounted and heliborne operations, sapper skills, and individual marksmanship, they can fight on any difficult terrain.

As witnessed in both Afghanistan and Tajikistan, tank units can deploy to the mountains. Nonetheless, Russian sources acknowledge their limited utility. Movement for armored forces becomes restricted to reasonably wide valleys which are not only easy to mine but also subject to plunging fire from the heights. The tank's inability to elevate its main gun sufficiently to return fire in many situations further increases its vulnerability. Thus, armored forces in this environment must frequently confine their role to serving as mobile armored artillery. The difficult terrain also substantially increases maintenance problems with both tracks and engines, and a halted tank - whether from enemy fire or maintenance problems - can block the progress of an entire column.

III. FUNDAMENTALS OF DEFENSIVE OPERATIONS IN MOUNTAINS

Although mountainous terrain will likely make organizing a defensive operation more difficult, most Russian tacticians readily admit that in this type of topography defense constitutes the stronger form of warfare. The poor accessibility of the area, as noted previously, will require a thorough reconnaissance before positioning strongpoints and thus could increase the time needed to establish a defensive zone. Likewise, the presence of significant amounts of dead space and potentially numerous concealed approaches will hinder observation and may facilitate the enemy's circumvention of established defensive perimeters. However, the defender's advantages easily offset these problems.(34)

The existence of numerous obstacles combined with the limited number of roads, for instance, will impede offensive maneuver flexibility and heighten the element of surprise for the defender. Terrain constraints will compel an advancing enemy to conduct many of his combat operations along valleys and ridges. Being forced into seizing the high ground which controls the mountain passes, the attacker's momentum necessarily slows. Coordination problems also grow more difficult as units move along different routes separated by natural barriers.(35)

Based on these observations and experiences, Russian commentators note that mistakes prove more difficult to correct in this environment. Afghanistan certainly gave witness to the difficulties associated with mountain warfare and the fact that successful leaders must often make radical adjustments. Accordingly, the Russians establish a number of prioritized requirements which their commanders must fulfill in order to exploit the inherent advantages offered by the mountains when conducting a defense. Reduced to their lowest common denominators, these basic principles include: arranging the defense in depth with multi-tiered primary and supplementary firing positions; orienting defensive positions on the direction of the main attack but encompassing a 360 degree perimeter with interlocking fires for protection; formulating plans not only for artillery but also for defensive measures such as anti-air, anti-tank, and anti-airborne assault; constructing a system of engineer obstacles and covering all dead spaces by observation and indirect fires. Additionally, flexibility of maneuver must remain within the established defensive zone.(36)

Basic Principles

When considering these factors more specifically, it becomes clear that Russian tacticians emphatically advocate applying their basic principles of defense in normal conditions to mountain warfare. Modifications are necessary and expected, but primary emphasis remains on organizing the defense to cover all possible avenues of attack. Units must frustrate enemy attempts to circumvent positions by exploiting gaps or conducting an envelopment by outflanking defended key terrain through the use of obstacles, ambushes, patrols, and constant observation. Commanders should establish mutually supporting platoon and company strongpoints especially in areas where the enemy can potentially use tanks. They must position these strongpoints for all-round defense and make use of both the forward and reverse slopes of hills. If the enemy penetrates the defenses and surrounds these small strongpoints, the units occupying them will be expected to continue fighting since they must hold commanding terrain at all costs.(37)

Responsibility for competently utilizing the terrain and organic camouflage resources to conceal positions also belongs to the subunits. They should employ decoy targets both to disguise the true organization of the defense and increase protection for the troops against nuclear and high precision weapons. The same guidance applies to the formations which comprise the second echelon. They are encouraged to make use of gullies, the back slopes of hills, previously scouted mountain roads, and shallow river channels to reach

the deployment line and conduct an unseen counterattack. These units will select positions to ensure that they can execute the operation downward from higher ground on hillsides, valleys, and ridges -- preferably into the enemy's flank or rear. Their positions should also facilitate artillery support.(38)

The establishment of a defensive sector will vary somewhat according to topography. For example, a unit with a mission to protect a ridge line will probably place the front edge of its position as far forward as possible in order to relinquish minimal dead ground to its front. Contrarily, the defense of a pass would likely require a unit to concentrate its main effort on the slopes of the hills located at its approaches. Regardless, the character of the defense must remain active and emphasize strong supporting fires. Units should secure all crossing points and aim to dominate any approaches by creating a killing zone with flanking or cross fires from adjacent hills.(39)

The effectiveness of the defense, in fact, will depend largely on the system and organization of fires. As noted previously, Russians position weapons in tiers in order to obtain a high density of fire. Commanders will site them on slopes facing the enemy as well as on the reverse sides of hills in such a manner that they can destroy the enemy in the valleys below. Additionally, all gunners will employ their weapons at maximum effective ranges to force the enemy to deploy prematurely. Planners normally will concentrate fires on appropriate terrain features, but they also prepare targets immediately in front of the forward edge of the zone, within the defensive area itself, on the flanks, and in the intervals between the strongpoints.(40)

Specific means for implementing these guidelines depend on the type of weapon system utilized. Artillery operations, for example, will require the strengthening of regimental (RAG) and division artillery groups (DAG). The problems associated with artillery in mountainous regions have been discussed earlier; however, the mountain defender does acquire some unique advantages associated with templating the enemy. In that terrain limits routes and maneuver flexibility, artillery planners can more accurately predict enemy movements and select appropriate targets. They can combine artillery and mortar fires with air and helicopter strikes and can cover some concealed approaches and dead space ahead of the forward edge and within the defensive zone. Schemes of fire will incorporate wide limits on the expected direction of the main attack, but units must remain capable of massing fires in the event of enemy attempts to conduct an enveloping maneuver. In addition, artillery units should plan to counter enemy preparatory fires with massive fire strikes.(41)

The Russians anticipate that in mountainous terrain an attacking enemy will make increased use of air transport assets to shuttle troops for raids and conduct airborne or air assault operations into the flanks and rear areas of the defender. Thus, air defense fires deserve special attention due to the significant aircraft acquisition difficulties which the terrain creates for radar. As noted previously, units will form a system of visual observation posts to serve as an augmentation for the normal automated system of control. These positions require 360 degree observation as well as the capability to fire in any direction.(42)

Although the terrain may severely restrict armor operations for an attacker, anti-tank operations play an important role in the overall concept of the defense. Russian commanders will attach anti-tank guns and missile launchers (and possibly tanks) to company strongpoints defending road junctions, exits from valleys, ravines, tunnels, and river crossings. Anti-tank reserves (including attack helicopters) will cover all tank approaches. Like other fires, planners position these assets to engage the attacker at maximum ranges while concurrently creating anti-tank kill zones. In ravines, some small groups may locate themselves well forward to launch anti-tank ambushes while others mount their weapons on slopes to obtain plunging fire and create a killing zone in the mouth of the terrain feature. Ideally, gunners engage tanks and other armored vehicles on upgrades where their speed decelerates.(43)

Engineer preparation of the strongpoints adds the finishing touches. In the defense, these forces must accomplish several fundamental tasks including reconnaissance, construction of fortifications, erection of an obstacle system, and preparation of maneuver, evacuation, and supply routes. While engineer troops will conduct reconnaissance continuously and thoroughly, they may perform the other missions, especially the building of fortifications and obstacles, almost simultaneously.

Russians typically construct mountain fortifications partially underground using available stones and fill covered with a layer of earth and sandbags. Engineers may also adapt mines, caves, and other natural shelters to protect personnel against weapons of mass destruction as well as the elements. In order to reduce the vulnerability of combat equipment to high precision weapons and supplement organic camouflage screens, they fabricate overhead protection out of local materials.(44) Engineers also erect manmade obstructions and integrate them with natural obstacles in those areas of anticipated combat operations. Barriers must be dispersed but numerous in quantity and varied in type to prevent the enemy

from circumventing them and gaining the element of surprise. Sappers will prepare bridges and trails for demolition and create rock and timber obstructions where these resources are present. They will lay minefields and coordinate with fire support personnel to ensure coverage with artillery and anti-tank weapons. Foremost, they will devote special efforts to the obstacle network in front of the defensive zone and will attempt to make it especially menacing in order to impede any penetrations. Mountain roads likewise will receive considerable attention since obstructions placed here can force enemy columns to halt over a considerable depth. Lack of dispersal sites then makes these columns susceptible to destruction by aircraft and artillery.(45)

Route preparation and security constitute additional important defensive missions for troops in the mountains. Engineers will perform the tasks associated with clearing these roads between units; but subsequently, commanders will probably assign responsibility for their safeguarding to motorized rifle units. Experience in Afghanistan taught the Russians that they required a series of security posts or platoon strongpoints in the more dangerous areas to keep open passages and lines of communication. In exceptional cases, local reserves or helicopter patrols can also perform this function.(46)

Organization For Defense

Admittedly, much of the approach discussed above remains theoretical. The realities and contingencies of this environment will not always permit the accomplishment of every rudimentary requirement delineated by tactical and operational level thinkers. Afghanistan, for example, underscored the lesson that planners must base modern defense not only on the containment of a position but also on important sectors. Extensive defenses surrounded almost all of the major Afghan cities; yet, due to the terrain, the mujahedin infiltrated these sites with near impunity. The Russians certainly learned from this experience and now recommend appropriate adjustments to their existing norms when organizing defensive operations in mountainous conditions.

While Russian tacticians continue to prefer a belt or zone concept of defense, in the mountains they organize it around a series of strong points rather than lines. These positions provide ring defense and accomplish the mission of holding key terrain. The width of a defensive sector may encompass three times the area of a similar operation under normal conditions, and the nature of the terrain may dictate the necessity to accept open flanks as well as a lack of mutually supporting and overlapping fires. Accordingly, each unit must retain the capability of long-term independent action on every potential direction of advance.(47)

When organizing a defense in this environment, the rational disposition and use of both the second echelon and reserves receives considerable attention. In order to exploit enemy inabilities to correct maneuver mistakes, Russian authors recommend establishing the positions of these forces closer than normal to the first echelon. Such an arrangement (for regimental and divisional units) allows them to halt an enemy assault from prepared positions either inside the main belt or within proximate distance to it. Furthermore, it facilitates counterattack missions.(48)

A battalion defending in the mountains will likely utilize only one echelon with a reserve. If the terrain permits, the latter will locate itself in a nearby side valley or deep in a ravine to launch a counterattack or give additional fire support. Frontline regiments and divisions will deploy in two echelons to defend the main belt. Second echelon Army divisions will probably occupy the area between the second defensive belt and the Army defensive boundary.(49)

IV. FUNDAMENTALS OF OFFENSIVE OPERATIONS IN MOUNTAINS

Commanders unquestionably must organize offensive combat in the mountains to counter the advantages afforded to the defender. As described in the previous section, the rough terrain will strongly favor the creation of a potent defense. The presence of numerous natural obstacles, the inaccessibility of the region, and the rapidly changing weather patterns will aid opposing forces in the planning of formidable defenses which an enemy can construct in a minimal amount of time over a wide front with relatively few personnel. Nonetheless, mountain defenders also must deal with vulnerabilities and the successful attacker will exploit these when confronting enemy formations.

Russian sources emphasize that commanders must effectively utilize their assets to estimate enemy defenses and ascertain their strong and weak points, their systems of fire and obstacles, and the availability of any concealed approaches. The evaluation of terrain becomes critical in that offensive operations may require elaborate maneuver schemes to facilitate covert penetration of enemy defenses. Likewise, commanders must deny the enemy sufficient time to prepare alternative and supplemental positions. Persistence and intensity as well as careful planning and coordination should characterize attacks.(50)

Practical experience in both exercises and the early stages of the Afghan war demonstrated that roads and valleys made the most convenient directions for attacks. However, these terrain features proved to be precisely the locations where the enemy would concentrate combat power. Such a choice of venue for an offensive operation additionally exposed attackers to the enemy's flanking fires from adjacent heights. Consequently, commanders and theorists began to implement two variations of tactical solutions to this dilemma. While some advocate launching an attack over practically impassable ground where vulnerabilities exist in the enemy defensive plan, others believe a more expedient method involves diverting the enemy's attention to the front with part of the force and executing either an enveloping or turning movement with the remainder of the formation to shatter the defense.(51)

Movement

Although many of the general requirements for conducting a march in the mountains remain the same as those during normal conditions, the operation will become substantially more complex. Terrain accessibility will limit routes and transit speed as well as increase the need for caution while traversing difficult ground. Night marches, while not impossible, will severely exacerbate traffic control problems. Other complicating factors such as severe weather can make routes impassable and mandate changes to any existing norms. Exhaustion levels among the troops will rise and commanders must constantly deal with unexpected tasks. Nonetheless, as one mountain expert stated quite succinctly:

The capability of units and subunits to carry out a march immediately on being assigned a combat mission is the most important requirement of high combat readiness. Therefore all preparatory work must be carried out beforehand. As a result, warning orders acquire considerably greater importance. Besides instructions on the likely character of the mission and the time of its fulfillment there must be indications of what requires particular attention during preparation.(52)

One of the items that certainly requires the particular attention referred to above is the quality of reconnaissance. It must cover a wider than normal front and extend to a greater depth in order to establish the nature of enemy defenses. Reconnaissance subunits should also protect exposed flanks by continually combing the areas where the enemy may establish ambushes. Russian commanders employ helicopters to search difficult sections of terrain as well as the reverse slopes of hills while ground assets thoroughly inspect danger areas such as narrow passages and ravines. All-arms reconnaissance should utilize such resources as engineer teams to examine natural and man-made obstacles, motorized rifle or tank units to operate along roads, and dismounted patrols to probe inaccessible sectors.(53)

The most important mission of reconnaissance units, however, remains the penetration and reconnoitering of the enemy's forces. Most Russian specialists advocate conducting a preliminary analysis with the use of maps and aerial photographs to ascertain information such as likely bottlenecks and potential areas of enemy action. Commanders will then utilize uniquely organized reconnaissance groups to confirm this initial estimation. These units should possess organic capabilities to maneuver flexibly and fight sufficiently when necessary. Some subunits will land by helicopters into the most critical sectors and probable points of contact along the route. Others will form into independent patrols consisting of armor, motorized infantry, and engineer elements which can operate up to thirty minutes in front of the next serial. These groups should possess the capability of deploying small combined arms teams along minor and alternative routes and detours, if required, to ensure that obstructions do not hinder the main body.(54)

Another factor which demands substantial attention while moving through mountainous terrain is the requirement for enhanced security. Russian commanders will deploy security patrols to protect the main element from unanticipated skirmishes both while moving and during halts. They task these subunits primarily to engage and destroy any discovered enemy forces, but at a minimum, they will also provide the commander with adequate warning concerning the position and status of adversaries. In the front, a forward security patrol will operate between the reconnaissance forces and the main body. On flat ground it would lead the main element by 2-3 kilometers; but given the difficulty of traversing the terrain and the increased time required to reach the line of engagement, the Russians reduce the distance in the mountains. When available, the vehicles in this unit will be equipped with front-end attachments, mineplows, and wire cutters

to make gaps in enemy obstacles. Combat helicopters may also accompany them to provide additional security. Behind the main element, a rear guard patrol will trail at a distance of approximately one kilometer. It will protect the unit from attack in this direction or at least delay enemy forces long enough to allow the commander sufficient time to react. Additionally, Russian commanders will employ some type of flank security. The mountainous topography may preclude use of a mobile patrol, but at a minimum, two static flank elements will deploy within two kilometers of the main body. They will then leapfrog to temporary static positions on key terrain along the route.(55)

Based on their convoy experience in Afghanistan, the Russians may also employ a temporary formation referred to as a movement support detachment (otryad obespecheniya dvizheniya). These units consist primarily of combat engineers but also include elements of the commandant's service and other components such as motorized rifle troops. Collectively, they remove mines and obstacles, conduct route reconnaissance, construct bypasses, and repair small sections of road when required in order to facilitate movement for the main body. Movement support detachments frequently will be the first to encounter the enemy, and the sappers who performed this mission in Afghanistan were among the war's most decorated soldiers.(56)

Russian tacticians believe that the aforementioned heavy emphasis on reconnaissance and security measures will directly help to reduce the time spent on moving the main body. When planning and organizing the march, the commander will base his appraisal of the situation on the usual factors of enemy, weather, and terrain. He will specify speeds of movement, probable points of enemy encounters, the types of movement formations, and his intended actions if a meeting engagement should occur. Planned times for marches will include short halts of thirty minutes every 2-3 hours for preventive maintenance procedures with a long halt (up to four hours) at the midpoint of a day's objective.(57)

Since the terrain will slow the tempo of movement, commanders will attempt to compensate for losses of time when possible. Normative speeds even in low mountainous areas fall to 15-20 kilometers per hour. In higher elevations or poor weather conditions, these likely decrease to approximately 5-8 kilometers. Natural obstacles (such as mountain rivers) take longer to cross than normal and roads consist of winding turns conducive to blocking and mining by the enemy. Steep grades and sharp turns double the prescribed distances between vehicles from fifty to one hundred meters and Russian tacticians recommend negotiating obstacles one march serial at a time. As a result, drivers will increase speed on the relatively easy sections to make up lost time; and if the reconnaissance elements have thoroughly performed their mission, they will pass through passes, gorges, canyons, and other areas susceptible to enemy attack nonstop.(58)

While moving, units will attempt to exploit the protective and concealing properties of the hills to prevent detection by enemy radars and sensors. If space permits, such as in a valley or ravine, subunits will usually travel in an inverted wedge formation. However, they will not move into these type of terrain features until helicopter gunships and artillery have neutralized the adjacent high ground. Task organization thus becomes extremely important to the commander who must ensure that he can utilize the right assets at the right time. He cannot afford to find himself trapped in this environment without sufficient maneuver space. Accordingly, he will disperse assets such as artillery, air defense, and engineers throughout the column rather than group them as distinctive subunits in accordance with usual procedures.(59)

Motorized rifle units, reinforced with tanks, will usually lead the main body to ensure maximum flexibility and tactical independence. Commanders may distribute artillery as low as company-level. Air defense presents special problems in that movement along accessible routes increases vulnerability to enemy air strikes while the mountains concurrently reduce radar acquisition and individual observer capabilities. Thus, in addition to allocating air defense weapons to each march serial, commanders may also deploy these assets to static positions along the route and leapfrog them much the same as flank security patrols. Logistical and technical support units follow behind the infantry. Fuel and ammunition are carried very far forward with all subunits tasked to carry extra stocks.(60)

Meeting Engagements and Attacks From the March

As evident from the above discussion, terrain considerations substantially decrease standard rates of movement. Speed and momentum become nearly impossible to attain. Furthermore, if the enemy possesses sufficient time to properly prepare his defenses, the inherent advantages enjoyed by the defender will inhibit the attacker's aggressiveness and initiative. Attack ratios of personnel and equipment will require an increase over existing norms; the intricacies of shifting forces and deploying the main element will multiply due to canalization; the potential for exploiting breakthroughs will be reduced; and formations will remain constantly susceptible to surprise attack and ambush. For these reasons, Russian

commanders in this environment prefer not to attack directly from the line of march as they do in normal conditions. Rather, they will attempt to initiate offensive action from direct contact whenever possible. This option may simply not always present itself, however, in that the element of surprise in this terrain will likely result in a high frequency of meeting engagements.

In mountainous conditions, especially, Russian tacticians emphasize that success in a meeting engagement requires forestalling the enemy and denying him reconnaissance data, seizing advantageous lines and areas, and executing a turning maneuver into the enemy's flank. In those locations where terrain precludes the use of motorized and tank forces to conduct this operation, commanders should organize and employ available aviation and airborne/air assault assets as turning detachments. Preemptive capture of dominating hills and road junctions also assumes paramount significance since the terrain creates favorable conditions for isolating enemy columns and destroying them piecemeal.(61)

As in other conditions, reconnaissance elements will attempt to locate the enemy and transmit required information back to the commander. He, in turn, will then begin deploying his troops in order to outflank or at least deter the advancing enemy column. Meanwhile, the forward security patrol (possibly aided by tactical airborne troops) will try to capture key terrain to both deny it to the enemy and facilitate the attack by the main body. If their mission proves impossible, the patrol will engage the enemy to forestall him and afford adequate time for the commander to organize and deploy the force.

The main columns will always form appropriately to satisfy the commander's intent during forthcoming meeting engagements; nonetheless, the difficulties associated with reforming in the mountains requires emphasis on self-sufficiency in the maneuvering elements. Artillery assets locate closer to the heads of the columns than normal in order to immediately take up firing positions and thwart the enemy from opening fire. Planners likewise position anti-tank weapons near the front to engage enemy tanks as soon as possible.

Russian experience from war and exercises indicates that meeting engagements in the mountains usually begin with air strikes and long-range artillery bombardments. They consider combat helicopters to be particularly effective in this role. These assets can delay the arrival of the main enemy force and deprive it the possibility to deploy and join the battle in sufficient time. They can also destroy targets such as bridges, roads, and other structures in front and behind of advancing enemy columns to create a killing zone. Measures such as these can produce exceptional results in gorges and other narrow places where deployment of columns becomes impossible.(62)

In addition to factors associated with the appropriate composition and disposition of units, Russian authors note several other basic principles required to conduct successful attacks from the march and meeting engagements in the mountains. Foremost, they maintain that the offensive force must not permit the enemy time to assume the defensive due to the enhanced potential for rapidly organizing such an operation in this terrain. Forward security elements must eliminate enemy covering subunits by firepower and resolute action to deprive them any potential for assuming the defense on advantageous lines. If the enemy does manage to deploy earlier, the commander should utilize part of his force to assume the defensive on the most favorable terrain available and immediately engage him. Part of the unit will attempt to dig in on a hillside, while concurrently, the main body uses concealed routes to go around the hill and execute an enveloping maneuver. In this environment it is frequently more expedient for the main forces not to deploy on the lines captured by advance detachments but rather to deliver a blow from terrain accessible to the flanks and rear of the enemy.(63)

Attack From Direct Contact

Realizing that an attack conducted directly from the line of march requires sufficient maneuver space to deploy all subunits and supporting arms, the Russians prefer to conduct offensives in rough terrain from a position of direct contact with the enemy. They recognize the distinct disadvantage of increased vulnerability to enemy fires associated with static positions. However, they emphasize that it enables the commander to conduct better reconnaissance of routes and enemy defenses and thus plan his attack more thoroughly. These prerequisites require less emphasis during operations in normal conditions where offensive forces can more easily exploit breakthroughs and enemy weaknesses with tactical redeployments.(64)

Russian theorists acknowledge that the most difficult fighting in this environment will involve the seizing of key objectives and terrain such as passes, dominating heights, road junctions, strongpoints, and population

centers. They insist that all plans and orders for mountain offensives stipulate procedures for capturing these objectives and specify measures to surmount rough terrain and obstacles. Commanders must describe control methods by which they will maintain orientation and direction of advance as well as appropriate security measures to cover the flanks and rear. They must also delineate the composition and missions of enveloping detachments and tactical airborne forces and the means by which these troops will coordinate with units attacking from the front.(65)

Offensive operations which initiate from direct contact will vary according to the severity of ground relief, obstacles, and climate as well as the type of defense organized by the enemy. Planners reduce the depths of objectives but expand the zones of attack. They expect gaps to form between sectors since the terrain will likely split the action into isolated areas of combat. Initial objectives orient on the front line of the enemy's defense while subsequent objectives include commanding terrain and other key features. (In normal conditions all objectives orient on the enemy.) Companies and battalions will probably attack along one axis and regiments on two or three axes.(66)

Most tacticians argue that a main frontal attack must coincide with close and deep enveloping maneuvers in order to launch simultaneous assaults on designated objectives from several different directions. They believe this method provides the best potential for success when operating from a position of direct contact. Accordingly, commanders place high priority on seeking or creating breaches in enemy defenses and searching for dead spaces and covert ingresses to enemy positions. Rather than attacking in two echelons (standard practice on normal terrain), Russian units will utilize one deep echelon with a strong combined arms reserve to deal with unexpected circumstances. They will probably not use forward detachments in this case.(67)

Specific assault techniques differ slightly depending on the type of objective to be seized, but certain principles apply universally. For example, almost any operation in the mountains requires the control of the dominating high ground prior to conducting the main attack. When moving up a valley, the Russian commander will accomplish this by using strong detachments on both ridges to get behind the enemy's initial defensive positions. While only a small contingent moves up the valley, the detachments will establish artillery and mortar sites on the high ground to fire down upon the enemy. The commander will then dispatch reconnaissance patrols to locate the enemy's secondary defensive positions and help continue the advance as rapidly as possible. Other types of objectives, however, such as strongpoints, ridges, and passes require extensive use of envelopment attacks.

In most offensive operations launched from direct contact, the actions of subordinate enveloping detachments, in fact, will play the decisive role in achieving success. Russian authors point out that obtaining the element of surprise requires such diversionary actions. Without them, the main attack will grind to a standstill unless it possesses the added benefit of overwhelming artillery and close air support. These subunits must noiselessly exploit the terrain during conditions of limited visibility and maneuver to the enemy's flanks or rear to strike concurrently with the main attack from the front. If the enemy discovers their presence prematurely, they will attempt to avoid decisive engagements and move rapidly to the objective. Meanwhile, a security element will remain behind to confront their foe.(68)

Surprise, of course, also plays a key role when the enveloping detachments move into enemy-controlled terrain. Two techniques favored by tacticians to achieve a stealthy crossing include moving front line units from flank to flank in a diversionary attempt to probe for weaknesses and utilizing artillery fires, possibly coupled with air strikes, for distraction. Once across, these units will normally operate within range of friendly artillery even though they bring along mortars for organic support. Their size varies according to the mission, but the goal of making them as independent as possible remains constant. Thus, most commentators appear to favor a reinforced motorized rifle platoon or company at the battalion and regimental levels.(69)

When available, airborne or air assault units will operate either in concert with enveloping detachments or will perform this mission themselves. They receive training that enables them to function deeper in enemy territory and rely on attack helicopters (primarily MI-24 and various models of MI-8) rather than artillery for fire support. The Russians consider these types of operations essential for inserting troops into rear areas to encircle and destroy the enemy; however, they emphasize that the mountains pose a unique set of problems and require a higher degree of proficiency for both aviators and landing forces. Close cooperation and coordination between all branches of troops involved in the operation must also occur. Commanders usually assign two groups of helicopters to the landing parties. One group will subsequently provide fire support while the other performs evacuation and rescue missions. The regimental commander of the landing unit will personally control the operation from a separate helicopter.(70)

Although Russian tacticians willingly make concessions for the terrain in these operations and admit that motorized rifle units must often attack dismounted over extremely rough ground, they remain reluctant to part with their tanks. They cannot mass them but will allocate them to support combined arms teams. When discussing this type of operation the authors of Taktika state, "tanks operate directly within the line of (dismounted) attacking subunits while infantry fighting vehicles advance behind the tanks, annihilating with their fire any targets hindering the forward progress of the advancing subunits." Historically, the Russians enjoyed great success in utilizing tanks in these conditions during the Great Patriotic War and they continue the practice to this day in the mountains of Tajikistan.(71)

Artillery support for this type of operation necessarily deviates from Russian norms of centralized control. Commanders and artillery chiefs may distribute mortar or artillery batteries (and sometimes both) as low as maneuver company level to suppress enemy weapons in strongpoints or on commanding heights. Massed preplanned fires will strike these types of targets but artillery units will also attempt to eliminate isolated objectives. Direct fire weapons of all types will engage enemy positions where possible, but the Russians anticipate wide use of smoke to neutralize those located in deep folds and caves. During operations conducted in ravines, artillery officers utilize self-propelled artillery capable of large angles of elevation as well as direct fire weapons to produce desired effects. Units conduct dismounted assaults with only 82 mm mortars in support, but as pointed out earlier, they may employ specialized techniques to lift guns to the high ground when assigned sufficient aviation assets.(72)

A final important facet of an attack from direct contact concerns the variations pertaining to command and control procedures. Command elements deploy closer to the forward edge of the battle area than normal with the division main headquarters positioning itself between three to five kilometers behind the main attack and army-level headquarters between seven and fifteen kilometers. Alternate command posts will be established for contingencies and specially equipped helicopters will assist with communications. The commanders themselves, however, will likely operate from a small forward command post where they can place themselves closer to the action and retain the flexibility of moving more frequently.(73)

V. CONCLUDING REMARKS

In an assessment written approximately half way through the war in Afghanistan, General Yuri Maximov concluded:

Surprise, resoluteness, and audacity play an especially important role in mountain operations. ... Even a small subunit can decide the outcome of the whole battle by unexpectedly maneuvering around a defender's flank or capturing a dominating height. ... in mountain combat the subunits should operate independently of the main body. This, to be sure, imposes additional responsibility on the commanders and subjects their subordinates to increased psychological stresses. ... We believe it of paramount importance to train the commanders of motorized infantry companies to control the fire of not only their own subunits but also of attached artillery, tanks, and aviation.(74)

While the Soviet army proved incapable of implementing General Maximov's advice for the remainder of the war, the lessons learned during these years certainly influence current Russian thinking in the art of mountain warfare. In the foreboding terrain of Afghanistan, commanders realized the fallacy of ignoring tactical theory. No longer do their writings neglect the junior leader skills which earlier resulted in such an inordinate amount of problems. They now look beyond the legacies of the Great Patriotic War and emphasize such skills as the coordination of fire support, the use of maneuver, and the importance of independence and initiative among lower level commanders. While planning for mountain operations in places such as Tajikistan will likely remain centralized to ensure operational coherence, tactical execution has necessarily become more decentralized.

Contemporary Russian tacticians also stress the importance of analyzing the climatic and geographic factors which impact upon the employment of forces in these special conditions. The environmental challenges posed by the mountains severely strain the operating characteristics of weapons and equipment as well as the limits of human endurance. Difficult terrain, coupled with sudden and often unexpected meteorological changes, affect everything from aviation to engineering operations to communications and unit movements. Prolonged exposure to the elements in these conditions and extended stalemated combat operations (Afghanistan and Tajikistan) sooner or later have a detrimental effect on morale.

Motorized rifle troops, deemed the most flexible combat arm, appear to remain the Russian unit of choice when operating in these surroundings. Nonetheless, they certainly do not overlook the advantages accrued

by employing specialized formations such as airborne units to augment them and accelerate the offensive. This selection and cross-attachment of types of forces becomes especially important when considering the variety and difficulty of operations to be performed. The terrain dictates special skills and training as well as the ability to handle unexpected situations during both offensive and defensive operations.

In summation, the Russians realize, perhaps better than anyone else, that combat in mountainous regions remains a difficult undertaking. It strongly favors a defender who can exploit the rugged terrain and hold key areas with relatively small forces while limiting the effects of heavy armaments. To overcome these advantages, a successful attacker must organize his forces into autonomous groups capable of independent action. Turning movements and envelopments will play key roles in destroying enemy defensive areas.

Russian tacticians also contend that operations in the mountains requires continuous but flexible control. Information dissemination procedures and control measures acquire great significance when advising subordinates of anticipated maneuvers. Experience shows them that the art of being a commander in this environment lies in precisely ascertaining the beginning of a maneuver, its type, the sequence for accomplishing it, the forces used to enter into fire, and the most favorable sector of operations. They stress that when conducting a maneuver the commander must not lose the fire initiative. Equally important, he must disrupt the enemy's countermoves by properly employing reliable engineer support. In short, the commander must make the difficult decision of when to conduct mountain warfare as well as possess the skills required to wage it.

ENDNOTES

1. See, for example, Colonel S. Pechorov, "Geostrategicheskiye Ugrozy Rossii: Oni Real'ny ili Mnimy?" (Geostrategic Threats to Russia: Are They Real or Myth?), *Krasnaya Zvezda*, (referred to hereafter as "KZ") 20 Mar 92, 3 and A. Umnov, "Whose Border is Guarded by Russia in Tajikistan?," *Moscow News*, 27 August 1993, 6.
2. See Colonel V.G. Safronov, "Kak Eto Bylo" (How It Was), *Voyenno-Istoricheskii Zhurnal* (Military History Journal - hereafter referred to as "VIZ"), May 1990, 68 and Scott R. McMichael, *Stumbling Bear: Soviet Military Performance in Afghanistan*, Brassey's (UK), 1991, 43-44.
3. General I. Tretiak, "Organizatsiya i Vedeniye Nastupatel'nogo Boya v Gorno-Tayeznoi Mestnosti" (The Organization and Conduct of Offensive Combat in Mountain-Taiga Terrain), *VIZ*, No. 7, 1980, 42-49 and G. Shevchuk, "Manevr v Gorakh" (Maneuver in Mountains), *Voyenny Vestnik*, (hereafter "VV") (Military Herald) No.12, 1985, 29-31. General Tretiak is believed to have acquired a great deal of mountain experience in Ethiopia as well. Some of his "lessons learned" there probably influence this article.
4. General-Lieutenant V.G. Reznichenko, General-Major I.K. Vorobyev, and Colonel M.F. Miroshnichenko, *TAKTIKA*, 1987, Moscow, (hereafter referred to as "Taktika"), 269-270 and Lieutenant Colonel N.V. Rysakov, "Osobennosti Postroyeniya Operativnoy Oborony v Gorno-Pustynnoy Mestnosti" (Peculiarities of Operational Defenses in Mountainous-Desert Terrain), *Voyennaya Mysl*, (hereafter "VM") 10/92, 36-41.
5. General-Major L. Korzun, "Peculiarities Of A March And Meeting Engagement In Mountains," *Soviet Military Review*, No. 5, 1982, 21-24.
6. General Yuri Maximov, "Mountain Training," *Soviet Military Review*, No. 12, 1984, 5-7. A subunit (*podrazdeleniye*) in Russian usage refers to organizational elements which generally cover the range from squad to company.
7. Captain N. Stepanov, "Granatometchiki v Gorakh" (Grenadiers in the Mountains), *VV*, No. 9, 1985, 23 cited in McMichael, 64.
8. Rysakov, 36-41.
9. Lieutenant Colonel G. Ivanov, "Razvedka Gornogo Perevala" (Reconnaissance of a Mountain Pass), *VV*, No.1, 1985, 25-27.

10. L. Petrunev, and Y. Klemin, "Povyshayem Tochnost' Meteorologicheskoy Podgotovki Strel'by v Gorakh" (We Are Increasing Accuracy Of Meteorological Preparation For Fire In The Mountains), VV, No. 12, 1990, 37-40 and V.A. Chernukhin, "Boyevoye Primeneniye Artillerii v Gorakh," (The Combat Use of Artillery In Mountains), VIZ, No. 11, 1986, 28-34.

11. A. Fedorov, "Vybor u Privyazka Ognevoy Pozitsii v Gorakh Noch'yu" (The Selection And Surveying Of A Fire Position In The Mountains At Night), VV, No. 6, 1986, 57-58 and V. Litvinenko, "Peredovoy Nablyudatel'nyy Punkt Batarei v Gorakh" (The Forward Observation Post of a Battery In Mountains), VV, No. 7, 1986, 52-53.

12. V. Tumanov, "Strel'ba pryamoy navodkoy v gorakh," (Direct Fire In Mountains) VV, No. 3, 1989, 54-56. (The Russian 82 and 120 mm mortars are man-portable and often deployed down to a low unit level.)

13. M. Shaposhnikov, "Nekotorye Osobennosti Strel'by v Gorakh" (Some Special Features Of Firing In The Mountains), VV, No. 9, 1986, 60-61.

14. Colonel A.A. Kiyanenko, "Boyevoye Primeneniye VVS v Respublike Afganistan" (Combat Employment of the Air Force in the Republic of Afghanistan), VM, No.8, Aug 91, 24-28.

15. Ibid. The continuous orbit tactic usually involved four aircraft flying 2000 meters apart. Attacks were conducted from the direction of the sun to blind AA gunners and draw off heat-seeking SAMs.

16. Safranov, 67-71 and Kiyanenko, 25-27. Pilots noted that structures could be detected only at 3-3.5 km and caves at 1.2-1.5 km.

17. Ibid. Shturmovik include any low-flying attack aircraft (e.g. SU-25), but in this case the authors are specifically referring to attack helicopters. The helicopters did their best to use terrain irregularities but nevertheless were forced to fly at extremely low levels. Meanwhile, fixed wing aircraft were flying between 5,000 and 7,000 meters in order to support the helicopters.

18. Current Russian (or even Soviet) commentary on air defense matters pertaining to mountain warfare in Afghanistan, Tajikistan, and elsewhere are rare. A good example of better "old" material, however, can be found in the following:

Colonel A. Gryaznov, "Zenitchiki na Takticheskoy Uchenii v Gorakh" (Air Defense Personnel In A Tactical Mountain Exercise), VV, No. 12, 1982, 74-76. Most of the information in this section can be inferred from various general sources concerning mountain warfare as well as this older material.

19. General-Major A.N. Limno, and Colonel V.K. Shamshurov, "Inzhenernoye Obespecheniye Oborony V Gorakh," (Engineering Support In The Mountains), VM, No. 6, 1988, 37-44.

20. Colonel S. Voryshak, "V Gornyykh Usloviyakh," (In Mountain Conditions), VV, No. 9, 1993, 60-63 and N. Goverdovskiy, "Inzhener-Reconnaitssant v Gorakh," (Engineer Reconnaissance In The Mountains), VV, No. 9, 1984, 76-79. The importance of engineers during the conflict in Afghanistan cannot be overemphasized. The Soviets required many additional engineer troops just to keep traffic flowing.

21. A. Kremenchutskiy, "Uzel Svyazi v Gorakh" (Communications Centers In Mountains), VV, No. 5, 1989, 47-49 and Y. Kuzmichev, and S. Ponomarev, "Perepriyem u Retranslyatsiya v Gorakh" (Relay and Retransmission In the Mountains), VV, No. 12, 1986, 74-75.

22. See, for example, A. Semenyaka, "Spetsnaz Ukhodit v Gory" (The Spetsnaz Are Leaving For The Mountains), KZ, April 30, 1991, 4 and I. Levitskiy, "Komu Pomogut Gory" (Whom Do The Mountains Help), KZ, March 24, 1990, 2.

23. V. Redko, and V. Nekhoroshev, "Deystviya Khimikov-Razvedchikov b Gorakh" (Chemical Reconnaissance Operations In The Mountains), VV, No. 2, 1988, 63-65 and Colonel I. Klyachin, "Khimicheskoye Obespecheniye v Gorakh" (Chemical Support In The Mountains), VV, No. 9, 1984, 83-86.

24. Ibid.

25. Colonel P.P. Butkov, and Colonel V.V. Shmidt, "Osobennosti Tylovogo Obespecheniya V Gornopustynnoy Mestnosti" (Particular Features of Rear Support in Mountain-Desert Terrain), VIZ, No. 9, Sep. 88, 38-45.
26. Korzun, 21-24.
27. Butkov and Shmidt, 39-41.
28. For a comprehensive assessment of maintenance problems and their impact upon personnel see V. Solovyev and V. Sokolov, "T-72 Ekspluatatsiya v Gorakh," (T-72 Exploitation in the Mountains) *Technika i Vooruzheniye*, No. 11, 1989, 10-11 and Colonel Engineer M. Starostin, "Tank Operation In Mountains," *Soviet Military Review*, No. 5, 1982, 29-30.
29. Korzun, 22 and Butkov and Shmidt, 39-40.
30. Ibid.
31. Taktika is representative of these analyses.
32. Maximov, 6. The Soviets failed to heed their own advice and most of their troops did not in fact receive any special training. However, they did establish a mountain warfare school in the Turkestan Military District (MD) as well as mountain centers in the Carpathian, North Caucasus, Transcaucasus, and Ukrainian MDs.
33. See, for example, Vladimir Zhitarenko, "Desantno-Shturmovye: Elita Pogranvoysk" (Desant-Assault Troops: The Elite of the Border Troops), *KZ*, 18 Aug 93, 2 and Colonel Y. Varyukhin and Colonel I. Alpatov, "Posadka Vertoleta v Gorakh" (Helicopter Landings in Mountains), *Aviatsiya i Kosmonavtika*, No. 9, 1991, 10-11. Evidence from Afghanistan also demonstrates the desirability of using these types of forces in the mountains. Several sources estimate that by April 1986 nearly 70 percent of all Soviet operations were heliborne.
34. See, for example, Taktika, 399-401. In normal circumstances, the Russian army views the offense as the stronger form of warfare. Mountainous terrain generally provides the one exception to this rule; although even in this circumstance, some disagreement persists.
35. In view of these advantages, it also becomes apparent that defense in the mountains also makes an excellent economy of force mission. Fewer personnel and less equipment are required in the mountains to perform the equivalent tasks on even moderately rough terrain.
36. Rysakov, 38-40.
37. Signal devices and guard dogs also may be employed as early warning devices.
38. Taktika, 401-402.
39. Colonel V.I. Nazarenko, "Oborona Obshchevoyskogo Soyedineniya v Gorakh" (Defense of a Combined Arms Formation in the Mountains), *VM*, No.3, Mar 88, 52-58.
40. Rysakov, 38-40 and Taktika, 399-402.
41. Nazarenko, 53-55.
42. Rysakov, 40.
43. Taktika, 400-401.
44. Limno and Shamshurov, 38-43.

45. Colonel Y. Galitsky, "Mine Obstructions In Mountains And Deserts," Soviet Military Review, No. 1, 1971, 24-26.

46. Maximov, 6-7 and Rysakov, 41.

47. The width of a defensive belt for a Front in mountainous operations may extend up to 3000 km. An Army may cover 500 - 700 km and a Division 80 km or more. A company strongpoint may defend up to 1.5 km.

48. See, for example, Limno and Shamsurov, 39-40 and Taktika, 399-401.

49. Rysakov, 36-38.

50. See, for example, Taktika, 269-272.

51. Korzun, 21-22.

52. Ibid.

53. Colonel A. Shakhbazyan, "Po Dnu Ushchel'ya" (Along The Floor Of A Gorge), Znamenonsets, No. 5, May 78, pp 4-6.

54. Korzun, 22.

55. Major A. Vetakh, "Battalion On The March In The Mountains," Soviet Military Review, No. 11, 1984, 22-23 and Captain R. Karpov, "Manevr v Gorakh" (Maneuver In the Mountains), VV, No. 9, 1982, 44-47.

56. Dr. Graham H. Turbiville, Jr., "Ambush! The Road War In Afghanistan," Army, January, 1988, 32-42 and Voyennyi Entsiklopedicheskiy Slovar' (Military Encyclopedia Dictionary), (Moscow: Voenizdat, 1986), 529.

57. Halts will generally occur on even terrain which affords some degree of cover and camouflage. Parking on dry river beds, water drains, steep grades, and under cliffs is prohibited. In especially difficult terrain, the number of halts may be increased to permit additional time for maintenance and rest.

58. Vetakh, 22-23. Although these rates of advance appear slow, they are significantly higher than the average pace made during the Great Patriotic War. During the Krasnodar operation of 1943, for instance, troops crossing the northern spurs of the Caucasian Ridge averaged only two kilometers per day.

59. Taktika, 273-275.

60. Vetakh, 22-23.

61. Korzun, 21-24. On flat land as well as in less difficult mountainous terrain, such as valleys and plateaus, an attack from the line of march remains the preferred and most common method of offensive operation.

62. Ibid. One of the most important missions associated with this type of operation is the capture of mountain passes. These terrain features frequently provide the key to an enemy defensive system, and reconnaissance units will always attempt to reach and secure them prior to the enemy.

63. See, for example, Vetakh, 23.

64. Taktika, 269-270.

65. Ibid.

66. Colonel N. Kobrin, "Action In The Mountains," Soviet Military Review, No. 8, 1986, 45-46.

67. Ibid and Karpov, 44-47.

68. Taktika, 273-275.

69. Karpov, 45-46.

70. S. Dovzhenko, "Desantirovaniye v Gorakh," (An Assault in the Mountains) *Aviatsiya i Kosmonavtika*, No. 6, 1988, 20-21. It must also be stated that the Russian theoretical concepts and innovations summarized in the above section are far removed from what the Soviets were capable of doing in Afghanistan.

71. Taktika, 273. For an excellent historical article on the Soviet Army's use of tanks in World War II, see H.F. Stoeckli, "Fighting In the Carpathians 1944-45 And Relevance To Modern Conditions," *La guerre et la montagne (Mountains and Warfare)*, Tome 2, *Actes des Colloques de la Commission Internationale d'Histoire Militaire (XVII Colloque)*, Berne, 1993, 357-363.

72. Tumanov, 54-56 and Shaposhnikov, 60-61.

73. See, for example, Taktika, 117-128. A division forward command post will move approximately every two hours; the main headquarters moves at least twice per day.

74. Maximov, 5-7.