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Moving Artillery Forward: A Concept for the Fight in Afghanistan

Joseph A. Jackson

The United States Army is no stranger to mountainous and high-altitude war fighting. American history contains many instances of successfully executed mountain conflicts. Central to this success was the movement and use of artillery in direct support of those campaigns. The first notable American instance of moving artillery across mountainous terrain occurred when Colonel Henry Knox's Continental Army soldiers wheeled, sledged, and levered the guns from Fort Ticonderoga across the Berkshire Mountains in the winter of 1776. These fifty-nine assorted cannon became the deciding factor in General George Washington's siege of Boston. Other notable campaigns include the U.S. Army operations in the Italian Alps during WWII, the Taebaek Range of Korea, and the Annamite Range in Vietnam. Each of these locations and conditions provides ample instruction on artillery use in mountain warfare; yet this time fighting in the mountains of Afghanistan is proving to be a greater challenge than anticipated.

Strategists and commanders who consider employment of artillery in Afghanistan should take a fresh look at history, doctrine, and tactical concepts. Doing so will ensure artillery can employ optimally, and in sufficient strength, and of the correct caliber to create the tactical conditions for success. Without a significant increase in firepower delivered by a correspondingly lightweight and maneuverable field howitzer, the long-range fight in Afghanistan will devolve into an even deadlier and protracted conflict.

Solely relying on technology and precision munitions incrementally applied across the current arsenal will not achieve the conditions to exploit and pursue the insurgent fighters ever higher and farther into the mountains between Afghanistan and Pakistan. Operational planners, artillery professionals, congressional staffers, and military acquisition officers should examine these relevant histories, review doctrine, and consider their implications. These sources serve as a guide to develop successful and sustained operational approaches to combat the Afghan insurgency. They also provide a reference for adaptive tactics and procurement requirements for weapons needed in protracted high-altitude mountain warfare.

Defining the Operational Environment

In Afghanistan, the terrain and weather dictate the tactics and choice of weapons. Understanding the operational environment necessitates consideration of multiple factors. These dynamics include warfare in mountains that force non-linear fighting, training that does not prepare soldiers for vertical terrain, awkward and counterproductive positioning of the weapons,

changing and treacherous weather conditions, and punishing temperatures that renders troops less effective.

In Afghanistan, significant mountain ranges such as the Himalayas and the Karakoram rise in the east. The Hindu Kush towers in the center of the country. The Suleman and Kirthar ranges jut toward the eastern border with Pakistan and extend into Baluchistan. Finally, the Paghman Range shrouds the capital city of Kabul. These ranges elevate more than two-thirds of Afghanistan's territory above 5,000 feet. These ranges provide natural concealment and protection for the insurgent fighters.

Fighting in extremely mountainous terrain and at high-altitudes is not linear. While forces move along pre-designated phase lines as on flat terrain, difficulties arise in maintaining continuity between units as they methodically scale from one point to the next. Fronts do not necessarily follow contiguous and sequential sets of ridges; they may even require simultaneous attacks on crests, ledges, and tactical objectives in opposite directions. A valley floor lying several thousand meters below may provide the only geographical point of continuity.¹

Most armies train and equip themselves for conventional warfare on terrain that facilitates effective command and control and allows efficient employment of combined arms. Ideal terrain for mechanized forces are wide plains, rolling hills, plateaus, deserts, or sparsely populated regions that favor the linear and contiguous properties of maneuver warfare. None of these conditions is present in the bordering highlands along the eastern length of Afghanistan.

Extreme terrain also constrains fire support weapons. Artillery faces limitations imposed by steep road gradients and sharp bends that prevent deployment of the support vehicles and guns. To maintain the employment of guns as far forward as possible, batteries must disperse into sections, one or two guns per position, to maximize coverage to the supported units. To optimize the usefulness of the artillery, forces position their guns in terrain folds and on reverse slopes. Other positioning options include road heads, near villages, and along valleys. Deployment of artillery is often constrained because of logistics to support their use.²

Positioning of artillery becomes even more important when defending in mountainous terrain. The drastic changes in elevation and uneven ground make maintaining a continuous line of units tied together along their flanks difficult. A reverse-slope defense poses problems as well. While these positions mask unit movements and strengths, troops often lack sufficient overhead cover. Positions become susceptible to artillery fire and airbursts showering positions with fragmentation.³

¹ Lester Grau and Lieutenant Colonel Hernán Vázquez, Argentine Army. "Ground Combat at High Altitude," *Foreign Military Studies Office*, Fort Leavenworth, KS. <http://fmso.leavenworth.army.mil/products.htm#casia>. (accessed March 20, 2009) 4.

² *Ibid.*, 9.

³ *Ibid.*, 5.

Meteorological implications affect artillery use at higher elevations. Low air pressure, cold temperatures, and high wind speeds make standard firing tables ineffective.⁴ These conditions increase inaccuracy. The lack of adequate maps and surveyed locations and the lack of precise meteorological reports increase the probability of error in range and altitude. Spotting rounds at high-altitude requires extra observers to walk rounds onto targets and to make drastic shifts to achieve accurate fire.

Human endurance must factor into the problem as well. Men cannot endure temperatures ranging from as high as 128°F and as low as -15°F in the central highlands of Afghanistan and greater Southwest Asia. Prolonged exposure at high-altitudes depletes the strength of infantry units and requires frequent rotations of the troops.⁵ This condition places greater responsibility for augmentation by the field artillery. Firepower must compensate for the aggregate reduction in troop strength. The tactical, geographical, and physical conditions interlock. Continued exploitation of the environmental conditions by the insurgents who are accustomed to these extremes allows them to engender more credibility than their weaponry and troop strength warrant.

Other weapons systems do not improve these circumstances. In fact, their limitations reinforce the demand for an artillery capability. Aircraft are of limited utility in high-altitude operations. Atmospheric conditions such as heavy rain, blizzards, fog, high winds, and low oxygen density limit performance. Camouflaged ground troops use the natural contours of the mountains that include deep shadows and overhanging ledges to prevent visual identification by aircraft. Aircraft use in valleys is dangerous; pre-positioned air defense weapons and massed small arms fire force aircraft to fly higher. This technique creates a visual positive identification problem and increases the risk of fratricide. Helicopters serve as good artillery spotters but weather and elevation limit their usefulness. Noise from approaching aircraft provides advance warning for units giving them time to hide among the rocks.⁶

The Current Paradigm

Presently, the United States Army has implemented self-limiting measures in Afghanistan. This formidable institution refuses to commit its full spectrum of ground combat capabilities to overwhelm the enemy forces of the Taliban and Al Qaida. Instead, it continues to deploy its weapons in piece-meal fashion, arriving with a force that is too little too late. Nowhere is this more obvious than in the employment of the United States Field Artillery.

Delineating present limitations on the current artillery corps helps define the problem. Field Artillery battalions in support of expeditionary brigades continue to deploy with less than their full complement of cannons. Batteries often deploy with only 50% of their guns while the troops spend alternate periods serving as provisional infantry, quick reaction forces, augment logistics activities, and a myriad of training tasks focused on host nation capabilities. Additionally, the current arsenal lacks mobility. Cannons positioned on Forward Operating Bases arrive by

⁴ Ibid., 6.

⁵ Ibid., 6-9.

⁶ Ibid., 6-9.

helicopter. Once in position, they do not often reposition. U.S. artillery limits itself to only two calibers, 105mm and 155mm to engage targeted Taliban cells. Although these have proved effective in conventional wars in the mountains of Afghanistan, two is not enough. The other choice of weaponry, the M 270, Multiple Launch Rocket System (MLRS), provides a significant capability and extreme precision. However, its optimal use fires at targets well beyond the immediate reach of the infantry involved in the fighting where individual and crew-served weapons make the difference.

Afghanistan presents a prolonged challenge. The restrictive practices of U.S. forces coupled with creative Taliban tactics create an operational dilemma. Direct insurgent attacks against fortified positions pit enemy rockets, rocket-propelled grenades, and machine guns against mortars, and heavy and light crew-served weapons. The distance created by the insurgents using these weapons ensures that rifleman cannot effectively range them with their small arms. These tactics enable a small group of insurgents to attack and pin down a technologically advanced force in a fixed position. The result is that two divergent tactical fights emerge. The first fight belongs to the infantry, fighting in platoon or squad-sized actions at ranges of one kilometer or less. The second fight is in the purview of the artillery as it attempts to fight a much deeper battle against selected small targets out to 30 kilometers (See Figure 1).

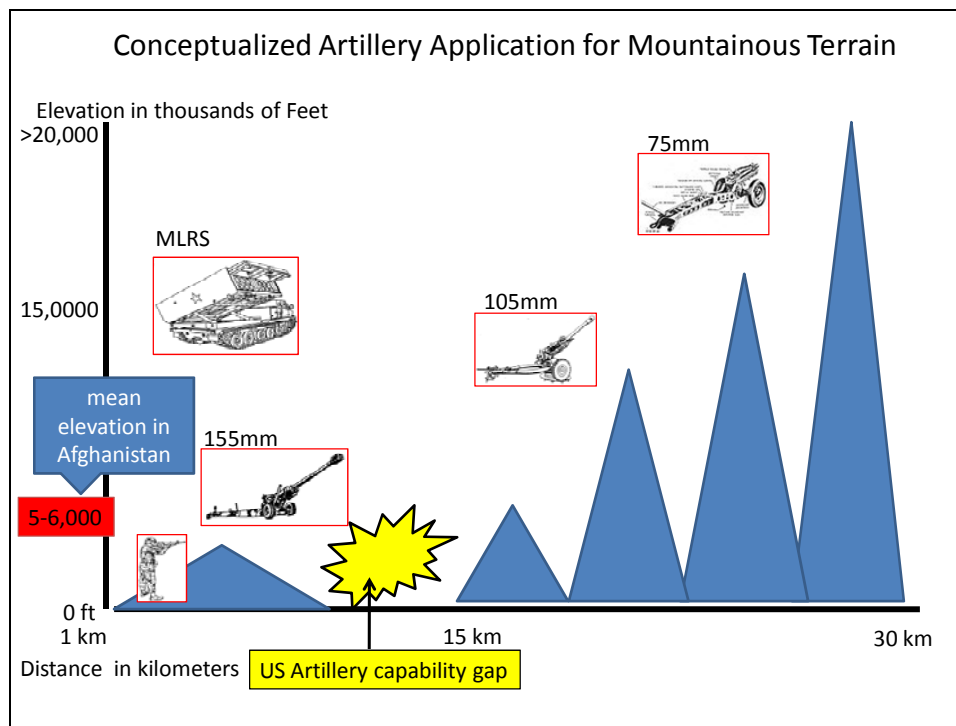


Figure 1: Field Artillery Application and Capability Gap in Afghanistan.⁷

⁷ This diagram represents more than just the present mobility gap hindering combined infantry and artillery missions. It also represents how artillery might be echeloned by caliber according to altitude to fight in increasingly higher altitudes. The weapons systems displayed, with the exception of the 75mm pack howitzer, are currently in use by the U.S. Army. The Multiple Launch Rocket System typically engages targets beyond 20 kilometers and serves to fight the “deep fight” in American doctrine. Joseph A. Jackson, U.S. Army, *Howitzers on High Ground: Considerations for Artillery in Southwest Asia*, School of Advanced Military Studies, (Fort Leavenworth, KS October 2009) 35.

Taliban groups study and comprehend the U.S. tactics. They observe that artillery remains fixed on bases and lacks mobility to follow the infantry into the deep defiles and higher elevations. After eight years of conflict, insurgent fighters further understand the limitations of shell fuse combinations and the restrictions that the environment places on rotary and fixed wing aircraft. By moving under cover of the mountains and along remote paths, they can avoid U.S. radar and the limited number of forward observers who can engage them.

Insurgent fighters use the natural shape, strength, and remoteness of mountains to retain their freedom of maneuver and create the conditions for a long-range fight. They utilize the man-made caves that served them well during the Soviet conflict twenty years ago. Cave utilization forces heavily encumbered American soldiers to pursue the enemy into forbidding regions often beyond the range of direct support artillery. While mortars may provide a quick response, they still lack the punch, mass, and range to support the fight in Afghanistan for the long-term. This lack limits the ability of offensive forces to achieve two important aspects of offensive operations – exploitation and pursuit. The inadequate application of combat power over the past six years facilitated the increase in hostilities by the Taliban (See Figure 2).

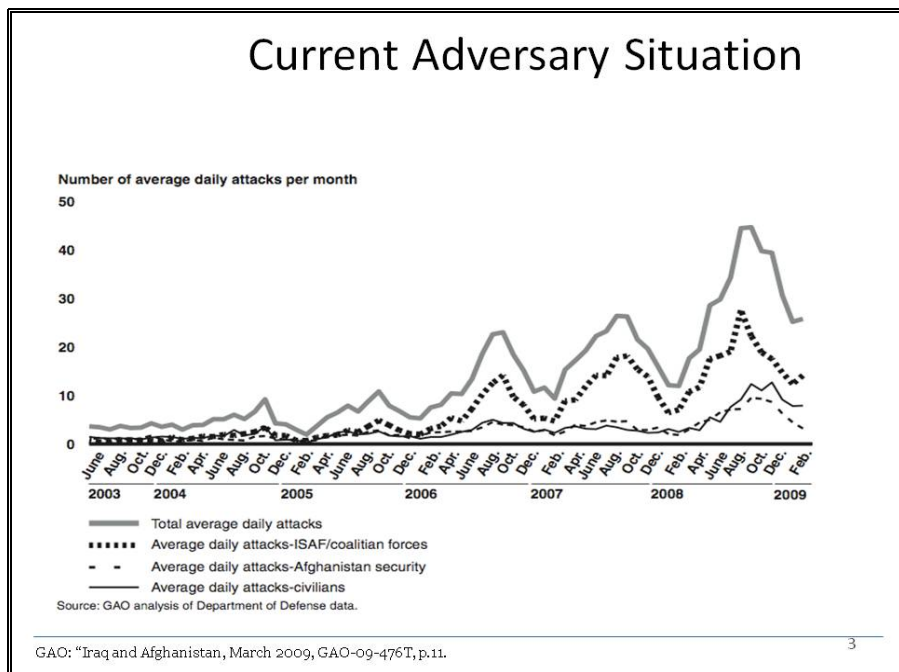


Figure 2: Location and Percentage of Taliban Attacks by Region in Afghanistan. Source: School of Advanced Military Studies, Exercise One. Data Extracted from U.S. Government Accounting Office Report on Iraq and Afghanistan, March 2009.

As recently as 2009, improved insurgent tactics now include firing volleys of rocket-propelled grenades, mortar rounds, and missiles from the back of trucks to allow insurgent groups to maneuver to disrupt coalition forces and seize key objectives such as remote outposts and towns. The lack of coalition troops in any given area and a corresponding lack of artillery to mitigate that deficiency in troop density has allowed the insurgency to fight along increasingly

conventional lines not witnessed since Operation Anaconda in 2002.⁸ The tactical dilemma that presented itself then emerges again now. The weapon system designed to engage in the long-range fight (cannons, howitzers, and rockets) remains noticeably absent from the majority of the fighting in significant numbers.

The Lens of History

The Soviet occupation and American approaches to fighting in Afghanistan warrant attention and denote significant but important contrasts. For the Soviet Union's five and two-thirds divisions, the geographical and operational limitations of Afghanistan reinforced the Soviet reliance on artillery as the centerpiece of their army formations. In contrast, Afghanistan has been an example of limited incremental technological application for the United States.

The complexity of fighting in Afghanistan produced an arguably counter-intuitive response for the Soviets. At first glance, the task of fighting an asymmetric enemy in largely uncharted territory would seem to warrant limited artillery formations in favor of lighter and more mobile forces. However, the experience of the Soviet artillery corps in the prosecution of the army's campaigns clearly noted that it remained a central combat arm in counterinsurgency warfare. Despite the limited maneuver space, winding mountain roads, and narrow valleys, creative methods of utilization allowed the artillery in certain circumstances to fight with limited or no infantry support. Moreover, the Soviet infantry fully appreciated the necessity for maintaining adequate fire support assets on all types of missions given the limited numbers of infantry battalions attempting to cover the entire country.

The Soviet Artillery Corps worked to integrate their weapons systems into the overall operational plan, rather than work to the exclusion of other arms. Mortars in significant numbers shared battle space with howitzers, aircraft and cannons in large numbers synchronized their efforts against objectives, the Soviets sought to integrate as many weapons systems of as many calibers as possible to execute a combat mission. The Soviets did not permit the Mujahedeen's tactical exploitation of the environment to dictate the terms of the utility of rockets and howitzers, both towed and self-propelled systems proved useful. The decentralization of the artillery to support infantry platoon, company, and battalion level operations also revealed that Soviet Army officers became more adaptive and innovative over time. Though initially resistant to change, the Soviet Army proved increasingly flexible and adaptive out of tactical necessity.

Two notable examples illustrate the effectiveness of the Soviet artillery in Afghanistan. First, the successful artillery ambush conducted by Lieutenant V. Kozhbergenov, a D-30 (122mm) howitzer platoon leader, displays the accuracy that Soviet artillery operating in decentralized platoons could achieve through indirect and unobserved fire planning (Figure 3). At night, the *Realii-U* operator, (a seismic recording device), reported that 10-15 people, two trucks and pack animals were passing through the eastern most concentration, number 112. The platoon leader fired three concentrations. As the Mujahedeen continued to approach concentration 111, the gunners fired a volley. Then, the first piece switched to fire concentration 110 and the third piece

⁸ Alfred de Montesquiou, "Marines launch new Afghan assault against Taliban," *Associated Press*, http://news.yahoo.com/s/ap/20090812/ap_on_re_as/as_afghanistan (accessed 12 August 2009).

switched to fire concentration 112. Number 2 gun continued to fire on concentration 111. The platoon destroyed two Toyota trucks, four pack animals and six men as well as destroying small arms and ammunition.⁹

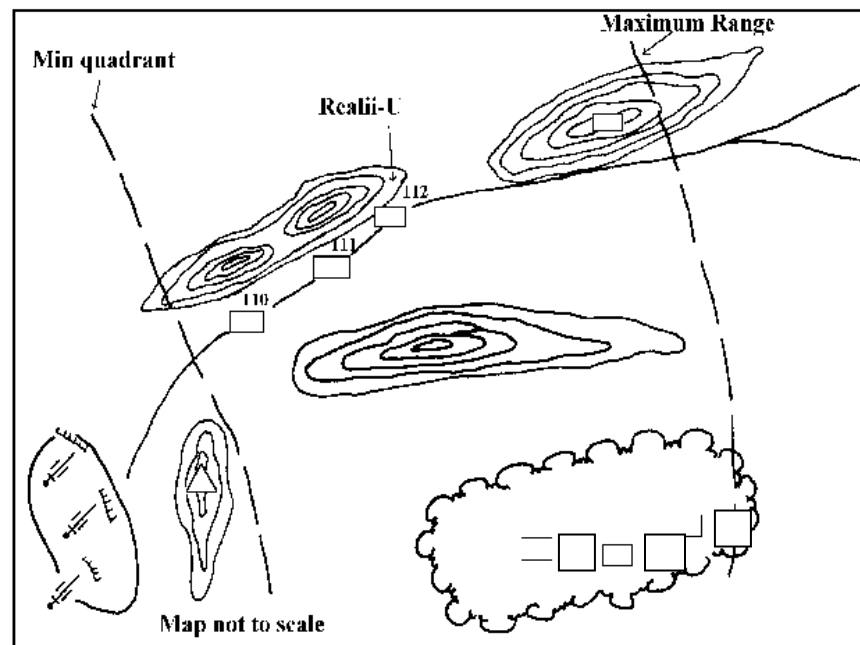


Figure 3: Diagram of the Artillery Ambush near Talukan, Afghanistan February 1986.

Source: Foreign Military Studies Office, Fort Leavenworth, Kansas.

http://www.ciaonet.org/cbr/cbr00/video/cbr_ctd/cbr_ctd_51.html (accessed 10 August 2009).

In a second example, the Soviets made maximum use of a battalion of 152 mm, 2S3 howitzers in direct fire mode in 1986 in the Baghlan Province of Afghanistan. A battalion of self-propelled howitzers employed direct fire across a wide front and moved forward by coordinated bounds by battery. Each successive bound brought the guns between 100 and 150 meters closer to their targets. The supporting towed 122mm, D-30 artillery battery groups continued to fire concentrations across a one-and-a-half kilometer front and a depth of three kilometers. These concentrations effectively pinned the enemy inside the valley and the fortified villages, while the maneuvering 2S3 batteries systematically reduced specific enemy targets. By matching the sequencing of the fire plan to map lines, the guns accurately shifted fires from one line to the next destroying the enemy-covered firing positions.¹⁰ The integrated fire plan successfully suppressed the opposition and enabled the capture of the village with limited exposure of Soviet troops to enemy fire. It eliminated the village stronghold.

⁹ Lester W. Grau, *Artillery and Counterinsurgency: The Soviet Experience in Afghanistan*, (Foreign Military Studies Office, Fort Leavenworth, Kansas, June 1997) 1-9.

¹⁰ Soviet artillery proved not only extremely valuable in the offensive examples above, but also in support of infantry breaking contact with the Mujahedeen. The supporting artillery fired suppressing fires in front of withdrawing troops to keep the enemy from closing or immediately reoccupying their fighting positions. Additional suppressive fires targeted key terrain along the flanks preventing the infantry from being enveloped or from receiving enfilading fires. The Russian General Staff, *The Soviet-Afghan War: How a Super Power Fought and Lost*. Translated and edited by Lester Grau and Michael A. Gress, (University of Kansas Press, 2002) 173-74.

For the Soviet Army changing tactics and fully integrating their indirect firing systems into the fighting gave them an increased level of success. The final withdrawal from Afghanistan rested not on faulty tactics. The Soviet political leadership in Moscow realized that the continued cost in lives and materiel could not substantiate or guarantee a clear political victory.¹¹

The Artillery Gap of Operation Anaconda

In 2002, the United States committed troops to fight in Paktia province. Ironically, this had also been the location of brutal fighting between the Soviets and the mujahedeen during the Soviet-Afghan War. The Shah-i-Kot Valley, the “Place of the King” had historically been a refuge for Afghan guerrillas. The valley became the scene for one of the largest battles of the U.S.-Afghan War.

The fighting in the Shah-i-Kot valley rested on two inferences. First, that Al Qaida would not stand and fight, and second, that those weapons systems at hand (mortars and fixed and rotary-wing aircraft) would be sufficient to handle any fighting that did occur. In the months prior to Operation Anaconda, the U.S. military, coalition special operations troops, and local Afghan militias banded together and defeated Al Qaida and elements of the Taliban in their attempt to control of the city of Kandahar and a few weeks later at Tora Bora.¹²

The United States Army did not recognize the fallacy in those assumptions until after fighting in the Shah-i-Kot Valley commenced. During Operation Anaconda, 1-18 March 2002, unlike the previous Soviet intervention, no artillery was present for the coalition and American troops. This absence of artillery created a noticeable capability gap that placed an increased burden on other weapons platforms such as mortars, helicopters, and an array of fixed-wing aircraft. Eventually, the application of mortars combined with air power destroyed large stores of enemy munitions, sealed off caves, spoiled a would-be counterattack, and scattered the survivors.¹³

Unfortunately, the notable achievements made by the use of coordinated close air support did not occur before significant delays, including fratricide, occurred in the original plan for the operation. Initially, the enemy retained the advantage in weapons and used them to disrupt the sweep through the valley. They not only possessed mortars of equal and greater caliber than the Americans, but also employed D30, 122mm howitzers that could range the length of the valley

¹¹ Robert F. Baumann, *Russian-Soviet Unconventional Wars in the Caucasus, Central Asia, and Afghanistan*, (Washington: U.S. Army Center for Military History, 1993) 216.

¹² The US Special Forces groups to included elements of forces from USSOCOM, JSOC and CIA's Special Activities Division. Other units and coalition partners consisted of TF 11, TF Bowie, and TF Dagger, British Royal Marines, and Canada's 3rd Battalion, Princess Patricia's Canadian Light Infantry, and Joint Task Force 2. The German KSK, the Norwegian FSK and elements of the Australian Special Air Service Regiment, the New Zealand Special Air Service and Danish Special Forces from Jaegerkorpset and the Danish Frogman Corps and the Dutch Special Forces (Korps Commando Troepen) took part in Operation Anaconda. Steve Call, *Danger Close: Tactical Air Controllers in Afghanistan and Iraq*, (College Station: Texas A&M University Press, 2007) 59.

¹³ *Ibid.*, 78.

floor.¹⁴ In response, the U.S. employed a number of aircraft including Apache AH-64 helicopters and fixed-wing aircraft that included A-10s, F-15Es, F-18s, and AC 130 gunships. These eventually bridged the gap between the limited mortar range and total lack of friendly artillery.

It is doubtful that the use of the current U.S. artillery arsenal in support of Operation Anaconda would have produced a decisive change in the immediate engagement. The overall inability of the artillery to support the mission due to a lack of expeditionary systems is the real point of significance. Of the two American systems that are air transportable (the M198 and the M119), only the M119, 105mm howitzer might have provided some measure of equal range and impact to offset the enemy D30s. The real value of Operation Anaconda to the artillery is that it illustrated how unprepared the U.S. artillery arsenal was to fight an expeditionary war in Afghanistan's rugged landscape.

Future Possibilities

Fighting in Afghanistan reinforces the point that the fundamentals of artillery gunnery remain relevant regardless of the nature of the conflict and terrain. These recommendations serve as a basis of consideration and warning that while digital advancements in weaponry and precision munitions serve an important role, fighting in extremely mountainous terrain also requires the ability to move and to mass fire support at close ranges. During these engagements, aggregate rounds, not surgical precision establish a decisive advantage. Therefore, fundamental changes should match the demands of the operational environment.

Reforms must align people with devices, and that combination with the geography. To accomplish this, the U.S. Army should consider expanding its arsenal of weapons systems and revising its doctrine. Specifically, the 75mm pack howitzer is ideally suited for Afghanistan. This system, still in use by Pakistan and India along the Siachen Glacier and Kargil regions of the Kashmir, allows the artillery to move with the infantry into narrow defiles and up steep escarpments. It permits a high velocity, direct or indirect fire capability to destroy targets nested in caves and formidable terrain.

In the United States, the 75mm pack howitzer saw extensive wartime service. The U.S. Army issued 75 mm howitzers to airborne and mountain units during World War II, (See Figure 4). An airborne division, according to the organization of February 1944, had three 75 mm howitzer battalions. Glider units fielded two field artillery battalions that contained two six-gun batteries each and one parachute field artillery battalion (three four-gun batteries) totaling 36 pieces per division. In December 1944, new Tables of Organization and Equipment increased the divisional

¹⁴ The decision not to deploy even light artillery – 105mm cannons – was deliberate. General Tommy Franks concluded that there was too little airlift capability to haul the pieces into the high altitudes. Instead, artillerymen of the 10th Mountain Division trained to operate the 120mm mortar. This battle in the Shah-i-Kot Valley fueled the discussion on the use of mortars and airpower to fill the void where artillery pieces could provide a sufficient bridge in the tactical weapons system gap. The D30 122mm howitzer possesses an effective range of 15.4 kilometers, with a rocket assisted projectile, this increases to 21.9 kilometers. In contrast, the 120mm mortar's maximum range is 7.6 kilometers. *OP 4: Field Artillery in Military Operations Other Than War: An Overview of the US Experience*, (Combat Studies Institute. CSI Press. Fort Leavenworth, Kansas) 37.

firepower to 60, 75 mm howitzers. The 10th Mountain Division contained three 75 mm howitzer battalions, containing 12 guns each.¹⁵

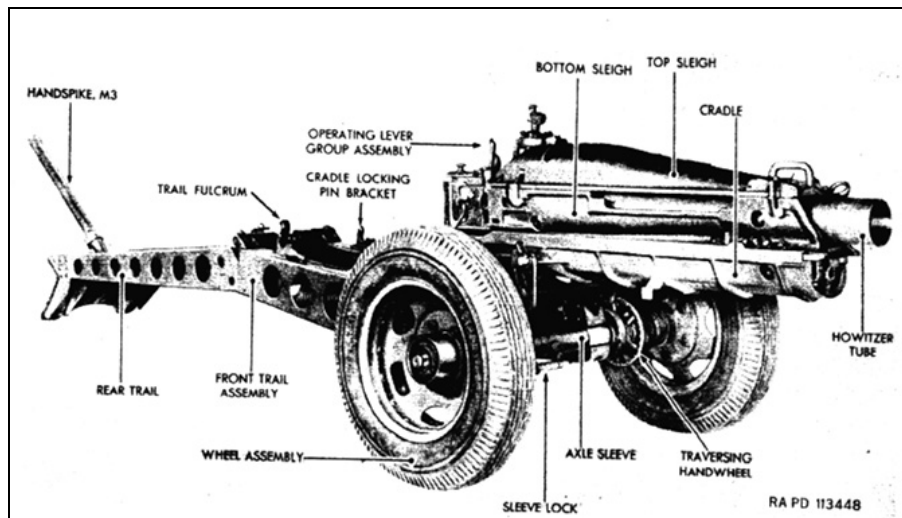


Figure 4: Diagram of the 75mm Pack Howitzer from Technical Manual 9-319. U. S. Army¹⁶ Source: http://www.ww2gyrene.org/weapons_pack_howitzer.75mm.htm.

In the US Marine Corps, under the E-series Tables of Organization (TO), from 15 April 1943 divisional artillery included three 75 mm howitzer battalions of 12 guns each. The F-series TO from 5 May 1944 reduced the number of 75 mm battalions to two, and the G-series TO eventually removed them. The Marine Corps then shifted to 105 mm and 155 mm howitzers. Although the G-series TO was only adopted on 4 September 1945, in practice in some divisions the change was introduced early in 1945.¹⁷

The 75mm howitzer, during its time of employment, proved successful. Nearly 5,000 guns were produced. As a part of Lend Lease, more than 800 saw service with the British forces in the

¹⁵ The U.S. Army recently decided to use the XVIII Airborne Corps and its aligned divisions consisting of the 82nd Airborne Division, 101st Air Assault Division, and the 10th Mountain Division to rotate through Afghanistan. These light divisions could readily adapt to integrate a lightweight howitzer such as the 75mm. A suitable stockpile of these weapons could conceivably be left in theater while individual brigades would employ them. This would allow a consistent and more mobile artillery presence in each brigade area of operations and not increase the logistical cost of shipping more of their own assigned artillery of 105mm or 155mm to Afghanistan.

¹⁶ The 75mm pack howitzer is a mobile, general purpose, field artillery piece. It is manually operated single loaded, and uses fixed and semi fixed ammunition. The firing mechanism is a continuous pull (self-cocking type, actuated by pulling a lanyard). The recoil mechanism is a hydro pneumatic type, having a floating piston and a pneumatic respirator. It provided direct or indirect fire and could elevate to fire high angle fire to deliver plunging fire on a target to a range of 9 kilometers. Data extracted from TM 9-319 (75mm Pack Howitzer).

¹⁷ In addition to service with mule units, the 75mm howitzer became the main gun for glider and parachute artillery battalions in WWII. Airborne units so equipped won battle honors at Bastogne, Normandy, and Arnhem. The chief difference between pack howitzers for mule use and those for airborne operations were the wheels. The glider units had spoke wheels and the parachute units had pneumatic tires.

http://ibiblio.net/pub/academic/history/marshall/military/mil_hist_inst/a/artyc.asc

Balkans where they proved excellent for fighting in that mountainous region. Today, Afghanistan provides another opportunity to use this weapon or something similar.¹⁸

As a practical matter, converting these largely ceremonial guns into operational howitzers should not be beyond consideration. The pack howitzer ranges out to 9 kilometers firing high explosive, anti-tank, and smoke rounds. It disassembles into six components and its total combat configured weight is 1,009 pounds. A concept for employment would not require replacement of the current 105mm and 155mm systems already present in Afghanistan. Instead, these weapons would augment the infantry with platoons or sections of pack howitzers as they pursue the Taliban into the highest points along the Afghan-Pakistan border.

Recommendations do not limit themselves to weapons systems. Training doctrine provides the link among the soldier, weapon, and the environment. Soldiers and leaders require access to core documents from which to draw relevant and expedient tactics and methods. A review of U.S. doctrinal history reveals that the army previously experienced fighting in mountainous terrain. The following points regarding texts and training deserve consideration. The army should revise and publish Field Manual 70-10 *Mountain Operations*, Field Manual 70-15 *Operations in Snow and Extreme Cold*, and Field Manual 25-7 *Pack Operations*, all published in 1944.¹⁹ These manuals explain in detail methods of mountain warfare. The lessons and methods still apply to the mountain ranges of Afghanistan and Southwest Asia.

Conclusion

Historical case studies and eight years of experience validate the need and utility of a significant artillery arsenal in Afghanistan. The rugged landscape provides a natural fortress for insurgents that make locating and destroying them difficult.²⁰ Transnational insurgencies such as Al Qaida and the Taliban exploit the network of mountain ranges between Afghanistan and Pakistan to

¹⁸ Other systems are readily available on the world markets ready for use. The Italian-made OTOBREDA 105mm howitzer, manufactured by GIAT industries – disassembles into 11 components (a section can assemble it in three minutes) and is transportable by pack animals. It weighs 1,310 kilograms, or 2,880 pounds. This is a favorable savings in weight even when compared to the 4,690 pounds for the M119. The OTOBREDA fires nine different charges with a maximum range of 18.1 kilometers. Thirty countries presently field more than 3,000 of these systems worldwide. Tests and actual employment of this system in demanding environments such as Sweden, India, and Malaysia proved successful. Within the immediate area of Afghanistan, India's Ordnance Factory Board currently produces the India Field Gun (IFG), a 105mm howitzer specifically designed for mountain deployment. It weighs 2350 Kg (5,170 pounds) with a maximum range of 17.5 kilometers and deploys by either truck or helicopter. For heavier calibers, GIAT Industries produces the Caesar 155mm self-propelled howitzer. This system integrates the prime mover and gun. The gun rests on the truck bed. The design specifically addresses the inability of towed 155mm howitzers to deploy into mountainous areas Sengupta, Prasun K. 105mm Guns for Rapid Deployment Force and Mountain Warfare. *Asian Defence Journal*, no. 3 (March 1999) 24.

¹⁹ Some reprinted field manuals do exist. Nevertheless, they remain in the preveue of Special Operations forces. A significant portion of the army experienced fighting in rugged terrain well beyond the units comprising the traditional Special Forces community in Afghanistan since 2002. Previous army experience from World War II captured practical information of mountain troops in manuals such as, FM 25-7 *Pack Operations*, published in 1944. Presently published as *FM 3-05 Special Forces Use of Pack Animals*, Department of the Army, (Washington D.C., June 2004).

²⁰ *Ibid.*, 1-2.

their advantage.²¹ Insurgents use the mountains and the protection they offer to maintain weapons parity with U.S. forces. American forces must adjust to the limits imparted by geographical and environmental conditions to offset the enemy advantage.

Mountain warfare dictates that combatants redefine their tactics and operational approaches to isolate and destroy these natural makeshift forts. Creating that isolation requires artillery. However, to fill that requirement the artillery must become mobile and directly support a limited number of infantry with a significant volume of fire to reduce and destroy these positions. The example of the Soviet Union's forces in Afghanistan points to the utility of using the full spectrum of indirect weapons systems from mortars to rockets, towed cannon, and self-propelled howitzers. They further reveal that field artillery can provide a useful and leading role in shaping operations and can directly defeat known insurgent defenses.

The United States Army's institutional memory remains short and neglects the fact that the field artillery proved effective in massing fires for decades in full-spectrum operations. Whether for offense, defense, or in deterring enemy forces, the artillery facilitated operational success in numerous contingency operations.²² Maneuver commanders rely upon the presence of artillery to provide "firepower insurance" – having organic or assigned artillery capabilities present for any eventuality.

Certainly fighting in rugged terrain with artillery presents difficulties, but the case studies reveal that it is possible to use all types of artillery effectively and well beyond the confines of forward operating bases in Afghanistan and in the greater region of Southwest Asia. American forces need weapons that can destroy a smaller force in terrain not suitable for the current arsenal.

Major Joseph A. Jackson is a U.S. Army Field Artillery officer with deployment and combat experiences in Bosnia, Korea, Iraq, and Afghanistan. He earned a bachelor's degree in history and Russian from Purdue University and master's degrees from the U.S. Army Command and General Staff College and the School of Advanced Military Studies. Major Jackson is presently serving his second tour in Afghanistan with the NATO Training Mission, (NTM-A).

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²¹ Bard E. O'Neill, *Insurgency and Terrorism: From Revolution to Apocalypse*, 2nd ed. (Washington D.C.: Potomac Books, Inc., 2005) 65-66.

²² *Ibid.*, 36-41.

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