National Defence Défense nationale

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"AIN'T NO MOUNTAIN HIGH ENOUGH": A CANADIAN MOUNTAIN WARFARE CAPABILITY?

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JCSP 38

Master Of Defence Studies

PCEMI 38

Maîtrise en Études de la Défense

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Word Count: 20 673

Compte de mots : 20 673

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> *There is a nice sound to the phrase "mountain warfare." It has a ring of daring; it sounds cleaner than trench warfare and lighter than tank warfare. The only thing that can match it is war in the air, and that has become too deadly to be nice any more. It has also become too familiar; while war in the mountains is still strange enough to sound romantic. Except, of course, to the men who have to fight it.*[1]

INTRODUCTION

The Canadian Army ("CA") exists to conduct land operations in defence of Canada, in defence of North America operating with the US and abroad in the full spectrum of operations.[2] At least superficially there is doctrinal recognition that this requires the army to possess some degree of specialized capability in order to deal with a variety of specific environments, including mountainous terrain. Operations in mountainous terrain are generally considered one of the most challenging environments in which land forces can operate. The terrain requires extra-ordinary physical fitness and stamina, but also limits many of the advantages leveraged by modern armies; opportunities for combined arms teams are limited due to poor avenues for armoured vehicles and where aviation can be hampered because of rapidly changing weather. This generally makes mountainous terrain an environment where opponents can operate with a great deal of freedom of movement.

> Since irregular combatants don't have the combat power to stand up to government forces in a direct fight, they tend to hide, and thus to rely on cover and concealment. The concealment and protection afforded by complex environments help them to avoid detection by security forces, letting them move freely and fight only when and where they choose. For this reason guerillas, bandits and pirates have always

[1] McKay Jenkins, *The Last Ridge: The Epic Story of America's First Mountain Soldiers and the Assault on Hitler's Europe*, (New York:Random House Canada Inc., 2007),143.
[2] Department of National Defence, *Advancing With Purpose: the Army Strategy,* (Ottawa: Commander Canadian Army, 2014.), 2-4.

> flourished in areas where cover was good and government presence was weak. For most of human history this meant remote, forested, mountain areas such as the Afghan mountains discussed in the preface.[3]

A true military appreciation for the unique challenges of operating in such terrain is well established. In fact, the war in Afghanistan, at least for those who fought in mountainous terrain, has done much to re-instill lessons learned by British forces fighting in the same areas in the 19th and early 20th centuries. The following conclusion would not seem out of place in a modern discussion of the issue, despite its age:

> It is the campaigns of regular troops against hill-men fighting in guerilla fashion in their own native mountains and in defence of their own homes, campaigns almost the most trying which disciplined soldiers can be called upon to undertake, which create the conditions of genuine hill warfare and which deserve to be considered as a subject quite apart.[4]

While at least superficially the army acknowledges the need for specialized mountain operations capability through heavily dated doctrine and a variety of Individual Training ("IT") courses, the question remains: to what extent has the army formalized doctrine and prepared a capability to actually fight in these environments? Such operations are not to be taken lightly and both a historical examination of conflict in mountainous terrain as well as the seriousness with which our main ally views the difficultly of conducting operations in mountainous terrain demonstrate that the CA has a significant capability gap to close. While both the US Army and US Marine Corps have expended considerable time and effort to revitalizing their mountain doctrine in light of operational experiences, Canada has failed to do so. While Canada's

[3] David Kilcullen, *Out of the Mountains: The Coming Age of the Urban Guerilla* (Oxford University Press: New York, 2013) [Kindle edition]
[4] Col. C.E. Callwell, *Small Wars. Their Principles and Practice 3rd ed.* (Harrison and Sons Ltd.: London, 1905), 286.

mountain operations doctrine is dated 1979, both the US Army and the USMC have significantly modernized their keystone mountain operations doctrinal manuals.[5]

A comprehensive understanding about why Canada needs to develop a true mountain operations capability requires an understanding of a number of aspects of the issue. First: an understanding of the definition of mountain terrain which helps to explain why a degree of specialization is necessary. Second, a comparison of allied doctrine of mountain operations with an emphasis on U.S. doctrine, informed as it is by recent American involvement in Afghanistan which has resulted in revisions and modernization to their doctrine. This will by necessity examine Canadian training doctrine and the CA as an institution's view of what it wants to be able to do in the future as this vision will inform doctrine. Third, a historical overview of how armies have operated in mountainous terrain. With this understanding it will then be possible to understand where the Canadian Army lies in terms of its capacity to operate in mountainous terrain and why this capacity is a necessity, not a luxury. When referencing the Army, this paper addresses a capability possessed by the conventional army as distinct from SOF.[6] This does not at all suggest that SOF do not or cannot operate in mountainous terrain, but given the scarcity of SOF assets and the importance of it, a mountain warfare capability must reside in the conventional army.

[5] United States, Department of the Navy, Marine Corps Warfighting Publication MCWP 3-35.1 *Mountain Warfare Operations* (Washington D.C.: GPO, 2014); and United States, Department of Defence, U.S. Army Field Manual FM 3-97.61 *Military Mountaineering* (Washington D.C.: GPO, 2002). It should also be noted that these are core manuals only and there are a variety of additional manuals which will be identified elsewhere in this paper.

[6] Given security matters SOF operations in mountainous terrain are generally classified, although two recent published books justify the conclusion that even SOF are not immune to the challenges of mountainous environments. See Malcolm MacPherson, *Roberts Ridge: A Story of Courage and Sacrifice on Takur Ghar Mountain, Afghanistan*, (New York: Random House, 2006); and Mitch Weiss and Kevin Maurer, *No Way Out: A Story of Valor in the Mountains of Afghanistan*, (New York: Caliber Books, 2012) [Kindle edition].

Finally, a note on terminology. Throughout Canadian doctrine the term "mountain operations" is used, whereas allied doctrine uses a variety of terms including "military mountaineering", "mountain warfare" and the more perplexing "mountain warfare operations". For purposes of this paper the term "mountain warfare" is used to describe actual warfighting in mountains terrain which is best considered as a sub-set of the larger descriptor "mountain operations" which can encompass any variety of operations.

An analogous situation was set out by Cole Petersen with respect to amphibious operations.[7] The author identifies a number of sub-classes under the larger umbrella of amphibious operations, of which amphibious assault is only one.[8] With respect to the utility of the assault he notes, "[i]f amphibious raids, demonstrations or withdrawals are to be legitimate military operations, then the capability to conduct an amphibious assault must exist. Defenders won't fear an amphibious force afloat if they know they can repel the landing."[9] Similarly, an army's ability to climb mountains and traverse complex terrain is of little threat if those skills cannot be used to wield a capability that can be used to impose the nation's will on an enemy in that environment.

In his paper advocating for an enhanced military mountaineering capability, Sgt. Mike Gauley noted the then recent list of operations conducted by the Canadian Army as well as a predictive list of those which it could be called upon to execute.[10] Gauley noted that in 2002 the Canadian Army executed Op ANACONDA in Afghanistan as an expeditionary mission which required mountain operations considerations, and domestically completed Op GRIZZLY which

[7] Cole Petersen, "Over the Beach: The Enduring Utility of Amphibious Operations," *The Journal of Military Operations*, Vol 2, Issue 4, Fall 2014; TJOMO.com, Internet; accessed December 3, 2014.
[8] *Ibid*., 22.
[9] *Ibid*., 23.
[10] Mike Gauley, "Complex Terrain and the Canadian Forces Mountain Operations," *Canadian Army Journal,* Volume 6, No. 1, (Spring 2003).

was the Army's assistance to the G7 summit which involved, "… terrain analysis, mountain hazards, common mountain miseries, mountain rescue, effects of altitude on helicopter operations, OP selection in mountainous terrain, rappelling, and fixed lines."[11] Further types of operations which Gauley posited were likely mountain operations, or operations requiring a degree of expertise in some aspect of military mountaineering, included Search and Rescue, Assistance to Law Enforcement Agencies and Non-Combatant Evacuation.[12]

Finally, the purpose of this paper is not to detail tactics of Tables of Organization and Equipment for a mountain warfare capable land force. It is, rather, to argue that a mountain warfare capability is a valuable capability, that this capability has historical evidence to support its utility, that warfare in mountainous terrain is a realistic probability and that the appropriate formation in which to vest the Canadian Army's mountain warfare capability is within the army's light infantry battalions at the sub-unit level.

[11] Gauley, *Complex Terrain*…,18.
[12] *Ibid*., 18-19.

THE CURRENT CANADIAN ARMY

Before arguing that the CA needs a true mountain warfare capability, we must first examine the current state of the CA. The army, at its simplest, is the force which must fight on land,

> The Canadian Oxford Dictionary defines an army as "an organized force armed for fighting on land." For a nation state, an army is a group of citizens made up of both regular and reserve components trained, organized and equipped to fight on land for national interests as determined by the duly elected government. Central to its *raison d'être* is the primary function of conducting combat or warfighting.[13] [empasis added]

The Resource Dilemma

Any military has to asses future threats against which to assign resources; no army would concede that it has sufficient resources to allocate to every possible threat in part for the simple fact that not all threats can be foreseen so absent a limitation of resources, an army would prudently have the full capacity to engage all potential threats.

Any professional army should be caught between having established doctrine to guide how it can currently fight and looking to the future to determine how it will have to fight. With respect to mountain operations, we can look at both current doctrine describing how land operations are to be conducted as well as those strategic documents outlining army transformation to see whether a mountain operations capability is recognized as likely to be needed in the future. If so, this would suggest that if a capability is recognized then the capacity to actually fight in mountainous terrain must follow. In contrast, in the perpetual balance of

[13] Department of National Defence, *Land Operations 2021: Adaptive Dispersed Operations. The Force Employment Concept for Canada's Army of Tomorrow* (Kingston, ON: Directorate of Land Concepts and Design, 2007), 7.

resource allocation if there is no realistic expectation that the Canadian Army will have to conduct warfare in mountainous terrain then it may well be inefficient to allocate training resources to any type of mountain operations training. The more important part is that while the Army must be able to operate along a broad spectrum of conflict, it exists to conduct combat. This highlights the difference between mountain operations and mountain warfare. As mentioned earlier, while mountain warfare is a type of operation, possessing some capability to operate in mountainous terrain does not amount to an ability to wage combat.

The current Army Strategy, *Advancing with Purpose* outlines three key characteristics which it defines as essential to establishing the Army's core competencies and two are applicable to this discussion:

> …..
>
> The Army is an **adaptive and agile** force, capable of being deployed by a variety of means, rapidly responding to domestic, continental and international threats in complex environments; and
>
> The Army is a **medium-weight** force, reinforced with armour capabilities, capable of **leading and sustaining complex land-based operations**, up to divisional level, across the full spectrum of operations.[14] [emphasis in original]

The key qualifier is that the CA will be a medium-weight force. While not precisely defined, taken in conjunction with the fact that such a force will be "reinforced with armour capabilities" suggests that it is an infantry-centric army, which would also be related to the force being deployable "by a variety of means". Others have commented that an infantry-centric army, or at least infantry-centric Task Forces on recent deployments is neither unique to Canada nor

[14] *Advancing with Purpose*…, 10.

based on bias but rather proven operational effectiveness.[15] Further discussion on "medium-weight" lists certain implications of the term including that a medium-weight force will be relevant, meaning effective, rapidly deployable and sustainable and that it will be highly mobile and agile.[16] *Advancing with Purpose* goes on to state,

> [i]n order to fulfill its assigned missions in the future security environment, the Canadian Army must be a multi-purpose force, largely homogeneous but including critical enablers that permit it to perform successfully at the more extreme limits of combat and stability operations.[17] [emphasis added]

Homogeneity is an interesting term with significant connotation given that the army is one based around the Unit and combined arms Unit as the basic building block.[18] Since the army is and will be a medium-weight force, that suggests primarily a mechanized, light-armoured force.[19] If homogeneity were paramount, such a doctrine risks either not having an established and deployable mountain warfare capability or relegating such a capability to the domain of a small centre of excellence. Gauley suggests as much as one course of action to maintain and enhance the Canadian Army's military mountaineering institution.[20] As will be mentioned later, the British Royal Marines Commando's mountaineering centre of excellence saw operational experience in the Falklands Campaign, so such a suggestion is not entirely without merit.

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[15] James L'Heureux, "The Readiness Dilemma: Being Ready For Tomorrow Today," (Toronto: Canadian Forces College Command and Staff Paper, 2013) 45-47.
[16] Department of National Defence, *Designing Canada's Army of Tomorrow: A Land Operations 2021 Publication,* (Kingston, ON: Directorate of Land Concepts and Designs, 2011), 44-45.
[17] *Ibid*., 46.
[18] *Ibid.*, 42. The doctrine states that the Army of Tomorrow's primary focus shall be the battle group within a joint formation context, 42.
[19] *Ibid*., 44. Implicit as a force which must be capable of operations across the full spectrum of operations.
[20] Gauley, *Complex Terrain*…, 16-17.

Light Infantry

Given that homogeneity is not the paramount consideration in the make-up of the land force, premised as the word is by the adjective, "largely", this should allow for the smooth intellectual transition from an army comprised of three identically structured Light Armoured Vehicles (LAV) (or similar future armoured fighting vehicle) battalions per regular force infantry regiment to a structure which sees the third battalion of each regiment as a "light" battalion on a doctrinal basis, and not simply by default due to shortages of vehicles and equipment. The existence of regular force light infantry battalions has posed some difficulty for the Army since their inception.

This discussion seems particularly relevant given the institutionalized fence-sitting which accompanies the Army's light infantry units. As one author noted,

> Since the creation of the three light infantry battalions (LIBs) of the Regular Force in 1996, there has been an enduring lack of a holistic Force Employment Concept for the battle groups (BGs) that are formed upon them. The Canadian Army trend is that LIBs re-role to become mechanized units and backfill into mature theatres. That goes against the natural role of light forces, which is rapid deployment on terrain that inhibits the manoeuvre of mechanized forces and their integral transport.[21]

While the author focuses on an airborne capability, the essential nature of the light infantry unit remains the same. Lt.-Col. Lockhart argues that a parachute infantry company per light infantry battalion with additional companies able to follow on is the appropriate force structure required for a joint theatre entry capability and as will be seen, the same level in each of the three light infantry units would provide sufficient resources to maintain a true mountain warfare capability, provided those sub-units were appropriately trained.

[21] Paul A. Lockhart, "Light Forces For Rapid Deployment and Theatre Entry," *Canadian Army Journal* Vol. 14, No. 3 (Fall, 2012), 85.

The obvious resting place for any mountain capability rests primarily within these light battalions and such a capability certainly fits the description of being at the "extreme limits" of operations. While complexity of operations is often used to describe the continuum of warfare across the spectrum of conflict, it could also be applied to the terrain in which an army must operate.

Given the need to maintain a maximum degree of flexibility Canada does not possess a large enough army to specialize by investing the entirety of its mountain operations capability within a single battalion. In fact Canadian force development policy explicitly states that it cannot be "a specialized or 'niche' force" but goes on to state that it will be "largely homogeneous, but includes the critical enablers that permit it to perform successfully at the more extreme limits of combat and stability operations."[22] This balance is best struck by sub-units with demonstrated mountain warfare capability embedded within each light infantry battalion.

Vesting a true mountain warfare capability at the sub-unit level is justified by the focus on the sub-unit in both the army's current operating plan and more forward looking policy. The Canadian Army Operating Plan FY 15/16 reinforces that Level 5 combined arms training "has been critical to our success on combat operations over the past decade, and, despite not having an identified combat mission at this time, we must maintain these essential skills in order to maintain our abilities and credibility as a professional Army."[23]Further, others have noted that "… being ready for the next operation will not mean having formed masses ready to conduct operations of the future, rather it will require having smaller groups of forces (i.e. sub-units)

[22] *Designing Canada's Army of Tomorrow*, 46.
[23] Department of National Defence, *Canadian Army Operating Plan FY 15/16 v2*, 1-5/6.

trained and validated by live-fire and ready to execute operations."[24] This forecast has been borne out by our recent decade of experience in Afghanistan.

> As discussed earlier, it is the infantry sub-unit, which provides this balance of functionality on the battlefield since it possesses significant firepower, mobility and a basic level of sustainability. Recent operations provide ample evidence where infantry-centric BGs [Battle Groups] deployed overseas conducted solely sub-unit sized fights, and BG operations were nothing more than individual sub-unit actions that occurred in a BG area of operations.[25]

What seems clear, even if it is implied, is that the Canadian Army must, in pursuit of its Lines of Operations ("LOOs") be able to operate not merely in the theoretical complexity of modern operations, but in the territorial complexity where conflicts may arise. In specifically considering the design for its "Army of Tomorrow", the CA notes,

> Army of Tomorrow formations and battle groups will operate in both rural and urban environments, often simultaneously, and in virtually all terrain types including desert, mountain, jungle, wooded, savannah and arctic. Urban operations are expected to become increasingly frequent and will continue to pose the greatest challenges owing to their human, environmental and geographic complexities.[26] [emphasis added]

While it is beyond debate that urban operations pose unique challenges due to the three-dimensional nature of the battlespace, whether they are in fact any more complex than mountain operations due to that particular environment's challenges is debatable. David Kilcullen argues in *Out of the Mountains: The Coming Age of the Urban Guerilla* that future warfare will shift from remote and mountainous regions like Afghanistan to urban littoral areas simply because "wars happen where people live" and the population shift is from remote, rural areas to larger urban centres.[27] Despite this central thesis he still concedes,

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[24] L'Heureux, *The Readiness Dilemma…*, 85.
[25] *Ibid*., 86.
[26] *Designing Canada's Army of Tomorrow*, 19.
[27] Kilcullen, *Out of the Mountains.*

> Mountain warfare, with its extreme demands on troops and equipment, is also far from a thing of the past: mountain campaigns will most certainly happen again. Specialist mountain troops (such as France's outstanding Chasseurs Alpins, who so distinguished themselves in Afghanistan), light infantry (such as the American 10th Mountain Division), and airborne (parachute) or air assault (helicopter-borne) forces will remain essential because of their ability to infest a landscape, move quickly across broken and complex terrain, engage with a population, and get right up close and personal with a determined enemy.[28]

In the absence of specialized mountain troops on the lines of France's Chasseurs Alpins or the Italian Alpinieri, or dedicated airborne or air assault units, light infantry alone amongst the forces listed by Kilcullen is the most appropriate nesting ground for a mountain warfare capability.[29]

Regardless of the physical environment in which a land force finds itself, "[s]oldiers must be physically and mentally prepared to deal with the unique and arduous challenges imposed by this aspect of the operating environment."[30] As will be discussed in more detail later, mountain warfare requires a degree of physical fitness, individual soldier skills and an understanding by leaders which does not easily translate from mechanized forces. However given resource limitations which the CA faces it should be acknowledged that the development of a true mountain capability cannot realistically be done at the unit level. The competing interests of airborne, amphibious, jungle and desert training are cited as a reason why light forces must be jacks of all environments and masters of none. However, as will be argued, mountainous terrain is a capability that can be achieved within the current force structure and is of far more utility

[28] *Ibid*.
[29] Stephen Bull, *World War II Winter and Mountain Warfare Tactics* (Oxford: Osprey Publishing Ltd., 2013) [Kindle edition], Introduction. The authors note that the Chasseurs Alpins date back to the 19th century.
[30] Department of National Defence, B-GL-300-001/FP-001 *Land Operations* (Ottawa: DND Canada, 2001), 2-2.

than the other competing environments. Others have argued that some of these competing interests are without need.[31]

Capabilities

Much as the old adage about real estate being about three things: location, location, location, then-Secretary General of NATO Lord Robertson declared that defence transformation was about "[c]apabilities, capabilities, capabilities."[32] Although used throughout this paper to date, a precise definition of "capability" is useful to refine the issue. Capabilities are the effect that can be achieved through the use of people, money and assets.[33] The Canadian Army has seen fit to describe the issue as, "Capability. The ability (power) to accomplish something (composed of people, process, equipment and training)."[34] Nor are all assets created equal; some which are more technological in nature, that is leaning towards the money and asset aspects, can require less of an investment of people. By contrast, others, such as a mountain warfare capability it is argued, "… must be nurtured and developed over time. Furthermore, they are not merely achieved 'once and for all'; or they are not maintained, they can atrophy and may even disappear."[35] Gauley notes that skill fade at advanced levels is an issue both in terms of atrophy of existing skills and the need to maintain current or ongoing innovations in technical skills.[36]

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[31] See for example Andrew R. Jayne, "The Future of Canadian Airborne Forces," (Toronto: Canadian Forces College Command and Staff Paper, JCSP 33), 63, where the author states, "Despite the emotion, the tradition, political manoeuvring or the wishful extrapolation of possibilities, Canada does not need airborne forces."
[32] Christopher Ankersen, "Capabilities and Capacities" in *Transforming National Defence Administration*, ed. by Douglas L. Bland, 11-18. (Kingston, ON: School of Policy Studies, Queen's University, 2005), 11.
[33] *Ibid*., 12.
[34] *Designing Canada's Army of Tomorrow*, 89.
[35] *Designing Canada's Army of Tomorrow*, 89.
[36] Gauley, *Complex Terrain*…, 12. As one example, the Army Training Authority recently released a Safety Advisory indicating significant changes in qualifications and equipment permissible to conduct rappelling for conventional forces. See 4500-1 (COS ATA) *Safety Advisory Technical Safety Notice for Rappel Equipment and Training in the Canadian Armed Forces*, 29 January 2015.

Capabilities are only achieved through training and a mountain warfare capability is no different than any other. The issue in this instance, however, is that there is a significant institutional investment already paid out for the development of a degree of mountain operations skills through Individual Training courses and the expertise vested in the Canadian Army Advanced Warfare Centre. How useful those courses and skills are towards legitimate mountain warfare capability remains to be seen.

MOUNTAIN SPECIFICITY AND DOCTRINE

What is Mountainous Terrain?

What defines "mountainous terrain"? Even within this simple-sounding category there are a myriad of variables. "Soil composition, surface configuration, elevation, latitude, and climatic patterns determine the specific characteristics of each major mountain range."[37] The main defining criteria, however, is elevation. Canadian doctrine defines mountainous terrain as, "… country which is at least 600 metres in height, and which is characterized by steep slopes and deep valleys."[38] U.S.M.C. doctrine is more nuanced, dividing mountainous terrain into six levels depending on altitude and stating:

> In general, low mountains have an elevation of 305 to 914 meters (1,000 to 3,000 feet) with summits usually below the timberline. High mountains usually exceed 914 meters (3,000 feet) and are characterized by barren alpine zones above the timberline.[39]

U.S. Army doctrine, however, provides yet a third definition more in line with Canadian doctrine as, "[m[ountains are land forms that rise more than 500 meters above the surrounding plain and are characterized by steep slopes. Slopes commonly range from 4 to 45 degrees."[40] While definitions may vary, what is clear is that while altitude is the main criteria for doctrinal purposes, as historical examples will show the complexity of terrain and therefore the difficulty of operating within it is by no means limited only by altitude. The US Army's definition which includes a reference to slope angle provides a good warning to those who would restrict their terrain analysis to altitude.

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[37] United States, MCWP 3-35.1 *Mountain Warfare Operation*s, 1-5.
[38] Department of National Defence, B-OG-302-005/FP-001 *Specific Operations, Vol. 5 Mountain Operations* (Ottawa: DND Canada, 1976), Chap. 1, para 5.
[39] United States, MCWP 3-35.1 *Mountain Warfare Operations*, 1-5.
[40] United States, FM 3-97.61 *Military Mountaineering*, 1-1.

Having identified that mountainous terrain is a distinct type of environment, the next logical question might be, "So what?". If it's an environment in which the army is unlikely to operate the logical conclusion might be that it is unwise to expend precious resources specializing in such a capability. Mountainous terrain, however, is a fixture on every continent. Domestically, the Rocky Mountain Range comprises roughly one-quarter of Canada's land mass.[41] Outside North America,

> The Andes stretch as a continuous narrow band along the western region of South America. Narrower than its counterpart in the north, this range is less than 805 kilometers (500 miles) wide; however, it continuously exceeds an elevation of 3,048 meters (10,000 feet) for a distance of 3,218 kilometers (2,000 miles).
>
> The Eurasian mountain belt includes the Pyrenees, Alps, Balkans, and Carpathian ranges of Europe. These loosely linked systems are separated by broad, low basins and are cut by numerous valleys. The Atlas Mountains of North Africa are also a part of this belt.
>
> Moving eastward into Asia, this system becomes more complex as it reaches the extreme heights of the Hindu Kush and the Himalayas. The Himalayas stretch over more than 2,414 kilometers (1,500 miles) and contain 9 of the 10 tallest peaks in the world. Just beyond the Pamir Knot on the Russian-Afghan frontier, this range begins to fan out across all parts of eastern Asia.[42]

It should come as no surprise, then, that as mountain ranges are a feature of so many countries, many armies have devoted considerable effort into creating actual expertise in mountain operations forces. Looking back to the CA's stated core competency of being able to respond to international threats in complex environments and acknowledging the prevalence of mountainous terrain it follows that mountain warfare capability is very likely to be of use in the future. Whether political considerations would permit the deployment of such a capability remains an issue of prophecy but as it is the CA's mandate to respond, the capability must exist.

[41] United States, MCWP 3-35.1 *Mountain Warfare Operations*,1-3.
[42] *Ibid*.

The ubiquity of these types of geological formations is in itself insufficient to answer why Canada should devote precious resources and a degree of specialization required to ably conduct military operations there. No less an icon of military theory than von Clausewitz addressed the importance of command of the heights in *On War* in his chapter entitled "The Command of Heights".[43] As von Clausewitz succinctly puts the crux of the issue: "[t]he occupation of high ground can thus mean genuine domination. Its reality is undeniable."[44] The practical reality is that a force cannot occupy every height, and ultimately a height can often be dominated from a neighbouring height, making the control of peaks essential to allowing movement, let alone fighting. This results in a dispersion of forces causing an enhanced reliance on sub-unit and platoon sized formations to operate independently. French doctrine notes that mountainous terrain,

> …requires the forces to fight in isolation, even if they are geographically close together "as the crow flies". Two units engaged in two parallel valleys, separated by an impassable peak, may be considered to be neighboring units in contact within a conventional maneuver, but in fact any physical contact, even by radio, will be impossible. Against this background, decentralization is required by the combined effects of the relief and the climate conditions which fracture and wall off detachments down to the smallest level.[45]

This requires a force both experienced in moving and fighting in this terrain as well as with access to soldiers with a very high degree of specialization in technical climbing. How then is such a force made, for the argument remains that such forces are deliberately made through appropriate resourcing and training, not created in a time of need.

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[43] Carl von Clausewitz, *On War*, ed. and trans. Michael Howard and Peter Paret (Princeton: Princeton University Press, 1984), 352-354.
[44] *Ibid*., 354.
[45] France, Ministiere de la Defense et des Anciens Combattants, EMP 23. 431 *Doctrine D'Emploi des Forces Terrestres en Zones Montagneuse* (Paris: Centre de Doctrine D'Emplie de Forces, June 2010), 21.

Mountain Training

Only those unfamiliar with the realities of operating in mountainous terrain would characterize the issue as simply one of using conventional forces and having them adapt to this environment. In order to truly be able to operate in mountainous terrain, achieve freedom of movement and deny the same to the enemy, formed organizations require degrees of specialization. This specialization spans a spectrum ranging from highly trained individuals who are subject matter experts able to advise commanders down to basic skills required of every soldier operating in the environment. The spectrum of specialization has been approached differently by different armies but all agree that mountainous terrain requires specific study and skills. This is particularly true at small-unit levels as the small size of mountainous forces likely to be mustered can still achieve results out of proportion to their numbers.

> Mountain terrain is difficult, movement is slow and the hazards to health and physical well being are significant and constant. Combat at high altitude is a historical constant and a contemporary fact. It cannot always be avoided. Training for mountain combat is not simply light infantry training. Special training and acclimatization is necessary.[46] [emphasis added]

Training has a very specific role; as with the earlier consideration of allocation of resources writ large, training exists to prepare for operations, so if there is no required operational capability there should not be a precursor allocation of training resources. Instructor billets, student time devoted away from other tasks, supporting school staff such as standards and time devoted to assessing ongoing training in addition to outright money and consumables are finite resources which must be justified. As noted in *Designing Canada's Army of Tomorrow*, "[t]raining is classified as individual—to produce soldiers able to execute specific functions

[46] Lester W. Grau and Hernán Vázquez, "Ground Combat at High Altitudes" in *Mountain Warfare and other Lofty Problems: Foreign Perspectives on High-Altitude Combat* (Fort Leavenworth, KS: Foreign Military Studies Office, 2011), 12.

within a collective entity—and collective—to forge complete capabilities."[47] The issue this raises is, if as argued there does not exist a true mountain operations capability in the CA, how can one explain the significant training output with respect to mountain skills. Mountain climbing skills may be a component of establishing a mountain operations capability, but whether the current training system establishes a mountain warfare capability is suspect and it would be untenable to sustain the various courses and qualifications if they do not build towards a useable capability.

Here we will look at those aspects of training, particularly those set out in the keystone doctrinal document *Training for Land Ops*.[48] Some of the considerations for the development of a mountain operations capability include individual training (IT), collective training (CT) and access to adequate training areas. While the current Army Operating Plan acknowledges the need to allocate resources appropriately between IT, CT and Professional Military Education (PME) this only serves to highlight that all three, not just IT is required.[49] Canadian Mountain Operations doctrine is woefully lacking in this regard, with a scant three pages devoted to the type of individual and collective training necessary to successfully conduct mountain operations.[50]

Individual Training

IT is defined as the training that imparts, "…skills and knowledge to, and inculcate attitudes in, individual soldiers for the conduct of land operations and to perform their duties in a LF unit. These activities normally result in a qualification being conferred upon the member."[51]

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[47] *Designing Canada's Army of Tomorrow*, 51.
[48] Department of National Defence, B-GL-300-008/FP-001 *Training for Land Operations* (Ottawa: DND Canada, 2010) 5-1.
[49] *CA Op Plan FY 15/16 v2*, 1-6/6.
[50] B-OG-302-005/FP-001, *Mountain Operations,* Chapter 10, Section 1.
[51] *Training for Land Operations*, 5-1.

There are three levels of mountaineering qualifications available to members of the CA: Basic Mountain Operations ("BMO"), Complex Terrain Instructor ("CTI") and Advance Mountain Operations ("AMO"). While the BMO can be run as a course on a de-centralized basis, the Canadian Army Advanced Warfare Centre ("CAAWC") oversees the CTI and AMO courses.[52] The ultimate qualification offered within the CA IT system is that of AMO which qualifies an individual to instruct on all three levels of courses and requires the largest training time and associated allocation of resources.

What can be gleaned from even a cursory review of the Training Plans for each of the three mountain courses is that despite stated doctrine, the CA is exclusively concerned with what might be termed military mountaineering, that is, with mobility through mountainous or complex terrain. The BMO deals primarily with an individual's ability to move through mountainous terrain and the ability to construct installations under supervision.[53] The biggest contribution a BMO qualified soldier can make is that he exists to provide a pool of qualified personnel to draw from for subsequent, more technically demanding courses.

On the more advance ends of the spectrum CAAWC runs the CTI and AMO courses, which have undergone some modification in recent years and are governed by the same Training Plan.[54] CTI has arguably the greatest contribution to a capability as that is the level where a soldier is qualified to act as an advisor for an infantry sub-unit on mobility through complex or mountainous terrain.[55] AMO, in comparison, is a very technical course which provides specific

[52] CAAWC was formerly the Canadian Forces Land Advanced Warfare Centre ("CFLAWC") and in its prior incarnation was the Canadian Parachute Centre.
[53] A-P9-004-SCF/PH-B01 *Training Plan - Basic Mountain Operations* (13 June 2013).
[54] A-P3-002-SCG/PH-B01 *Training Plan - Advanced Mountain Operations* (22 August 2014). Module 1 is the Complex Terrain Instructor's qualification with Module 2 consisting of Advanced Mountain Operations Advanced Military Rock Climbing and Module 3 consisting of Snow and Ice Climbing.
[55] *Ibid*., Performance Objective 409 requires a student to complete a complex terrain annex both to and within mission orders.

alpine qualifications but is also the qualification with the greatest technical capability and experience in the full spectrum of mountainous terrain.

Regardless of all three courses, what may come as a surprise is that none of the courses are run in the winter, nor do they have a winter component. Given the considerations of weather as applicable to mountainous terrain, and coming from a country in which the core Army mandate is defence of Canada, it strikes as odd that this skill would not be further adapted to terrain most likely to be found in the country. As a rule many other nations either treat winter/arctic operations as going hand-in-hand with mountain operations or at a minimum complementary.[56]

On an individual level, acclimatization to altitude and physical challenges is required to a degree unmatched in any other operating environment. Physical fitness alone does not guarantee a soldier's ability to operate at high altitude.[57] An already fit soldier requires two weeks of acclimatization as a general rule, during which time conducting operations would only occur to a greatly reduced degree.[58] The Pakistani Army, which has an enormous institutionalized mountain warfare capability acclimatizes its forces over a seven week period, gradually introducing them to higher and higher elevations.[59] Their Army High Altitude School in Rutta provides a training area offering peaks of up to 19,000 feet.[60]

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[56] For example the British Royal Marines Centre of Excellence for Mountain training is the Mountain and Arctic Warfare Cadre.
[57] Muhammad Asim Malik, "Mountain Warfare - The Need for Specialized Training," *Military Review*, September-October 2004, 94.
[58] Grau and Vázquez, "Ground Combat at High Altitudes", 4.
[59] *Ibid*.
[60] Pakistan Army, "Army High Altitude School," https://www.pakistanarmy.gov.pk/AWPReview/TextContent.aspx?pId=287&rnd=491; Internet; accessed June 10, 2014. As a testament to the challenge of the High Altitude School for even soldiers of the caliber of the US Special Forces see John Clearwater, "Above and Beyond," http://pakdef.org/above-and-beyond/; Internet; accessed June 3, 2014.

During its formation in World War II, the U.S. 10th Mountain Division suffered more casualties during its initial training period to weather-related issues than it suffered during actual combat operations in Italy.[61] Despite the risk of the environment and the significant training cost associated with producing true mountain soldiers, the effects which can be achieved by properly trained soldiers is perhaps more disproportionate in mountainous terrain than in any other operating environment. Commenting on one particular action in World War I in the Italian campaign, Erwin Rommel successfully used "a few riflemen at the ravine exit was sufficient to halt an entire division."[62] In the cost-benefit analysis such a recommendation would argue for properly trained soldiers.

Compared to the variety of IT courses offered by the US Army one can see that the variety of courses both expand on mobility considerations as well as deal with the conduct of warfare itself in mountainous terrain. The adage that at the individual level an infantry soldier must be able to "shoot, move and communicate" is no truer than in mountainous terrain, yet the current Canadian Army IT system only addresses movement. It is highly questionable whether an army which does not even address marksmanship in complex terrain is paying anything more than lip service to its mountain operations capability. Marksmanship in mountains is markedly different than what soldiers are used to based on current conventional ranges; "[f]irst off, it is much harder to determine range in the mountains, second, if you shoot uphill or downhill using flat-land marksmanship techniques, you will shoot over the target every time. Third, the wind, the temperature and the humidity is different in the mountains — and all play havoc with normal

[61] Malik, "Mountain Warfare…", 94.
[62] Erwin Rommel, *Infantry Attack*s (Minneapolis: Zenith Press, 2009), 260.

flat-land ballistics."[63] In contrast, the vast majority of small arms ranges are on known-distance flat terrain suitable for the Personal Weapons Test Level 3 which requires a run-down. Even within the Canadian Army's dated mountain operations doctrine there are several marksmanship aspects identified. The difficulty is that Canada lacks a suitable training area in which to conduct such training.

As mentioned, Canada focuses on the "move" aspect of mountain operations with three ascending courses. While the US Army also maintains that aspect of mountain operations, they provide training of more general applicability to a fighting force including a Mountain Warfare Orientation Course which does not grant a course qualification but rather is intended as a form of introduction to the complexities of operating in mountainous terrain; Rough Terrain Evacuation Course which includes non-standard platform CASEVAC (casualty evacuation) and was identified as a training need from Op Enduring Freedom; Mountain Rifleman Course which addresses marksmanship in mountains terrain; and Mountain Planner Course aimed at sub-unit commanders, platoon commanders and battalion level planners so that those planning and leading operations in mountainous terrain better understand the key considerations without having to conduct the technical and tactical level training of military mountaineering.[64]

Collective Training

However, in order to have a true capability, units must train as they will fight. The Canadian Army has specified Training in Specific Environments ("TSE") for airborne, jungle,

[63] Lester W. Grau, "Small Arms Fire," in Lester W. Grau and Charles K. Bartles, eds. *Mountain Warfare and other Lofty Problems: Foreign Perspectives on High-Altitude Combat,* (Foreign Military Studies Office: Fort Leavenworth, KS, 2011) http://www.dtic.mil/dtic/tr/fulltext/u2/a549118.pdf; Internet; accessed February 21, 2014.
[64] Perscom with LTC Justin Davis, USA and former Commanding Officer of the USAMWC and also Army Mountain Warfare School briefing dated 7 February 2013.

amphibious and mountain skills.[65] This is achieved through designating sub-unit tasks to various Divisions as a lead, with platoons having supporting tasks. This spreads the costs of these specialized training to primary companies, with the ability to draw upon a complimentary platoon from another Division. However, what the sub-units lack is the opportunity to achieve identified collective Battle Task Standards, that is, train in their identified environment as a formed, cohesive sub-unit. This violates the key principle of "train as you fight".[66]

From a collective training point of view, a mountain warfare capability requires, at a minimum, a training area suitable for such forces to practice.[67] The reality is that Canada does not possess a military training area suitable to conduct mountain operations collective training although the Centre of Excellence is established within CAAWC in Trenton, ON. The U.S. Army's Mountain Warfare School, is located in Jericho, Vermont with an elevation of only 560 feet, while the U.S.M.C. Mountain Warfare School ("USMC MWS") is located in Bridgeport, California, at an elevation at 9,000 feet.[68] The USMC MWS is specifically identified as the Primary Training Venue for the Mountain Operations capability.[69] NATO has recently established a NATO Mountain Warfare Centre of Excellence ("COE") in Slovenia.[70] That our allies have devoted resources to establishing training areas which allow for manoeuvre forces to achieve some degree of specialized training suggests that true mountain operations cannot be

[65] *CA Op Plan 15/16 v2*, Chapter 3, Annex B, Appendix 2. The primary task is identified to be at the sub-unit level and has been tasked to 3rd Cdn Div, with a support task to the PRes within 5th Cdn Div.
[66] *Training for Land Operations*, 1-10. This principle is further sub-divided into five guidelines train realistically, train for Full Spectrum Operations and train as a team.
[67] Malik, "*Mountain Warfare…"*,100.
[68] *Ibid*.
[69] *CA Op Plan 15/16 v2*, Chapter 3, Annex B, Appendix 2.
[70] NATO, "NATO Mountain Warfare Centre of Excellence Memorandum of Understanding Signing Ceremony," http://www.act.nato.int/nato-mountain-warfare-centre-of-excellence-memorandum-of-understanding-signing-ceremony; Internet; accessed April 2, 2015. The current COE was built on the former Slovenian mountain school which intermediately became the Mountain Warfare Multi-National COE.

undertaken with any degree of skill by amateurs and the capability, if it is to be pursued, achieved and maintained, is deserving of the appropriate level of resources.

At the tactical level it is often said that the core skills of infantry soldiers boils down to: shoot, move and communicate. Canadian doctrine defines the operational functions as: Sense, Act, Command, Sustain, Shield.[71] At both levels, all skills and functions are degraded in mountainous terrain which provides serious incentive to train in the environment. The particularities of mountainous terrain mean that mobility is greatly impeded, offering advantages to movement of dismounted or light infantry, with corresponding disadvantages of difficulties in sustainment of these same forces. Reliance on helicopters is often a critical mobility enabler, but also requires additional expense for a military and turn true mountain operations into joint operations. Neither rotary-wing nor fixed-wing assets are panaceas, however, as these are subject to the large variations in weather patterns found in mountainous terrain. Such weather variations include: visibility, wind velocity, precipitation, temperature and atmospheric pressure.

Operating as a formed organization requires that commanders understand how to actually manoeuvre the trained forces in the terrain as well as the challenges inherent to the environment. Certain key fundamentals of operating formed units in mountainous terrain include "[s]eize and hold the ridges, and you command the valleys. Strike with speed and deception at the enemy's lines of communication and supply, and prevent him from taking the passes."[72] Similarly, others have noted that "[m]ountain combat is decentralized and often takes place at the platoon or squad level. The quality of junior leadership is decisive."[73] It only follows logically then that leaders be

[71] *Land Operations*, 4-18.
[72] A.B. Feuer, *Packs On! Memoirs of the 10th Mountain Division* (Westport, CT: Praeger Publishers, 2004) [Kindle edition], Chapter 1.
[73] Malik, "Mountain Warfare…", 96.

given the opportunity to train in formed platoons and sub-units in order to gain a fuller understanding of how their formations will operate in the mountainous environment.

One particularly noticeable difference between US and Canadian doctrine is the US acknowledgement of the importance of small units in mountainous operations. Both the US Army and USMC have published documents specifically dealing with small unit operations in this environment, which Canada has not.[74] More appropriately, the manuals do not focus solely on movement in this terrain but also how the conduct of warfare is affected. The Army's manual recognizes that, "A disciplined and prepared Infantry rifle company that is task-organized with and supported by the other members of the combined arms team is the key to successful small-unit mountain operations."[75] Preparation is not something that can be achieved without a sufficient investment of resources.

With the stated emphasis on Level 5 training as the vital ground to maintaining the Army's ability to retain its operational relevance, it is even more apparent that designated infantry sub-units are the key to a Canadian Army mountain warfare capability and that they be trained at this level. To take just one example, the use of artillery in mountains environments is both technically challenging on its own but creates further complications when incorporated as part of the combined arms team.[76] Major Joseph Jackson has written that in Afghanistan the US Army's use of artillery was in many ways self-limited despite the critical effects it can generate

[74] United States, Department of the Navy. Marine Corps Reference Publication MCRP 3-35.1A *Small Unit Leader's Guide to Mountain Warfare Operations* (Washington D.C.: GPO, 2013) and United States, Department of Defence U.S. Army Tactics, Techniques, Procedures ATTP 3-21.50 *Infantry Small-Unit Mountain Operations* (Washington D.C.: GPO, 2011).
[75] United States, *Infantry Small-Unit Mountain Operations*, 1-1.
[76] Grau and Vazquez, "Ground Combat at High Altitudes," 8. The authors note that due to the impact of weather on air and aviation, "Artillery remains the round-the-clock fire support system."

on the battlefield.[77] Deploying artillery units at an under-manned level, penny-packetting of guns to forward bases from which they are rendered static and limited use of platforms are all noted to be ways in which the artillery is rendered less than optimal. The same author has written elsewhere that the inefficient, to the point of ineffectiveness, use of artillery has created a weakness that the insurgents have noted and exploited; "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."[78] While mortars are a more portable indirect fire option, the Canadian Army is hampered by its lack of current light or medium mortar capability.

While only one example using this arm in a mountainous theatre requires not only that the artillery itself have proficiency in the environment, but that commanders understand the uses and limitations of it. This hold true for other members of the Canadian Army such as engineers, logistic and medics as each arm is impacted in its own unique ways by the environment. If Canada truly expects to operate a mountain capable force, CT must be viewed no differently than a conventional force.

[77] Joseph Jackson, "Moving Artillery Forward: A Concept for the Fight in Afghanistan," smallwarsjournal.com/blog/journal/docs-temp/397-jackson.pdf; Internet; accessed June 27, 2014.
[78] Joseph Jackson, "Howitzers on High Ground: Considerations for Artillery Employment in Southwest Asia," (Fort Leavenworth, KS: School of Advanced Military Studies, United States Army Command and General Staff College Paper, 2009), www.dtic.mil/get-tr-doc/pdf?AD=ADA513465; Internet; accessed June 27, 2014, 34.

MOUNTAIN OPERATIONS IN HISTORY

Having established that the Canadian Army recognizes, at least superficially, the validity of a mountainous terrain this may still not be sufficient to persuade that such operations are sufficiently common or unique to warrant specialization. A review of some mountain warfare examples further supports this argument.

Perhaps the most iconic story which even most children would recognize of warfare in the mountains is that of Hannibal's crossing of the Alps during the Second Punic War. While the legend has outgrown reality – to begin with all of Hannibal's war elephants died before reaching the battle at Cannae and there is no consensus amongst historians on where he actually moved through the Alps – there remain some nuggets of truth which can be mined to demonstrate some timeless concepts of operating in mountainous terrain.[79] First, Hannibal prepared for his passage by sending out emissaries to the Cis-Alpine Gauls, demonstrating an acknowledgement of the importance of the human terrain in mountainous land frequently peopled by defiant, independent tribes.[80] However, he also found himself on the receiving end of indigenous animosity when he was ambushed by tribesmen amongst the high Alps after being shadowed for days and led into canalizing ground where, although he was ultimately successful in fighting through the ambush, of the roughly 40,000 men Hannibal entered the trap with, "…only 65 percent would survive the week or so it took to reach the Lombard plain."[81]

Second, he demonstrated the importance of understanding and using the terrain itself. In demonstrating an awareness of climate as it relates to the opening of seasonal passes he timed his

[79] Robert L. O'Connell, *The Ghosts of Cannae: Hannibal and the Darkest Hour of the Roman Republic* (New York: Random House Inc., 2010), 68.
[80] *Ibid*., 93.
[81] *Ibid*., 102.

advance to ensure that he would be able to arrive at his goal.[82] He had the ability within his force not only to identify paths, relying on guides where possible, but also the equivalent of an engineering capability to force a new road, highlighting the importance of maintaining mobility commensurate with your force.[83]

Both more modern and more familiar to current forces, *Passing it On* was published as a form of *aide memoire* on fighting the tribal peoples as part of what was then called the North-West Frontier. The author, General Sir Andrew Skeen had vast experience in the North-West Frontier first deployed there in 1897 to face an uprising centred in what is now the Federally Administered Tribal Area ("FATA") of Pakistan.[84] He returned in 1916 and again in 1919 in the Third Anglo-Afghan War as a commander and fought in the Waziristan campaign, eventually becoming the Commander of the North-West Frontier District.[85] To be expected, some of his comments on culture are today distasteful and some of the tactics proposed, namely booby-traps, illegal, but his overall observations on the challenges of not simply operating in mountains but fighting mountain people in mountains remain constant.[86]

World War I

Although most associated with mechanized warfare in the Second World War General Erwin Rommel wrote about combat in mountainous terrain based on his experiences as the commander of a detachment the Württenberg Mountain Battalion during the First World War,

[82] O'Connell, *Ghosts of Cannae*…, 95.
[83] *Ibid*., 104.
[84] General Sir Andrew Skeen, *Passing it on: Fighting the Pushtun on Afghanistan's Frontier* (Fort Leavenworth: Foreign Military Studies Office and Maneuver Center of Excellence, 2011), xi.
[85] *Ibid.*, xiii.
[86] To the extent that this manual, first published in 1932 was re-published by the Foreign Military Studies Office, an open source research organization of the U.S. Army in 2010.

part of a larger organization of the Alpine Corps. Commanding his forces in mountainous terrain, particularly in the Carpathian and Italian campaigns, his *Infantry Attacks* provides numerous observations of the distinct nature of true mountain operations. In one particular instance in Romania in late 1916 Rommel was tasked to reach and hold Hill 1794 at an altitude of 5920 feet. He describes attempting to ascend to the peak in order to locate his soldiers who could not initially be located due to poor weather conditions. Despite arguments that the troops should be withdrawn from the peak, supported by the medical officer who warned of casualties due to altitude sickness and frostbite, the force was ordered to remain in place.[87] Disobeying orders, another officer moved the forces off of the peak where ninety percent of the soldiers required medical treatment due to frostbite and cold exposure. Rommel concluded, "The occupation of Hill 1794 (5920 [feet]) showed how high mountain weather can influence the efficiency and resistance of the troops, especially when the equipment is not suitable and complete, and supply fails."[88] More generally Rommel's observations lend credence to the requirement to seize and hold mountain peaks and tactically significant high ground in order to facilitate ongoing offensive freedom of movement. In accomplishing this, expertise in analyzing the terrain in order to find any advantage was critical. In one particular action in August 1917 Rommel noted,

> In spite of the enemy's superiority in number and armament, the Rumanians had numerous machine guns and mountain guns at their disposal, -the Rommel unit, by taking advantage of the smallest irregularity of the terrain, succeeded in capturing and defending the crest of the heights eleven hundred yards behind the hostile front. The enemy was thus compelled to vacate his positions opposite the 18th Reserve Infantry Regiment and the Württenberg Mountain Battalion during the night.[89] [emphasis added]

[87] Rommel, *Infantry Attacks*, 84.
[88] *Ibid.*, 85.
[89] Rommel, *Infantry Attacks*, 121.

This type of expertise can only come from soldiers and leaders experienced in movement in this type of terrain. Without valid CT and if left to the attempt to develop in the breach this earning carries with it a steep curve at a high cost.

One of the most difficult operations of Rommel's Romanian campaign involved the seizing of Mt. Cosna (elevation 788m) in August 1917. The approach involved movement both by night into a point where they could not be observed and an ascent by day during which some of the soldiers carried packs in excess of one hundred pounds.[90] By this point in the war the Romanians had made certain adaptations from earlier losses and used the terrain to better advantage. On the point of trained mountain forces, Rommel noted that "[o]nly with a unit accustomed to the strictest combat discipline could I dare to feel my way through the hostile combat outposts by day."[91] This means more than simply combat-tested soldiers, but soldiers trained to operate at a high level within the particular environment. Similarly for commanders, experience in this type of terrain was needed as the estimate process, particularly the calculations of time and space necessary for manoeuvre are more challenging than in other types of terrain.

By the time Rommel and his battalion moved to the Italian campaign they were exceedingly well experienced and achieved significant success. Considering his force's achievements, Rommel noted that "carrying heavy machine guns on their shoulders - they surmounted elevation differences of eight thousand feet uphill and three thousand downhill, and traversed a distance of twelve miles in an air line through unique, hostile mountain fortifications."[92] This adaption did not, and will not, come easily to a formed organization unless they are used to operating as a formed and cohesive unit, regardless of how fit they may be.

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[90] *Ibid.*, 133.
[91] *Ibid.*, 139.
[92] Rommel, *Infantry Attacks*, 225.

World War II

An examination of the US 10th Mountain Division in WWII provides an operational level example of mountain capability. Their history provides an overview of the dilemma faced by even large armies in committing forces to what are by their very nature specialized roles. Despite what would be a very rapid build up and specialization, the 10th Mountain Division would go on to operate successfully in the Italian Campaign, fighting in the more mountainous Western side of the country. It was ironically noted that Europe's "soft underbelly" as the Italian axis was commonly referred to was all mountains. As late as March 1942 both Airborne and mountain divisions existed only notionally.[93] In the following six months the U.S. Army established a number of special installations including the Mountain Training Centre.[94] This was not a foregone conclusion as there was significant debate with the Army itself as to the merits of over-specialization and misallocation of personnel and resources to divisions seen as less effective than traditional infantry divisions. LGen McNair, then Chief of Staff for Army Ground Forces was a vocal and avid opponent of specialization, citing that general training of divisions known to be required, such as mechanized divisions, suffered when formations engaged in "special training in amphibious, desert, mountain, airborne, assault and winter warfare. It is desirable that units receive such type of special training only when the special operations can be

[93] Greenfield, Kent Roberts, Robert R. Palmer and Bell I. Wiley, *United States Army in World War II. The Army Ground Forces: The Organization of Ground Combat Troops* (Washington DC: Historical Division of the Army, 1947), 278.
[94] *Ibid*., 340.

foreseen with reasonable certainty."[95] This is in essence the same argument against specializing Canadian light infantry sub-units, albeit on a much smaller scale.

It was not until June 1943 that authorization was given to form three light divisions, of which one was the 10th Light Division (Pack, Alpine), using primarily forces already at the Mountain Training Centre.[96] Initial validation exposed significant problems with generating sufficient ratios of fighting forces to administrative personnel, or in today's nomenclature "tooth-to-tail". The requirement to use division fighting personnel to move supplies greatly reduced the size of the fighting force. As a result of these observations among others, the decision was made to organize the 10th Light Division as a standard infantry division, although with the addition of specialized mountaineer and ski personnel.[97]

Even with this understanding that operating in mountainous terrain required skills more commonly found in specialized civilian communities such as alpine skiers and mountaineering than in the military, only roughly 20% of the division had such experience. This is not an insignificant factor given that many had noted that it was easier to make skiers into soldiers than soldiers into skiers.[98] The particular stand-up of the Division marks a very unique scenario whereby civilian mountaineers and skiers played a role in the genesis of a military formation; a situation which we can safely dismiss as likely to happen in the modern CA. Nonetheless, the story of the force generation and eventual force employment of the 10th Mountain Division retains practical application to today.

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[95] Thomas P. Govan, "Training for Mountain and Winter Warfare", *The Army Ground Forces Study No. 23,* Historical Section Army Ground Forces 1946; http://www.history.army.mil/books/agf/agf23.htm; Internet; accessed June 8, 2014.
[96] Greenfield et al., *The Army Ground Forces*, 345.
[97] *Ibid*., 348.
[98] Feuer, *Packs On!…,* Forward.

It could be argued that the creation of the 10th Mountain Division was founded on erroneous fears. First, it was driven by civilian skiers who had an irrational fear that if Germany invaded the US, Americans could wage a guerrilla war using the country's mountain ranges.[99] Second, one of primary impetuses for the creation of a mountain force was the Finnish experience in fighting the Russians in the Russo-Finnish War.[100] What was particularly odd about this consideration was that the Finns did not fight the Russians in the mountains, but through the use of cross-country skiing and their use of the forested terrain to conduct ambushes using infantry forces against armoured Russian forces. This scenario was clearly not applicable to mountain forces but despite this, those civilian skiers who played the moving force in convincing army authorities of the need for a US mountain force could point to several very real factors: the Germans had three mountain divisions at the outset of the war and other European countries has specialized mountain forces including the French and Italians.[101] Relying on their own experience in the mountains and their patriotism, such visionaries such as Charles Minot "Minnie" Dole began lobbying for the formation of mountain forces. Dole in particular was instrumental in, if not the cornerstone of, the force generation of the 10th Mountain Division. A wealthy businessman, he was also an avid skier in New England and was an avid proponent of ski safety, so much so that he was the first head of the National Ski Patrol.[102] When Dole met with David Bradley, who had been a US Army observer during the Russian invasion of Finland

[99] Peter Shelton, *Climb to Conquer: The Untold Story of WWII's 10th Mountain Division,* (New York: Scribner, 2011),12.
[100] Jenkins, *The Last Ridge*…, 15. See also Shelton, *Climb to Conquer,*…., 8. However from the Army's perspective any lessons learned were to be drawn from winter fighting, not mountain fighting. See Govan, "Training for Mountain and Winter Warfare."
[101] Shelton, *Climb to Conquer,*…13, 15.
[102] Jenkins, *The Last Ridge*…19. See also Bull, *World War II Winter and Mountain Warfare Tactics*, Introduction where the author notes the revival of German mountain troops began in 1938 with the formation of its 1st Mountain Division followed by the creation of two more based on Austrian troops after Germany's annexation of that country.

and a former ski racer at Dartmouth college, the real genesis of a mountain division was formed.[103]

What was common thinking, perhaps coloured by their own views of the technical nature of skiing, was that it would be far easier to train adept skiers to be soldiers than select soldiers and attempt to train them to be military skiers and mountaineers. As Bradley himself wrote in a report to Minnie Dole which eventually through Dole was submitted to Army Chief of Staff George Marshall, advocating for the formation of mountain troops, "There is little use wasting all the time and energy teaching a bunch of southerners how to ski. I should think the army would call in the thousands of experienced skiers, send them to a good training place in Colorado, and from them build the nucleus of an expanding winter defense force."[104] In an ironic twist, the number of experienced skiers was bolstered by European ex-patriots who escaped the German army.[105] This exodus, which imbued the young mountain force with a particular level of expertise would not have been possible had the German army not advanced throughout Europe. These individuals included world record skiers, ski jumpers and some of the most elite mountaineers in the world.

As an institution one of the army's first forays into mountain operations was the testing of appropriate equipment. Even then, without the general expertise in this area the task was primarily delegated to civilians from the Alpine Club and National Ski Patrol although there was also contribution from members of the army's Quartermaster Corps.[106] Those testing were obviously biased in terms of the capabilities and attributes required of mountain soldiers, and remained of the view that it would be insufficient to equip "flatlander" soldiers with even the

[103] Jenkins, *The Last Ridge*…, 16.
[104] *Ibid*.
[105] Shelton, *Climb to Conquer*…, 33.
[106] Jenkins, *The Last Ridge*…, 31.

best mountaineering equipment. Instead what was required was, "….a specially trained, elite unit of mountain soldiers who could use the new gear in just the way skiers and sport climbers did: to enter into and survive in the world's most challenging regions, in the most inhospitable climates."[107] While it might be tempting to attribute these views as self-serving as they amount, to a degree, to a reflection of those advocating for the creation of a mountain force and their reverence for mountaineering, but it was not without objective corroboration. In August 1941 Italy attacked Greece and in the following Greek counter-attack, the Italians fled back to the mountains where approximately 10,000 of them died. The US Army attaché's report noted that,"…an army which may have to fight anywhere in the world must have…units especially organized, trained, and equipped for fighting in the mountains and in winter…such units cannot be improvised hurriedly from line divisions. They require long periods of hardening and experience, for which there is no substitute for time."[108] This re-iterates the need for a trained, formed organization as opposed to generic light infantry forces who, while they possess fitness and *esprit de corps*, lack practical, sustained experience. While the term "elite" was used it is clear that the 10th Mountain Division remained a conventional, albeit highly trained, force.

This may have proved the final factor in the Army's decision and in November 1941 it authorized the formation of the 1st Battalion 87th Mountain Infantry Regiment in Washington.[109] If not a case of putting the cart before the horse, the army certainly put one next to the other as it was not until the formation of the 87th Bn that the army established the Mountain Winter

[107] *Ibid*.
[108] Govan, "Training for Mountain and Winter Warfare."
[109] John Imbrie, *Chronology of the 10th Mountain Division in World War II,* National Association of the 10th Mountain Division Inc. June, 2004; http://10thmtndivassoc.org/chronology.pdf; Internet; accessed February 21, 2014.

Warfare Board (MWWB) to provide advice on equipment and training.[110] This can perhaps be forgiven as they US Army was, at the same time, developing an institution to govern mountain operations as well as a relevant field force.

Forced to create a mountain force which planned to actually fight in high mountains, the key considerations the planners were faced with are useful to an intellectually honest consideration of the factors the Canadian army must wrestle with if it is to develop a capable mountain force, "[h]ow, in a vertical world, would tactical theory change from flatland fighting? How do you move men and artillery in large numbers over the snow? How will they eat and sleep and stay warm? How to attack, and how to defend? How will it all work?"[111] The US Army as an institution disdained specialized divisions and did not have the corporate knowledge to provide guidance to the newly formed organization. As a result, the mountain troops were required to find their own solutions, particularly by relying on the experts within their ranks, regardless of rank. This often found enlisted personnel training officers in military skiing and mountaineering.[112] This is a reflection of the reality that mountaineering is a skill driven pursuit and particularly at the training stage, ability will drive all other considerations. The fledgling mountain unit attempted to bolster its qualified personnel by drawing on those with civilian expertise, particularly in "…Alpine equipment, know Alpine technique, and be capable of instructing troops in rock climbing, ice climbing, and snowfield climbing."[113] It was deemed easier to select experienced men, send them to basic training and then to Officer Candidate School ("OCS") to create leaders, rather than take leaders and attempt to make them mountaineers. This again speaks to the very specialized nature of mountaineering, which attracts

[110] *Ibid*.
[111] Shelton, *Climb to Conquer*…, 58.
[112] Shelton, *Climb to Conquer.*…, 35.
[113] Jenkins, *The Last Ridge*…, 36.

a certain type of person who even then requires time and practice to achieve a baseline of competence.

The recognition of the need for a mountain division was a mixed blessing. By summer 1942 two additional battalions, the 2nd and 3rd Battalions 87th Mountain Infantry Regiment were activated, diluting the pool of experienced soldiers and instructors. This marked the start of an even more rapid expansion as well as focused training. Over the winter of 1941 the training focused on military skiing but once the snows melted, the training switched to mountaineering and in particular the ability to move military arms and equipment up vertical walls.[114] Commensurate with the switch in focus was an even greater expansion with the Mountain Training Center, a provisional division command, stood up in Colorado with the mission to develop procedures, manuals, test equipment, and conduct training in mountain warfare.[115] While yet another milestone in the institutionalization of a mountain warfare capability, it was also a case of having to catch up to the nucleus of the existing force. In order to bolster the standardization of army mountain warfare doctrine there was a further dilution from the 87th Regiment with the Mountain Training Center Detachment in Fort Lewis. Washington selected 100 of the experienced skiers and mountaineers from the regiment.[116] While this detachment operated as a sort of "train the trainers" corps which introduced soldiers from other types of divisions to basic mountaineering, it remained a loss for the 87th at the time.[117] To aid in the training a more suitable training area was selected and Camp Hale, Colorado at an altitude of over 9000 feet was selected and built to accommodate the growing force. The training area provided every possible type of terrain required to train and validate the mountain troops. It

[114] *Ibid*., 42.
[115] Imbrie, *Chronology of the 10th Mountain Division in World War II*.
[116] *Ibid*.
[117] Shelton, *Climb to Conquer*…, 95.

possessed altitude, including area of up to 13,000 feet, with ample snow in the winter to train skiing and sufficiently complex terrain in the summer to practice ascents and repelling.[118]

This should not be taken to mean that the growing division was, as thought by some, a military ski club and the influx of officers and non-commissioned officers from established divisions ensured the soldiers understood that they were soldiers first and the aim of the training was warfighting.[119] The army was also not prepared to treat the division with any greater degree of autonomy simply because it was preparing to operate in a unique environment. Rather the opposite, with this new force the army determined it needed a baseline to determine the capabilities of the neophyte formation and in February 1943 ordered a battalion of infantry and a battalion of pack artillery to ascend to over 11,000 feet and conduct a series of tactical problems.[120] At that early stage of preparation there were more lessons learned than successes achieved. Under crushing loads in excess of ninety pounds for the average soldier and 125 pounds for support weapons soldiers, enduring altitude and temperatures as low as -48 degrees Fahrenheit, the exercise quickly suffered over 250 medical cases.[121] The newer recruits in particular suffered the worst and the enemy force was never put into action. Despite the poor performance of the battalion, the exercise served to confirm that operating effectively in mountain terrain requires challenging collective training, which can only be achieved with time, appropriate resources and of course a suitable area.[122]

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[118] Jenkins, *The Last Ridge*…, 50-51.
[119] Thomas P. Govan, "History of the Tenth Light Division (Alpine)," *The Army Ground Forces Study No. 28*, Historical Section Army Ground Forces 1946; Internet: http://www.history.army.mil/books/agf/agf28.htm; accessed June 8, 2014. "The training mission of the 10th Light Division was to attain ultimate combat efficiency in high mountain warfare."
[120] Shelton, *Climb to Conquer*…, 59.
[121] *Ibid*., 59-60.
[122] Observers noted, amongst other issues, "The winter training did not appear to be adequate to condition personnel for marching and maneuvering under conditions of extreme cold and adverse weather conditions." and "Training programs indicated a lack of planning to provide frequent overnight

That time would not be granted indefinitely and the division was required to complete what was referred to as the "D" Series in March to April 1944.[123] This bears further discussion as it was the most significant collective training event for the Division before its deployment. That the US Army insisted on such manoeuvres reinforces the need for collective training confirmation as set out in Canadian doctrine. Consisting of roughly three weeks at altitudes of between 12,000 and 13,000 feet, the Division applied all of its learned skills.[124] Consisting of 12,000 soldiers operating at altitude in sub-zero temperatures, while ultimately successful the Division's accumulation of frostbite, injury and illnesses resulted in five times as many injuries in preparation for war as any other US Division.[125]

In July 1943 the US Army officially stood up the 10th Light Division (Pack Alpine) consisting of the 85th, 86th and 87th infantry regiments as well as the associated supporting units including artillery, quartermasters and the 126th Engineer Mountain Battalion.[126]

The Italian Campaign

Although the first operation by any formed organization from the 10th Division was the rather dismal action on Kiska in the Aleutians in August 1943 it is not necessary for this paper to examine it in any detail. After years of training, itself an anomaly within the US Army during WWII, the soldiers of the 10th Mountain Division looked forward to an opportunity to deploy. Despite their self-confidence and the confidence of their commanders in their capabilities, the commanders in the European Theatre of Operations suffered from a myopic view which often

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exercises necessary to properly condition men for winter maneuvers of extended duration." See, Govan, *Training for Mountain and Winter Warfare.*

[123] Govan, *History of the 10th Light Division (Alpine)*.

[124] Govan, *Training for Mountain and Winter Warfare*.

[125] Jenkins, The Last Ridge…, 116.

[126] *Ibid.,* 51.

raises its head today: the view that troops formed and trained for mountains are simply not suitable for modern, mechanized warfare.[127] Multiple theatre commanders declined accepting the 10th Division, "…citing the division's comparatively small size, its specialized training and its light armament."[128]

Despite objections at high levels, the mountainous terrain of Italy cried out for the 10th Mountain Division's level of specialized training. A survey of the terrain shows that north of Rome the more mountainous terrain lies on the western side of the country, with the eastern side, open to the Adriatic, being generally flatter and providing far easier manoeuverability.[129] There was some debate about the better way to fight North through the country with many proposing an amphibious landing on Italy's East coast which would have negated any need to fight through the mountains. This view was held in particular by General Oliver Leese, commander of the British Eight Army, although he could perhaps be forgiven his analysis and attempt to avoid the mountains given that,

> [a]fter fighting north all the way from Italy's boot, his men were barely standing from battle fatigue. Even if they somehow managed to win the battle in the mountains, they wouldn't have the strength to chase the Germans through the plains. Just as troubling, the Allies had lost their only mountain troops when General Alphonse Juin's French mountain soldiers, who had fought so effectively at Cassino, had been stripped off to support Operation Anvil in southern France.[130]

[127] *Ibid*., 122. Although Army Chief of Staff George C. Marshall acknowledged the value and training of the Division, when it was offered to General Eisenhower's Chief of Staff, he looked at the Division's table of organization and responded, "All those mules? Hell no!".
[128] Shelton, *Climb to Conquer*…, 107-108.
[129] Lt.-Col G.W.L. Nicholson, *Official History of the Canadian Army in The Second World War. Volume II*. *The Canadians in Italy 1943-1945,* (Queen's Printer and Controller of Stationary: Ottawa, 1956), 459.
[130] Jenkins, *The Last Ridge*…, 130-131. See also Nicholson, *The Canadians in Italy,* 491.

In the end the British Commander's views were acceded to and the mountains were left to General Clark and the US Fifth Army.[131] It proved relatively easy to identify the key terrain from an analysis of the ground, but that analysis did not easily translate into victory. By the fall of 1944 the Allies were bottled at the Apennines. As can be seen in Figure 1, the key for the Fifth Army's advance was, not surprisingly, Highway 64 being the high speed approach which would allow the Allies to break into the Po River valley and from there northwards.

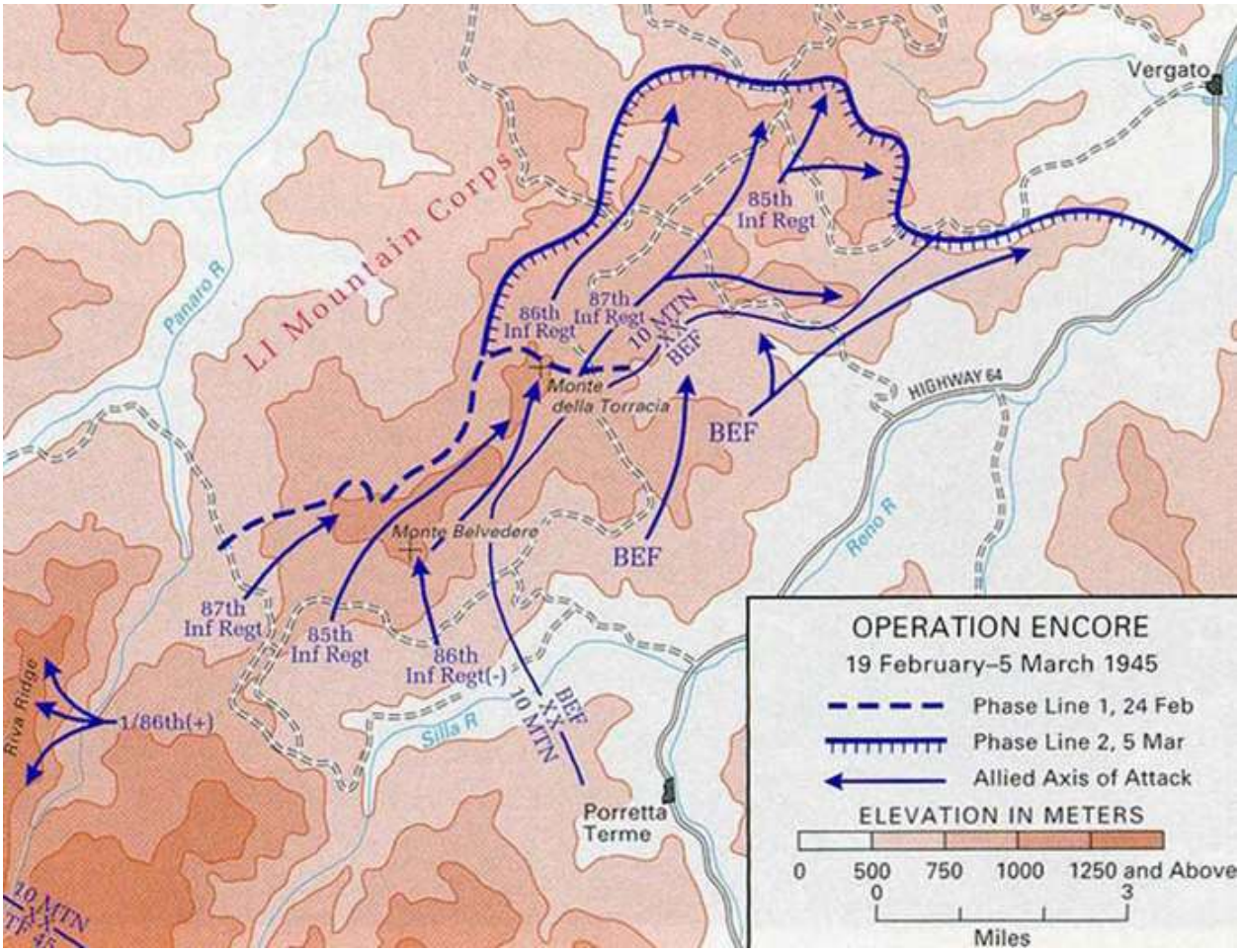

Illustration 1. Mount Belvedere to the Northwest of Highway 64 and Northeast of Riva Ridge. (http://www.flamesofwar.com/Default.aspx?tabid=108&art_id=4497&kb_cat_id=100)

[131] The British feint on the Adriatic did have the effect of drawing the German 1st Parachute Division to that front. See Jenkins, *The Last Ridge*…, 131.

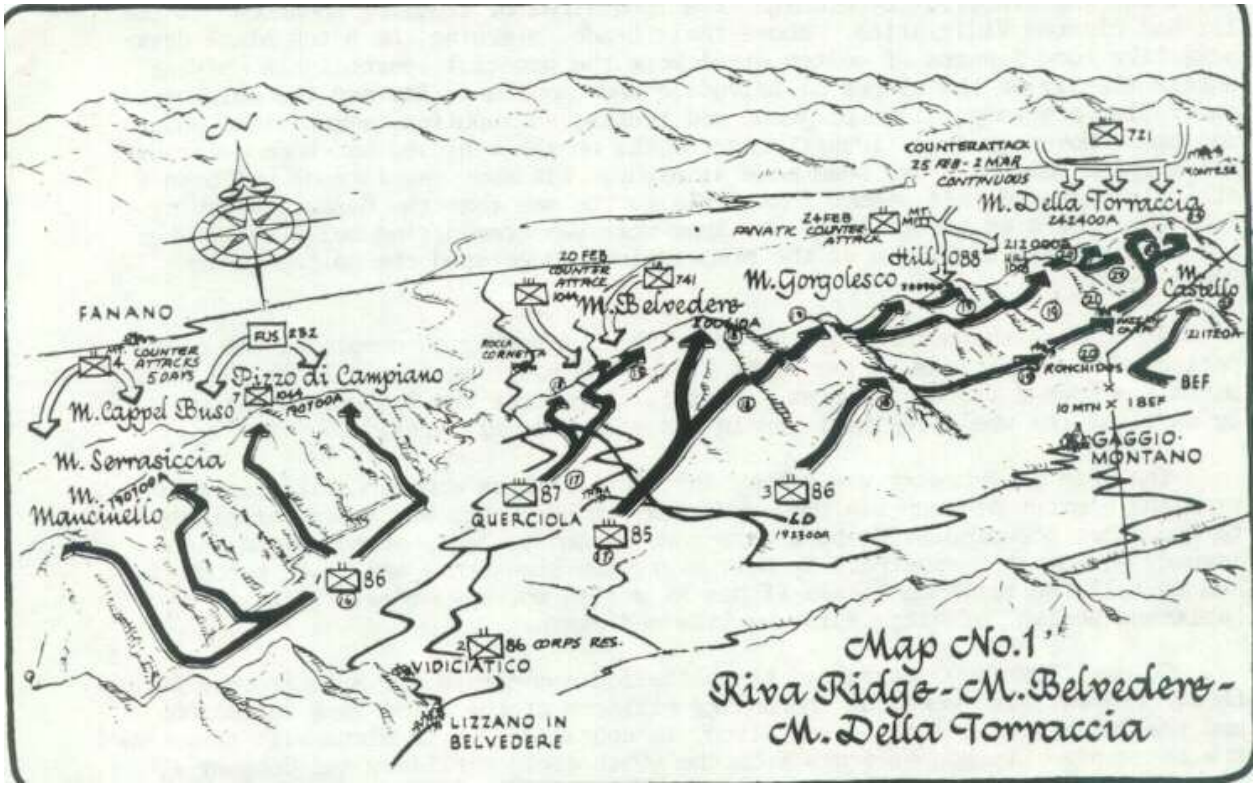

Illustration 2. 10th Mountain Division assault on Riva Ridge and Mount Belvedere. (http://users.commspeed.net/wb9vgj/docs/mountain.htm)

Just as a series of dominos relies on the one before it to fall first, Highway 64 was dominated by Mount Belvedere which was held by the Germans. Attempts to seize Belvedere had failed in November and December 1944 because it in turn was dominated by a chain of hills to the west known as Riva Ridge. Riva Ridge provided German artillery observers with clear views of anyone approaching Belvedere's flanks and its westernmost face was to sheer to be gained.[132] Or at least by the forces then in theatre.

It was this particular problem that the 10th Mountain Division was deployed to the Italian campaign to solve. It is worth noting, due to the prevalent fixation on height as the determining factor in speaking of mountain operations, that the half-dozen peaks comprising Riva Ridge were

[132] Jenkins, *The Last Ridge*…, 135-136.

far lower than the mountains the division had trained on in Colorado with the highest being roughly equivalent to Mount Washington in New Hampshire; "[t]he trouble with any assault on the ridge was not the height, however; it was the sheerness of the face".[133] In order to gain Riva Ridge, elements of the 10th Mountain Division would be required to climb at night, under enemy observation. While doctrine, including Canadian, focuses on altitude when discussion mountain operations, this example highlights why it can be fatal in mountain warfare to equate difficulty only with altitude.

Commander 10th Mountain Division's plan involved dispatching a single battalion to seize Riva Ridge, with an additional follow on force to assist in holding it.[134] The remainder of the division was tasked with taking Belvedere once Riva Ridge was secured. This highlights the impact that a unit level organization can have and challenges an argument that the Canadian military is too small to have an effective mountain warfare capability; even with a full division available, taking the key terrain fell to a single battalion. Further highlighting the impact of small unit effects, the battalion seized Riva Ridge on multiple routes, further dividing itself into even smaller forces. These routes were scouted by some of the best, most technically skilled soldiers in the battalion, acting as mobility enablers and even then much of the reconnaissance was done at night as the routes were under enemy observation from atop the ridge. With multiple routes identified the plan called for 1st Battalion, 86th Regiment with an additional company to seize Riva Ridge by night and with a measure of surprise to the larger German force on Mount Belvedere. Despite the technical nature of some of the routes, the decision was made to keep formed platoons intact, another point that identifies the value in well trained small units, as opposed to the alternative which would have been to draw out the most capable climbers from

[133] Jenkins, *The Last Ridge*…, 153.
[134] *Ibid*.

the various companies.[135] In fact, the most difficult route, which led directly to the top of *Pizzo di Campiano*, the most northeastern peak of Riva Ridge and the closest to Mount Belvedere, was taken by a single platoon.[136] This was not a decision based on force ratios, but a decision based on the difficulty of the climb and the route itself, but again demonstrates that in mountainous terrain, perhaps like in no other, small units can have impacts out of all proportion to their size. But these were not generic infantry platoons from the mechanized forces or even light forces; they were highly trained specialized, intelligent and extremely physically fit forces, used in exactly the planned environment that capitalized on their training. That fitness would be put to the test as Riva Ridge had to be seized between midnight and sunrise or the division's attack on Mount Belvedere would be cancelled.

The battalion's success in seizing Riva Ridge was undoubtedly aided by the element of surprise and the Germans' security in the unassailability of their position. This once again showcases the value that trained small units can have. Once secure on Riva Ridge the US forces had to withstand a fearsome counter-attack as the Germans attempted to regain the high ground, but were unsuccessful. The Germans on Mount Belvedere, however, were well aware of the attack by now and prepared for the rest of the division's assault. While a hard-fought battle with significant casualties, the 10th Mountain Division's attack on Mount Belvedere required less technical mountain skills and relied more on the intangible character traits that the division possessed as a result of the mountain training: the physical fitness and small unit teamwork required to succeed in rough terrain. The entire operation took the division only 5 days and not 2 weeks as senior planners expected.[137] Victims of their own success although finally receiving

[135] Jenkins, *The Last Ridge*…, 161.
[136] *Ibid.*, 162-163.
[137] Jenkins, *The Last Ridge*…, 196.

acknowledgement of their capabilities, following the Mount Belvedere operation the Fifth Army plans changed from relying on II Corps to push north to a reliance on the 10th Mountain Division to push through the last peaks before the Po River including *Mount della Spe* and *Castel d'Aiano*.[138]

The division suffered massive casualties and as replacement personnel were provided they did not have the skills of the men they replaced so there must be an acknowledgement that the 10th Mountain Division was not fighting as a truly mountain organization for the duration of its campaign. However, in what was arguably the most defining of the 10th Mountain Division's battles, Riva Ridge was taken by a single reinforced battalion, manoeuvering as sub-units or as platoons. This action toppled Mount Belvedere which toppled Mount della Spe, opening the 64th Highway for Allied use and in turn opening the Po River Valley. The other shortcoming of the 10th Mountain Division is that in the subsequent chase north its lack of vehicles meant that other mechanized divisions were designated to assume the advance, but the the division's *esprit de corps* overcame this and the 87th Regiment made the first crossing of the Po River.[139] What they lacked in integral vehicles the division made up for in fitness and ingenuity.

As a case study Riva Ridge exemplifies the key reasons why mountain warfare capable sub-units are a valued capability: despite size that is small in the context of a conventional force they have real impact in mountainous terrain, they cannot be trained at the last minute.

[138] *Ibid.*, 197.
[139] Shelton, *Climb to Conquer*…, 188. See also Nicholson, *The Canadians in Italy,* where the first Allied formation to cross the Po river is referred to as the "remarkable 10th Mtn Div," 676.

The Modern Mountain Battlefield

True Mountain Warfare

Warfare in complex and mountainous terrain has continued since World War II and a brief review of some more modern examples will establish the inevitability of these types of operations. The epitome of warfare in mountainous terrain is exemplified by the ongoing conflict between India and Pakistan on the Siachen glacier. Arguably not warfare in the vein of the 10th Mountain Division's success in WWII, but rather a WWI style stalemate; a type of high-altitude entrenched warfare with periodic raids across no-man's land. These operations take place on the world's largest non-polar glacier that rises to almost 23,000 feet.[140] It is, quite literally, the highest battlefield on the planet. The contested area has been occupied by India and Pakistan since 1984 due in part, much like the Durand Line between Afghanistan and Pakistan, to an unclear boundary.[141]

[140] Eric S. Margolis, *War at the Top of the World: The Clash for the Mastery of Asia* (Key Porter Books Ltd: Toronto, 1999), 125.,

[141] Asad Hakeem, Gurmeet Kanwal, Michael Vannoni and Gaurav Rajen, "Demilitarization of the Siachen Conflict," http://www.mediafire.com/download/in71v4szmzyae6b/Demilitarization+of+the+Siachen+Conflict+Zone.pdf; Internet; accessed November 7, 2014, 7.

Illustration 3: Siachen glacier. (http://www.simplydecoded.com/2013/02/04/siachin-conflict-background-and-current-situation/)

While primarily a propaganda piece, it is unlikely that Siachen poses any real strategic value given the inhospitability of the area.[142] Notwithstanding this, the countries are too firmly entrenched at this point with India physically occupying the glacier. Actual conflicts now consist of primarily small-scale clashes in the summer and exchanges of artillery fire.[143]

> The forward battle positions along the Saltoro ridgeline are composed of a series of small posts typically manned by 6 to 18 troops depending on the location. The exact number of posts is not known publicly but the Indian Army is estimated to have about 80 forward posts. Many Indian and Pakistani posts are close enough to see each other. The highest posts in the area of Conway Saddle and Sia La are over 20,000 feet in elevation. Artillery support positions are located some distance behind the forward battle positions … Logistic supply camps are also located behind the ridgeline in positions where they can support a set of forward posts.[144]

Despite this stand-off, the reality is that far more casualties have occurred due to the terrain and environment than actual combat. The highest outposts are in the 18,000-22,000 foot range known to mountaineers as the "death zone" where the risks of high-altitude pulmonary edema ("HAPE") and high-altitude cerebral edema ("HACE") are prevalent and for which the only cure is decent to lower altitudes. For these reasons soldiers are rotated through the outposts on a frequent basis.

The Falklands

A brief examination of the British use of its mountain warfare specialists during the Falklands war is illustrative of how a center of excellence can be used in times of war. The Falklands provide another example of how the complexity of terrain is not tied solely to its height, and how mountaineering skills transfer more easily into less complex terrain than more

[142] Hakeem et al., "Demilitarization of the Siachen Conflict Zone," 18.
[143] *Ibid*., 23.
[144] *Ibid.,* 27.

traditional skills transfer into it. The Royal Marines' Mountain and Arctic Warfare Cadre is the institutional staff who train mountain leaders for employment in the field force. Yet at the outbreak of the Falklands War in 1982 when the Cadre was running a course, it deployed with its students.[145] It must, however be acknowledged that as the main focus of this paper is on a conventional force, the Royal Marines may not provide a readily useable template. In addition, at the time of the Falklands campaign, the reconnaissance troop in each Royal Marine unit was commanded "…by a trained mountain leader officer and contain[ed] NCOs and Marine specialists in mountain work…".[146]

Brigadier General Julien Thompson noted,

> With training in morse and long-range communications added to their already confirmed sills of survival in adverse conditions, and the ability to reach and return from almost inaccessible positions in the mountains, the M and AW Cadre was ideally suited to the task of medium-range reconnaissance and surveillance both ahead of and on the flanks of the Commando Brigade. In this role they filled the gap between the local reconnaissance tasks performed for the commandos by their own reconnaissance troops and the long range, often strategic, reconnaissance, executed by SBS and SAS.[147]

Afghanistan

Perhaps the lessons learned by the Russian Army in their conflict in Afghanistan were largely ignored due to the perception that the Russians ultimately lost because they were invaders and therefore had no lessons to impart on a legitimate NATO force. However, this view remains as flawed as suggesting that Skeen's lessons from nearly a century earlier were inapplicable. As noted in the US Army's preamble to its re-issuing of Skeen's text, "[a]fghan wars have evolved

[145] Max Hastings and Simon Jenkins, *The Battle for the Falklands* (London: Michael Joseph Ltd.: 1983), 289.
[146] Julian Thompson, *No Picnic: 3 Commando Brigade in the South Atlantic: 1982* (London: Leo Cooper, 1992) [Kindle edition], Chapter 1.
[147] *Ibid*., Chapter 1.

more in weaponry, less in the tactics of mountain warfare" and even more importantly, "[w]hile the weapons of frontier warfare have changed, the topography of the area has not."[148]

While Canada's fighting in Afghanistan was mostly confined to Kandahar province, an area of flat terrain, the exception was its initial involvement in Afghanistan which saw Canadian forces from 3 PPCLI, ironically a light infantry battalion, participate in Op ANACONDA.[149] These actions have been well canvassed elsewhere but an examination of operations in some of the country's more complex terrain remains possible, primarily by looking at the US forces who operated subsequently in Afghanistan's eastern provinces. As a result of its involvement in Afghanistan, the US military has devoted considerable time and effort in re-analyzing its mountain doctrine and has seen the publication of new versions of its mountain doctrine as well as "A Soldier's Guide to Mountain Warfare" from the US Center for Army Lessons Learned.[150] *Apropos* of the issues argued in this paper, the Soldier's Guide includes, besides chapters on general tips and mountaineering skills, chapters dealing with how to "Shoot", "Move" and "Communicate".[151]

One excellent case study in conventional, modern small unit operations in modern mountain operations is Sebastian Junger's *War*.[152] Over the course of five visits to US troops deployed to the Korengal Valley in Kunar Province Junger's observations, though primarily centred on the impact of war on soldiers, keenly observed the effects of operating in that mountainous terrain; some of the same terrain, in fact, which gave rise to Skeen's text. "While

[148] Skeen, *Passing it On*, x, xii.
[149] Pat Stogran, "Fledgling Swans Take Flight: The Third Battalion PPCLI in Afghanistan," *Canadian Army Journal* Vol. 7, No. 3/4 (Fall/Winter 2014), 14-21.
[150] United States, United States Army Center for Army Lessons Learned, *Soldier's Guide for Mountain Warfare: Observations, Insights and Lessons;* http://www.globalsecurity.org/military/library/report/call/call_12-13.pdf; Internet; accessed June 27, 2014.
[151] *Ibid*., Chapters 2, 3 and 4 respectively.
[152] Sebastian Junger, *War,* (Toronto: HarperCollins Publishers Ltd., 2011).

modern forces prevail in flat open planes or desert terrain, in the hills and mountains of Afghanistan, and the frontier territory of Pakistan the guerrilla tactics utilized by Pathan (Pushtun) tribesman against the British Indian Army, the Soviets, and now the NATO coalition forces have changed little."[153]

While the primary outpost in Junger's reporting was the Korengal Outpost ("KOP"), it remained dominated by surrounding peaks with the result that enemy fighters remained able to engage the outpost at will and withdraw down the opposite slope in cover from the KOP.[154] The solution to this problem is, similar to the Indian and Pakistani positions in Siachen, a matter of occupying more and more outposts on supporting heights. The difficulty this poses is that this requires both more forces and that those forces must operate in smaller numbers, opening them to the possibility of capture if an enemy can amass in large enough numbers.

The soldiers deployed into the Korengal Valley at this time period were not mountain infantry in the vein of the 10th Mountain Division which had, in any case, ceased to exist after WWII. Although a division bearing that name was re-constituted, it did not have the same focus as its predecessor.[155] The soldiers were, however, fit infantry soldiers from the 173rd Airborne Brigade Combat Team. Even these highly trained infantry soldiers found that "…war also diverged from the textbooks because it was fought in such axle-breaking, helicopter-crashing, spirit-killing, mind-bending terrain that few military plans survive intact for even an hour."[156]

The company followed by the author manages to occupy a peak from which they were regularly attacked, however seizing and occupying prove to be two different matters in mountainous terrain. Whereas a lightly armed, mobile enemy can more quickly ascend a height,

[153] Skeen, *Passing it On*:…, ix.
[154] Junger, *War*, 16.
[155] Imbrie, *Chronology of the 10th Mountain Division in World War I*I.
[156] Junger, *War*, 48.

shoot and depart before the full weight of modern military weaponry is brought to bear, modern western soldiers intent on occupying terrain require a modicum of force protection. Although a force ascended the problematic peak by night to out-manoeuvre the enemy, they had no protection other than the local rocks and trees until they could dig themselves in over a series of weeks, their position visible to the enemy.[157] As noted earlier the age-old difficulty is that to dominate in mountainous terrain is a series of battles for the heights, with the result that forces are dispersed to a far greater degree than in conventional operations.

Even dominating high ground does not provide an all-encompassing defence to a determined enemy, particularly indigenous peoples with superior knowledge of the terrain who are able to move quickly. On one particular operation the US forces were ambushed through a location that, much like how the Germans viewed Riva Ridge, they considered impassable and therefore failed to factor into their local defence plan. A subsequent assessment of the enemy attack was that they spent twenty-four hours "creeping through the woods to the base of the cliff" and "climbed the cliff with their weapons over their shoulder" from a vantage point of only 50 metres away.[158]

A comparison between Skeen's observations on fighting in the Afghan frontier zone bears striking similarities with the experiences of the US Army a century later. The lesson to be absorbed is that the enduring nature of mountain warfare is far less susceptible to technological advances than in other environments and can be expected to be an operating environment in which conflict will continue to be waged.

[157] *Ibid*., 62-63.
[158] Junger, *War*, 111.

CONCLUSION

When examining the environments in which the Canadian Army trains, if not operates, one might ask why the importance of mountain operations. Airborne operations have a more institutionalized basis given the history of the former Canadian Airborne Regiment and Canada's vast coastlines might suggest a focus on littoral operations. In addition to the argument made above mountaineering itself has much in common with the Army in general. John Keegan used a mountaineering analogy in his *The Face of Battle* comparing it to an analysis of the trends of battle.[159]

> Mountains, like battle-fields, are places inherently dangerous for the individual to inhabit. it is less easy to get killed, of course, on a mountain, if one takes sensible precautions, than on a battlefield, yet the risk of death always stalks the climber, just as it attracts him to the mountain range in the first place, and numbers of climbers are killed on every major range every year.[160]

Keegan uses the various factors which affect the difficulty of a mountain ascent, such as altitude, exposure and length of time to use as factors which carry over to the assessment of the three battles analyzed in his book. Specifically looking at the factor of exposure, Keegan draws a more specific analogy between mountaineering and land warfare.

> For the modern fashion of combining 'extreme' techniques with very long ascents has increased the degree of 'exposure' (danger of falling, risk of stone-falls) to almost intolerable limits, while making retreat from exposed situations more and more difficult….And in the same way it is the very nature of modern battlefields which, given the 'objective dangers' present, invests them with such peril for the individual soldier.[161]

[159] John Keegan, *The Face of Battle: A Study of Agincourt, Waterloo and the Somme*, (London: Pimlico, 2004), 299-302.
[160] *Ibid.*, 299.
[161] *Ibid.*, 308.

While Keegan was merely using mountaineering as an analogy for the trend of warfare, not writing on mountain warfare directly. Beyond this broader spiritual comparison, mountain warfare has much more practical considerations. Still, the analogy was well-chosen and accurately deals with both the inherent dangers of conducting military operations in mountainous terrain as well as the applicability of mountaineering skills to warfare more broadly. As already discussed, history has shown that mountain warfare capable forces, when trained as such, are highly physically fit, require mental robustness and due to the nature of the terrain which depends on small unit actions, independent and skilled junior leaders.[162] All of these traits are applicable to operations in any type of terrain, and this is not to suggest that conventional units geared towards other types of operations cannot or do not possess these traits, it is simply that they are critical to fight in the mountains. But this presupposes that Canada will even fight in the mountains. In this age of rationalization of resources and financial constraints, any argument for creating or maintaining a capability must be useful.

There are a number of strategic arguments to be made in favour of Canada possessing a true mountain warfare capable force. First and foremost is that Canada itself is a country possessed of numerous mountain ranges with the Rocky Mountain range occupying roughly one quarter of the country's land mass.[163] Looking outward, Canada has a number of strategic military commitments. The most important is Canada's commitment to the North Atlantic Treaty Organization ("NATO") and as was discovered during World War II, a proficiency in mountainous operations is a necessity. This is unlikely to change even in the modern era. Beyond NATO, Canadian policy states that wherever possible Canada will operate as part of a coalition; it would be prudent to say the least that we possess the ability to operate across the battlespace in

[162] Grau and Vázquez, "Ground Combat at High Altitudes."
[163] United States, MCWP 3-35.1 *Mountain Warfare Operations*, 1-3.

which it can be reasonably expected to deploy the Canadian Army. As has been established in Afghanistan over our decade-plus involvement, the ally with which we are most likely to operate is the U.S. Given that they have both actual relevant mountain operations doctrine and the ability to validate their forces' ability to operate in the environment, we must either accept the reality of a degree of specialization or stand accused of paying lip-service to an alleged mountain operations capability.

Upon a plain reading of army training doctrine generally there is a logical framework in which the Army teaches individual skills which enable CT which is conducted at progressive levels with the ultimate goal of being confirmed as ready to conduct operations. "Confirmation is an assessment of performance against a specified standard," and is intended to ensure that training standards are objectively achieved.[164] One would expect then that if various Army doctrine acknowledges both the complexity of mountain operations and the need for the Army to be prepared to conduct warfighting throughout the full spectrum of specific environments, then it must have a mountain warfare capability generated through the established training cycle used to confirm mechanized force capabilities. This capability cannot be generated *ab initio* at the outset of a conflict.

Certainly a review of Canadian doctrine suggests that Canada acknowledges mountain warfare not only its specific mountain warfare doctrine but references to the difficulties of operating in this environment in other doctrine is general in the extreme.[165] Land Operations for example states, "[t]he battle for the heights will, therefore, be the governing factor in operations in mountains", and goes one to identify a number of difficulties encountered in operating in the

[164] *Training for Land Operations*, 1-19.
[165] B-OG-302-005/FP-001, *Mountain Operations* and B-GL-300-001/FP-001 *Land Operations*.

environment.[166] In addition to doctrine the Canadian Army has invested considerable resources through establishing the three military mountaineering courses, each of which require Training Plans which must be periodically updated. While the BMO is decentralized, every time one is run time, staff and resources are drawn away from competing training interests. The more advanced CTI and AMO courses are even more resource intensive as they are run at CAAWC and therefore that institution has invested instructor billets and accompanying resources in addition to maintaining Training Plans for those courses. The field force has also dabbled in mountain operations and there are periodic sub-unit level exercises.[167] A casual observer could perhaps be forgiven for assuming that Canada possesses an actual mountain warfare capability; why else would the Army devote such resources to what appears to be mountain operations.

The reality is that Canada has invested not inconsiderable resources into an institutionalized mountain mobility capability. Certainly the CTI and AMO graduates are highly proficient in the art of moving individually and enabling larger forces to move through mountain and complex terrain. No one could argue that this does not provide some capability to conduct mountain operations by facilitating movement in the terrain, but what does this really provide to the Army? It is in effect a pool of highly trained military mountaineers in whom the Army has invested considerable time and resources through the IT system. However, individuals do not provide the Army with a capability, and it is capabilities that generate effects and outcomes, and it is capabilities that constitute an army's fighting power.

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[166] *Land Operations*, 8-24.

[167] Government of Canada, "Canadian troops participate in mountain operation training in Poland," http://news.gc.ca/web/article-en.do?nid=957849&tp=1; Internet; accessed April 7, 2015. See also Tijana Martin, "Castle Mountain to host soldier training," *Lethbridge Herald,* 26 February 2015; http://lethbridgeherald.com/news/local-news/2015/02/16/castle-mountain-to-host-soldier-training/; Internet; accessed March 4, 2015.

> Military operations are the application of a force's fighting power in order to achieve desired outcomes and end states. It exists at all three levels of command. Fighting power is not simply generated or created through a total sum of its constituent components. Aspects of fighting power take years, decades, and even centuries to develop. Fighting power is the total sum of capability.[168] [emphasis added]

This requirement for specialization is perhaps the most significant argument against developing a mountain warfare capability. Where will the specialization end, they ask. Our doctrine also acknowledges the specialization required to operate in jungle and littoral environments as well as the potential for airmobile and airborne forces. As a small army designed to be a middle-power, we simply lack the forces to generate mechanized combat capable forces and at the same time specialized forces. However, these arguments are the same which stood in the face of the development of the 10th Mountain Division in World War II.[169]

Any argument against specialization withers in the face of a demonstrable need for a capability. Even a cursory review of mountain warfare reveals some constants. First, conflict in mountains has been, and is likely to remain, a permanent factor. It could even be argued that with the rise of non-state actors conflict in mountainous terrain will become more frequent as the terrain provides a way to minimize a modern army's technological advantages.[170] However it would be a mistake to focus only on an irregular enemy. Given the presence of mountainous terrain across the globe there remains the real potential for peer-conflict in mountain terrain. In essence then in order to have a true mountain warfare capability Canada needs a fully trained force which has gone through progressive and realistic CT and been confirmed at whatever level is mandated.

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[168] *Land Operations*, 4-1.
[169] Govan, "Training for Mountain and Winter Warfare."
[170] *Training for Land Ops*, 2-11.

As argued, the appropriate level of specialization for Canada should be built on the infantry sub-unit within the three light infantry battalions. This would provide a meaningful capability within each of the three Army brigades. As demonstrated by the 10th Mountain Division's experiences in Italy generally and at Riva Ridge specifically, a true mountain company is capable of generating both tactical and even operational effects.[171] These effects were generated not with a standard light infantry battalion with a number of individuals possessed of a high degree of mountaineering expertise. Instead the success was due to well trained and led companies and platoons who had trained in the full spectrum of warfighting in challenging mountainous terrain prior to their deployment.[172] Platoons and companies were able to fight in their integral formations without having to re-organize in order to form new teams of the most experienced climbers.[173]

The current state of doctrine and training points to several courses of action. First, the Army can recognize that mountain warfare is a form of fighting that requires a measure of specialization and act accordingly. Second, if this is deemed as too expensive of a capability and too much of a conflict with the need to generate mechanized forces, then it must determine what to do with the existing mountain operations infrastructure. Can the Army justify the IT courses at all if at the end of the day it isn't prepared to actually have the capability to fight? A new role for the mountain operations institution may be required in order to justify their existence, such as a short-notice, high readiness centre of excellence capable of readying a Task Force that may be called upon to deploy to mountainous terrain, or perhaps even to deploy themselves as key

[171] Jenkins, *The Last Ridge*…, 153.
[172] Govan, *Training for Mountain and Winter Warfare.*
[173] Jenkins, *The Last Ridge*…, 161.

enablers. Either of these options falls short of an actual mountain warfare capability, but admittedly is better than abandoning any exposure to mountain operations.

If as set down in policy and doctrine Canada's Army expects to fight in mountainous terrain it risks stepping into the realm of professionals without adequate preparation. Dated doctrine and lip service will not prove of any value to the soldiers who may be called upon to ascend to victory. It is only with an intellectually honest assessment of the resources required to generate this needed and scarce capability that the Army can do itself justice.

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