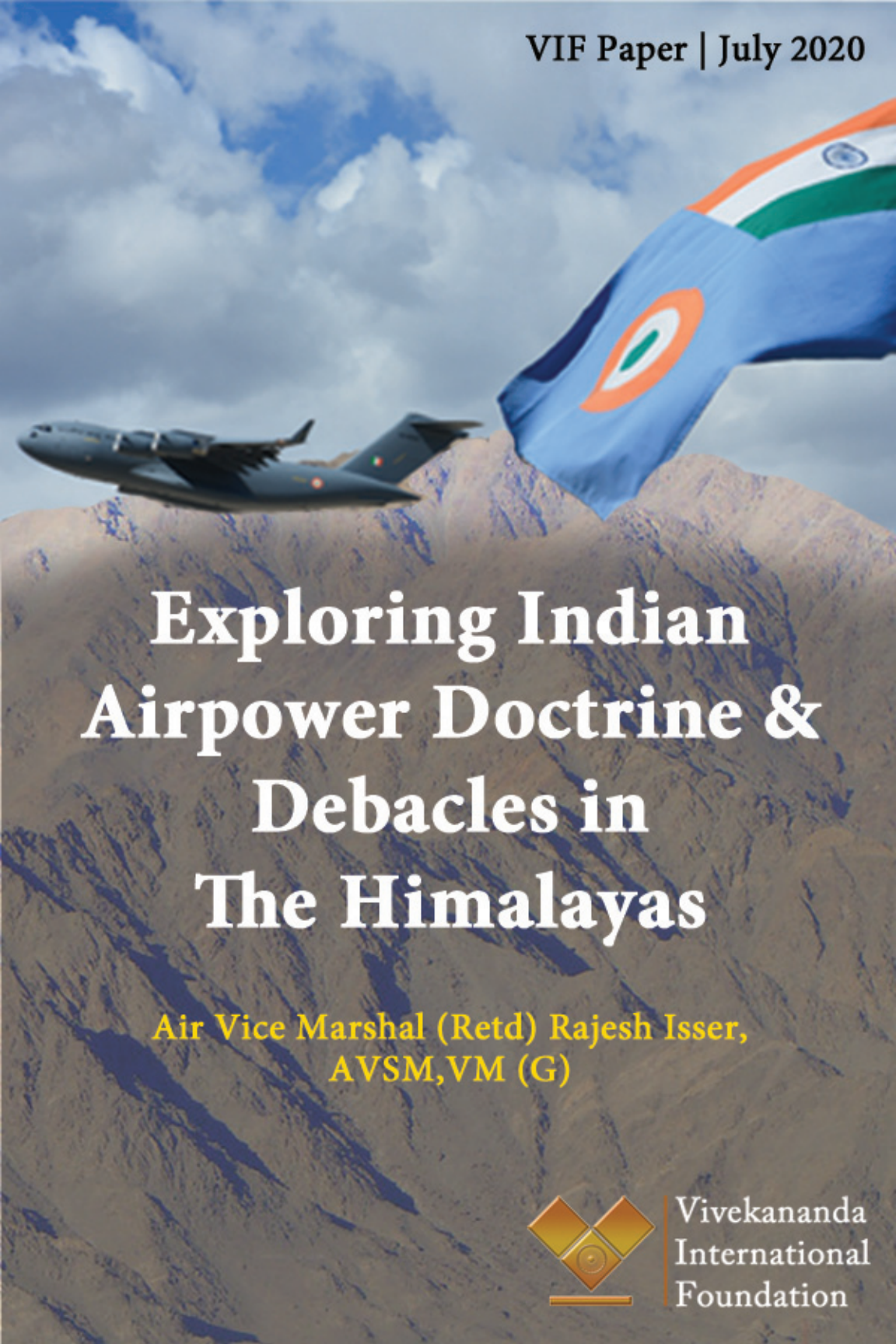


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Exploring Indian Airpower Doctrine & Debacles in The Himalayas

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Exploring Indian Airpower Doctrine & Debacles In The Himalayas

Abstract

This is an article exploring some of our wars in the Indian Himalayas to derive correct lessons for future conflict management. In light of the Chief of Defence Staff (CDS) and future theatre commands, restructuring and reorientation for the future is already on, but with Covid-19 and its aftermath, there is an urgency and imperative to accelerate changes. While the Indian armed forces are much better prepared to fight the integrated battle, it is still important to revisit doctrines and debacles as a reiteration of important lessons of mountain warfare. The paper analyses airpower issues in 1962 Sino-Indian War and the 1999 Kargil War, before deliberating on doctrinal and helicopter employment issues that have plagued jointness and integration in armed forces. A prognosis for the current LAC standoff and for the future is attempted

Introduction

This is an article exploring some of our wars in the Indian Himalayas to derive correct lessons for future conflict management. It is a literature review of analyses of past conflicts with a focus on employment

of airpower and its efficacy, perceived or actual. A critical examination of primary and secondary sources will identify insecurities prevalent in each service about jointness over the decades since independence. The article then delves into airpower doctrines to examine their relevance and appropriateness in light of fast changes to the character of conflict. Much has improved since Kargil, but much is still left to be done. In light of CDS and future theatre commands, restructuring and reorientation for the future is already on, but with Covid-19 and its aftermath, there is an urgency and imperative to accelerate changes.

Indian Airpower has evolved technologically and doctrinally in leaps and bounds keeping pace with other evolved armed forces. However, as is well known air forces are relatively young, having wrested independence from long-established and traditional armies and navies only recently. That battle for influence, dominance and share of national budgets continues across nations. There is a tendency on all sides to cling to outdated doctrine and practices despite major changes to the character of war and conflict. Well established and larger service are at fault for not understanding the finer nuances of capabilities of airpower, and this ends up in insecurities and loss of trust all around.

In the context of our two prime adversaries, airpower is a positive asymmetry in favour of India. Pakistan cannot match the technological and numerical superiority, and mainly relies on a defensive bubble aiming to cause unacceptable attrition. On the other hand, China though having larger assets, suffers from a geographical complexity affecting aeroplanes. In plain terms, IAF strike aircraft will take off from lower altitude bases with far larger armament load; strike multiple targets in a coordinated mass action across the LAC, while achieving a temporal favourable air situation to keep adversaries from interfering. All this is possible because our bases and dispersed sites are at lower altitudes and close to the scene of action. On the other hand, Tibet bases are at high altitude with severe penalty on weapons carriage, besides their vulnerability to Indian counter-air.

If there is anything that negates the Chinese superiority of infrastructure that allows it to mass forces and firepower better than the Indian forces, it is this edge in the third dimension. Quite obviously, the Chinese game-plan would include aiming for high attrition to Indian airpower by deploying large networked air defence assets including a preponderance of Man Portable Air Defence Systems (manpads) and use of its large surface-to-surface missiles against Indian airbases. After Kargil, both Indian Army and IAF are fully geared up to meet these challenges. But it is still important to revisit doctrines and debacles as a reiteration of important lessons of mountain warfare.

Chinese Stratagem

An analysis of recent historical behaviour clearly shows that despite the popular attribution of “winning without fighting” to the Chinese psyche, the Chinese Communist Party (CCP) has always moved to use of force with ‘a-first-mover’ advantage, especially when bigger powers were distracted with more pressing issues. This has been evident from events staged against Taiwan in 1954-55 and again in 1958. It was even clearer in 1962 against India when it took over large tracts in Ladakh and Northeast, and thereafter, moved back, except vital portions in Aksai-Chin. ‘Teaching-a-lesson’ is part and parcel of its middle kingdom & peripheral tributary countries hegemonic framework. Post-1962, the psyche and perceptions of East and SE Asia to the Sino-Indian equation was altered for decades, despite India responding well in 1967 and 1986-87 by giving back as good as it got.

Similarly, in 1979 when the Soviets and U.S were focussed on Afghanistan, China moved towards Vietnam to teach a lesson to an upstart. Actually, the well-experienced Vietnamese did much better and foiled Chinese plans by trapping them deep and causing huge attrition. However, CCP declared victory and moved back, to the satisfaction of its aroused public nationalism. But the timing and opportunism was evident in the stratagem. The Chinese civil and military leadership seem to view creating crises for

multiple objectives e.g. probing an adversary's intentions, disrupting ties between allies, reduce 'enemy' resolve and affect domestic policies.

Clausewitz and Sun Tzu exemplify the stark difference between Western and Chinese treatment of risk, escalation and conflict. Clausewitz considered war as a continuation of politics, but considered it a slippery proposition in terms of controlling escalation and the role of elements such as "chance, luck and guesswork". Any rationality in war had to contend with emotions, which by any measure are difficult to wholly control or predict. His analogy of a game of cards when controlling conflict summarises the western approach.

On the contrary, Sun Tzu's writings reveal a belief that despite uncertainties and horrors, conflict can be rationally controlled, and that order and disorder depend on the organisation and the control of its generals. Sun Tzu believed that generals were above emotional and personal motivations when he states, "... and therefore the victories won by a master of war gain him neither reputation for wisdom nor merit for valour." His cardinal premise was that all warfare is based on deception. This is amplified as encompassing: when active, feign inactivity, and when capable, feign incapacity; anger his generals to confuse, and bait the enemy; attack where he is not prepared etc. This is amply different from Clausewitzian theories of centre of gravity and attrition warfare.

The two differ on what defeat means. Western militaries glued to Clausewitzian thoughts focus on destruction of enemy's army, capture of his capital, and a decisive blow to his ally. The Chinese, in Sun Tzu's tradition, prioritise principal targets as enemy's strategy, his alliances, his army, and only then cities. It underlines a firm belief that rather than an over-kill by use of force, it can be used with an extremely rational and focussed approach. The Chinese manner of use of force and coercion, nuanced but highly politically guided, seems to be at odds with the West.

Covid-19 has caused a geopolitical earthquake of great magnitude which will not only change and reshape the world's political landscape,

but will continue giving the proverbial aftershocks for decades to come. The coronavirus outbreak has exposed fault lines in China's relationships with almost the whole world. Besides accelerating the drift in Sino-US relationship, the fallouts of a cascading crisis by Covid-19 might cripple Russia resulting in increased dependency on China against an energised but not so pro-China Europe. A post-pandemic order of a zero-sum superpower contest for global leadership will lead efforts to wean and enlist Association of Southeast Asian Nations (ASEAN). Indo-Pacific will be a key area of contest.

The key security component of US' strategy is the 'Quadrilateral' or Quad. Its membership of major maritime powers such as India, Japan and Australia, will ensure partnership naval capabilities to play an effective role in the region. For ASEAN, the main problem is geography of a neighbouring giant with an autocratic leadership. But it is also aware that without the US security umbrella, China may be less benign and constrained. However, China's revisionist tendency in its maritime claims and the current propensity to be in a hurry under Xi Jinping has raised alarms and concerns all around. ASEAN countries have realised the inherent risks of BRI projects carried out mainly by Chinese state-owned banks and companies. India being a key state in the 'wall', China will leave no stone unturned to pressurise, coerce and influence Indian decision making.

1962 Sino-Indian War

On 20th October, 1962, the PLA launched its attacks across both the western and eastern sectors of its border with India. Chinese artillery barrages opened up and were followed by infantry assaults.¹ By November 20, 1962, it fully controlled the entire claimed area in the west, and had reached the foothills all across (then NEFA) Arunachal Pradesh.

According to Amrita Jash, Mao's motives behind the 1962 surprise on India were in essence three-fold: first, to regain his pole position in

China's politics after many setbacks; second, to damage Nehru's prestige by exposing Indian weakness; and third, for messaging to USSR and USA about favouring India to isolate and encircle China. It was indeed a win-win situation for Mao personally. The timing with the Cuban Missile Crisis was a masterstroke in strategic opportunism.²

It was also a classic failure case of adopting the rational-actor model where cognition of principal leaders may upset standard assumptions of rational decision-making. A more apt process would be a cognitive approach that assumes complexity, non-rationality and bias present in national leaderships' reasoning and decision-making. Awareness, open-mindedness and adaptability through a lens of objectivity cannot be assumed or taken for granted.³ Individual sources of meaning and perceptions of reality have to be factored in.

Air Ops 1962

General B.M. Kaul rues in his memoirs that the IAF was not used in close support, in turn disputed by then IB Chief B.N. Mullik that Kaul had not asked for it.⁴ So where was the professional advice of the potency of airpower use? The Chief of the Air Staff had considered using the Air Force, but concluded that it would endanger own troops. Neville Maxwell' in his book *India's China War* maintains that Indian Govt ruled out offensive air power for fear of Chinese retaliation against Indian cities, so painfully untrue in hindsight. AVM (retd) Arjun Subramaniam in *India's Wars* asserts that "with joint Army-Air Force structures in place at the corps level, and forward air controllers with the brigades, it is clear that the IAF brass was timid and diffident about forcefully articulating to both the Army and the political leadership that in an asymmetric situation on the ground, offensive air power could play a stabilising role, if not a decisive one."⁵ While the levels of jointmanship in light of subsequent 1965 performance poses question marks, there is no doubt that IAF leadership must be faulted for not making a forceful case.

In 2012, then Chief of the Air Staff, Air Chief Marshal N.A.K. Browne said “the outcome of the 1962 war would have been different had the IAF been allowed in an offensive role.”⁶ AVM (retd) A.K. Tewary in an article in the Indian Defence Review was of the view that India could have defeated China in the 1962 war had its air force been used.⁷ According to him, top military and bureaucratic leadership of that time are to be blamed for over-estimating the capability of the Chinese Air Force. Tiwary maintained that Gen Kaul had conceded in his book that “we made a great mistake in not employing our air force in a close support role during these operations.”⁸

While Tiwari’s work tries hard to show that IAF could not be faulted, there are large voids in his analysis. He cites that Canberras flew 22 photographic reconnaissance missions between October 13 and November 11 in 1962 over Aksai Chin, Tawang, Se la and Walong with some sorties at 300 feet above Chinese concentrations. No damage to these from Chinese anti-aircraft artillery was proof of poor capabilities. He cites Air Marshal Raghvendra, then a Wing Commander and a staff officer, in the exact professional advice given to PM and RM about marginal capability of the Chinese air force operating from Tibet and beyond. But importantly there are no minutes or records of this advice. Similarly, he invokes the ‘thoughts’ of Air Vice Marshal Arjan Singh, then Air Officer Administration at Air HQ; yet no question on why this never came up till Arjan Singh took over as Chief of Air Staff, or even later.

Tellingly, he cites (with records) Gen Kaul who stated “Unfortunately, it was the reluctance on the part of the IAF to be able to mount offensive sorties as a legitimate exercise of self-defence which added to the fears of Government in Delhi. If the Air Staff had undertaken to do this, the political appreciation might have been different.” Even in Kargil, some 37 years later, similar echoes reigned true, at least according to the Indian Army. General Thorat’s pragmatic plan in 1959 of trapping the Chinese into our chosen killing ground was good professional advice based on cold military logic, but not politically correct.

Group Captain Bewoor laments the penchant to study other wars and campaigns such as Battle of Britain, 1973 Arab-Israeli Wars, Bekka Valley Operations, OP El Dorado Canyon (Libya), and the 1991 Gulf War, but not our own debacles of 1962, 1965 and 1971.⁹ He points to unchallenged issues in Indian conflicts that would bring out very relevant lessons: sending Vampires into Chhamb in 1965; the disastrous amphibious assault at Cox's Bazaar with Gorkha troops; the decision to put in attacks on the Kargil heights with MiG- 23s and -27s.

He questions the lack of a proactive approach and visualisation of the battle in NEFA or Ladakh. The Chinese intent and Army's forward posture was clear but no activity undertaken to gear up for aerial support at heights above 9,000 feet. IAF was, "...still training for aerial combat, and Close Air Support (CAS) in the plains, with our very own private Counter Air Operations (CAO)". Bewoor cites specifics in proving the inadequacy of IAF fighter aircraft to operate in mountains at that time. For example: training for quality CAS in the mountains was not even thought of in July 1962; quality cooperation with the Army was nonexistent; till Oct 1962 no fighter had even landed in Srinagar or Leh.

General Shankar Roychowdhury (2010) also raises pertinent questions on employment of offensive airpower in 1962. He rightly brings out issues of inadequacies of both sides due altitude, terrain, and importantly cites the ineffectiveness of USAF in the Korean War to affect ground operations.¹⁰ He appreciates efforts such as airlifting of six AMX-13 tanks of his own regiment, 20 Lancers, from Chandigarh to Chushul airstrip in Ladakh, which were in action within a short while of deplaning.

Kargil Debacle 1999

Kargil Review Committee Critique

Air Marshal (retd) BD Jayal in 2001 lamented the absence of annexure, appendices and deletions made by the government in the interest of national security to 'From Surprise to Reckoning', the KRC Report as presented

to Parliament. According to him, Indian armed forces were caught off guard as also the entire security establishment, judging by the three-week response time before the Cabinet Committee on Security (CCS) formally met, authorised the use of air power and the Indian armed forces generally adopted a posture of deterrence¹¹. Actually, it seems that the reckoning part was never fully introspected? Also, in hindsight, the overall delay in unleashing airpower is a burning question till date. Jayal asserts that root cause of specific failures of individuals, institutions and systems, causes that have far deeper ramifications to overall national security management should have been conducted, at least in a classified in-house review of operations. Shouldn't this have also been the responsibility of the Defence Secretary? No wonder there was any forward movement on this considering the lack of inter-service transparency. "*The KRC findings question the vested interest of the 'whole' establishment in maintaining the status quo.*" Jayal suggests specification of inputs that resulted in such far reaching conclusions. He is bang-on on this important issue - the culture of zero accountability and general obfuscation has to be discarded.

The Air Marshal contends that IAF was ignored in managing a hostile LoC in peacetime and relegated to the side lines while reviewing the post-Kargil lessons, which merely indicates a national security mindset that remains frozen in the 1962 era that equates airpower with escalation. Unfortunately, he ignores the fact that starting from Tipnis, IAF leadership were never keen to get involved in 'tactical' security issues. Why blame somebody else's mindset? Did the IAF ever advocate a contrary-Siachenisation template - where airpower could effectively offset huge human costs?

He states, "Tactical and armed reconnaissance of the tactical area, which clearly includes the LoC, is the designated role of the IAF and it is the responsibility of the Army to involve the IAF in effective monitoring of such borders." But shouldn't fingers be pointed at joint structures existing at operational and tactical levels? Jayal states that the root of the problem is pure and simple inter-service turf for owning helicopters and UAVs. But

it does beg a fundamental introspection: why this 'need' in the army, and is IAF doing all it can towards effective joint operations? Air Chief Tipnis' interview to a national daily, wherein he stated "the need was for locating the intruders and their supply lines which we did once the task was given", raises an important issue - why the wait? IAF was doing precautionary deployment anyway, and could have been proactive in detailed target analysis.

Jayal concludes that the Indian military displayed a sluggish and slumbering approach which could partly be due to the prolonged use of the Army in internal security duties - an ardent belief among senior IAF leadership without due thought to the dire circumstances of the times. But no such alleviating factors defend the IAF.

According to Pant & Goulter (2018), outside of the Indian subcontinent, Kargil was a little known war, mainly because the West's attention was focused on the Kosovo conflict. Admittedly, the change to precision weapons played a significant role in swinging the campaign in India's favour. They do point to intelligence failings, as highlighted in the Kargil Review Committee Report, such as Pakistani aircraft located near the border just prior to the incursion, where both army and air force intelligence assessed this activity as "normal." Intelligence voids such as dismissing construction of helipads and non-sharing of analysis that could have picked up the movement of five Pakistani light infantry battalions as they crossed the LoC, point to a classic pitfall mirror-imaging.¹²

Air Operations: Kargil 1999.

While there are a plethora of op-eds, opinions, and even books dissecting Kargil 99, the first real objective analyses happened in the United States, where the importance of learning right lessons of such a unique operation was well understood. Two such studies are worth deliberating since they are extensively cited when referring to this operation: 'High Altitude Warfare: The Kargil Conflict and the Future' by Captain Marcus P. Acosta as an MA thesis in Naval Post-Graduation School, USA, and 'Airpower at 18,000



Source: <http://vayu-sena-aux.tripod.com/kargil-maps1.html>

Costa Marcus

The young officer's bias as an army artillery officer is somewhat evident when he states that trained and well-equipped light infantry and artillery, rather than air power, are the only means of ground manoeuvre at high altitude.¹³ He contends that Indian air power, although psychologically devastating and effective against fixed targets, did not provide reliable and consistent close support. According to Costa, the Northern Light Infantry (NLI) (approx 1,700), assisted by Special Services Group (SSG) soldiers and least eighteen artillery batteries occupied outposts along a total frontage of about 150-km, at heights approaching 18,000 feet (5,485 m) above sea level.¹⁴ Almost 130 posts in Indian-held Kashmir created a total frontage of about 150-km that varied in depth from 4 to 8-km across the LOC¹⁵.

The NLI deployed significant air defence weapons to counter IAF aircraft. Elements of four missile and two gun batteries reportedly crossed the LoC carrying more than one hundred missiles, including US-made FIM-92A Stingers and Chinese-made Anza Mark-II.¹⁶ The NLI's heavy weapons (heavy machine guns and automatic grenade launchers) covered uphill approaches with direct fire and ample artillery support. At least one of its three organic artillery batteries and several 120-mm mortar platoons crossed the LOC. Twenty artillery batteries reportedly provided direct

support to the NLI from PoK (Shingo Valley in the Northern Areas). Three 120-mm and two 81-mm mortars stopped Indian assaults on the Tiger Hill complex for several weeks.¹⁷ The author states that dispersed and concealed SAMs destroyed an Indian helicopter and two ground attack aircraft early in the campaign. This is not fully true. One each fighter and helicopter were fatally downed by missiles. Videos of helicopter dives showed multiple launches that were mostly erratic or deflected by flares. The helicopter that was downed did not have a flare dispenser, and the MiG-21 followed incorrect tactics and procedures.

He attributes airpower's ineffectiveness to altitude effects on aircraft and weapons, adverse weather, heightened SAM threat and a lack of pilot training for CAS in the mountains. The IAF eventually adapted and enjoyed some success, primarily against fixed targets. The introduction of laser-guided munitions increased accuracy and contributed to the fight on Tiger Hill. IAF pressure on NLI soldiers had a significant psychological effect.

In building a case against airpower, Costa cites the Soviet military in Afghanistan which lost more than 100 ground-attack aircraft and 300 helicopters to well-hidden mujahedeen missile and anti-aircraft gun teams during ten years of combat in the mountains of Afghanistan. Actually, the reasons for ineffectiveness of CAS (or IAF's BAS) are not new, and any professional force should have thought about in the years of 'peace and practice'. Also, IAF's flawed doctrine of helicopters being unsuitable for such offensive missions are not supported by data gained in conflicts such as Soviets in Afghan & Chechnya, and US in Op Anaconda. The real gains are reduced numbers of boots on ground and risk to them. For example, for the Soviets in Afghanistan over 10 years, a vast inhospitable terrain and poor troops (except Spetsnaz) - airpower was a great enabler of operations.

Costa rightly believes that defence of static positions seldom succeeds in high mountain wars. After initial disastrous attempts, 2 RAJ RIF showed

the way forward with a combine of a new mountain assault doctrine, an acclimatization program, and a logistic support plan. It identified two avenues of approach to the Pakistani positions, over which it could launch multi-directional attacks and achieve surprise. Twenty artillery batteries totalling over 120 guns would support the operation as well. On the night of 12 June, a massive six-hour bombardment by all twenty artillery batteries preceded the assault.¹⁸ Indian Army doctrine that set a 9:1 force ratio against defensive positions at high altitude proved to be accurate. A single night-time operation could involve as many as a thousand men moving against a single post occupied by only ten people. Indian artillery fired more than 250,000 rounds over the course of the campaign. Artillery demonstrated its value on the high altitude battlefield, creating conditions that allowed Indian infantry to advance and take the heights¹⁹.

Costa is quite critical of the IAF which according to him attempted to avoid involvement in the conflict altogether, claiming inexperience in mountain warfare and unfamiliarity with the terrain, as well as the risk associated with the heightened SAM threat in the mountains.²⁰ Indian Army reports claim that of over eighty CAS missions in the month of June, only twelve projectiles landed near the target, with no direct hits²¹. Mirage aircraft attacked twenty-five ground targets, including the two main Pakistani supply sites, Muntho Dalo in Batalik and Point 4388 in Dras. Mirage aircraft flew CAS missions in support of the attack on Tiger Hill as well, destroying an NLI battalion headquarters and causing considerable damage to enemy forces²². He cites the Army Chief General V.P. Malik qualifying the air effort as “not effective against enemy posts” but “innovating and ... ever willing”. The IAF achieved remarkable successes, yet CAS strikes did not provide reliable and consistent firepower to ground forces²³.

Benjamin Lambeth

Lambeth's work on Kargil War is the most quoted and referred to by airpower proponents especially by IAF leaders.²⁴ The foreword carries

glowing tributes from Indian and U.S. airpower luminaries such as Air Chief Fali Major, Vinod Patney and Ashley Tellis. Patney even claims that the work bridges the gap between inevitable uncertainties in planning and conduct of operations, and subsequent recollection of the experience by some based on uninformed hindsight! But it should not be forgotten that Patney as AOC-in-C, WAC during the war was a principle stakeholder, and must be answerable for overall air operations.

Also, by Lambeth's own admission, the work was an outgrowth of three week-long trips made to India in 2008, 2009, and 2010 at the invitation of Jasjit Singh, the founding Director of the Centre for Air Power Studies, Delhi. There are some other related issues that must be kept in mind before analysing Lambeth's work. He is a Fighter Pilot of considerable experience, ex-CIA and a known airpower (manned strike aircraft) advocate in the U.S. The timing was during the MMRCA acquisition push - suggesting an agenda. Why not our own honest joint report?

Lambeth's opening salvo claims a 'near-total lack of transparency and open communication between the Indian Army's top leaders and the IAF with respect to the gathering crisis.' How was this possible? What about Tactical Air Centres (TACs) and Adv HQs embedded within army structures? Were they in the dark, or was IAF not so conversant (or willing to be) with nuances of ground operations? Quoting Patney, he says that local ground commanders in Kargil and Srinagar did not appreciate the full gravity of the Pakistani challenge at the start of the gathering crisis. Possibly true but that is the fog of war that only clears with time and effort. Was there no accountability of AOC J&K and Western Air Command (WAC) in terms of ISR assets? While stating the challenges to fighter operations, he is not willing to suggest an early use of PGMs which could have changed the course of the operation. He attributes Tipnis' stand on political clearance because committing airpower in close proximity to the LoC could dangerously escalate the conflict. Why this logic within 'Indian' territory where deployment of anti-aircraft 'manpads' constituted an airspace violation too is not questioned.

Aerial firepower could have been provided, had we prepared for war in the mountains. It may have checked the growing intrusion and its support base. Escalation gaming could have prepared us better. Was this permission issue a result of not being prepared to hit ridge-top and forward slope targets, enemy supporting arty guns and mortar within Loc? Insistence of Army Vice-Chief (officiating COAS), that support be provided solely in the form of armed helicopters was nothing undue, the final call was with IAF professionals - it was finally done albeit after a precious delay. One can recall the improvisations on Mi-4 helicopters in 1965 to allow it an armed role in record time? Also, managing issues at service levels is not new.

Lambeth appreciates IAF's adaptability, when it quickly moved to equip all of its participating fighters with flares in order to provide an active countermeasure against any enemy infrared-guided missiles. But the question is why this had not been foreseen if war in the mountains was seriously expected? Moving of hundreds of Stingers from Afghanistan towards India had been feared for a long time. He asserts that such combat operations by fighters over high mountainous terrain at night had never before been attempted in the IAF's history - true, but lessons from Soviets in Afghanistan and Chechnya were available. Knowing that limited wars were the only possibilities, and J&K Mountains were the highest probability, shouldn't an air force be prepared for this?

Lambeth emphasises that the introduction of Mirage-2000 and precision bombs changed the scenario considerably, especially affecting morale on both sides. But the claim that IAF waited until the Muntho Dhalo encampment had grown to a size that rendered it strategically ripe for such targeting is illogical. The delayed timing of attacks and 'real' effects achieved need serious and objective analysis. By 25th May when LGBs were used (and not 17th as claimed), the strategic environment had changed. Lambeth adds that the LGB pod integration to the Mirage-2000 had been essentially completed and declared fit for operational use in January 1999. A duly conservative final certification of the pods for actual combat

employment, might have required as much as a week to complete once the start of Operation Safed Sagar was clearly imminent, but “ego hassles” and other sources of bureaucratic pushback occasioned a needless—and costly—delay in the first use of laser-guided bombs until June 24.

Anyway, considering the situation, bunkers and sangars on ridge tops were top priority targets if quick eviction and lesser casualties were primary concerns. One is reminded about the endless debates in Staff and War Colleges on offensive air support, and IAF students and DS asserting the futility of BAS when compared to BAI. It is the context which should dictate priorities and not dogmatic positions. Surprisingly, there is no mention of the efficacy of Mi-17 rocket attacks. Enemy despatches after Mi-17 rocket attacks tell a tale of dropping morale. Why does it take a failure to see importance of heavier calibre rockets and stand-off munitions on armed helicopters? Was it a doctrinal aversion to very close ‘BAS’ or negating the importance of helicopter-based offensive air support? There is a hint of this by fighter-pilot thinkers for a long time; at the same time IAF did not want to let go of this huge fleet of tactical weapon system that supports so many ‘starred’ ranks.

Lambeth goes on to justify all perceived errors of the IAF’s strike fleet, at times with hindsight and bias, such as ‘judicious’ dropping of 500 general-purpose bombs in all during the seventy-four-day campaign, none of which were released indiscriminately and the majority of which were deemed to have been effective against their assigned targets. Another example, he claims that because of their high gross weight when fully fuelled and armed, the Mi-25 and Mi-35 Hind attack helicopters were unable to operate at the high mountain elevations where most of the fighting took place. But a year later they were able to. In this context, refer to the innovative re-equipping and employment of Mi-4s in 1965. He even quotes Patney, “after every mission, the army would give us the results of the attack. In about 70 percent of the missions, we were told ‘bombs on target.’” However there is no official acknowledgement from

Army units as Battle Damage Assessment, and neither with IAF cameras? Documented ground inputs at that time were quite the opposite.

He sings paeans about GPS-aided level bombing from safer altitudes above the effective reach of the enemy's man-portable infrared surface-to-air missiles. But there is no hard evidence; and a sobering thought that even US JDAMS (Joint Precision Munitions) in Afghanistan with P-code couldn't claim such accuracies. Patney's claims that if the coordinates were accurate - the results would be reasonable are downright naïve. As if this itself was not a tall claim, he then quotes Air Chief Marshal Tipnis applauding MiG-21 pilots lacking sophisticated onboard navigation suites resorted to the use of stopwatches and GPS receivers in their cockpits for conducting night interdiction bombing - as air war's "biggest contribution to ingeniousness."²⁵ This is downright Rubbish! Can any repeat demonstration prove this? If this was effective innovation, then God help us in learning the right lessons!

Lambeth finally admits that the unusually demanding challenges presented by Operation Safed Sagar made for a sobering wake-up call for the IAF, which evidently had not given much thought to such a scenario and had not trained routinely at such elevations until it was forced to do so by operational necessity. So what about fixing accountability and responsibility? He quotes Air Commodore Jasjit Singh calling Kargil "a template for limited war and future options if war becomes inevitable."²⁶ Only the IAF was ignorant because this scenario and difficulties of taking back heights is well-appreciated and war-gamed, at least by the Indian Army. What 'agendas' kept IAF stuck to other templates is debatable. What was the use of public firepower demonstrations with immediate photos to Raksha Mantri if you cannot fight a most likely conflict?

He cites several fighter-pilot thinkers in espousing better jointness. An example is, "one of the valuable lessons that emerged from the Kargil operations was the need for closer joint army-air force planning and consultations from the very beginning," whereby the targeting advice of

Indian airmen “could, at the very outset, be incorporated into the army’s plan for ground operations.²⁷ So is this an admission of failure of current models of Command and control i.e. Adv HQ and TACs? A most telling comment cited by Lambeth is of an IAF thinker who said that these operations also silenced critics within India who [previously had] felt that airpower was essentially escalatory in nature.²⁸ This misgiving seems to be mostly in IAF leadership of that time; but more so pointing to voids in IAF’s appreciation of what conflicts it should have been prepared for.

Lambeth signs off by asserting, “it (Kargil) should have had a tempering influence on their (Pak) initial presumptions about the extent to which merely having a credible nuclear attack capability in and of itself empowered them to try conventional acts of territorial acquisition with impunity.” I don’t think Pak had any doubts about ‘bleeding with thousand cuts’ and avoiding higher escalation. Western strategists try to make too much out of this cold-war deterrence template.

Analysis of Indian Writings & Views

In succeeding paragraphs, a review of thoughts of Indian airpower advocates is analysed. The intention is to only look for faults in logic or identify agenda-driven doctrine or dogma.

Vinod Patney

Reportedly, a six-volume report by the Directorate of Military Operations and Army Training Command was completed a couple of years after the Kargil conflict, but its contents had remained a secret. When contents got leaked, one damning analysis pointed out that delay in starting air strikes in Kargil led to the large number of army casualties. It also highlighted the lack of coordination with Air Force, poor air space management over the battlefield and vulnerability of communication links. Patney countered this by stating, “By now the whole country and international community knows that the Indian armed forces, particularly the army, was very poor in tactical planning. Instead of keeping quiet, they want to point fingers

at others.” He blamed the army chief, General Ved Prakash Malik of poor leadership and tactical sense in sending men to their deaths. He pointedly referred to the Chief’s foreign tour in the critical period till 19th June.²⁹

He also claimed that 80 percent of army casualties were due to Pakistani artillery firing, not frontal attacks. If IAF had been allowed to cross LOC, it would have dealt with Pak artillery and supply lines. He said “What they (the army) ought to have done was to hold on to the positions, take stock of the situation and ask air force to go out and hit their (Pakistani) artillery and supply lines, soften them out and then send the army on ground. That would have been correct militarily. But they wanted to charge, wanted quick results.”

Arjun Subramaniam

In an article on Kargil War in CLAWS Journal, AVM (retd) Subramaniam (2008) queried “was it also a case in the early days of ‘my war’! ‘can you help,’ rather, than ‘our war, let’s do it together.”³⁰ This seems to be a case of pure word-play that discounts a certainty in all conflicts - the initial uncertainty and fog of war? He cites “the military objectives of the Indian Army reflected a rather typical mindset because it looked to fight a classical high altitude battle on its own”.³¹ While asking, “Could we have done it earlier, with reduced casualties?” Subramaniam does not ponder on why the IAF did not at all levels propose this rather than insist on govt being first brought in. He states that the air force went into immediate preparations for hostilities, waiting for government sanction to employ air power offensively. But it begs the question - why wait? The action was within the LoC, involved foreign intruders, and even Indian airspace was violated (Pak AD missiles)? He brings out that from May 11 to May 25, ground troops supported by the air force, tried to contain the threat, assessed enemy dispositions and carried out various preparatory actions. Was there any effort in pinpointing of supply points like Muntho Dalo or heavy mortar positions within Loc? Did army share intelligence with Advance HQ or the TAC on these issues or was there a fixation on

occupied sangars etc? If all this had been done, the move to PGMs would have been faster.

Subramaniam then goes on to some far-reaching conclusion based on flawed logic. For example, he states that on the second and third day of the operations, still in the learning curve, the IAF lost one MiG-21 fighter and one Mi-17 helicopter to shoulder-fired missiles by the enemy. He thereafter concludes that attack helicopters have a certain utility in operations under relatively benign conditions but are extremely vulnerable in an intense battlefield, and a sounder understanding of air power capabilities would have dictated that the most vulnerable platforms be inducted last. This is more of a justification for IAF's vacillating position of offensive air action. The downed helicopter was due to absence of flare dispenser, and the MiG-21 due to a tactical and procedural blunder. The fighter-pilot dogmatic stand on battlefield helicopters is in evidence as also the reason for the lopsided acquisition plan of the IAF at that time disconnected from expected conflicts.

He laments the lack of an integrated plan for the operation (Operation Vijay and Operation Safed Sagar). But he fails to question AOC J&K's non-involvement in the early stages? Were we expecting limited wars to take place somewhere else? Where did the IAF expect limited conflicts if not in the mountains? When these war games were being played by the army, where was AOC J&K all the while? Historical surprises by Pakistan in 1947 & 1965 should have prompted us to play out every scenario and prepare - basically an Advance HQ's job. This reflects a lack of diversity in thought processes and a fighter-cockpit myopic outlook. He misses out on commenting on accountability of IAF ISR assets invested upon heavily by MoD. IAF should have analysed and pinpointed targets from the first warnings. Why the onus on army only? If there was any lack of jointness at Northern Command in sharing intelligence it should have been flagged by AOC Adv HQ to HQ WAC.

The Air Marshal then states that IAF continued high tonnage attacks with 'iron bombs'. It is time now to question the effectiveness of dumb ammo on small camouflaged targets on knife-edge ridges? And what nonsense about night attacks with hand-held GPS (Trimble C code) and stop watches. Can anyone even replicate this today? ACM (ret'd) Dhanoa needs to answer this honestly since he was the commanding officer and has taken credit for this, otherwise we will continue to pull wool over our eyes.

Thereafter, some points are made as to how a phased response, absence of own troops within a few kilometres of the target area to allow aerial targeting, time for the IAF to shape the battlefield along with artillery, and other such suggestions are put forward. It displays a faulty understanding of tactical realities of mountain warfare, as also the context and situation available. Is there a point of mountain-experienced pilots to only staff such appointments? The Indian Army ensures that their top commanders in J&K and Northeast have multiple experiences and commands in these most conflict-vulnerable areas. Very surprisingly, no mention is made of a joint operation in Chakwali (Gurej Sector) where four disassembled artillery guns were lifted in 40 sorties in a day to allow direct-fire mode on Pak positions. This allowed a walk-over without any casualties to Indian troops (Gurkhas). At a later stage, Subramaniam does mention similar US operations during Op Anaconda. This selective amnesia of non-fighter operations by IAF writers is perplexing.

He then indulges in semantics about 'effects' and OTR (over target requirement), ignoring that the army was quite clear of it wanted to be destroyed on ground - and PGMs should have been the choice. Imagine what effects it would have been created if just 10 of them had been taken out in the first volley - the house of cards would have collapsed with plummeting morale. He also makes a case for keeping enemy air power inactive casualties would have multiplied. Very true but one needs to remember that entire operation was on our side, and escalation was against Pak objectives. It is stated that another fallacy about air power that

still needs to be debated extensively is related to the so-called myth that it is essentially escalatory, and more so, in unconventional/sub conventional scenarios. How do we explain that this was the CAS' very argument in his letter! In conclusion, the Air Marshal agrees that operationally, the IAF still has a fair way to go in leveraging all its competencies and exploiting its wide range of capabilities in order to address the lower end of the conflict spectrum and warfare at high altitude. He should have added that first a change of mind-set away from a purely manned fighter cockpit-based approach is imperative. Understanding ground operations in detail is the key to an integrated approach, especially in the Himalayas.

A Turf Battle?

The timing of multiple articles appearing in Indian Defence Review (IDR) in 2010 is important. The generals were pointing to the ineffectiveness of IAF in the tactical realm, while the air marshals were defending Kargil actions, and their perceived turf. The real battle was for control of helicopters, especially a near-future acquisition of a vast fleet of heavy, medium, attack, armed and light helicopters. In the process, both services had their daggers drawn.

According to Gen Bhandari (2010), HQ 15 Corps had wanted air operations to commence immediately to lower the morale of the enemy and show our resolve to escalate.³² DGMOs of both countries met at Attari on 9 July to discuss the commencement of Pak withdrawal with effect from 0600 hours on 11 July. He claims that approximately 85–90 air missions had been flown, of which only a small percentage was effective or partially effective. He does credit attacks on Munthodhalo as very effective and a huge success. But he gives far more credit to the effectiveness of artillery especially the employment of BOFORS in direct firing role.

Gen Harwant in an IDR article contended that the Air Chief's sustained reluctance to deploy attack helicopters and the attitude that, 'we know better' and it was the 'army's problem' and a condescending attitude can find little justification. He questions IAF's doctrinal position that use of

air power in direct support of the ground battle is its most inefficient utilization. He claims that it was the CAS' position on escalation that 'scared' the PM, RM and the External Affairs Minister. He also claims vindication on the actual turn of events.

Very interestingly he chides Air Marshal RS Bedi (Retd) former DG Defence Planning Staff of MoD, who in an article in Hindustan Times (Chandigarh edition) dated 21 June, 2004, wrote that no air force in the world is trained to engage targets at heights of 15000 to 20000 feet, nor are such weapons designed anywhere in the world. The Gen rightly rebuffs this claiming no other air force is required to operate at such levels, and that admission of not training for this was tantamount to ignoring a daily reality of the Indian Army.

Unfortunately, Bedi reacted to this article with a poor response (IDR Vol 25.1 Jan-Mar 2010) that included ludicrous assertions like: employment of air power has all pervasive implications and it opens up the entire country to enemy air threat; questioning efficacy of battlefield gunships wrongly inferred from Kosovo; the allegation that "IAF had long contended that the use of air power in direct support of ground battle is its most inefficient utilisation" is right; IA in its zest to acquire armed helicopters gave a commitment to the air force that it would not ask for close air support from the air force in the future. Taking the army's commitment seriously, the air force cut short close air support training of its fighter pilots which was subsequently stopped altogether by the successor CAS. The last comment of Bedi is most alarming even if partially true.

Air Marshal Narayan Menon, who was AOC Adv HQ during Kargil gave a more mature reply, but still with little serious introspection (IDR Vol 25.3 Jul-Sep 2010). He claims that HQ Northern Command called him for a meeting on 8 May 99 to discuss 'a few operational aspects', where he first learnt about a limited intrusion. This is strange since meetings with CoS and AOC Adv HQ takes place almost daily, especially in the 24x7 active Northern Command. Menon claims "a political go-ahead was

necessary as there was an agreement signed between India and Pakistan in 1991 about prohibiting armed aircraft from flying 10 km either side of the IB or the LoC. While the agreement may not have been valid under conditions of declared hostility, informing the government which was a signatory would have been mandatory when no alert had yet been sounded.” This is debateable. As already brought out this was in effect an invasion including that of Indian airspace since manpads had come in. The larger point is nothing stopped the IAF to be proactive as it had done in even 1965 (Mi-4 example). Fortunately, Menon does acknowledge effective helicopter operations especially Mi-17 armed attacks on May 26th and 27th.³³

Menon, however, brings in the point of COAS Malik’s abroad trip on 10th, and as gentlemanly as possible opens up a very confounding issue - why did he leave for abroad if the situation was so serious? He states, *“The army knew about some incursions on 3 May, IAF was informed, along with a request for air strikes on 8 May and the COAS left only on 10 May. The COAS was also the Chairman COSC and he should have had the best possible knowledge of what was going on. In any case, Poland and the Czech Republic do not figure very high on India’s military priority list and the trip should have been curtailed and the burgeoning crisis dealt with. COAS has to say in his book ‘Kargil-From Surprise to Victory’, page 109, “On 17 May I asked the DGMO and the VCOAS if I should return to New Delhi immediately. Both advised me that as the situation was well within the capability of 15 Corps and Northern Command, there was no need for me to do so.” Or in other words, the situation was not ‘serious’ even on 17 May.”*

Menon signs off with one unfortunate dogmatic assertion borrowed from Lambeth, “In future wars too, it should be the interdiction targets that take priority. Destroying enemy command and control centres, supply concentrations and surface communication networks would be far more operationally beneficial to the army than taking out a medium machine gun emplacement³⁴.” This is not in context of the strategic, political and tactical realities of the time.

IAF Website

The IAF website details on Kargil War too has howlers embedded that point to faulty doctrine and a dogmatic approach. Besides other issues, it invokes the example of NATO, which after deploying 100 Apache attack helicopters in Greece, reconsidered bringing them into Kosovo till the shooting was over, as they felt the environment didn't justify it. Wrong - it was cancellation of the planned ground offensive and continuing the attrition by air. Apaches were linked to the ground operations. In the Kargil Mi-17 case it was purely the absence of a CMDS (flare dispenser) on that particular helicopter in the formation of four Mi-17s.

It asserts that air power is not to be frittered away on insignificant targets like machine gun posts and trenches, but on large targets of consequence (like the supply camp at Muntho Dhalo, enemy Battalion HQ on top of Tiger Hill, etc). This is not contextual, since situational demands outweigh dogmatic approaches. It claims that almost from the very beginning of the operations, IAF intellects were busy ticking over in a near constant brain-storming session aimed at lesson-learning from Operation Safed Sagar. But a pertinent query is where was the TACDE (top-gun institute of IAF)? Patney never allowed it to go beyond Jammu and 'interfere' with operations of HQWAC. A blinkered approach will never allow a fast and genuine learning curve.

The webpage then makes an overarching statement that lessons would be applicable to all the world's air forces, and, was the first time that IAF fought a limited war, hitherto thought to be an unlikely eventuality. Operation Safed Sagar was, therefore, a turning point in the history of military aviation. This is truly farfetched and rhetorical, and hopefully for public consumption only. The real lessons are: only PGMs for ridge top targets; how not to be indecisive; and, having a quick and honest learning curve. With LICO scenarios being the most topical issue in war colleges at that point of time, and even today, it is not understood how Kargil was an unlikely eventuality.

It is no wonder that Praveen Sawhney (2019) hints at the hollowness of the 'victory' at Kargil.³⁵ He quotes Gen Malik in 'Kargil: From Surprise to Victory' that 900 elements comprising artillery guns, howitzers, mortars and one rocket battery were employed in the Kargil War, including all 100 Bofors guns with the army. In his book 'In the Line of Fire', Musharraf claims that just five NLI battalions forced Indian Army to deploy four divisions and the bulk of the Indian artillery from strike formations; hinting that entire national resources, including their air force was forced into action by a simple Pakistani tactical action. It is clear that a clever enemy will not fight the war you want; and therefore, flexibility and adaptability of minds of leaders and commanders can only happen in an atmosphere where 'loyal dissent' is encouraged at every step of thinking and executing warfare.

Current Thoughts on Kargil

Twenty years post Kargil, CLAWS held a seminar with stated aims to honour those who took part and revisit lessons learnt.³⁶ The Director, Gen VK Ahluwalia in his opening address invoked the need to identify gaps and structural infirmities that still exist, and to look beyond the horizon. It is worthwhile to look at the deliberations since most of the participants were involved in Kargil 1999, and whether we could still learn correct lessons, even after 20 years. Army Chief Gen Bipin Rawat very aptly described current and near-future conflicts having a pre-eminence of unconventional and asymmetrical characteristics along with indeterminable factors. Technology, cyber and information domains would be key drivers, and that integration would have to be planned at the apex level. While the second statement is bang-on, the first is nothing new since Pakistan has been indulging in this from 1947-48.

Gen VP Malik, the army chief during Kargil, and who has often been criticised for leaving the country on an inconsequential visit abroad at the start of the crisis, pointed to three glaring facets: lack of knowledge of terrain; lack of special clothing; and, lack of surveillance besides foot patrol.

It begs an important question - whose job was it to identify and process this? If we still cannot pinpoint this, then lessons-learnt would never be complete. He praises the level of jointmanship but forgets his own lament over the years about the lack of it. There is a need to be clinical while introspecting without worrying about emotional angles. Gen NC Vij, the then DGMO, talked of indulging in tactical nuclear weapons without debating whether this was not walking into the conceptual trap laid out by Pakistani generals. However, he did bring out two important issues that are relevant in today's context: air power clearance signified a higher level of messaging (resolute); and, the difficulty of troops to change over from counter-insurgency to conventional orientation. Both viewpoints of the two generals seem to suggest that scenario-based planning, exercising and assessments can reduce the chances of complete surprise - for that was essentially the reason for the whole debacle.

The seminar report adequately brings out, and rightly so, the courage of infantry battalions which surprised the whole world. Also, artillery's role was equally crucial, especially in the direct-firing mode. For example, the attack on Tololing required 26,000 shells (95 tons TNT+527 tons steel), while Tiger Hill required 60,800 shells (23t TNT+ 500t steel). A total of 2,43,000 artillery shells were expended in 90 days. The question being avoided by a land-centric mindset is whether airpower could have achieved much better results with more efficiency at a fraction of this effort.

Airpower and Doctrinal Traps

Doctrine & Dogma

Are thoughts of great thinkers of conflict management like Sun Tzu, Chanakya and Clausewitz really all-time truths as often quoted to make a point, or are they to be treated in context of their times? For example, Sun Tzu is credited with propounding "defeating the enemy without violence" as opposed to Clausewitzian attrition warfare. However, many researchers point out that he proposed conserving strength for inflicting

violence at a most opportune moment to annihilate effectively. Similarly, many quote him as an ancient proponent of anti-guerrilla warfare. But his writings advocate: swift victories and avoid prolonged operations; wars to be conducted only on the enemy's terrain (ignoring population support); and, he stressed on an army's unity and discouraged dispersed operations - all three issues are against basics of counter-insurgency.

Current debate distinguishes between the nature (permanent features) and character (context dependent features) of war, primarily attributed to Clausewitz, which is not quite true. Michael Howard and Peter Paret's translation of *On War* cites him in book 1, chapter 1, "War is thus more than a mere chameleon, because it changes its nature to some extent in each concrete case."³⁷

Clausewitz had two lenses to look at war: an abstract one based on reasoning and logic; and other steeped in reality and based on practical experience. There are two ideas of war at play in *On War*. The Trinity is comprised of three "dominant tendencies: primordial violence, hatred and enmity, which are to be regarded as a blind natural force." According to Clausewitz, the first mainly concerns the people, the second the military; and, the third the government. Clausewitz asserts that these tendencies in reality moderate war's abstract nature. His theory based in abstraction and logic means war is between two unified entities and about combat only. Its applicability to ongoing conflicts is seriously suspect. For example, he clearly dismisses law as irrelevant and considers international law barely worth mentioning; but today many contemporary conflicts are internal conflicts in which the domestic law of the local state holds good.³⁸ Another example is his ignoring other issues in war's socio-political context, such as geopolitics, religion, culture, economics and technology leaps that can also affect war's nature and character.

Emile Simpson (2018) sums up Clausewitz's relevance by, "*On War* is simply a text, and should be read unsentimentally in its own context, retaining what works, if necessary by adaptation or analogy to new situations, but

distinguishing what does not.” By plugging in modern operational doctrine wrongly to a historical tradition, there is possibility to misunderstand current conflicts. Clausewitz updated the theory of war and warfare to account for the experience of his own day; in similar manner, a need to update the theory and principles of war as per current experience.

Surely, with an ever-changing character of war, and even its nature, as is argued here, these should only serve as analogies to one’s narrative. Leaping technological progress and fruitful convergence of different fields are providing an almost continuous revolution in concepts of war-fighting that requires a newer prism to discern and cope. While there are certain ‘truths’ that flow out of pure logic and common sense, to quote these classical great works in every situation as relevant is bordering on the ridiculous.

Even airpower thinkers, past and modern such as Douhet and Warden, among others are being questioned for their relevance and applicability today. Writings and viewpoints of Indian airpower advocates like Jasjit Singh and Kapil Kak are justifiably facing critiques about their applicability. New and fast-evolving technology and their low-cost availability e.g. hypersonics, artificial intelligence, precision, networking, IoT and autonomous weapons bring in concepts of non-contact warfare and swarming that can even upset long-cherished principles of war. For example, the principle of mass and concentration is challenged by ubiquitous sensors, networking, precision, stand-off ranges and no-contact concepts.

While the character of war has forever evolved and changed, it is widely believed (Clausewitzian followers) that its nature does not. Quite evidently, the information revolution and technological advances have expanded it to include a variety of actors and instruments of power beyond the armed forces. Today, more than anything the trinity of technology, information and strategy influences changes in how conflicts are managed. A case in point - information manipulation enabled by technology is far more potent in influencing target behaviour than any other weapon available.

Irregular warfare is another case that challenges the classic model. For example, 'war amongst the people' constituting insurgency, and hybrid conflicts along known fault-lines, among others brings out complex relationships, power structures and a variety of people involved. Typically, such conflicts cannot be framed in binaries and constants that militaries rely on to plan war campaigns. The practical problem is in linking tactical actions with strategic objectives. Such situations are inevitably and fundamentally a struggle between competing legitimacies and efforts to win over the will of the people, and is full of complexities. Therefore, these conflicts break and upset the temporal and spatial sequencing of Clausewitzian model of warfare. Military operations are mixed with politics and run parallel, or in uncertain trajectories. The 'strategic corporal' is a truism, where tactical actions may sow strategic effects. Paradoxically, rather than war being a continuation of politics by other means, politics may be the continuation of war by other means.

Coercion & Airpower Evolution

Most great military historians and thinkers like Clausewitz, Jomini and Mahan have focussed their work based on what had happened or was happening, or what military capabilities existed at the time. However, airpower theorists generally have centred their work on future technological and projected capabilities that mostly did not exist. Being the last to arrive and new on stage, airpower needed not only pure theorists but also hard-sell and advocacy, in the ominous presence of established land and naval turf. The battle was for limited resources and attention of civilian leaders. This reflects on all classical airpower concepts and doctrines. According to Johnson (2003), an example is Douhet's and Trenchard's passion for strategic bombing, and its ability as a coercive instrument to bring about behavioural changes in opponents.³⁹ It was partly fallout of the importance to be seen independently effective of naval and land forces. A similar refrain on maritime defence by Mitchell in 1925 is illustrative.

Between the World Wars, only bombers were capable of bypassing surface forces and go deep since even fighters and escorts were not technologically capable at that time, and therefore, *command of the air* was a central concern. T. Biddle (2002) claims that as a result there was an emphasis on long-range bombing's importance and independent decisive action, and the promise to win the next war quickly through technological innovation.⁴⁰ There were some theorists like JC Slessor (1936) who articulated insightfully the importance of interdiction attacks ground forces, while naval theorists and aviators focussed on aircraft carriers as game changers.⁴¹

Strategic bombing campaigns were attrition warfare at their core. Just the RAF and the US Army Air Forces had *each* lost more than 40,000 airmen in the strategic bombing campaign against Germany. Bernstein's research informs that the final economic collapses of Germany, or even Japan, were due a combination of bombing, blockade, battlefield losses and economic mismanagement.⁴² The advent of nuclear weapons and air-delivery transformed airpower, and it became capital-intensive, with smaller numbers of more potent aircraft influencing larger areas. This is clearly evident when comparing the effort required over specific targets in WW II and over Vietnam. The US' Second Offset paved the road to precision-guided munitions, stealth aircraft, and new sensors and systems for air battle management;⁴³ and was demonstrated as an effective hard-sell in Iraq, Serbia, and Afghanistan subsequently.⁴⁴ According to Ehrhard, in the next evolutionary phase, powerful militaries are transforming by embracing unmanned autonomous swarm concepts.⁴⁵

There has been a clear effort by airpower theorists to amplify its unique characters when compared to naval and land power. The 'inherent strategic' character of going deep bypassing every obstruction, has been debunked by many including Colin Gray pointing out that all forms of military power have strategic effects today. Similarly, the claimed unique ability to mass in time and place without delay is questionable. Conceptual and technological advances in air defence in all its manifestation today have

tilted the balance from offence to defence, at least when considering manned expensive platforms as offensive assets.

According to Karl P Mueller, another attribute is the belief that “air power is inherently offensive” than others which stems from a number of factors: the individual cockpit view of downing the enemy; the absence of protective terrain in the air making defence pointless; and, an attacker’s ability to concentrate at selected places and times.⁴⁶ But there are many instances such as the Battle of Britain where the defence won. Criticising this cockpit view and absence of critical thought, JR Carter blames “.. an aerial cult of the offensive, suppressing rational analysis and decision making and contributing to dangerously unrealistic planning.”⁴⁷

The next independent attribute as per Cohen is its use as punishment or retribution against an adversary if centralised employment and calibrated control is a must or minimising friendly casualties are important.⁴⁸ This of course is applicable to less-than-peer opposition, and falls markedly with powerful nations that can adequately defend and attack. One important aspect of ubiquity of airpower is that it represents a potency to be applied as desired and not defined in black and white as other domains. However as per Epstein, this has some unintended consequences, for example, most strategic analyses of the Cold War in Europe gave little attention to airpower in the initial planning calculus.⁴⁹

Current ‘aerospace’ theorists emphasise that air and space are a seamless continuum based on two arguments. The first issue of a continuum is a 100 kilometre with little atmosphere to sustain aerial flight and too low orbital satellites.⁵⁰ The second is about more common functionalities but this too is punctured by Sheldon on many counts including most fundamental operational and strategic characteristics of air power are almost wholly absent in the space arena.⁵¹

Coercion and Strategic Air Power

Pape in 'Bombing to Win' makes a case for target selection being a follow up of strategy and objectives, and not serve as a basis for strategy.⁵² Choice of targets have varied across decades from Douhet's population centres, to industry and infrastructure, ground forces, to Warden's leadership and command in the Gulf War. Erhard identifies air-strategy as a process usually started with selection of end-objectives or end-state, followed by designing the method for coercion or punishment, and the cause-and-effect sequence of events expected to lead to the desired outcome.⁵³

Deterrence theory, in its classic form, clearly differentiates between strategies for punishment and denial. Denial is focussed on enemy militaries or anything that directly supports or sustains them. On the other hand, punishment strategies do not to weaken the military. Pape states vide examples, that while denial strategies may be effective on a military, it does not always produce desired coercion; but punishment strategies always fail to coerce.⁵⁴ Pape believes that as a whole strategic bombing never succeeds, and effort is better spent on targeting the enemy's military i.e. BAS or BAI. Targeting of military production facilities may be relevant only in the long-term.

MacIsaac quoting the first US Strategic Bombing Survey on psychological effects in World War II explains that a considerable degree of resilience was witnessed in British, German, and Japanese civilians mainly because of no other alternatives but go through it.⁵⁵ In fact, fragility of military morale has been witnessed due to isolation, extreme deprivation, and the option to desert or surrender. Air strategists have focussed on political effects of an air campaign as pillars of a coercion strategy. But most have failed including triggering popular uprisings or military coups, as was attempted against Saddam Hussein; and as Arkin(2007) states in trying to pressurise governments into action which was not tenable i.e. Israeli airpower against Lebanon in 2006 to oppose Hezbollah.⁵⁶ Suffering of the populace is offset by either strong nationalism or repression fear, or

a combination of both as in Germany in WW II. Byman and Waxman explain that any coercion campaign is actively countered by an adversary; for example in Vietnam, the North was able to counter-coerce and convince the Americans of the prohibitive costs and futility of the war.⁵⁷ Owen gives a valid example of what is really at stake and for whom as an overriding factor in coercion. Citing the success of the NATO air campaign of 1995 in Bosnia, he believes that capitulation was more due to the fact that Croatian and Bosnian government attacks had already taken over all the territory that was to be given up.⁵⁸

Analysing Indian Thoughts on Airpower

Practitioners of airpower have as a result of traditional identity crisis have mostly been 'men of action' and a 'can-do' variety. This has come at the cost of lesser intellectual thought and shallow conceptual foundations. This is evident from the range of short-lived concepts such as strategic bombing, Wardens Ring's and EBO. The larger picture of follow-on effects and integration of capabilities inevitably got blurred in this proclivity to provide tactical solutions. Similarly, command of the air among peer competitors is an unaffordable luxury to be sought. A preponderance of lethal manpads, urban settings and other asymmetric means pose a caveat even in conflicts with lesser adversaries. There is hurry in universalising any immediate success, e.g. EBO after Gulf War, or even after the doubtful impact of airpower in Kosovo. Lack of incisive analysis and intellectual depth plagues Indian thought on employment of airpower in contextual terms. Dogmatic approaches are misfit in an environment where technology and societal issues are constantly altering the character of war.

A centennial appraisal of air power by AVM (retd) Kapil Kak, a former Deputy Director of Indian Defence & Strategic Analysis (think-tank), in 2001 is worth dissecting to see what has changed and what has not doctrinally.⁵⁹ He starts with stating how for nearly a century since its inception, air power had a dominant role in the generation and successful enforcement of favourable asymmetry. However, in the same breadth this

is entirely attributed to manned combat aircraft which allows calibrated escalation and disengagement control. This according to Kak makes airpower an ideal weapon for deterrence by denial or punishment. Of course, at the time of writing development and diffusion of technology had not skyrocketed and only manned aircraft offered such characteristics.

Today, attributes of “high speed, long reach, quick response, and termination, technological intensity, precision fire power and shock-effect, without regard to frontiers and coastlines” do not need manned platforms in high-risk environments. He gives examples of Blitzkrieg, Battle of Britain, Battle of Atlantic, Pearl Harbour, and numerous wars since then in East-Southeast Asia, South Asia and West Asia where air power achieved decisive results. The author also gives examples of failures warning of disregard of fundamental air doctrines. However, it is today evident that these essentially created surprise, asymmetry and decision dilemmas through the third dimension. The questionable is - is it time to adapt to a newer environment?

Kak correctly states that India’s strategic doctrine of war prevention places a high value on deterrence; but in the event conventional deterrence breaks down, war will be short, sharp and swift, with the winning side being the one which has favourable asymmetry in overall capability, quality and technology of combat air power. However, this too is questionable in current context. For example, superior Israeli airpower has not been able to deter Hezbollah and Pakistan’s cuts to India continue despite a ‘Balakot’. His concept of this awesome deterrent tool is manned combat aircraft supported by an array of high-tech sensors, networking, precision weapons etc that will allow coercive and deterrent diplomacy. All this can be done by unmanned concepts such as UAVs and swarming at lower costs. Yet, like in Syria or Libya it did not achieve deterrence or a change in behaviour. In the coming decade all this will not require ‘manned’ platforms, and most networking and processes will be handled by AI, being too much for humans.

The air marshal, citing historical examples from WW II, Indo-Pak wars (1965) and Arab-Israeli wars (Bekaa) that met with disaster, devotes a lot of space to air superiority campaigns in order to seize the initiative, carry the war into enemy territory, neutralise air power, and establish control of the air to provide freedom of action for our surface forces. He asserts that this campaign must precede a major offensive operation on land or at sea and cannot run concurrently if such forces have to be immunised against interference by the adversary's air forces. The author underscores 'indivisibility' in light of challenges of air space management in the context of SAMs and a plethora of other weapons in the TBA. However, contexts and technologies have changed making even age-old concepts such as C of G and EBO highly questionable. Favourable Air Situation (FAS) in time & space is more optimum and achievable with current lethal long-range AD in a combat between equals. Air superiority campaigns may still be true in conventional large fight-to-death campaigns but costs and contexts will dictate newer paradigms. Even the 'indivisibility' favourite of airmen requires relook with newer technology and concepts that allow disaggregated, distributed and networked multi-domain operations. How about a case for integrated templates - theatre commands?

Kak's push for strategic air campaigns are based on the Gulf War where Iraq's Air Force was made so impotent that on the tenth day 118 aircraft escaped to Iran. In hindsight, it was a case of gross technological and conceptual surprise, shock and awe. Arabs have been less savvy in handling technology and better in ground-based irregular warfare. He reiterates the case for multi mode aircraft with PGMs or air-launched-cruise missiles (ALCMs) for long-range precision strikes. But where is the requirement of manned aircraft in BVR concepts - will it be more effective, cheap and low-risk to do this otherwise?

The most relevant issue to look at is the treatment of Counter Surface Force Campaign (CSFO). Kak invokes a 1945 US Army Air Force manual listing three priorities for tactical air forces: "the first is to gain the necessary degree of air superiority, the second may be summarised in

current terms as interdiction, the third as close air support.” He then goes on to assert that there is immutability about this prioritisation even after 55 years. He then envisions a future conventional battlefield for counter surface force action, where the greatest challenge would be management of change in the war paradigm with enhanced firepower, greater mobility, high tempo and manoeuvres by smaller mechanised forces. In a battlefield of high fluidity with no distinctive fronts, flanks and rear the focus would be on joint application of air and land combat power, and this emphasises a central role for interdiction, surveillance, reconnaissance and establishment of air superiority conditions. An interesting proposition is then put forth: the greater the dependence on momentum, the greater the impact of delay; and, conversely, the greater the dependence of defensive forces on reinforcement, the greater the impact of both delay and destruction. While this template may be applicable in long-duration open-terrain mechanised manoeuvres, it is not relevant in mountainous warfare or short-duration conflicts.

While Kak laments poor coordination between army-air force in 1962 and 1965, although he acknowledges far greater effort towards joint planning in the 1971 operations, he cites the Kargil Conflict as a fine example of joint approach which does not indicate true introspection or academic rigour. Other ‘combat-aircraft’ bias are also evident; for example, he cites the contribution of the air drop at Tangail towards the advance to Dhaka in the 1971 War as substantial, but highly successful special heliborne operations as just “also a feature of the operations in the East,” which is a gross faulty analysis.

IAF Doctrinal Shift

AVM (ret'd) Subramaniam, a prolific writer and airpower analyst, believes that because of changing paradigms of global warfare and IAF's own refined understanding of it, two fundamental doctrinal shifts took place in the 2011 edition of IAF Doctrine (Subramaniam 2018). The first was to discard the principles of sequential warfare and adapt to parallel warfare.

Secondly, an increased focus on the employment of air power at the lower end of the spectrum of conflict and an increased emphasis on joint operations in varied terrain with missions like shaping the battlefield and interdiction of the enemy's combat potential before it entered a theatre or Tactical Battle Area (TBA)⁶⁰. Was this a case of the IAF finally facing Indian-context conflict realities? Actually, land-centric priorities followed by maritime prowess are in our face, whether we like it or not.

In the entire article, Subramaniam hints at a doctrinal and technological asymmetry being created by China, mainly against the USA, but stops short of recommending a multi-domain response preparation from the Indian side. It is still about IAF's distinct roles and tasks - in other words, the importance of maintaining a distinct identity in the operational and tactical realm. He does not consider that jointness may not be enough anymore, and that true integration and synergies are imperatives in the near future. Current structures of war-fighting need a serious relook.

Pant & Goulter (2018) have commented on the IAF Doctrine with Kargil as a backdrop.⁶¹ For example, they consider the IAF attack on the Pakistani logistics hub at Muntho Dhalo as a fatal blow to both Pakistani morale and their ability to sustain their campaign (quoting KRC Report). But they fail to deeply inspect this in terms the timing and relating it to the larger strategic and political developments that were taking place, e.g. Indian NSA's parlays, Nawaj Sharif's call to Clinton etc. The truth about Muntho Dalo attack in this larger context will bring about some correct lessons especially in terms of the delay.

Another thrust in their article is on the strategic nature of airpower and that tactical application would only fritter away its prime advantage of creating strategic effects. In another part they state, "... the classification of an offensive air operation as 'strategic' is not determined by range, platform type or the weaponry used, but is determined by the objective or the purpose served." But what they conveniently ignore are issues so important in the sub-continent's context, e.g. tactical helicopter

employment, BAS/BAI (battlefield air strike/interdiction) and air defence of the TBA? Also, air operations' uniqueness is depth, speed, response etc. In the TBA, an army can achieve similar strategic effects. Their contention subsequently on IAF's modernization program making steady progress towards a strength of 42 squadrons by 2022, and types of aircraft being procured indicating a serious intent to develop a balanced air force and a true strategic capability, actually gives out the manned aircraft industry agenda of the acquisition game.

Quite correctly they critique the 2011 doctrine in downplaying the role of intelligence as dangerous and an oddity? However, they appreciate the naval strike role given to the air force especially the distinction drawn between anti-shipping strike and maritime strike. Although a moot question is could this be better done by naval airpower with integrated maritime assets? Both these issues may be a reflection of IAF's 'conceptual thought' dominated by strike and AD fighter pilots with no room for diversity.

Air Cmde JPS Bains' recent article in *Air Power Journal* (CAPS, N Delhi) broadly reflects IAF's current thinking on close air support (a term discarded in favour of battlefield air strike or BAS).⁶² He starts with a dogmatic assertion that it is the least efficient application of air power, but qualifies that it may be the most critical for ensuring the success or survival of surface forces aka Anaconda. The problem is the use of 'least' in context of expected conflicts.

Bains forecasts that conventional land battles in the foreseeable future will be characterised by increased violence, lethality and destruction, with the battle being prosecuted with enhanced firepower, high tempo and manoeuvres by mechanised forces. In this battlefield of high fluidity, with no distinctive fronts, flanks and rear, the focus would be on joint application of air and land combat power. But is this template correct in the Indian context of a nuclear Pakistan, Sino-Indian mountainous border, LICO in urban settings etc? Mountain warfare is most probable,

and most of these characteristics do not apply or are modified. And as if by a tad late realisation, he acknowledges that tactical engagements are now often fought amongst non-combatant populations and increasingly in urban areas, where situational awareness is no longer enough to conduct effective military operations; instead, commanders need to develop situational understanding.

The article then indulges in some common views of airmen i.e. errors of substituting airpower for ground forces and inadequate genuine joint-planning, asserting, “prudent and necessary to move away from a “threat-based” preparation, to a more accommodative and flexible “capability-based approach.” But China and Pak will remain primary concerns for India, especially in Himalayas. So how true is this adage involving nuances of threats versus capabilities so relevant for expeditionary templates? A collation and tabulation of trends of the previous century and a changing viewpoint by RAND Corporation is then put up. But even a cursory look makes it clear that conflict management has always included all this but evolved with changing technology and operating environment.

Lastly, Bains invokes the full ‘spectrum of threats’ from nuclear confrontation, conventional war, conflicts limited in area, scope or objectives, to lower end friction, such as insurgencies and terrorism; and, India also needs to be prepared for an escalation of conflict from limited to nuclear on two fronts. No comment is offered on key concerns of probability, priority and affordability, which are the key to spending on acquisition in future.

Chinese High Altitude Warfare Trends

For high-altitude operations, the PLA, along with the militaries of the other members of the Shanghai Cooperation Organization (SCO), have been moving toward the Russian concept of Reconnaissance Combat Operations (RBD). Based on tactics developed during the Soviet era, the concept was refined through combat with Chechen insurgents based

in mountainous regions. RBD involves the extensive use of signals intelligence, helicopters and reconnaissance teams to provide intelligence for light infantry. The light infantry is then able to serve as blocking forces to ambush and halt retreating insurgents as well as provide fire coordination for long-range artillery and air support. These tactics, which coincide with the PLA's emphasis on networked and highly mobile units, have been especially embraced by the light infantry units operating on China's western periphery composed of Tibet and Xingjian.

PLA army aviation units have Z-9G helicopters equipped with imaging infrared (IIR) sensors and artillery units use data links to provide near-real time fire support. This follows the Russian experience in Chechnya where Russian forces have used attack and other helicopters equipped with IIR seekers and real time data links to identify Chechen insurgent positions. Furthermore, the PLA has used their first airmobile regiment with its Z-9G helicopters in Xinjiang to develop high altitude tactics and operating procedures. These can be mounted with cannon pods and air-to-air and anti-tank guided missiles. For the movement of airmobile units, PLAAF Mi-17 transport helicopters equipped with navigation radar and uprated engines are available.

A ground force destined for combat in the high mountains must be tailored to meet the demands of the environment. Logistic support is necessarily difficult and requires more assets than in other less strenuous environments. The force requirement increases accordingly, to both secure and man supply lines and other essential assets, such as artillery batteries. Similarly, decisive manoeuvre in the mountains requires a significant infantry force capable of operating in small units. The force must be unencumbered by heavy loads, and capable of traversing the world's most inaccessible terrain. The full range of firepower, delivered from the air and ground, is necessary to provide overwhelming lethality to the force engaged in combat at high altitude. Aerial munitions are part of the full spectrum of echeloned firepower that should be available to ground forces. Attack helicopters can provide responsive firepower if pilots are trained to

fly in thin air and employ “running gunfire” techniques with PGMs and standoff weapons.

Yet air power cannot be relied upon as the sole provider of the responsive, concentrated fire needed to support ground manoeuvre. Suppressive fire, created by a heavy volume of continuous fire over a wide area, is a necessary complement to ground manoeuvre, and is best provided by artillery. Artillery must be available to forces engaged in ground combat, despite the challenges posed by the high mountains. The Indian Army at Kargil demonstrated the overwhelming lethality of artillery. All weather, responsive fire is essential to manoeuvre warfare on any battlefield, including the high mountains. British and U.S. forces that deployed to Afghanistan after Operation Anaconda brought 105mm artillery batteries. They successfully transported the artillery pieces by helicopters throughout the country, proving that artillery can be mobile in the mountains.

A Case for Helicopters

1965 Lessons

Extensive infiltration of the Pakistani Gibraltar Force at various points across the 750-Km long cease-fire line and the international border between Pakistan and Jammu and Kashmir began on 5th August 1965. The activities of the armed infiltrators covered areas from the south-western tip of Jammu and Punch and Uri in the west, Tithwal in the north-west, Gurez in the north, and Kargil in the north-east. Initially, about 1,500 of them crossed the Indian border in Jammu and Kashmir surreptitiously in small batches, and concentrated at selected points inside Kashmir to organize themselves into larger groups. This force was equipped with light, automatic weapons, and its aim, apart from sabotage, was to indoctrinate the Kashmiri's so that they could rise in a rebellion against India. Infiltration was mainly directed towards Kanzalwan, Keran, Tithwal, Kargil, Uri, Gulmarg, Mendhar, Punch, Rajauri, Naushahra and Jammu areas.

The second wave of infiltrators was inducted into Jammu and Kashmir in the third week of August. At this time, which was the period of their peak strength, their number was established between 5,000 and 6,000. Taking into account the replacements for those who “infiltrated”, it is estimated that on the whole, a total strength of about 8,000 took part in these operations. By about the first week of September 1965 when the open hostilities started between India and Pakistan, a third wave of infiltrators, approximately 5,500 strong, was ready in Pak-Occupied Kashmir for induction. But this could not be sent across the Indian border due to the operational pressures in West Punjab. The infiltrators initially worked independently in small groups. Subsequently, as worthwhile success was not achieved, they changed their tactics and attempted to concentrate themselves in selected areas and operate in larger groups. Some of the infiltrators from various columns managed to exfiltrate without participating in any operations while other kept drifting and operating indifferently till they ran into another group and merged with it. Towards the later part of their operations they were able to establish their bases and consolidate themselves into strongholds in certain areas. Most of these were in remote, isolated mountainous regions which were not frequented and were not easily accessible.

Helicopter Support

During the dark days of Operation Gibraltar, a helicopter task force, initially consisting of two Squadrons, but later raised to three, was formed to assist in fighting against the Pak armed infiltrators who had entered Jammu and Kashmir in August 1965. This task force was mainly based in Srinagar, and it carried out 79 offensive sorties against the infiltrators from 20 August 1965, till the end of the hostilities. These IAF helicopters, suitably modified, bombed and strafed the positions of infiltrators in many areas, especially Haji Pir Pass, Tangdhar, Badgam, Mandi, Budil, and the hills around Gurez. While these offensive sorties did inflict much damage on the enemy, more importantly, they certainly exerted a great demoralizing effect on the Pakistani guerrillas. The helicopters also

played an important logistical role by dropping approximately 92,000 Kg of essential stores and urgently needed ammunition to army columns operating in different areas, lacking suitable ground communication. They also performed a useful task by speedily evacuating critical casualties from inaccessible areas, flying a total of 198 trips, each loaded to maximum capacity. Some of these helicopters, including three Alouettes, were used by senior army officers to get a good view of the areas of operations, so that quick decisions could be taken to plan and execute counter-offensives against the infiltrators.

The Indian Air Force contributed its air effort, limited to helicopter sorties only, till 1 September 1965, when its other aircraft also joined the fray. Helicopters proved to be especially useful in Jammu and Kashmir for the following task:

- Transportation of urgently required defence stores, arms, ammunition and other equipment during critical moments and operations.
- Evacuation of serious casualties from difficult areas, with consequent good effect on morale.
- Specially reconnaissance over large areas, especially in sectors where other means of transport were not available.
- Tracking and hunting of enemy infiltrators in terrain almost inaccessible to regular columns.
- Use as Air Observation Posts.

Future Helicopter Force

Short duration highly confined but fast and intense conflicts are more likely than wider conventional wars. Though airpower would play a vital role, the boots on the ground and combat support missions of airpower would form the backbone of any success in such Op. The helicopter

was perhaps tailor-made for mountain operations and thus will play a pivotal role, especially in providing tactical mobility, logistic support and fire support besides numerous other support roles. A strong case exists for greater jointness in operations. Issues such as a Joint Special Ops Command and Joint Helicopter Command as in the UK for theatre applications need to be seriously explored for viability.

A strong case exists for quantitative and qualitative increase in light, light combat, medium and heavy lift helicopters in Indian inventory. It needs to be borne in mind that helicopters inherently are capable of multitasking and could serve, as they already do, in border infrastructure developments and disaster management. In terms of pilot training, there is a need to look for intense but low cost options like simulators, enhanced night capability and special skills which improves the ability of aircrew to adapt to new and changing situations. A core group of pilots should always be available to carry out the more demanding situations of special operations.

The indigenisation programme based on the ALH model must be given a boost. No country, as yet, has a helicopter tailor made for the high Himalayas. Similarly, in the future the medium lift helicopter (MLH) and heavy lift helicopter (HLH) requirement need to be addressed by an indigenous programme. The light combat helicopter (LCH), as promised by HAL brochures, is an absolute and immediate requirement which needs to be met at the earliest. Modernisation of the fleet, including night and all-weather capabilities is underway. Out-of-Country contingencies would best be catered to by incorporating air-to-air refuelling in all future MLH/HLH inductions. Similarly, incorporating PGM capabilities on most types would act as a tremendous force multiplier.

Helicopters in Mountain Campaigns

The ability of helicopters to take off and land vertically and to sustain hovering and low-speed flight brings unique capabilities that make them particularly suitable for employment in a battle. In combat, for example, helicopters may approach targets covertly by flying in the nap of the earth,

which may not be possible using fixed-wing aircraft. Counter-air ops which contribute to success of all other operations may seem to be critical to helicopter ops in the battlefield too; however, the efficacy of high speed fighters to take on attack helicopters (AH) flying low and armed with defensive suites is highly debatable. The equation may change if the AH is provided air-to-air capability. On the other hand, AHs can themselves play an important role in offensive counter-air by suppressing enemy AD.

In Land-Air Operations, the counter-surface-force-op (CSFO) missions such as battlefield interdiction (BAI), battlefield air support (BAS) and armed reconnaissance are just some that can be carried out by AHs, independently or in conjunction with other elements. Under normal circumstances, BAS are high-risk missions for high-speed fixed-wing airpower, however, AHs using ground hugging and terrain masking techniques, employing their defensive suites and stand-off weapons, and integrating with other land based fire support will have great chances of survivability in the mountains. A helicopter's ability to operate from forward basic helipads and Forward Area Refueling and Rearming Point (FARRP) and ubiquity allow it to sustain a presence in the battlefield and impose a manoeuvre effect when employed in large numbers.

In the mountains, terrain becomes a primary consideration and factor of warfare. The physical obstacles of terrain coupled with unpredictability of weather in the mountains only increase the degree of difficulty for combat operations. Mountains limit the freedom for rapid movements or manoeuvre, and thereby may hinder concentration of combat forces at a point of choice. Conversely, they may cause unplanned clusters at critical points. Not only does movement become predictable on mountain trails, vulnerability to counter attack on the flanks increase multifold. Battles in the mountains will primarily be for holding on to passes, dominating heights and roads, all under multi-tier fire from the enemy. The point here is that terrain will force compartmentalization of action, and therefore, the necessity of independent sub-unit action, including calling in of firepower (artillery or airpower) at a much lower level than the battle in the plains.

In the defensive mode, a planner would be able to effectively cover most likely avenues with a range of firepower. In a sense, the defender is able to effectively template the aggressor's major moves. Therefore, the aggressor would rely on air transport assets to launch operations into the flanks and rear areas. This would call for strengthening air-defence and anti-helicopter actions by the defender. A case in point is the introduction of Stinger missiles in Afghanistan and even the Kargil Ops. An attacker's game plan would include recce and surveillance of anti-air assets of the defender, and to neutralize them at the earliest with attack helicopters using terrain masking and stand-off weapons if required. UAVs and HUMINT would provide the intelligence inputs, some even real-time, to pairs of hunter-killer helicopters. Thus, pairing of helicopters and UAVs at the tactical level seems to be in order in the mountains.

An attacker's main body is protected in the flanks by security patrols and recce parties, which engage any ambush or flank attacks to destroy them and more importantly, to warn the main body of impending attacks. At such times, attack helicopters on call, coordinated by trained FACs on ground could more than thwart the enemy's moves and neutralise troop and gun placements on adjacent high grounds. Since terrain and few roads during the march do not allow sufficient turning movements to a large attacking force, integral light artillery and attacking air power are the only means to cater to meeting engagement with a counter-attacking enemy. A critical requirement would be availability of FACs on ground in adequate numbers (even at battalion or company level) while on the march.

A very effective way of achieving surprise in the mountains is enveloping detachments from the main body to the enemy's flanks. In case this is closely coordinated with firepower, the probes could detect vulnerabilities and provide windows to exploit. Attack helicopters would provide the means to protect the heliborne forces which would augment the enveloping detachment, as also the necessary fire power when exploiting the enemy's weakness. This calls for a high level of coordination at the

lower level. Artillery de-confliction and co-ordination of multi-tiered fire support would have to be delegated to a lower level.

Artillery in mountains is constrained due to a number of reasons such as trajectory angles, difficulty of observation of hits to call out corrections and abrupt changes in weather. The terrain does not allow ideal placements of guns and may even force them to cluster near roads, making them ideal targets by air or counter-battery. These reasons among others will force decentralisation of artillery and would lead to lack of integral firepower at critical times. Such phases would require dedicated fire support in constricted space and time pockets. Attack helicopters at the Corps/ Div level could be delegated to brigade and battalion levels to cater to such emergent requirements.

Night & Stand-Off Capability

A number of forward-looking infra-red (FLIR) systems have been developed for helicopters and these are perhaps best epitomized by the TADS/PNVS target acquisition designator sight, pilot night vision sensor produced by Lockheed Martin for the McDonnell Douglas AH-64 Apache. A huge leap has taken place in terms of stand-off weaponry and target acquisition/designation. For example, the Lockheed Martin Hellfire II air-to-ground missile offers a number of advantages: most importantly, the option of fitting various warhead types and the ability to employ 'man in the loop' guidance modes, such as a ground-based laser designator. Missile options are covered by the AGM-114K, with semi-active laser (SAL) guidance and tandem HEAT warhead; the AGM 114L, with millimeter-wave active radar seeker, the AGM -114M, with SAL and blast-fragmentation warhead; and the AGM-114N, with SAL and thermo baric warhead. The Russian Mi-28N features a Phazotron radar for fire control. This is a millimeter-wave system providing 360-degree coverage and is mounted on top of the Mi-28's rotor. It has the ability to detect incoming missiles, aircraft and hostile helicopters, as well as

supporting air-to-ground and air-to-air targeting and attack. The system also provides ground mapping and terrain-following flight capability.

An unmanned aircraft could act as a pathfinder for a main helicopter force, watching for anti-aircraft threats as the strike package moves to its objective. The picture seen by the UAV could be relayed back to helicopter crews, and they could adjust their route accordingly. The main strike force could also take advantage of targets of opportunity as they are discovered by the UAV. The unmanned system could provide targeting data to allow the crews to fire their weapons from stand-off ranges. If the UAV itself is armed, it could be instructed to engage threats directly. A future Indian Light Combat Helicopter should be aiming for many of the developments and capabilities listed above.

Lessons from Other Militaries

Lessons from previous campaigns of AHs show that the greatest cause of helicopter losses has been pilot error, technical defects and even poor tactics as a result of inter-service turf fights. Since the existing model of joint funding, IAF ownership and manning, and joint employment already exists, this needs to be strengthened to save costs. At the same time, the AH force is a tactical force and needs to be fully responsive to the ground commander.

The FAC cadre, training, exercising etc all need review. This is a critical element in the employment of AHs. Teams need to be properly equipped to acquire and designate and call in air strikes by all forms of airborne platforms. US and Russian experience brings out that greater efficacy was achieved with teams at even company levels in the mountains. The greatest vulnerability to AHs is incorrect employment as was the case initially with the Soviets in Afghanistan and the Americans in Iraq in 2003 against the Republican Guard. Airspace management will be complicated and requires a system that promotes safety but also does not restrict any critical system. A combined arms concept must synergise

the capabilities and limitations of all the various weapon systems. In the mountains especially, provisions will have to be made for decentralised, combined arms, small units operating in non-linear and non-contiguous areas of operations.

A critical and immediate need is to build a AH capability that fits operations in the mountains. Whether this is done by buying existing western platforms or indigenization needs to be addressed by the country at the earliest. This must be followed by preparing a cadre of AH aircrew which has truly trained in the mountains and that too jointly with the ground forces. This will take time, funding and focus. Despite the numerous warnings of a cautionary approach from advocates of fixed wing who consider rotary wing as unnecessary distraction, it is a moot point that the successful Soviet dominance of Afghanistan for more than a decade with the given “boots on the ground” strength was possible only due to helicopters – both in the support and offensive roles. The same has been seen thereafter with the allied forces in Iraq and Afghanistan. This point must be well appreciated otherwise very serious mistakes can be made in upgrading our capability.

Conclusion

The Future

Technology is moving ahead in leaps and bounds, and in the years to come, it will be a prime driver of doctrinal changes in how conflicts are started, managed and won. Technologies such as big data analytics, hyper-connectivity, robust and ubiquitous sensors, internet of things, lasers, hypersonic and 3D printing allow endless scope for battle concepts such as swarming, unmanned warfare in high-risk environment, non-contact warfare from stand-off ranges and militarisation of space. Multi-Domain war fighting seeks cross-domain synergy by close synchronisation. And a true whole-of-nation approach. Most evolved armed forces are fully on

board the race to develop asymmetric capabilities, such as China's Anti-Access & Area Denial (A2AD). These have implications for India.

At the same time, India has to be prepared for conflict handling in the present that is characterised by increasing uncertainty and complexity. A spectrum of counter-insurgency, hybrid and compound wars need adaptive capabilities of a very high order which incorporate multi-agency synergy and fast learning curves, among others. Some pertinent questions are posed below that are relevant to Indian airpower capability building.

The first step in looking at future threat scenarios is posing some uncomfortable but right questions. The bottom-line is that an over-investment in current doctrines, concepts and platforms today may close the windows to adapt to future revolutionary changes in the coming decades. Complexity and uncertainty are a given in the future. It demands agile, curious, creative and questioning minds to gauge ahead and build adaptive capabilities. Asking difficult questions and posing disruptive thoughts is a good start to face such a future.

There are some important questions that will require constant deliberation and honest introspection. This article has aimed to open the debate on some of these questions on leveraging our potential keep adversaries at bay effectively.

- What are some of the real lessons to be learnt from our mountain-combat experience that get obfuscated for a variety of reasons?
- Have we applied the right lessons from our experience in the Himalayas in terms of acquisition of assets in general, and airpower in particular?
- How do concepts such as multi-domain campaign and effects-based approach, and existing and dominating airpower doctrinal postures apply to warfighting in Indian Himalayas?

- What is the way-ahead for Indian airpower to support and win conflict scenarios in the Himalayas?
- How can Indian airpower contribute to the nation's future power projection capability in light of changing geopolitical realities in the world in general, and Asia in particular?

A Prognosis

As stated at the start of the article, Indian armed forces are fully geared up to meet challenges on the LoC and LAC. Airpower is a great asymmetry in India's hand to blunt advantages that the PLA has accrued through decades of investment in infrastructure that allows it to mass quickly and effectively. It is indeed ironical that the same geography that makes life easier for the PLA in an intense contest against India penalises the PLAAF critically.

According to a detailed study, Chinese authoritative writings and thoughts on escalation management through the first decade of the new century appeared to be under-theorized and still under development.⁶³ As brought out earlier, Chinese strategists believe that war can be controlled if correct processes and scientific principles aided by advancements ISR are followed. However, the need to control conflict is premised on a concern that an uncontrolled local war could derail China's economy and in the process foster widespread domestic discontent and instability that would threaten the legitimacy of the Chinese Communist Party (CCP).

There is no reflection on inadvertent and accidental escalation, or any thought given on an adversary's differing perception of red lines. Chinese writings emphasise on seizing the initiative, and a belief that crises be exploited as windows of opportunity with a conviction that in territorial and sovereignty issues, Chinese leaders would be justified in refusing to initiate communications. Effective communication does not equate with complete transparency of intent, and ambiguity is justified. The LAC standoff should be seen in this light.

This could mean that the situation on the LAC is and would be exploited to test the resolution of India's noisy democracy. China may have calculated the economic and geopolitical trajectory of the world, and realised that there was not much to lose economically. Also, like 1962 it could be perceived by China as an opportunity to 'teach a lesson' as a decisive demonstration for ASEAN and South Asia, and even the world (Quad). And so the issue of 'not losing face' and 'dominating the escalation ladder' assume primacy for India.

As earlier stated, the advantages of airpower employment lie with India, and therefore, China would focus on area (airspace) denial to the IAF through a very dense AD network. It also would rely on Pakistan Air Force to create suitable conditions for taking away some of IAF's focus. A key element would be effective and innovative use of electronic warfare in suppressing Chinese air defence. But India needs to dominate the escalation ladder mainly through airpower with all-weather, day-night and precision attack on any clear-cut intrusion into Indian Territory without crossing the LAC. There can be no better show of resolute intent than by using offensive airpower.

It is still important to revisit our use of airpower in 1962 and 1999, not to open any divisions, but to reiterate the importance of an integrated battle. It is important to recognise the priorities of ground operations, empathise with the soldier on the ground, and give adversaries a quick bloody nose in what will be inevitably quick conflicts in these trying times.

List of Abbreviations

AD -	Air Defence
Adv HQ -	Advance HQ (Office of AOC J&K)
AH -	Attack Helicopters
AOC J&K -	Air Officer Commanding J&K
ASEAN -	Association of Southeast Asian Nations
BAI -	Battlefield Air Interdiction
BAS -	Battlefield Air Strike
BVR -	Beyond Visual Range (air-to-air engagement)
CAS -	Close Air Support (US term)
CDS -	Chief of Defence Staff
CCP -	Chinese Communist Party
CAO -	Counter Air Operations
COAS -	Chief of Army Staff
CSFO -	Counter Surface Force Campaign (BAS + BAI)
DGMO -	Director General Military Operations
EBO -	Effects Based Operations
FAC -	Forward Air Controller
FARRP -	Forward Area Refuelling and Rearming Point
GPS -	Global Positioning System
HLH -	Heavy Lift Helicopter
HUMINT -	Human Intelligence

IAF -	Indian Air Force
IDR -	Indian Defence Review
ISR -	Intelligence, Surveillance & Reconnaissance
LAC -	Line of Actual Control (Sino-Indian)
LCH -	Light Combat Helicopter
LGB -	Laser Guided Bomb
LoC -	Line of Control (Indo-Pak)
MLH -	Medium Lift Helicopter
NLI -	Northern Light Infantry
PGM -	Precision Guidance Munitions
PLA -	People's liberation Army
PLAAF -	PLA Air Force
PoK -	Pakistan Occupied Kashmir
RBD -	Reconnaissance Combat Operations (PLA)
SAM -	Surface to Air Missile
TAC -	Tactical Air Centres
TBA -	Tactical Battle Area
UAV -	Unmanned Aerial Vehicle
WAC -	Western Air Command

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