ARMY AVIATION IN INDIA

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Aviation is proof that given the will, we have the capacity to achieve the impossible.
—Eddie Rickenbacker

The history of military aviation dates back to the middle of the 18th century when armies faced each other on the field of battle, standing and advancing in the open, towards an equally exposed enemy. Although air observation as a branch of military science is generally associated with recent advancements in the field of modern warfare, the earliest suggestions for employing balloons with armies in the field seems to have been made in France after the first successful ascensive power of heated air was demonstrated by Joseph Montgolfier at Annonay, near Lyons, on June 5, 1783. The first man to advocate and point out the military possibilities of the new invention was Andre Giraud de Vilette.[1] The technology needed to make a flying machine was not available and balloons were used—tethered observation balloons to look into the other side or the enemy's side, observe, communicate and direct fire. This paper traces certain events and facts which reveal, with an emphasis, that observation from the air and requirement to direct fire was primarily the requirement of the surface forces from which evolved the need of exploiting the dimensions of air and then space. It does not draw any parallel between air force and army aviation as we

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1. Fredrick Stansbury Hayden, *Aeronautics in the Union and Confederate Armies* (Manchester: Ayer Company Publishers, 1980), pp.1-2.

Progressive thinking identified the domineering power of the air power and, therefore, the need of a specialised Service.

know it, but as a probable interpretation of facts, it is seen that aviation has been primarily military in nature and the distinctive term "air power" itself came into use soon after the first powered flight by the Wright Brothers.[2] The quest for advancement in this field has been with the ultimate goal of securing and preserving the sovereignty of a country. Sport and other functional means of this dimension have been ancillary developments, which have gained prominence in the event of more functional and constructive thinking. The mindset of the air force as a subsidiary force had always given a more tactical hue and, therefore, indulgence into practical development remained restrictive till the years of World War I. Progressive thinking identified the domineering power of this dimension and, therefore, the need of a specialised Service. World War I itself lent the tactical-strategic dimension which later paved the way for the air force to be considered as a strategic power. The need for this specialised Service, however, could not distance the requirement of close support for the land and naval forces and, therefore, in the line of this thinking, a requirement of an air wing for the land and sea forces brought about the existence of army and naval aviation. Air is intrinsically entwined with land and sea operations, whether strategic or tactical, and, therefore, study of any component—in this case, army aviation—requires attention on the aspects of its role based on historical evolution of the entity, past and present performance, and a contemporary look into future requirements.

BACKGROUND

A short interject of the history and development of "flying machines" will be essential to understand the evolution of flying in the army. Although fixed-wing aircraft received attention by most historians, initially, rotary flight was, envisioned by man. The ancient Chinese, as early as the 4th century AD, played with a hand-spun toy that rose upward when revolved rapidly—this could be

2. Air Commodore Jasjit Singh, *Air Power in Modern Warfare* (New Delhi: Lancer International, 1985), p.xvi.

taken as the first concept of rotary wing aviation. About 320 AD, Ko Huang speaks of a flying machine on the principle of the helicopter: "Some have made flying cars *(fei-che)* with wood from the inner part of the jujube tree, using ox leather straps fastened to returning blades so as to set the machine in motion."[3] This is the first recorded pattern of what we might understand as a rotary wing or a type of propeller. The technology needed to create a helicopter rotor or propeller had not been produced yet but the concept of rotary wing aviation had unquestionably been found. During the period 1487-90, the great Italian inventor Leonardo Da Vinci, used his fertile mind to make drawings of the aerial screw or air gyroscope which was a futuristic design, and actually looks like an ancestor of the helicopter.[4] Thus, we see that the origins of flight, as conceived in the early days, commenced from a concept based on rotary motion flight, which is virtually synonymous with army aviation, as we know it today. Among the technical developments of the industrial revolution was a much improved artillery field gun and more powerful ammunition. This allowed the commander to fire an artillery barrage on the enemy and its reserves and neutralise them before they could be committed. However, for this barrage to be effective, it was necessary to see where it was falling and to direct it onto the target. Sending artillery observers out to a convenient viewing point to direct the gunfire was slow and not very effective. Man-carrying balloons had been around since the latter half of the 18th century and developed over many years to become relatively effective observation platforms. The French were the first to use balloons for aerial reconnaissance in the Battle of Maubeuge on June 2, 1794, and then on June 26, 1794,[5] during their conflict with Austria, with the tethered observation balloon, *L'Entrepenant*. Thereafter, during the siege of Venice by the Austrian Army in 1849,[6] balloons were used in an attempt to drop bombs into the besieged city as two miles of water prevented the "balls and bombs" from reaching their destination, though the attempt stood failed as the wind direction changed after the launch.

3. Luigi Pareti, *The Ancient World* (London: G. Allen and Unwin, 1965), p.747.
4. Enrica Crispino, *Leonardo* (Italy: Giunti, 2002), p.112.
5. Don Berliner, *Aviation: Reaching the Sky* (Minneapolis: Oliver Press, 1997), pp.24-25.
6. William Coxe, *History of the House of Austria* (London: Henry G Bohn, 1853), p.Ixxxviii.

However, their use on the battlefield came to be considered as too cumbersome and the earlier ideas of usage of this mode became restrictive in thinking and their only use thought of was as signals in war.[7] Further development of ideas and innovative use by the confederate armies of America led to some enthusiastic use for observation and aerial reconnaissance, "...that the aerial reconnaissance had been so satisfactory in results that the general-in-chief (Gen Meigs) had ordered four more balloons added to his army."[8] It was also historic when Thaddeus S. Lowe, on September 24, 1862, directed federal artillery fire from a balloon by the use of the telegraph. In the Franco-Prussian War, balloons were used to great tactical advantage when Paris was surrounded and sealed off by the Germans – as many as 66 balloons were utilised to keep contact outside the siege which carried dispatches with almost 1.5 trillion letters.[9] Hereafter, from the year 1878, efforts began to introduce such measures into the British Army.

EARLY HERITAGE OF INDIA'S ARMY AVIATION

Since 1794, as stated above, we have gone through two eras and have now entered a third, in aerospace power. Two centuries ago, there was a problem of integrating the intelligence, surveillance and reconnaissance system into the military. A century ago, we had similar problems involving the aircraft and, today, we move to integrate the entire space into our operations. In effect, as the balloon did to cavalry and surface forces, the airplane, with manned and unmanned space vehicles as of today, did to the balloon and surface forces which bear a direct relationship to military operations. In 1892, the French War Ministry had contracted Clement Ader to build a combat airplane capable of dropping explosives. This air power prophet had remarked, "Whoever will be the master of the sky, will be the master of the world."[10] Focussing on the heritage of India's army aviation, the most technical arm of the British Army at that time was the Corps of Royal Engineers. They were entrusted with the responsibility of

7. Henry Philip Stanhope, *Notes on Conversations with the Duke of Wellington, 1831-1851* (Boston: Adamant Media Corporation,2001), p.86.
8. Hayden, n.1, p.229.
9. James J. Clarke, *The US Air Service in the Great War, 1917-19* (Westport: Greenwood Publishing,1996), p.5.
10. Henry Villard, *Contact! The Story of the Early Aviators* (New York: Dover Publications, 2002), p.140.

operating the balloons and the first tethered observation balloons were purchased; balloon schools and balloon sections were established in 1890.[11] There seemed to be a technological pause between the end of the Franco-Prussian War and 1890, which could be attributable to the lack of funding for such development. During the next ten years, the balloon sections developed their techniques, and at the close of the century, a number of sections operated with great, even decisive, effect in South Africa during the Boer War,[12] but the branch was always kept on a tight budget by the War Office which showed scant enthusiasm in spite of the military intentions of France and Germany in aeronautical soldiering. In the interim, Samuel Franklin Cody, a showman and American expatriate who was fascinated by the way the Chinese flew a variety of kites, fired up his passion to develop the Cody War Kite. By the year 1904, his success attracted the army and he was employed by the War Office between 1905 and 1909. He built Britain's first military dirigible, the *Nulli Secundus*, (which flew from Farnborough to London) and then the first aeroplane to fly in Britain. The machine, based on the Wright Brother's latest model, made the first sustained flight in Britain on October 16, 1908.[13] After the accidental death of Cody, the War Office in Britain had almost decided to discontinue work on aeroplanes when Press and public attention in Britain was seized in the same year when Louis Bleriot crossed the English Channel in an aeroplane on July 25, 1909—he took off from Calais for a 27 minutes flight and landed at Dover on the other side of English Channel.[14] By 1910, a small number of aeroplanes were owned and operated by army officers and some of these persuaded the War Office of their importance as aerial platforms for observation and reconnaissance. In 1911, the Royal Engineers Air Battalion was formed; its 150 men, in two companies, were to be instructed in the use of balloons, man-carrying kites and aeroplanes.[15] The Press and public pressure obliged the

11. Charles Fredrick Snowden Gamble, *The Air Weapon: Being Some Account of the Growth of British Military* (London: H. Milford, 1931), p.25.
12. Laurence Yard Smith, *The Romance of Aircraft* (New York: Fredrick A. Stokes Company, 1919) p.26.
13. Villard, n.10, p.81 and Peter Hore, *Patrick Blackett: Sailor, Scientist and Socialist* (London: Frank Cass, 2003), p.13.
14. Neville Duke, Edward Lanchbery, *The Saga of Flight* (New York: John Day Company, 1961), pp.46-47.
15. Walter Alexander Raleigh, Henry Albert Jones, *The War in the Air: Being the Story of the Part Played in the Great War* (London: Clarendon Press, 1922), p.142.

government to look into the development of military aviation and, ultimately, led to the formation of the Royal Flying Corps on April 13, 1912, to comprise the military and naval wings and a joint Service Central Flying School. Aeroplanes had now joined the balloon and kite sections and companies of the Royal Engineers. Almost immediately, and despite the goodwill of the officers actually engaged in flying, the two wings drifted apart. The War Office and Admiralty were unable to agree on a common policy for the development of aviation, which could meet the requirements of the two forces and by July 1914, the *de facto* split was acknowledged by the independent formation of the Royal Naval Air Service on July 1, 1914.[16] The Royal Flying Corps became the army's air branch and was no longer part of the joint Service organisation for which it was originally intended. Therefore, what was widely accepted is that although military flying was very much in practice, and the acknowledgement that a superior form of combat can be waged from the air, the nature of warfare is such that it requires dedicated efforts in every aspect, whether of strategic or tactical nature. The air corps of the army existed as a support measure; there did not seem to be much significant thought on its employment in terms of strategically linked operations, hence, a sort of amalgamation of utility and basic requirements existed as far as air power was concerned.

WORLD WAR I

World War I witnessed the use of air to gain advantage over the forces engaged on the surface of the earth. Aircraft were used either to bomb enemy locations, which included civilian settlements, or to engage in aerial observations. There were personalities like Gen Ferdinand Foch of France (a country considered a forerunner in the development of aviation technology) who, in 1910, prior to the outbreak of World War I, had remarked, "That's good sport, but for the army, the plane is of no use." Similar views were also aired by the British General Sir Douglas Haig who lectured at the British Army's Staff College, "I hope none of you gentlemen is so foolish as to think that aeroplanes will be usefully employed

16. David French, Brian Holden Reid, *The British General Staff: Reform and Innovation* (London: Frank Cass,2002), p.207.

for reconnaissance from the air. There is only one way for a commander to get information by reconnaissance and that is by the use of cavalry."[17] This gives an insight into the military thinking at a certain point of time which suggests that there was a lack of military understanding about the effect air power could have to further military objectives. Even those with limited military knowledge and perspective of air power, would in some fundamental way accept the idea of aerial observation and reconnaissance in the aid of surface forces. This aspect was highlighted during the war when aerial observers were called to locate troops, railheads, aerodromes, camps and supply dumps. Aerial reconnaissance and artillery fire direction flourished in an atmosphere of cooperation between army flyers with the aid of the signal corps. However, controversial alterations in existing doctrine were demanded when the broader combat implications of military aviation were considered. Both dirigibles and airplanes were potential weapons for attack upon troop concentrations. These concepts required revolutionary changes in army thought patterns and it was viewed that aerial combat was a necessary means to achieve the aerial superiority to maintain dominance in the air space over the battlefield.[18]

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This was the beginning of the concept of a dedicated air force to create and maintain total dominance of the air while the surface forces were to battle it out with the aid and support of this force. Eventually, the rise of a dedicated air wing for the land forces would be conceptualised and later be termed as the army air corps or army aviation. In the first part of World War I, military aviation still had only one officially recognised function: to serve as the 'eyes' of the army. Be it a

17. Michael Dewar, *An Anthology of Military Quotations* (London: Robert Hale, 1990), p.25, and Sebastian Cox & Peter Gray, *Air Power History* (London: Frank Cass, 2002), p.94.
18. Herbert Alan Johnson, *Wingless Eagle: US Army Aviation Through World War I* (North Carolina UNC Press, 2001), pp.68-69.

tank, an airplane, or a longbow, the appearance of a new weapon has traditionally posed a fundamental question to the minds of military thinkers: shall it be used as an auxiliary to an older mode of fighting or shall the new instrument be used as a main striking force in its own right? In the typical case, the first answer has been that the new weapon should constitute an auxiliary to the older tools of war. Then, as the technology of the new system improves, there gradually emerges a body of thought which advocates its use in organisations which have independent offensive missions of their own, and so it was with airplanes. The first impulse in the days of World War I was to consider it as a new and better horse, or at the very most, a better kind of long-range artillery. Even before the war had started, the armies of the world had conceived of reconnaissance and artillery spotting roles and, therefore, had developed rudimentary organisations for accomplishment of those missions. The development of artillery spotting was handicapped by the difficulty of communications between the observer and the gun battery commander but the reconnaissance missions produced immediate and important results as in the first Battle of Marne. Any sociological study of the first generation of airmen will reveal that a disproportionate share of them came from the artillery branches of their respective branches.

Giulio Douhet, a military career soldier, who rose to the rank of general and military strategist, advocated the idea that air power is a decisive instrument of war in its own right and has a role completely independent of the army and navy. This idea is really the crux of all the inter-War struggles between the air warriors and their brethren on the ground; once the proposition is accepted, everything else would necessarily follow.[19] During the first weeks of the war, however, when hundreds of thousands of troops swarmed all over, aviators often attacked marching columns at their own initiative with whatever weapons they happened to have. Headquarters of the Royal Flying Corps (RFC) noted: "Several instances have occurred lately in which targets suitable for attack have been passed over without any action being taken. In future all aeroplanes

19. John H. Bradley, *The Second World War: Europe and the Mediterranean* (London: Square One Publishers, 2002), pp.55-56.

carrying out reconnaissances *[sic]* will carry bombs ...whenever suitable targets present themselves, they should be attacked by dropping bombs." Thus, we see that the growing need of a specialised Service to look into the needs of such strategic action was already emerging. Artillery spotting maintained its importance because of the central role of artillery during the conflict. The early command relationship between air and ground forces sprang largely from the need for air reconnaissance and artillery spotting. The Royal Flying Corps (RFC) assigned a squadron to each army corps: in the French and German Services, the various army corps were allotted *Escadrilles* and *Flilegerabteilungen* (flight units) respectively.[20] This was signalling the requirement of not only a specialised Service but also of a future need of identical nature of support to the land forces, thereby, setting the grounds for a dedicated support Service for the army to perform similar tasks. One British document on artillery spotting observed laconically, "One of the principal factors necessary to enable successful work with the artillery is a slight knowledge of gunnery on the part of the observer."[21] As longer range artillery guns were brought into service, "spotting" for artillery became important. To emphasise the traditional role of observation and reconnaissance in those days from the air, the British Royal Air Force had taken 14,678 photos and helped range artillery on 9,539 targets.[22]

The organisational structure of the British during that period, comprised a system with a director of military aeronautics in the national capital and a commanding general in the war zone, which the Americans also adopted. The Italians followed a unified command for artillery spotting during the period April 1916 to April 1917 but otherwise, till 1918, there was only an aviation commander assigned to each individual army (initially, as the unit commander of the aviation group allocated to each army).[23] A number of Indians had served in the Royal Flying Corps, and distinguished among them was Lt Indra Lal Roy (his nephew Air Marshal Subroto Mukherjee would become the first Indian to

20. Benjamin Franklin Cooling, *Case Studies in the Development of Close Air Support* (Darby: Daine Publishing Co. 1990), p.16.
21. Sebastian Cox & Peter Gray, *Air Power in the First World War* (London: Frank Cass, 2002), p.5.
22. Arnold D. Harvey, *Collision of Empires: Britain in Three World Wars, 1793-45* (London: Continuum International Publishing Group, 1992), p.404.
23. Harvey, Ibid., p.420.

command the Indian Air Force) who was awarded the Distinguished Flying Cross (DFC) for his exemplary performance in war with the Royal Flying Corps, a rare honour for an Indian.[24] In the midst of the war, the British Army chose to restructure the armed forces and, thus, came into existence the independent Royal Air Force on April 1, 1918.[25] The Royal Air Force was the first independent air force and owed its creation in World War I to the hue and cry over the bombing of London by the Germans.[26]

Every transformation has its equal share of pros and cons. On the one hand, it led to the consolidation of a specialised Service and, on the other, it created a situation thereafter wherein the army felt that it was unable to make much progress in putting soldiers in the sky. Interest in vertical flight was practically non-existent during World War I; during the 1920s, there was a variety of experiments, followed by a wave of popular interest in the 1930s led by Juan De La Cierva. In 1923, the autogyro was the first type of rotating-wing aircraft to fly successfully and this demonstrated a useful and practical role in aviation, pre-dating the first successful flight of a helicopter by about fifteen years. Over thirty different designs were produced during the period 1923-38 and the capability of low speed flight and capability to land in confined areas gave a new dimension to military applications.[27]

WORLD WAR II

As a result of the prevalent thinking in the Royal Air Force, during the inter-War period, whereas the German and French Armies both had different types of aircraft for ground attack, general purpose close support and artillery observation roles, the Royal Air Force had only a single type, the Westland Lysander, which was able to carry out all different functions involved in aerial support of a ground army. The Germans used the Fieseler Fi 156 Storch as an artillery observation plane with remarkable success, having one-third the power and half the weight and speed, compared to the British aircraft. The Westland Lysander which was a two-seater army cooperation and short range tactical reconnaissance aircraft, of course,

24. Air Commodore Jasjit Singh, *Defence from the Skies* (New Delhi: Knowledge World, 2007), p.5.
25. Simon Hall, *The Hutchison Illustrated Encyclopedia of British History* (London: Taylor & Francis, 1999), p.294.
26. Williamson Murray, *Strategy for Defeat: The Luftwaffe 1933-1945* (Philadelphia: Diane Publishing, 1983), p.321
27. J. Gordon Leishman, *Principles of Helicopter Aerodynamics* (London: Cambridge, 2006), p.692.

earned fame for a different reason by way of landing and picking up secret agents, made possible because of its remarkable short landing and take-off run (the plane weighed 2,685 kg in normal loading). By October 1939, the British Army had called for a new type of light aeroplane to improve the application of artillery fire.[28] It was felt that the British Westland Lysander was falling short of the requirements which the ground support role demanded. The whole gamut of true army cooperation duties and in particular artillery observation and coordination duties, was undertaken by the genuine light liaison aircraft, the Austers (weighing 499 kg), which were inducted into No. 654 Squadron in August 1942.[29] The British were not too much in favour of the close air support concept during the inter-War period, resulting in the Royal Air Force finding itself in a situation of comparative inadequacy in 1939. The entire air support of the Royal Air Force was equipped and trained to provide what was officially termed "army cooperation," and emphasised reconnaissance. There was one joint RAF/Army School of Cooperation at Old Sarum where junior army officers were trained for liaison duties with the squadrons, with the aim of providing tactical reconnaissance, artillery spotting and photographic reconnaissance to the British expeditionary force.[30] In the meantime, a key factor in the return of the air observation post to the British Gunners was the formation of the Royal Artillery Flying Club in 1934. Capt H.C. Bazeley (later colonel) was seconded to the Royal Air Force as an army cooperation pilot who formulated the detailed concept of the air observation post which essentially coupled the requirement of "gunners" for air observation tasks, thereby, leaving other combat roles to the pilots of the Royal Air Force.[31] They would fly simple, unarmed light aircraft, depending for survival on being agile

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28. Harvey, n.22, p.645.
29. Chris Bishop, *The Encyclopedia of Weapons of World War II* (London: Sterling Publishing Company, 2002), pp.424-425.
30. Dr Ian Gooderson, *Air Power at the Battlefront: Allied Close Air Support in Europe, 1943-45* (London: Routledge, 1998), p.22.
31. Peter Mead, *The Eye in the Air* (London: H.M.S.O, 1983), pp.153-154.

and inconspicuous and by flying, as far as possible, over areas held by friendly forces, but using height and freedom of movement to look into areas not visible to ground observers. Bazeley's ideas were seconded by two other like-minded soldiers, Lt Col (later major general) J.H. Parham and Brig H.R.S. Massey. In 1939, Brig Massey was Brigadier Royal Artillery Southern Command, and was able to add weight to the army's case for the "Flying OP (Observation Post)" as it was called.

The proposal was finally accepted amidst some debates and after tentative trials in 1938-39, a flight was established for the purpose in 1940 (D Flight RAF). Capt Bazeley, was given command of this unit.[32] The first squadron to come into action was No. 651 Air OP Squadron (RAF), commanded initially by Lt Col Bazeley and then Maj R.W.V. Neathercoat. The squadron fought throughout the North African campaign during 1942-43 where it amply proved the success of the Air OP concept, often flying in the face of enemy air superiority. Though, it has also been argued that by 1943, while the Royal Air Force moved towards becoming a close support workhorse, especially in Northwest Europe, operations saw artillery being relegated to a secondary role and, therefore, less emphasis on artillery spotting. This happened mainly because of the speed of operations where the armoured thrusts would succeed in penetrating the German defensive positions and be beyond the range of supporting artillery, thereby, becoming limited to those pieces which could be transported to the dropping zones.[33] Although the D Flight raising could not convince most of the sceptics, authority was given in 1941 for the formation of Air Observation Post Squadrons. To overcome inter-Service organisational limitations and 'ownership' of the squadrons, a compromise was agreed upon. These squadrons were to be RAF units, each commanded by a gunner major (pilot) with an RAF adjutant. The RAF would provide the aircraft (Austers) and the airmen to maintain them; the army would supply vehicles, ground radios and soldiers to man them; all the pilots would be artillery officers, trained to fly by the RAF. The RAF would be responsible for technical flying matters but

32. Royal Aero Club of UK, *Flight International* (London: IPC Transport Press, 1962), p.154.
33. Gooderson, n.30, pp.59-84.

the army would command the unit in the field.

Later experience proved the need for observers in the rear seats of the aircraft to watch out for enemy fighters. As no official provision had been made for this eventuality, volunteers from the squadrons, army and RAF ground crews carried out this duty when needed. No. 651 Squadron was followed by the formation of 15 more squadrons during the period 1942-45, numbering 652 to 666. Of these, No. 663 was mainly Polish manned, and Nos. 664 to 666 were Canadian. The squadrons flew in every theatre of war and made a significant contribution towards greater efficacy of the use of artillery. Their outstanding attribute was their ability to put a skilled artillery observer into the air at short notice, fully aware of the tactical situation and the needs of the troops on the ground, and able to direct the fire of all guns within range. By the end of the World War II, Air OP pilots had been awarded more than 90 Distinguished Flying Crosses. During the 1940s, the Cierva Company had developed a light, two seater, piston-engine helicopter as an aerial observation platform. However, the Cierva Company merged with Saunders-Roe Ltd and the aircraft became known as the Saunders-Roe Skeeter. The army's attention was attracted to the possibility of the helicopter for AOP duties and on September 1, 1947, Capt P.R.D. Wilson RA made history by conducting the first AOP shoot from an army helicopter. It was a further ten years before the helicopter would enter army service in the observation role. No. 656 Air OP Squadron (RAF) was the first Air OP unit of the British Army to set its feet on the Indian subcontinent in December 1942. The unit was sent to India as part of *specialist units* to assist the operations in the Burma campaign where it provided valuable ground reconnaissance and directed artillery fire in greater numbers; artillery shoots were conducted with much greater effectiveness, which caused heavy casualties to the Japanese.[34] It was here that the squadron adopted the "Chinthe Badge" which shows two crossed

Capt Furdoon S.B. Mehta (who later rose to the rank of brigadier) was the first Indian artillery officer to wear the Air OP Wing.

34. E.W. Maslen Jones, *Fire By Order: Recollection of Service with 656 Air Observation Squadron in Burma* (London, Lee Cooper, 1997), p.86.
35. Mark C.A. Hennniker, *Red Shadow over Malaya* (Blackwood, 1955), p.184.

guns in the background and the side face of the mythical lion, "Chinthe." After successful participation in the Burma campaign, the squadron returned first to Madras and was subsequently assigned for the liberation of Malaya.[35] The initial training for the squadron was done with the "Tigermoth," and later it was equipped with the "Auster."

Capt Furdoon S.B. Mehta (who later rose to the rank of brigadier) was the first Indian artillery officer to wear the Air OP Wing. He trained as a pilot at No. 2 Elementary Flying and Training School (EFTS) at Jodhpur which was established by Lt Gen and Air Vice Marshal Umaid Singh, Maharaja of Jodhpur, who had established an aircraft landing ground in 1924, at Jodhpur Flying Club in 1931 and EFTS in 1941. Brig Mehta (then captain), along with seven others, traced out the squadron in Arakans, because the arrival of the squadron more or less coincided with the Japanese offensive, first in the Arakans and then later on the central front, the main feature of which was the Imphal plains,[36] from where they were told to fall back to Dimapur, the location of the Squadron Headquarters. The course at EFTS of ten weeks terminated on April 15, 1944, but they still had to complete their training in Air OP duties and had to wait till the squadron fell back to Ranchi for rest and refit forced by the monsoons. The Air OP wings were awarded in November 1944, with Brig F.S. Mehta (then captain) assigned 'A' Flight, to the successful five out of the seven who had joined the squadron. This sort of ad hoc arrangement of training in EFTS, Jodhpur, and then at the squadron was not found suitable and, therefore, 1587 Air OP Refresher Flight RAF was raised and attached to the army in Devlali on October 16, 1944, under 227 Group RAF in Lahore[37] which was responsible for all air training, and continued training pilots in Air OP till December 31, 1945. Officers in Britain were training in the No. 43 Operational Training Unit (OTU) at Larkhill, established on October 1, 1942, which kept shifting base close to each other, and had formed a helicopter training flight using Hoverfly 1 till January 1946. No. 656 Squadron had already returned to England by early 1945 after their Malaya tryst, to never again revive their Indian connection thereafter. Capt H.S. Butalia was the first Indian pilot to be trained at No. 43 OTU and graduated on January 15, 1946.[38]

36. Mead, n.31, p.189.
37. Ashley Jackson, *The British Empire and the Second World War* (London: Hambledon Continuum, 2006), p.367.
38. Lt Col S.V. Pandya, *Soldiers in the Sky* (New Delhi: Flight Safety Section, ADG Army Avn, 2006), pp.21-39.

POST-WAR DEVELOPMENT TILL 1971 INDO-PAK CONFLICT

The 61st Course of No. 43 OTU was the last basic course of Indian pilots and, notably, Capt A.B. Awan (later lieutenant general) was Pakistan's first army aviator. By July 1948, the training had shifted to No. 2 EFTS at Jodhpur and the gunnery leg of the Air OP conversion was to be completed at Devlali where the first batch of six Indian artillery officers completed their training in March 1949. While the saga of No. 656 Squadrons association ended, No. 659 Air OP Squadron, raised on April 30, 1942, which had accredited itself as part of 8th Corps in Operation Goodwood during the Normandy tryst,[39] arrived in Bombay (now Mumbai) in October 1945 and moved to Dhubulia, 80 km north of Calcutta (now Kolkata).[40] The flights of this squadron were displaced over the expanse of the country and had the arduous task of assisting the Punjab Boundary Force. Just prior to partition of the country, the disposition of No. 659 Air OP Squadron (RAF) was Squadron Headquarters and 'B' Flight at Lahore, 'A' Flight at Devlali, 'C' Flight at Razmak, 'D' Flight at Jullunder and Rear Maintenance Detachment at Peshawar. With the partition of the country also came division of assets of No. 659 Air OP Squadron (RAF) which virtually ceased to exist at midnight of August 14, 1947. Capt H.S. Butalia, with Capt Govind Singh, Capt R.N. Sen and Capt S. Mansingh, hurriedly flew out the assets of 'B' Flight from Lahore to Amritsar and then on to Jullunder. These assets were to comprise the raising of 1(I) Air OP which actually started functioning on October 6, 1947. Capt R.N. Sen was soon to be posted out for the raising of 2(I) Air OP Flight at Devlali with the assets of 'A' Flight of No. 659 Air OP Squadron (RAF). The Indian No. 659 Air OP Squadron was to be once again raised on June 1, 1958. No.1 (I) Air OP Flight was very much involved in the days of 1948 and historically on February 12, 1948, Maj H.S. Butalia flew Defence Minister Shri Baldev Singh for reconnaissance of the forward area in Jammu and Kashmir.[41] Capt S. Mansingh (later brigadier) and Maj S.W. Shahane (later brigadier) were awarded the Vir Chakra on account of outstanding gallantry for evacuating the body of Brig Mohammad Usman,

39. Perry Moore, *Kursk in Normandy* (Infinity Publishing, 2005), p.69.
40. Pushpinder Singh, *History of Aviation In India* (New Delhi: Society for Aerospace Studies, 2003), p.230.
41. Pandya, n.38, p.54.

In spite of being vulnerable to enemy aircraft and ground fire, the Air OP aircraft flew over enemy concentrations, directing fire of their own guns and more so in the Chhamb-Jaurian sector.

commanding 50 Parachute Brigade, killed by the splinters of an enemy shell,[42] and Air OP shoots after locating enemy guns at Bagsar and Batot. 2 (I) Air OP Flight participated in the "Hyderabad Action" (Operation Polo) after diplomatic parleys had failed with the Nizam of Hyderabad, on September 13, 1948. The flight was able to provide effective communication from an elevated platform to 1 Armoured Division when other means failed and also dropped leaflets on the headquarters of the commander-in-chief of the Hyderabad State Forces and crown prince of Bidar, as also the Nizam of Hyderabad's plenipotentiary.

The raising of additional Air OP units was put on hold till the government sanction for raising was issued in a letter dated October 11, 1956, wherein a Squadron Headquarters (that is, No. 659 Air OP Squadron) and two Flights (Nos. 3 and 4 Air OP Flight) were to be raised, with orders for No. 5 Air OP Flight to be issued at a later date. The squadron and No. 3 Air OP Flight were raised in Devlali while No. 4 Air OP Flight was raised in Adampur. No. 3 Air OP Flight was later moved to Adampur in January 1959 along with Squadron Headquarters placed at Jullunder. No. 4 Air OP Flight was raised in Adampur and later shifted base to Dimapur for operations in the Naga Hills in 1961. No. 3 Air OP Flight also saw action, Operation Vijay, in Goa, in support of 17 Infantry Division being commanded by Maj Gen K.P. Candeth, when it was tasked to engage enemy armour and artillery concentrations, reconnoitre enemy movement and water obstacles as well as casualty evacuation on requirement. The reason for the slow expansion was attributable to the government stance, financial constraints and perception variances, which were all ironed out with the ominous clouds of war. Even after the ceasefire in the Rann of Kutch, No.1 (Independent) Air OP Flight was put in support of 50

42. K.C. Praval, *Valour Triumphs: A History of the Kumaon Regiment* (Faridabad: Thompson Press, 1976), p.202.

(Independent) Parachute Brigade and was instrumental in directing artillery fire on a ammunition dump at Biar Bet, of 71 Medium Regiment on April 30, 1965, during Operation Riddle. Maj S.K. Mathur (later major general), who was commanding the flight, had earlier directed fire on a moving convoy in Kangarkot and was decorated with the Maha Vir Chakra.[43] No. 660 Air OP Squadron had been raised at Adampur on January 1, 1965, followed by No. 5 Air Op Flight on April 1, 1965 at Nasik Road, No. 6 Air Op Flight on July 1, 1965, at Bagdogra [Maj Atma Singh (later major general) was the first flight commander], No. 7 Air Op Flight on September 6, 1965, at Patiala and No. 8 Air Op Flight on September 11, 1965, at Jullunder. This was all in anticipation of the second conflict with Pakistan.

The flights were raised but there was a severe shortage of serviceable aircraft which was eventually tided over with the intervention of Brig Furdoon S.B. Mehta who, with the generosity of Air Marshal (Retd) Harjinder Singh, in his capacity as the aeronautical adviser to the Government of Punjab, was able to get the Pushpak aircraft of the Flying Clubs of Punjab, though further work had to be done to get this through and out of the doors of the ministry, Service Headquarters and Directorate General of Civil Aviation.

The war broke out on September 1, 1965, and each division in the plains could manage a flight affiliated to it. Army pilots on regimental duties were recalled to make up a perennial shortage. In spite of being vulnerable to enemy aircraft and ground fire, the Air OP aircraft flew over enemy concentrations, directing fire of their own guns and more so in the Chhamb-Jaurian sector. They not only directed artillery fire on Pakistani tanks but at times also gave early warning of approaching enemy planes.[44] For their valiant actions in the face of the enemy during the 1965 Indo-Pak conflict, Air OP pilots were awarded three Vir Chakras and four Sena Medals. After the end of the conflict and return of Pushpak aircraft to the Flying Clubs, Hindustan Aeronautics Limited (HAL), designed and developed the HAOP 27 Krishak, which was inducted after user trials. No. 5 Air OP Flight received the first of these aircraft in November 1965, followed by No.

43. Pandya, p.63.
44. Sitaram Johri, *The Indo-Pak Conflict of 1965* (Nagpur: Himalaya Publications, 1967), pp.203-204.

6 Air Op Flight. The period 1966-68 was one of debate and deliberations for expansion of the Air OPs and induction helicopters. Ten years would see the induction of 15 flights, with five between 1969-71, as also the decision to equip Alouette II (Chetaks in India) for the plains and SA 315B Lama (Cheetahs in India) for the mountains. No. 661 Air Op Squadron was raised at Nasik Road on January 26, 1967, followed by Nos. 10 and 11 Air Op Flight in March 1969 at Bagdogra. Nos. 12 and 14 Air Op Flights were raised in Nasik Road and Patiala in August 11 and December 31, 1970 respectively, followed by No. 15 Air Op Flight in June 1971. The training of additional pilots for these five flights was conducted at No. 660 Air Op Squadron at Patiala with the aid of Air OP instructors and civil flying instructors and aircraft of various Flying Clubs in Punjab, notably the Patiala Flying Club. Gen P.P. Kumaramangalam, DSO and Chief of Army Staff at that time, pinned the Air OP wings on 27 successful pilots on April 10, 1967.

Nos. 10 and 11 Air Op Flights were the first to be allotted Chetaks, and by the time the 1971 War was declared, only three flights had helicopters, namely, Nos. 10, 11 and 15 Air Op Flights while the rest had Krishaks and supplemented once again by Pushpaks of the Flying Clubs. The tenure of pilots for flying duties at this time was made six years, keeping in mind the time and flying effort required to operationalise helicopter pilots in Air OP duties. The allocation of flights in the Western Sector and a brief description of achievements by the flights action performed by the aviators are given in Table 1.

Table 1				
Ser. No.	**Unit**	**Location**	**Formation**	**Action**
(a)	HQ 660 Air OP Squadron	Madhopura	1 Corps	Air cover for offensive action in Shakargarh Bulge along with Nos. 1 & 9 Air Op Flights.
(b)	1 Air OP Flight	Madhopura	39 & 54 Infantry Divisions	(i) Enemy tanks damaged on December 6, 1971, in Thakurdwar. (ii) Enemy tank concentration engaged on December 9, 1971, at Lagwal and Lohara.
(c)	2 Air OP Flight	Udhampur	26 Infantry Division	(i)Three direct hits on enemy tanks along Munnawar Tawi. (ii) On December 9, Marala Headworks struck thrice with Air OP control of guns. (iii) Extensive damage to amour concentration with Air OP directed artillery fire.
(d)	3 Air OP Flight*	Rajasansi	15 Infantry Division	Custody of Squadron Leader Amjad Hussain Pakistan Air Force (PAF) after he ejected from his fighter plane.
(e)	5 Air OP Flight	Barmer	11 Infantry Division	Effective Air OP shoots on December 8, during the advance on Naya Chor due to limited observation of ground observers.
(f)	7 Air OP Flight	Faridkot	1 Armoured Division	Enemy tank and reinforcement movement.
(g)	8 Air OP Flight* (2 Sections)		HQ Foxtrot Group	Three enemy gun positions neutralised on December 8, 1971.
(h)	8 Air OP Flight*	Faridkot	11 Corps	Air reconnaissance and enemy reserve movement.
(j)	9 Air OP Flight	Madhopura	36 Infantry Division	As part of Shakargarh offensive.
(k)	12 Air OP Flight	Jaisalmer	12 Infantry Division	(i) Directing of Hunter aircrafts to enemy tanks in contact and advance reinforcing attack on Longewala Post on Dec 5, 1971. (ii) Message dropping right over the post during the battle. (iii) Directing of Hunter aircraft, artillery fire on enemy tanks, troops and guns on December 7, 1971.

In the Eastern Theatre, No. 659 Air OP Squadron, located at Bagdogra, provided Air OP cover. The squadron consisted of Nos. 4 and 6 Air OP Flights equipped with Krishak aircraft, and Nos. 10, 11, and 15 Air OP Flights equipped with Chetak helicopters, and disposition was as given in Table 2.

Table 2

Ser No	Unit	Location	Formation	Action
(a)	4 Air OP Flight (Less 2 Sections)	Krishnanagar & Barrackpore	2 Corps	
(b)	Air OP Flight	Bagdogra	33 Corps	Casualty evacuation and enemy engagement during Battle of Bogra.
(c)	6 Air OP Flight	Karimganj	4 Corps, 8 & 57 Mountain Divisions	Preliminary operations, air shoots and aerial photography.
(d)	10 Air OP Flight	Barrackpore	2 Corps	Aerial Command Post, reconnaissance and air photo
(e)	11 Air OP Flight	Agartala	4 Corps, 23 & 57 Mountain Division	(i) Detection of enemy movement towards Belonia. (ii) Damage to enemy guns with artillery fire at Pirbakshat. (iii) Artillery shelling on enemy at Kodda. (iv)Engaging enemy convoy on December 7, 1971. (v) Guiding assault troops in Mi-4 helicopters to the landing spot for assault across Meghna river by 57 Mountain Division. (vi) Leaflet dropping for propaganda.
(f)	15 Air OP Flight	Bagdogra	33 Corps, 6 & 20 Mountain Divisions.	(i) Air shoots, enemy movement detection and aerial photography in the capture of Bhurangamari. (ii) Silencing of enemy guns in the capture of Amarkhana. (iii) Photography and continuous reporting in the daylight capture of Khansama as also directing own aircraft on advancing counter-attack column with tanks.

Very accurate predicted artillery fire by night and observed fire by Air OP by day demoralised the dwindling Pakistani garrison.[45] For their valiant efforts, the Air OP pilots earned their share of honour, being awarded one Maha Vir Chakra, nine Vir Chakras, five Sena Medals, four Vayu Medals and one Mention-in-Despatches for their valiant actions beyond the call of duty in the 1971 Indo-Pak conflict. The experiences learned from the above conflicts that can be pushed forward have been the need for availability of equipment to conserve efforts of both man and machine for the actual offensive effort of fighting; communication between fighting and support elements in the battle zone to be a thrust area wherein in one instance, Capt (later lieutenant general) Narayan Chatterjee had to take an Air OP shoot from 39 Field Regiment guns by physically landing at the gun area for radio frequency handing/taking over. He was to take the shoot with the guns of 176 Field Regiment when radio communication could not be established.

The dedicated attack helicopter purports to counter the armour imbalance and, therefore, India's compulsion is not similar to that of Pakistan when we view the qualitative and quantitative aspects.

PRESENT DAY ARMY AVIATION IN INDIA

The Army Aviation Corps as we see it today was formally established on November 1, 1986. The proposal indicating a requirement for an integral army aviation was mooted by Gen J.N. Chaudhry in February 1963 when the J.R.D. Tata Committee deliberated on the expansion and rationalisation of the air arm of India. The case was submitted to the government in April 1968, with the underlying concept of induction of helicopters, including attack helicopters, with large scale mechanisation, combining various arms, including armour, mechanised infantry, self-propelled artillery, all requiring integrated command for meshing elements into a cohesive fighting force. A memorandum of July 16, 1986,[46] directed that the 31 Air OP Flights be transferred to the army by October

45. Lachman Singh, *Victory in Bangladesh* (Dehradun: Natraj Publishers, 1991), p.106.
46. Government of India, Ministry of Defence Memorandum No 69(6)/86/D(AirI)1808/DIA(AirI) dated July 16, 1986.

31, 1986, though the attack, medium and heavy lift helicopters were to remain assets of the air force, along with certain instructions not being elaborated here. The dedicated attack helicopter purports to counter the armour imbalance and, therefore, India's compulsion is not similar to that of Pakistan when we view the qualitative and quantitative aspects.

An Army Aviation Cell was created at Army Headquarters under Brig (later major general) Atma Singh who later became the first additional director general of Army Aviation. This nucleus was initially placed under the Director General Mechanised Forces. The air force continued providing logistic and maintenance support till October 31, 1989, for the 45 Chetak and 95 Cheetah helicopters. Regular expansion had been undertaken since the 1971 Indo-Pak conflict; even with the imposition of financial constraints and aviation development propositions by the government, 23 flights and 11 Squadron Headquarters have been established post 1971. In the meantime, the Indian Army became committed in Operation Meghdoot in the highest battlefield in the world—the Siachen Glacier. The requirement of man and machine to operate in the rarified temperatures is phenomenal and this has been a continuous effort on the part of army aviation since April 1984. No other helicopter, till the date of induction and some several years after, except the Cheetah, has been able to make a landing at the highest of helipads at altitudes in the range of 24,000 feet. The air at Siachen's altitude is half as dense as at sea level, which means helicopters are able to lift only a quarter of their load or even less.[47] A helicopter can carry only one soldier or a few boxes of ammunition or supply, and more so if it has to land.

The Indian Peace-Keeping Force (IPKF) had been inducted into Sri Lanka at the request of the Sri Lankan government in terms of the Agreement of July 29, 1987.[48] By this time, the first All Arms Course, comprising officers of the armoured corps, infantry and mechanised infantry who joined the artillery officers to be trained at Air Force Academy at Dundigal in June 1987, had earned

47. Eric S. Margolis, *War at the Top of the World: The Struggle for Afghanistan, Kashmir and Tibet* (London: Routledge, 2002), p.189.
48. H.P. Chattopdhyay, *Ethnic Unrest in Modern Sri Lanka: An Account of Tamil-Sinhalese Race Relations* (New Delhi: 1994), p.135.

their wings in November 1988. Select officers, after having qualified in the mandatory tests, would be trained by the air force, including the conversion to the rotary wing, and the final leg in gunnery and other tasks related with flying would be completed at Nasik Road under the squadron located there. The Combat Army Aviation Training School became operational at Nasik Road in September 2003. Aviation support during Operation Pawan was invaluable. Helicopters were christened "Ranjit" after being fitted with two medium machine guns fitted on either side. Directing artillery fire, evacuation of casualties, battle reconnaissance and surveillance were routine. The army aviation units in support of the IPKF were as under:

(a) HQ 664 Air OP Sqn - Trincomalee
(b) 10 Air OP Flt - 54 Infantry Division, Jaffna Peninsula
(c) 26 Air OP Flt - 36 Infantry and 57 Mountain Divisions Trincomalee
(d) 31 Air OP Flt - 4 Infantry Division, Vavunia

The last elements of army aviation returned to India in March 1990 by which time, trouble was brewing in Jammu and Kashmir. The nomenclature air observation post (AOP) was changed to reconnaissance and observation (R&O) with the formation of this separate corps. Notable contributions have since been made by the army aviators since May 1990 (Operation Rakshak) in insurgency ridden Jammu and Kashmir, in reconnaissance, casualty evacuation and air observation shoots. Operation Vijay involved tremendous helicopter effort to provide support in terms of ammunition supply and casualty evacuation. Two Vir Chakras, one Yudh Seva Medal and seven Sena Medals were awarded to this corps to commend their contribution in the three-month conflict with Pakistan. Not only has the battlefield seen active participation and contribution of this corps but active involvement in United Nation missions and natural disaster management as well as in aid to the civil authorities. Notable among these are the rescue of civilians on a Manasarovar trek at Malpa village (in Uttarakhand) when tragedy struck in August 1998, by way of a landslide, the Orissa cyclone in October 1999 and the Gujarat earthquake in January 2001.

Army aviation in India has been emblematic of significant contributions in terms of professional achievements and this would support a justification to sustain a capability-based organisation.

The acquisition programme for helicopters for army aviation is now a matter of much debate and choice. India emerges as a need–based country and, therefore, needs a balance in managing inter-relations, with not only neighbouring countries, but also its own standing as a military-politico-economic force to be reckoned with. India had announced a preferred purchase of 197 helicopters at an approximate cost of US $ 550 million dollars,[49] to replace the Cheetah and Chetak fleet of the 1970s vintage. Unfortunately, the arrangements with Eurocopter of France could not see the light of day on account of procedural requirement shortcomings, and the end was sounded on December 6, 2007. The indigenous helicopter programme of developing the advanced light helicopters (ALH) named *Dhruv* (Pole Star) had met with considerable success with a demand for 120 helicopters.[50] The Combat Army Aviators Training School has been functioning in Nasik Road since September 1, 2003, to train army aviators. As a paradigm shift to the training module, *ab-inito* training of aviators and instructors commenced at No. 664 Aviation Squadron (reconnaissance and observation) as rechristened, and the Rotary Wing Association at Bangalore, which was later discontinued.

THE FLIGHT AHEAD

The time had already come a decade ago when the ageing fleet of Cheetah and Chetak helicopters of nearly 40 years needed to be retired; however, a worthy heir to the Cheetah helicopter is still in waiting. The detailed process, commencing with paper evaluation and followed by winter and summer trials at present, has spread over a two-year period. Keeping in mind the time lost and urgency required in view of delivery schedules, with inherent delay factors, it is

49. Gulshan Luthra, "India Prefers it to Bell 407," *India Strategic* (New Delhi), April 2007, accessed online at http://www.indiastrategic.in/topstories03.htm on November 10, 2007.
50. http://www.army-technology.com accessed on November 12, 2007.

certainly time to step up efforts, since all the aircraft are not be procured in "fly-away" condition, and a significant number is expected to be built indigenously under a transfer of technology agreement at HAL. Significantly, a requirement of 115 helicopters by the air force to the 197 aircrafts that the army requires, pushes the value of the deal to $ one billion and the number of aircraft to 312. It is interesting to note that there will be an addition of two squadrons of attack gunships and six heavy-lift helicopters to complement the expansion and modernisation efforts, thereby, nudging the combined worth to $ 1.4 billion.[51] Army aviation in India has been emblematic of significant contributions in terms of professional achievements and this would support a justification to sustain a capability-based organisation rather than an equipment and inventory-based structure, implying commensurate induction of man, machine and infrastructure requirement, though not mentioned here in order of priority. Optimum asset utilisation and air space governance will require significant application and forethought. Application of aviation resources to disaster management has attained significance in the context of the requirement for growing economic and support stability operations and this would certainly require a doctrinal overview for optimum resource utilisation as compared to insulated application for combat scenarios only.

While the impressive modernisation and replacement programme arouses enthusiasm, a more than soft look may be required at the indigenous development efforts. It has been remarked that the performance of the advanced light helicopter *(Dhruv)* has been satisfactory and a concerted effort has been made to improve the serviceability state.[52] Certainly, early in the stage of a successful launch, its high terrain capability was questioned by Chile, and it also got into troubled waters regarding its maritime role due to "payload and endurance limitations."[53] The question is not in the efforts and credibility but the time penalty in terms of immediate upgrades at the doorstep of induction.

We also see completion of the design for the light combat helicopter (LCH)

51. http://afp.google.com/article/ALeqM5hTRelb3AUXlsZZACuvo66AdUivcQ accessed on February 7, 2008.
52. http://live.defenseworld.net/go/detailinterview.jsp?id=17, accessed on Februaru 8, 2008.
53. http://in.news.yahoo.com/indianexpress/20080209/r_t_ie_nl_politics/tnl-navy-rejects-hal-s-light-helicopters-0058794.html, accessed on February 12, 2008.

In the permanent cadre, the manning level in the flight is still a matter of constant concern on account of an even-paced flying and administrative commitment.

and it will be ready for the first test flight by the end of the year, which translates into another prototype in the inventory.[54] The questions hover around the requirement for it, inventory control becoming varied over a period of time, and a scheduled successful induction programme at the desired scale.

Intake and retention of army aviators has been a potential subject for animated debate. The average period of employment of an artillery officer on aviation duties was six years in the formative years, which has since increased to approximately eleven years for those in the support cadre. While in the permanent cadre, with induction, retention and recall rate of the support cadre caters to the minimum sustainable requirements of the aircrew, the manning level in the flight is still a matter of constant concern on account of an even-paced flying and administrative commitment on the part of those who constitute this corps. This may certainly require a policy analysis, considering that the equipment strength and base is increasing with the announcement of the induction of the light utility tactical battle support helicopters (TBSH), armed and attack helicopters (AH) in a phased manner during the current Plan period and extending up to 12th and 13th Plans.[55]

Along with the induction of equipment, a recount of the infrastructural facility, existing and proposed, to obviate adhoc storage arrangements, will certainly need advance thinking in terms of planning, capital outlay and time-bound completion. In the process of transition, what lies ahead is employability, not only in the battlefront but a milieu of multifarious tasking in all domains for potential realisation and tangible unrestricted contribution so that the power and capability within is gainfully exploited.

54. http://economictimes.indiatimes.com/News_by_Industry/HAL_to_test_flight_Light_Combat_Helicopter_0902.cms accessed on February 12, 2008.
55. http://live.defenseworld.net:9080/go/detailinterview.jsp?id=17, accessed on February 4, 2008.

CONCLUSION

Assessing the impact of army aviation is more complex than it might first appear. The requirement of an observation platform offering a useful perspective of the battlefield treaded into the realm of the need to direct artillery fire. The Nazi tanks racing across the Polish frontiers maintained supremacy which brought in helicopter gunships as significant counter-weapons. The embryonic nature of aerial warfare paved the way for specialisation and a kind of self-replicating motion gravitated towards the manifestation of air power in future wars. Army aviation in India stands at the juncture of physical and technological expansion, leaving behind a past that has witnessed various debates connecting its requirement and efficacy in the present and expanded forms. Since its evolution, teamwork has been one of the greatest trials, which paves the way for individual sustenance through collective functioning. The requirement to traverse large distances in mountainous terrain in the shortest possible time, in order to either save a life or transfer troops, remains as essential even today. The organic requirement of an integrated air element has held ground, based on the experiences both own and those of other countries, but what we see in totality will be the requirement of judicious admixes of organisational strength, based on geographical, military-socio-economic factors, and time relevant advancement.

The embryonic nature of aerial warfare paved the way for specialisation and a kind of self-replicating motion gravitated towards the manifestation of air power in future wars.