THE HISTORICAL PERSPECTIVE OF THE CIVIL AVIATION SECTOR ACROSS THE GLOBE AND THE BEGINNING OF LEGISLATIVE POLICIES IN INDIA

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Abstract

The man has always dreamed of flying. Despite progress, the dream or goal has not yet been completely realized. The most illustrious period in the annals of human civilization is when man first began to harbor an inner desire to conquer air and space. This wish includes research, hypotheses, exploration, and dreaming as well. Although the current flight's fuse is much greater than in the past, it is not yet fully lit. There are still many steps to be taken even though they have already taken some of the steps to improve the safety of a ship in flight. Everyone entering a ship must have complete assurance that they will travel without a hitch, no matter the weather, time, climate, brightness, weather conditions, temperature, or altitude. The goal of the current article is to present the history of the aviation industry as truthfully as feasible. The following essay is directed at everyone who has or is currently contributing to the realization of this magnificent human dream-flight.

Keywords: *Airships, Dirigibles, Kites, Lighter than Air, Air Navigation*

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INTRODUCTION

According to Aulus Gellius, the first artificial flying machine was designed and built around 400 BC It was a model in the shape of a bird propelled by a steam boost (an engine with a steamer used as the reactor with steam), about whom they say he flew successfully to about 200 m altitude. Archytas was a philosopher of ancient Greek, a mathematician, astronomer, lawyer, and political strategist. This device, which the inventor called "The Dove," could be suspended from a cable and allowed to fly steadily along a path of feed. According to John Harding, the first effort at flight heavier than air in the history of aviation was made by the Berber inventor Abbas Ibn Firnas in the ninth century. A British (English) monk named Eilmer of Malmesbury took control of a crude sliding canoe from the tower of Malmesbury Abbey in the year 1010 AD. Eilmer allegedly soared over 200 meters (180 meters) before coming to rest and breaking his legs. Later, he said that the only reason he was unable to fly further was that he neglected to design his flying instrument and a queue. To address this, he more technically redesigned his aircraft, but his ancestor forbade any further experiments on the grounds that they are dangerous and can result in catastrophic mishaps.

AVIATION SECTOR DURING VEDIC PERIOD

The development of aviation is an exciting story of accomplishment and expedition. The human spirit and his uncompromising determination created a strong foundation for Aviation History. Man has always risked his life to fulfill the desire to fly and enjoy the freedom of aerial navigation. The latest research into ancient Sanskrit literature has established evidence of flying in India in the hoary past. Some Manuscript has revealed very interesting things relating to Aviation technology. 'Yantra Sarwaswa' also

called as Encyclopedia of Machines is one of the Manuscripts found in India believed to be written by Maharshi Bharadwaj presumably around 2000 B.C.[1] In this Manuscript, a whole chapter is devoted to Vimanika Sastra i.e., Aircraft Manual. It is written in Sanskrit. It is preserved by our generations. The credit for the Discovery of this manuscript goes to Subbaraya Sastri who had explained and re-dictated it a century ago. It is now published in English.[2] In this manuscript, very interesting information is given. It gives information relating to aerodynamic designs, manufacturing technology, metallurgical composition, and the construction of aircraft. It contains designs of VTOL VEHICLES as also double and treble-decker aircraft. It bears amazing concepts of sophisticated radio and radar and precision photography. It also mentions techniques to harness different types of energies, integral and ambient, through 'Darpan', meaning mirrors and lenses. In all probability, this is an allusion to the utilization of solar energy.

In some slokas of this Vimanikasastra, it talks about qualification and training of pilots and the kind of food and clothing to be provided to them according to seasons, to keep them fit for flying. It says that clothing of pilot should be processed, treated and anointed. Regarding food it recommends five meals a day and food balls described as 'Tadabhavaay-Satva Golavaah' which is having resemblance to the energy/vitamin pills of today. It further says that the flier is not only a trained professional but a Yogi who has mastered 32 secrets of the "Vimaan", the aircraft hardware,

[1] S. Bhalchandra Rao, "Aeronautics in Ancient India", Chapter-IV, Traditions Science and Society (Banglore 1990), pp 54-74

[2] Maharshi Bhardwaj, Vyamanika Shastra-Aeronautics, propounded by Shri Subbaraya Sastriadn translated into English by G. R. Josyer, published by International Academy of Sanskrit Research, Mysore in 1973

and "Uddayan', the flying skill. It is hard to dismiss this text as fantasy or as a feat of clairvoyance; it sure is a glory of ancient India that stayed hidden for a long in the sands of time.

ANCIENT& MEDIEVAL PERIOD

Flight with Kites

The kites were believed to be the invention by the Chinese around 1000 B.C. It is a successful invention that is heavier than air which can fly. It is proved that the Chinese and Japanese has used huge size kites for military purposes in the 17th Century.[3]

The historian Roger Bacon (1214-1294), an English scholar and philosopher, is credited with creating the flying chariot. Leonardo da Vinci (1452-1519), an Italian artist and scientist, also created a device that allowed a man to propel a set of flapping wings with his legs. But no "Bird Machine" ever got made. John Damian, a philosopher, and physician at the Court of James IV of Scotland in 1507, fashioned himself a set of wings and tried to fly by leaping off the steep wall of Sterling Castle. He was fortunate to only sustain a fractured leg after falling to the ground. There have been numerous attempts to create excitement and adventure, but none of them have been effective.

Airlift through Balloons

The first known concept for a lighter-than-aircraft is thought to have been created in 1670 by a Jesuit priest by the name of Francisco de Lana Terzi.

[3] G. S. Sachadeva, History of Aviation, Air law and Policy in India, (Lancers Books, New Delhi) p. 37.

He came forward with the concept of a 'flying boat' with four hollow metallic spheres that would float in the air but it failed. After that, in the 18th century, Europe had amassed sufficient understanding of hot air balloons.

With the aid of artificial wings and feathers, efforts were made to fly like birds during the European Middle Ages. The next step in this path was the invention of the balloons in 1783. The credit for the first balloon journey in India foes to Joseph Lynn who took off from the Lal Bagh Gardens in Bombay on 24th November, 1877. This was followed by several balloon flights in various parts of the country.

The next development in this regard is an airship in 1833 with the use of electric power. In 1877, metal sheets were used by replacing paper or silk cloth for the construction of airships. In 1890 an airship named The Zeppelin was widely used in First World War. It carried passengers as well but soon after it was replaced by a modern airplane.[4]

In the history of aviation, the work of two brothers, Etienne and Joseph Montgolfier constructed the first man–carrying lighter than air machine on 5 June 1783. It measured 35 feet in diameter. On 19th September 1783, the Montgolfier brother successfully demonstrated their invention in the presence of Louis XIV and his Court. They used a silk balloon loaded with hot air to launch their device to a height of roughly 1500 feet while transporting a rooster, a sheep, and a duck in a tiny gondola. Everyone who participated in the experiment came out unscathed, with the exception of the rooster, who fractured his leg; the sheep likely kicked him. The Marquis

[4] Civil Aviation in India, (The Publication Division, Ministry of Information & Broadcasting, Government of India, 1961) p. 5.

d' Arlandes and M. Pilatre de Rozier would share the honor of being the first menhonory on November 21, 1783, after two courageous French courtiers ventured to fly in a hot air balloon. This was a landmark invention that is termed the beginning of Man's flight in the airspace. The lighter-than-aircraft became very famous and the skies of France had a common scene of this machine. This had given rise to an uncommon situation in France i.e., Trespass. The liability of reckless and unsafe experimentation had been a concern to French Police and hence a decree had been issued by French Police in 1784 that prohibited balloon flights without prior special permits. This was termed as the promulgation of the first Air Law.[5] Generally, a law to regulate any new activity came after the industry had been developed but in the case of aviation law, it is Law made first and the industry developed later. It was a quiet interesting history of Aviation law.

The French pioneers were joined in the creation of the balloon by the British, Americans, Russians, Poles, and Italians. Balloons were made with adventure and recreation, scientific research, and military applications in mind.

Sir George Cayley, an English Scientist had propounded the principles of heavier than air flight.[6] He died in 1857. He invented the glider in 1804 and also told that if this glider is accompanied by suitable engine, it could become a flying machine. The credit of heavier than air flight theory shall goes to Sir George Cayley. Similar flights of heavier than air were made by in 1855 by De Bris in a glider constructed on principles of wings of an

[5] C. N. Shawcross, K. M. Beaumont & P. R. E. Brown, Shawcross & Beaumont on Air Law, Vol.1, (London, 2nd ed, 1951), p3.
[6] R. E. G. Davis, A History of World Airlines (London 1954), p.3.

albatross.[7] But this flight was run on the mercy of wind and afforded scant control to the flyer.

After the Montgolfier brother's invention, One Hundred and twenty years later that is on 17 December 1903 it was again two brothers, Wilbur, and Orville Wright, who built the first successful mechanically driven heavier-than-air aircraft in America. Their vehicle was a biplane equipped with an elevator, rudder, and warping wings which measured 40 feet from end to end and were 6 feet apart. Aircraft constructed by the Wright brothers was fundamentally different from its predecessors the airship and the balloon. It was the first ever authenticated, controlled, and sustained flight by a man in a power-driven, heavier-than-air machine. The new aircraft was heavier than air but still had the ability to fly quicker and with heavier loads than the airship and balloon, which were lighter than air vehicles. The Wright brothers conducted a sequence of five history-making flights on a flat beach at the base of the Big Kill Devil sand dune close to Kitty Hawk, North Carolina, U.S.A. The First flight was made by Orville Wright which lasted twelve seconds and landed one hundred and twenty feet from the point of takeoff. Though it was a small flight it created history. This was a starting point of Modern Aviation technology and hence it's a milestone in the history of aviation and mankind as well.

There is another school of aviation history propounded by Major William O' Dwyer. His research said that it was not the Wright brother who invented the first air flight. He produced conclusive documentary shreds of evidence and said that it was Gustav Whitehead who fled the first airplane on 14 August 1901 off Lordship beach in Bridgeport, Connecticut, USA.

[7] *Supra note 5*

He flew in a butterfly-shaped acetylene-powered monoplane. This event was taken place two years before the Wrights brother's invention.

Airships and Dirigibles

After the invention of the hot air balloon, the next step of development was the construction of airships. It was also called 'dirigibles or blimps.' It was an adaptation of a balloon but based on the Archimedean principle. It was designed by Meusnier, a French army officer in 1784. It was shaped like Cigar. At that time the steam engine was used for the purpose of propulsion but it was too heavy. Its design was good but because of the heavy engine it was not successful and for that purpose, it waited till 1890. In 1890, a petrol-driven engine was developed and on 9 August 1884, a controlled flight in an electrically powered dirigible was made. Charles Renard and Ac Krebs made up the moniker "La France" for it. It was made up of a bamboo trolley work vehicle and a Chinese silk envelope. It completed a five-mile circular flight and had enough power and control to go back to the starting point.

Shortly after, in 1900, Count Graf Ferdinand Von Zeppelin, a German army commander, created an airship with a large, streamlined hull shaped like a cigar and hydrogen gas-filled compartments inside. Its aircrews were powered by gasoline engines. He used it to fly over Lake Konstanz in July 1900. Zeppelin achieved a triumph. By 1910, he had launched massive, self-propelled dirigible airships capable of carrying passengers and freight, despite being lighter than air. Germany used zeppelin during the First World War to deliver bombs over London. Later, in 1919, the enormous German aircraft "Graft Zeppelin" made a twenty-one-day circumnavigation of the globe. However, airships had a number of

drawbacks, including their shape and enormous size, which made it challenging in strong wind.

Fire posed an even greater threat because hydrogen is readily ignited. A number of mishaps involving airships occurred over the years; the worst of these occurred in 1937 when the "Hindenberg" crashed while landing in Lakehurst, New Jersey, United States, resulting in the loss of 36 lives and putting an end to the era of airships. The catastrophe was tremendous, and it left people feeling insecure.

THE GROWTH OF AIR CARRIERS

Germany is the country who had started world's first genuine operating airline company with an object to carry passengers. Count von Zeppelin, who was known for the fanatical crusader and visionary for air travel, formed an airline called DELAG (Deutsche Luftschiffahrt Altien Gesselschaft) on 16 October 1909. Its capital was 3 million Marks and 6 Zeppelin airships. It was operating a scheduled service between Friedrichshafen and Dusseldorf. During March 1912 –November 1913, it provided scheduled service of 881 flights which covered 65000 miles and carried 19,100 passengers.[8]

Wright brother were not fortunate enough, because the flights they made did not get official recognition and state patronage in United States of America. The people of America had also not shown much interest in such invention and hence the airline service America had been started much later. The first attempt to operate a regular passenger service was made by a company called St. Petersburg –Tampa Airboat Line in 1914 and this was

[8] *Supra note 6.*

the beginning of commercial aviation in the U.S.

In England, they were aware of the developments of European countries in aviation but made small contributions on their part in the early phases of aviation growth. France had shown much interest in Military aircraft and less in civil aviation. The Soviet Union had also not shown any interest in the early development of aviation. Nevertheless, Aeroflot, the then domestic and international flag carrier of the Soviet Union was acknowledged as the world's largest airline.

GROWTH OF THE INDIAN AVIATION SECTOR DURING BRITISH RULE

The delivery of air mail marked the commencement of commercial air travel in India on February 18, 1911. Henri Piquet, a French aviator, flew a Humber biplane six miles from Allahabad's Industrial and Agricultural Exhibition Ground to Naini Junction carrying approximately 6500 letters and postcards as air mail. India became the first country to fly air mail when this trip took place. This significant occasion prompted the Indian Postal Department to consider expanding and quickly improving their services. British India enacted the landmark Airships Act in 1911 to control airmail operations.[9] At a time when the motor vehicle was still a novelty in most of the world, this Act regulated the flight of aircraft over Indian Territory in great detail. The Indian Airship Act of 1911 was applicable to all of British India, including the Santhal Parganas, the Pargana of Spiti, and the then-British Baluchistan. According to Section 2(1) of the Act, an airship is any machine equipped with mechanical or other propulsion systems that is intended to fly or float in the air without being connected to the earth. This

[9] Gazette of India, August 26, 1911, pp.114-116.

definition encompasses any component of a machine. The responsibilities and duties of the Governor General in Council were outlined in Sections 3, 4 and 5 of the Act, including the creation of regulations for licensing the manufacture, possession, use, sale, import, alongside export of airships. Section 4 gave the Governor General the authority to impose import or export restrictions for the greater welfare. He had the authority to purchase airships for public use and to revoke or stop licenses under Section 5. The British India Government gave its approval on October 1st, 1915, for the establishment of a Central Flying School at Sitapur under the command of the army headquarters, with the goal of enabling cadets to acquire experience in Indian conditions. Because India served as a bridge between Europe, the Far East, and Australia during the First World War, the British were acutely aware of the geopolitical significance of the country. British citizens gave nearly 100 aircraft to India as soon as the war was over, and many of them were given to the Royal Air Force, aero clubs, and some Indian nobles.[10]

EARLY DEVELOPMENTS IN INTERNATIONAL AIR LAW AND INDIA

Paris Convention on Air Navigation, 1919

International Convention on air Navigation was signed in 1919 at Paris. This was the first International Convention in this area of aviation. British India had also signed the said convention. This Convention is known for its Basic Features which are as follows:

[10] V. S. Mani & V. Balkista Reddy, The History and Development of Air Laws in India-A Survey, (Lancer Books, New Delhi 1994).

a. Article 1 says that Every State had complete and exclusive sovereignty over airspace above its territory.

b. The aircraft, in which nation it is registered is the Nationality of that aircraft.

c. Rules as to the airworthiness of aircraft, certification, and competence of pilots and their licensing were to be universalized and standardized.

d. Rights of a State to take measures to ensure the safety of its people were recognized.[11]

This convention was very important for India because it opens the Indian Skies for foreign air services and facilities to be made available on Indian Territory. Flights had been started from Egypt and England to India during 1918-1919. The Royal Air Force had started Regular Air Mail Service on 24th January 1920 between Karachi and Mumbai with a night stop at Rajkot. This was the beginning, but these services were stopped after six weeks because it had resulted in huge financial loss.

The First Indian Air Board

In 1920, the government of British India created the Air Board to offer recommendations on how to support and promote civil flight. The Board delivered its report, titled "The Past History and Future Development of Civil Aviation in India" in 1926. The Board had issued a number of precise recommendations for the overall growth of India's civil aviation industry.

[11] Charles S Rhyne, Legal Rules For International Aviation, Virginia Law Review, Vol.31 (1945) p. 271.

The Board had recommended the following:

a) Creating airports and other on-ground infrastructure.

b) The hiring of a Civil Aviation Director on a full-time basis.

c) A thorough investigation of major thoroughfares.

d) The start of aviation service between Calcutta and Rangoon and the provision of financial aid to the business in charge of running it.[12]

Aerodrome Construction in India

The Air Board's 1927 recommendations were almost entirely approved by the government at the time. Civil aerodrome building began in 1924 at Gilbert Hill in Bombay, Bamrauli in Allahabad, and Dum Dum in Calcutta. The first Director of Civil Aviation was chosen to be Lt. Col. F.C. Shelmerdine. The foundation for air traffic control services was established in 1931 with the establishment of the core of four controlled aerodromes at Karachi, Delhi, Allahabad, and Calcutta. Four Indian aerodrome officers who had received specialized training in the UK were appointed to these four airports.

India had 225 aerodromes as of 1997, 179 of which were governmental and 46 of which were private. Philippines 295, South Africa 278; Australia 436; Brazil 2269; Canada 11758; France 709; Iran 521; Mexico 2042; UK 142; US 17167; Pakistan 65; Sri Lanka 51; and Singapore 2 were all present at that time. These numbers suggest that up until 1997, our performance was substandard.

[12] J. R. D. Tata, The Story of Indian Air Transport, The Journal of Royal Aeronautical Society, Vol. 65, No. 601 (1961,) p. 2.

International Air Routes and Indian Aviation

Till 1929-1930, Indian air transport services had attained a big name and fame on the world aviation map. The regular airmail service which was terminated in 1920 immediately after six weeks after its inception again resumed in March 1929 with the commencement of Imperial Airways service to Karachi. In December 1929 Imperial Airways service extended its route from Karachi to Delhi via Jodhpur. The Imperial Airways service did not go beyond India to the East. During the one year from April 1929 to March 1930 there were 36 International Flights across India of which 17 were Dutch, 8 French, 5 Australian, 2 British, 2 American, 1 Swiss and 1 Chinese.[13]

Air Routes provides lifeline for the growth of air transport and are broad indicators of the progress of the geographical region. It also fixes the growth of tourism. Traffic emanating from Europe, America, and from the Gulf region, and Africa, passes through India on way to South-east Asia and the Far East. Similarly, air traffic from South-east Asia and the Fare East for Europe and America passes through India. So far, India had not profited from its geographic position. This was due to the rigid policy followed in respect of the entry of foreign flights. After 1992, India changed its policy and Liberalization helped to promote air traffic from various countries resulting in the growth of trade in India.

THE BIRTH OF INDIAN AIR COMPANIES

The month of October 1932 is having grand importance in the history of

[13] S. Rammrithan, Development of Civil Aviation in India & Its future, The Aeronautical Society of India, New Delhi, (1975) p.3.

the Indian Civil aviation sector. On The 8th day of October 1932, Indian Air Force was established, and exactly one week after i.e., on the 15th of October 1932 Mr. J.R.D. Tata took off in a high-winged monoplane from Karachi to Bombay. With this, "Tata Airlines", became the first Indian Airline Company. Soon after some days, it was also granted a weekly airmail service from Karachi to Madras via Ahmedabad, Bombay, and Bellary (later changed to Hyderabad) covering thereby a route of over 1300 miles without any subsidy from Government. Tata Airlines later became Air India. In 1939, this company became a well-organized corporation. It was India's premier airline company at the time of the Nationalization of the airlines in 1953.

In June 1933, yet another airline business was founded. Goven Grant founded it, and it later went by the name Indian National Airways Ltd. It was founded in Delhi with the intention of developing feeder and other internal aviation services in northern India, as well as participating as a shareholder in the Indian Trans-Continental Airways (I.T.C.A.) Ltd. It was comparable to the merger of two aviation businesses. Both the daily service between Dhaka and Calcutta and the weekly service between Calcutta and Rangoon were subsequently discontinued in 1935.

The Madras Taxi Service was also established, and it started its services on the Madras-Puri-Calcutta route on 10th February 1934. In April 1935 one Himalayan Air Transport Company came forward to start service for pilgrims between Haridwar and Ganchar in the Himalayas for the journey to and beyond Badrinath. It was an eight-seater aircraft that reduce the journey time from 10 days by road to one hour. Another airline company namely Air Service of India was established in 1937 and it started services between

Bombay–Kathiawar and Bombay-Kolhapur.[14] In the meantime, Tata Airlines and Indian National Airways made al slow but steady progress. Karachi to Madras was a main route of Tata Airlines. They had just begun a brand-new route to Trivandrum and Delhi in the North and South, respectively. From 154,000 miles in 1933 to almost 600,000 miles in 1937, its overall operational distance increased.

CONCLUSION

Several stages can be identified in the development of aviation. Men's conceptions of flying machines were more or less practical until the early seventeenth century. Following the creation of aerostation and numerous gliding efforts at the end of the eighteenth century, this period saw the beginning of the conquest of the air. The first launches of self-launching motor vehicles took place during this time. Almost every flight is an effort to break a record. That is why the researcher has studied all the developmental phases of the history of the civil aviation sector in the world and in India.

[14] *Supra note 12.*