

AIR TRANSPORT – ITS ORIGINS UNTIL ITS COMING OF AGE IN JET AIRCRAFT

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ABSTRACT

This paper traces the origins of manned and powered flight, beginning with the early pioneers. From the 1903 first flight of the Wright Flyer the paper will mention the beginnings of manned flight in America, Europe and Britain. The controversial objection to the Wrights as the inventors of the first aeroplane is mentioned and the fact that they placed their first 'Flyer' in the Science Museum in London as a protest when the Smithsonian Museum in the US entertained the objections raised by people who contrived to prove that Langley's 'Aerodrome' made the first flight.

Also to be mentioned will be the boost given to aviation development by wars. The First and Second World Wars accelerated the development of the aeroplane as did the Korean War to a lesser degree.

The progression from piston engines through turboprop to jet engines will be discussed with the controversy that took place after the Second World War over who invented the jet engine.

The paper will end with the introduction of the Jet Age that changed the face of air travel, with a brief description of early jet airlines and their advantages and shortcomings.

If one were to ask an ordinary person when air transportation began, he, or she, would probably reply: 'It began in 1903 when the Wright Brothers flew their famous 'Flyer' in the Kill Devil Hills in the U.S.A.' For those who have studied the subject, the story of man taking to the air began well before that.

The first Aerial Voyage in history was in France when two men, d'Rozier and d'Arlandes flew in a Montgolfier hot air balloon at Paris in 1783. The first men to fly were designated by the French King were to be convicts but this was not an honour that the pioneers wanted to go to criminals. The King relented and let the two French gentlemen fly first. They climbed to 1500 ft and suffered a fire which they put out, and flew for five miles in twenty-five minutes.

In 1785 was the first airborne crossing of the English Channel—by Blanchard and Jefferies in a balloon.

Blanchard and Jefferies had upstaged the father of balloon flights at that time, Pilatre d'Rozier.

D'Rozier was determined to make a Channel crossing and regain French prestige so with a man named Romain he took off in a hybrid balloon to make his attempt. He used a hydrogen balloon for buoyancy and a hot air one for vertical control. This proved to be a lethal combination as, when they were blown back into France, the hydrogen balloon swelled up so the gas was vented out. The fire from the hot air balloon gave out a spark and the balloons ignited. The air vehicle became a ball of flame and both aeronauts were killed. The first man to fly became the first man to be killed in the air. The long road to man conquering the air would be paved with loss of life of brave men and women –human kind paid a heavy price to attain this.

Inevitably the balloon also became an instrument of war and was used for observation and artillery ranging in the American Civil War that was in 1861 to 1865. An interesting fact that happened at this time was that the young Count Ferdinand von Zeppelin tried to have a close look at these war balloons but was prevented by fears of a security breach. However he did manage to get a close up in 1863 of a civilian version in the United States. Zeppelin later became a great pioneer of the rigid airship, building huge craft that were used in war and peace.

It was not until 1804 that Sir George Cayley flew a model glider. Cayley was one of the people called a 'Father of the Aeroplane,' and a year later he flew an unmanned full sized version of the glider.

Stringfellow's model monoplane was tested in 1848.

In 1852 the first Aeronautical Society founded in France.

Now the biggest problem with balloons was: how to control them. They had a measure of control in the vertical plane by using variations in hot air or venting gas from the balloon canopy, but in the horizontal plane they were at the mercy of winds. To achieve some control and to counter wind effects required an engine and a steering system. A steerable balloon was called a dirigible. Thus the first flight by a manned, full sized, powered dirigible was in 1852. The pilot was Giffard and this was also the first aero-engine powered full size aircraft.

Also in 1852 was the first man-carrying flight by an aeroplane---Cayley's glider. The glider did a brief hop with Sir George Cayley's footman on board. The footman had no control and was probably terrified, but he made history!

1866 was a very important date in aviation history: the founding of the Aeronautical Society in UK. This later became the Royal Aeronautical Society.

1890 saw the first full size piloted aeroplane left the ground under its own power –Ader's Eole.

Ader was a Frenchman, the plane was steam powered, burning alcohol, but had no directional control and flew 164 ft and attained the altitude of 8 inches. It was the first flight of a man carrying aeroplane that left the ground and landed back. Its lack of control and very poor performance was a serious drawback to its claim for a first aeroplane flight.

Another person who could be called a 'Father of the Aeroplane, was the German, Otto Lillienthal . He pioneered glider flying in his bi-plane gliders which he launched by standing in the glider and running down steep hills. His machine was somewhat like the hang gliders of today and he controlled it (to a certain degree) by shifting his weight when airborne. He was killed when he stalled in a sudden gust of wind in 1896.

In 1896 another 'Father of Aviation,' Octave Chanute , had his biplane glider flown by two of his assistants, Herring and Avery as he was too old to fly himself. Chanute's glider had a strong influence on the Wright Brothers when they came to build their first gliders.

1900 was the time when the first Zeppelin flew. It suffered initially from control problems but was the forerunner of the huge rigid airships to come.

1900 was also the time when the Wrights flew their first glider.

The Brazilian pioneer aviator, Albert Santos-Dumont, operating from France flew his dirigible No 6, in 1901, around the Eiffel Tower.

Some measure of the superiority of the Wright Brothers designs and their determination was that, by 1902, they had made almost 1000 flights in their gliders and invented 'wing warping' for coordinated turning control –a major breakthrough in the path towards controlled manned flight.

This led in 1903 to the first powered, sustained and controlled flights in history by the Wright Brothers.

This momentous event was disputed in America, especially by Langley. The Secretary of the Smithsonian Institution, Langley had built models of aeroplanes and claimed that his full size plane, the Langley 'Aerodrome,' was the first machine 'capable of flight,' although it never actually flew before the Wright's Flyer. When attempts were made to fly the 'Aerodrome' it crashed twice on takeoff. It was rebuilt after the Wright's first flight and flown by a pioneer, Glen Curtiss, to prove that it could have flown—but it had been heavily modified. There were lawsuits and it is generally accepted today the Wrights were the first of them all.

In 1908 Wilbur Wright took the first passenger up—a Mr. C. Furnas. But also in 1908 Orville crashed in the USA when demonstrating the Flyer to the US Army. His passenger, Lieutenant Selfridge was killed, becoming the first air passenger fatality.

1909 was the year when Louis Bleriot made the first heavier than air aeroplane flight across the English Channel. It was nearly a disaster as his aeroplane, the Bleriot X1, had its engine overheat. A convenient rain cloud cooled the engine enough for him to make it to the cliffs of Dover where he made a landing on the grass above the cliffs, turning his plane over in the process. As he crawled out of his machine he was met by a British Customs Officer who formally enquired of Bleriot if he had 'anything to declare!'

The first tentative scheduled airline opened in Florida in the US in 1914.

In 1915 was the first Zeppelin raid on London. The Zeppelin raids which were initially carried out on British coastal towns had more of a terror effect than actual damage done but not only were they not effective in terms of damage done but the improvement in defensive measures and the equipping of fighter planes with incendiary ammunition that ignited the airship's hydrogen caused the Germans to discontinue Zeppelin raids. The British used 200 airships for ocean reconnaissance in the First World War. The next raids by the Germans was with Gotha twin engine bombers-the first mass aeroplane raid on London was in 1917.

A sad fact for humanity is that all scientific advancements receive a boost in times of war and the aircraft was no exception. The flimsy underpowered aeroplanes of 1914 had gone by 1918. At the end of the Great War fighter planes could fly above 20,000 at speeds of 120 mph. More importantly, for air transport, bombers such as the German Gotha and the British Handley-Page 0400 and Vickers Vimy, had twin engines and could carry bomb loads capable of inflicting damage on the enemy. It was not difficult to imagine that this new carrying capacity would mark the beginning of modified passenger and freight -carrying aircraft in peacetime.

1919 Marked the creation of the first civil airline for passengers: the Deutsch Reederai, which flew to Berlin, Leipzig and Weimar.

Also that year a French airline started tentative Paris-London flights. This was the Farman Company.

That year, 1919, was also known for the first Atlantic crossing in stages by the US Navy. Lt/Cdr Read.

Again, a non-stop Atlantic crossing was made by Alcock and Brown in a Vickers Vimy bomber aircraft.

The dirigible Airship, the R33 made a double Atlantic crossing in 1919. The Airship gave the heavier than air aircraft competition for early passenger flights. The aeroplanes then were draughty, noisy, small and uncomfortable but in the 1930s elite passengers in Airships travelled in a manner that would be envied by today's passengers. Cabins and beds, plus dining rooms with chef cooked meals and silver cutlery and cut glass featured in Airship luxury.

1924: The first round the world flight was accomplished by two Douglas bi-planes.

1927: The first solo Atlantic crossing by Charles Lindberg in the Ryan Monoplane 'Spirit of St. Louis.'

1929: Imperial Airways (the forerunner of BOAC) started a London-Delhi service which was an extension of their London Karachi service which was started in March 1929. The journey on these early flights was interesting. The first part of the journey was by air to Basle, most likely on DH 66, 3 engine 7 passenger aeroplanes, then by rail to Genoa. The next leg was a flight from Genoa to Alexandria in a Short S8 Calcutta flying boat. From there the route was by rail to Cairo to fly on a DH 66 from Cairo to Karachi. Later, in 1932 Handley-Page HP 42 four engine bi-plane airliners were used on the Cairo-Karachi route.

In 1930, Frank Whittle patented the Jet Engine. After the Second World War it was thought in some quarters that, because the Germans flew the first jet powered aeroplane (the Heinkel He 178) with an engine designed by a German named Ohain that it was Ohain who invented the jet engine. However, on a television program Ohain was interviewed and he said very firmly that Whittle was the undoubted inventor of the jet engine and he had based his engine on Whittle's published findings. Whittle, when interviewed, said that Ohain had made the first jet engine that had flown and should share in the credit for the invention. Both men admired each other and they made a welcome change from people who made passionate claims of being first inventors and condemning all others as pretenders.

1931: The HP 42 airliner, as previously mentioned, came into service.

1933: The Boeing 247, the first modern-type airliner flies. With two reasonably reliable engines, retractable undercarriage, faster speed than its predecessors, and a metal skin, it began a new era in civil air passenger transport. The Boeing Company rivals, the Douglas Aircraft Company, were quick to come out with their DC-1 in competition for the Boeing 247.

Douglas realised, almost immediately, that the DC-1 needed improvements and went straight on to the DC-2 which was larger. It was a success and many were sold.

1935: The ultimate development of the DC-1 basic design flew. It was the DC-3, destined to become a legendary aeroplane with more than ten thousand of them built. They were also built outside the US in many countries and in many versions. The DC-3 started off as the Douglas Sky Sleeper that could take passengers on flights in bunks. Later versions were all seat types. Thousands were built for the USAAF in WW2 as the C-47 and many books have been written about this plane which could arguably be called the most successful aeroplane in history.

1937-39: Experimental mail flights across the North and South Atlantic. These early flights were usually conducted in seaplanes because the larger land planes at that time could not use the short runways that were available. One example of the British expansion on eastern routes was with the Short Empire flying boats extending up to Karachi. The route was from Southampton to Karachi and from Lake Tiberius, after Alexandria went from Baghdad, Basra, Bahrain and

Dubai—on to Gawadur and Karachi. The first flight left Southampton on October 3 1937 and reached Karachi on the 8th of October.

1938: The first modern-type 4 engine airliner flies---the Boeing 307.

1939: The He 178, first turbojet aeroplane flies.

1941: The first British turbojet aircraft flies –the Gloster E28/39

1942: The first operational jet fighter flies—the Me 262. This fighter could have made a great difference in the balance of power in the air in WW2 as it was 100 mph faster than contemporary fighters but, fortunately for the Allies, Adolf Hitler made it carry bombs so it lost its speed advantage. Later it became a very effective bomber killer but the numbers were too small to make a difference.

1943: The Arado 234B-2, the first jet bomber flies in Germany. In that same year the Lockheed Constellation flies—another landmark plane that would be famous after the war.

1945: The first turboprop aeroplane flies—a Gloster Meteor with RR Trent engines.

1945-46: The first regular Trans Atlantic services introduced. The airliners were piston engine Constellations, Boeing Stratocruisers, DC-4s and later DC-6s.

1947: First flight of the Mig 15 swept wing jet fighter and the North American F 86 Sabre.

Pakistan was also born in this year and the Sabre would play a significant part in its first major war in 1965.

1948: The first turboprop airliner flies—the Vickers Viscount. PIA had the later 800 series that served the National Airline well. Orville Wright, the remaining Wright brother died in this year.

1957: The first turboprop airliner in Trans-Atlantic service-the Bristol Britannia.

1958: The first turbojet airliners in Trans-Atlantic service—the DH Comet and the Boeing 707.