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detailed summary of text 8A

Text 8A

From a Dream of Flight to Modern and Future Air Travel (1) The fantasy of flying through the air like birds had been in people's imagination for hundreds of years before it became a reality. Many early attempts to fly ended in failure and death*. However, famed Italian inventor Leonardo da Vinci is credited1 with designing early ancestors of the airplane based on the flight of birds. (2) Three centuries had passed before another major milestone in vertical flight appeared. Looking for a way to loft2 meteorological instruments into the air, noted Russian scientist Mikhail Lomonosov designed a model that used two propellers rotating in opposite directions on the same axis3. Lomonosov demonstrated his model powered by a clock spring4 to the Russian Academy of Sciences in 1754. Questions remain whether the device managed to lift itself during the demonstration or whether it was supported by a string5. (3) The year of 1783 was considered a breakthrough year in aviation: hot air balloons became popular in Europe with the help from the Montgolfier brothers. More significant advances came at the end of the nineteenth century when gliders were developed. Aviation industry received a boost when the Wright brothers developed the theory that the air pressure exerted on different parts of the machine could be altered by making the wings adjustable6 which would maintain equilibrium. Starting in 1902, the brothers developed a full sized, power-driven heavier-than-air machine. On December 17, 1903, the first airplane made its maiden7 flight. The airplane was born at just the right time for its intensive development by an industrial society. Before the availability of petrol, the Wrights' invention would have been nothing more than an improvement in gliders. The airplane found the old marine propeller and the new petrol engine for application. Pneumatic tyres replaced skids8. (4) The following years were marked by significant progress in the technology of aircraft construction. Aviation developed incredibly fast, with longer and longer flights and progressively larger planes. Aviation shortened distances between places, made it easier for people to travel from country to country and between continents. Very large passenger airliners eventually brought relatively cheap air travel within the reach of millions of people. Today's airplanes made a reality a wide range of technological advancements, including the introduction of full fly-by-wire9 flight controls technology, employing advanced materials in its airframes, developing cockpit designs that improve

pilot workload and efficiency, environmental control systems, and more. They can take us farther and faster, and move us in greater comfort than ever before. (5) But what about the future? One of the ideas suggested by aircraft designers is an aircraft with a lace-like10 structure which takes inspiration from the human skeleton, the design which is both strong and relatively lightweight. This means it could, in theory, drastically reduce the fuel costs of flying. The aim would be to 3D print the composite material that would make the structure. Other ideas for the plane of the future include an upward curve11 on the tail to reflect engine noise upwards and reduce noise pollution. Inside the aircraft, engineers envisage new "zones" to replace the traditional seating, with the seats that are able to harvest energy from those sitting in them as well as change shape to fit the size of passengers. It was also suggested that instead of having small doors into the jet, as is currently the case, the planes of the future would have much wider entrances where people could leave their hand luggage. The bags would then be automatically delivered to their seats. However, design alone would not solve all the industry's problems. Other aviation industry targets are to reduce environmental impact, to enhance efficiency and to ensure safety. Flying in the future must remain both safe and affordable while also being safe from an environmental perspective. *E.g. the flight of Icarus in Greek Mythology.

The fantasy of flight, inspired by birds, lasted several centuries before becoming a reality. The first attempts often ended in failure and death. Leonardo da Vinci is credited with creating the first examples of flying machines based on bird flight. In 1754, Russian scientist Mikhail Lomonosov demonstrated a model of vertical flight using two propellers rotating in opposite directions. The year 1783 marked a leap in the popularity of hot air balloons. The theory of controllable wings, developed by the Wright brothers in the late 19th century, paved the way for airplane flight in 1903. Technological advances led to larger airplanes, making air travel affordable. Today's airplanes feature fly-by-wire technology, advanced materials, improved cockpit design, and environmental control systems. Looking to the future, designers are proposing the use of lace structures inspired by the human skeleton to reduce fuel costs. Airplanes of the future may feature upward-curved tails that reduce engine noise and innovative seat areas that collect energy. Wider cabin entrances will allow automated baggage delivery. Despite innovations in design, the industry is committed to reducing environmental impact, improving efficiency and ensuring safety for a stable and affordable future.

The dream of flight, inspired by birds, spanned centuries before realization. Leonardo da Vinci pioneered bird-inspired flying machines. In 1754, Mikhail Lomonosov showcased vertical flight using counter-rotating propellers. The hot air balloon's popularity surged in 1783. The Wright brothers' wing theory led to the first airplane in 1903. Technological strides made air travel accessible, with modern planes featuring fly-by-wire tech, advanced materials, and eco-friendly systems. Airplanes of the future may utilize lace structures to improve fuel efficiency and innovative tail section designs to reduce noise. The entrances to the salons can also be expanded for automatic baggage delivery, which underlines the industry's commitment to efficiency and safety.

detailed summary of text 8C

Text 8c

Pioneers in the Sky (1) How could a man make such heavy machines fly? The power of thought of a human being is amazing. Build a model, then you'll know what the issues are and whether it is viable. If Icarus's mishap is true, the engineers have advanced a long way since then. Now we know that to make a heavy machine fly one should take into account the laws of aerodynamics. Aerodynamics from Greek (ἀήρ aero-air + δυναμική-dynamics) is the study of motion of air, particularly when affected by a solid object, such as an airplane wing. In modern times George Cayley invented the first flying machine that technically demonstrated the chambered lifting wing, stabilisers, control surfaces and identified the four forces acting on an aircraft: propulsion1 (he used a horse to get into the air more quickly) countered by drag, aerodynamic lift countered by weight. (2) What modern aircraft can do is the most spectacular thing in transportation technologies. The Su-35 with vectored thrust2 engines and unstable design, is probably the most maneuverable plane. The aerobatics of the Su-35 leaves the impression that the aircraft is weightless: it can stop in mid-air and descend3 in circles, sailing like a leaf on the wind. There are plenty of airshow videos showing the Sukhoi do backflips and J turns and what not. It can hover, move in any direction and stop on a dime, rotate very quickly through any axis, stop and immediately reverse. Nothing we have seen really comes close to doing what it can do in terms of maneuverability. (3) The Tu-114 is a long-haul aircraft, which is made for the transport of passengers and is equipped with turboprop4 engines. It was designed in the mid-1950s on the basis of the Tu-95 bomber. The Tu-114 had no equal in the world in terms of the number of passengers that could be accommodated on board and it had remained the

largest passenger plane untill the early 1970s. Due to the fact that the aircraft was low-wing, the designers equipped it with a fairly high chassis, which was not found in any aircraft of this class. But this landing gear5 system also brought its disadvantages to the aircraft. With the help of this plane, as many as 32 world records were set. They were obtained for the following achievements: - this was the largest turbofan aircraft at the time that was able to carry passengers on board; - it was also the fastest passenger liner in the world with this type of engine; - it had the most powerful engines in the world back in its time. At the moment, there are no operating Tu-114s left in the world. Only three non-operational versions exist and all the three are used as museum exhibits. During its service life, only two Tu114s crashed. So, probably, it was also one of the safest aircraft ever. (4) Although it is the Concorde that earned a place in history, the lesser known Tu-144 beat it twice: it had its maiden flight on December 31, 1968, two months before Concorde, and then achieved its first supersonic flight in June, 1969, beating the competitor by four months. Both planes were clearly ahead of their time, as civil aviation had barely just transitioned from props to jets. But their striking similarities have long fuelled spy stories. Although they looked alike and could fly at nearly twice the speed of sound cutting travel time in half, they were rather different planes. The Tu-144 was bigger and faster than the Concorde. Europeans managed to create a liner more suitable for the conditions of market operation. It was more economical, had a longer range and was definitely safer. The Tu-144 had been in passenger service for a year before it was withdrawn6 over safety concerns, after only 55 flights. Concorde had been twentyseven years in service and was retired three years after the crash outside Paris on July 25, 2000. So, at this moment there is no supersonic passenger plane in service. Still some companies are working on its development. Will we fly supersonic again?

In the early days of aviation, the question of how to make heavy machines fly was a puzzle solved by human ingenuity. The evolution from the Icarus accident to modern aerodynamics marked a significant journey. George Cayley's invention demonstrated key principles such as the chamber lift wing and the four forces acting on an airplane. The Su-35 now demonstrates amazing maneuverability thanks to its variable thrust engines, capable of stopping in mid-air and performing complex aerial feats. Another notable airplane, the Tu-114, created in the 1950s, has set many records for passenger capacity, speed, and engine power. Despite the fact that the plane is no longer in service, it boasts a relatively benign history, with only two accidents during its entire service. The Tu-144, which is often eclipsed by the Concorde, actually surpassed it in

terms of first flight and first supersonic flight. Despite the similarities, the Tu-144 was larger, faster, and more cost-effective, but safety issues led to its removal from production after a year of operation as a passenger airplane. The Concorde, despite its historical significance, went out of service in 2003. There are currently no operational supersonic passenger airplanes, but ongoing attempts suggest that a return to supersonic flight is possible.