PROGRESS BEYOND THE CLOUDS AND METAMORPHOSIS OF TIME

Sobolev, Dmitry A. The history of development of passenger aircrafts (1910–1970s): To the 100th anniversary of civil aviation. Moscow, «Russkie Vityazi» Foundation, 2018, 264 p.

ABSTRACT

The book is devoted to the history of development of passenger aircrafts from the beginning of their appearance until the mid-1970s. The book tells how the first passenger aircrafts appeared and civil aviation became more and more in demand, which was intended to master the previously inaccessible long-distance routes, to turn into an independent powerful mode of transport, with its specific infrastructure, intercontinental transportation system, and the rapidly developing aircraft industry. The main stages and vectors of development of civil aircrafts are traced, evolution of their design, technical and economic characteristics is shown. The author focuses particularly on the growing level of comfort and safety of passenger aircrafts from the beginning of the commercial use of airlines.

The work is intended for a wide range of people interested in the history of aviation.

Keywords: *history of civil aviation, passenger aircraft, stages of formation, transportation market, progress in aircraft construction, leading countries.*

It so happened that a year ago I had the opportunity to get acquainted with the book of D. McCullough about the Wright brothers, and then, using the example of the consequences of creating the first aircraft, I suddenly felt acutely aware of the explosive essence and creative force of technical progress. I was struck by the dynamics of the changes that were taking place in front of literally short two or three generations of people who were witnesses of the birth and rapid development of the aviation industry.

In the journal article («The most beautiful movement is flight» // World of Transport and Transportation, Vol. 15, 2017, Iss. 6) my emotions were reinforced by easily correlated figures and facts. After all, we are well aware of the developmental path that a locomotive and a railway, a steamer and all its land and underwater modifications have gone through for two hundred years, and the more long-lasting, though not so revolutionary, transformations on the automotive front are no less known. However, compared to these types of transport, the hand-made «birds» achieved truly extraordinary results in development of airspace: from the first home-made models of flying machines from 1903 to 1906, until the appearance of a supersonic American fighter in 1947, only forty years later, and even twenty-one years afterwards the first in the world supersonic passenger airliner Tupolev-144 (USSR) made its flight. Incomprehensible jerk!

In the recently published book by Dmitry Sobolev (he represents the Institute of the History of Natural Science and Technology of the Russian Academy of Sciences) the stages of historical research indicated by him do not include the period of pioneers-ascetics to whom Wilbur and Orville Wright with their «Flyer» and other aircrafts belonged. This initial stage of the aircraft manufacturing era, judging by the context of the author's narration, does not relate to the history of development of passenger aviation. Strange, and why, in fact, it does not relate thereto?

Firstly, we should not forget, in my opinion, that the very idea of building a flying machine from the Wright brothers and other enthusiasts of aeronautics has always been associated, above all, with the desire to provide an opportunity for people to fly. Already later, the purpose of the flight was also cargo, and even more so bombs or military troops. And no matter how many passenger low-powered first-generation planes (1–2, 3–4, 5–6 people) initially took on board, they didn't cease to be actually passenger planes.

Secondly, if passenger planes meant only machines intended for commercial use, as can be understood as the reference point stated in the book (p. 6), then, apparently, it would be more correct to speak about the history of passenger air transportation, and not development of aircrafts as such. That is, with this approach, there is a certain reticence, ambiguity in interpretation of the topic and its derivatives.

In any case, namely the designers, according to Sobolev, had the idea to use airplanes on commercial lines, and the French Henri Farman became the pioneer in the business of transporting passengers. In November 1910, he tried to organize flights between the cities of Buc and tampes (in a straight line of about 40 km) on his double biplane. However, the cost of tickets was high and there were very few people who wanted to justify the cost of operating the machines.

Other similar experiments, including St. Petersburg – Tampa first regular passenger airline in Florida, USA (30 km), did not last for a longer time for the same economic reason. Air transportation could only become profitable if there were multi-seat aircrafts.

In 1911, Louis Bleriot built a monoplane with four passenger seats. It is curious that it received the name «Airbus», which has become today a household name for wide-body aircraft. At the same time, the designer intended to use it as an air bus or taxi, but everything was limited to demonstration and entertainment flights, since even the ability of an airplane to lift up to ten people into the air did not attract serious entrepreneurs.

Equally unsuccessful were the proposals of the British firm of C. Grahame-White (four-seater biplane Charabanc) and other aircraft manufacturers. The failure of this series of machines was explainable: all the planes had one engine, a small payload and a close passenger compartment.

In this period (1913–1914) the first in the world four-engine aircraft «Russkiy Vityaz» and «Ilya Muromets», created in St. Petersburg at the Russian-Baltic factory by young designer Igor Sikorsky and his colleagues, had incomparably greater opportunities. Several engines provided higher flight safety in the event of engine failure, the cockpit had a double steering wheel and instruments to fly in the clouds. Spacious indoor compartment with comfortable seats, large windows, electric lighting, heated by engines, toilet showed a decent level of comfort. The Vityaz could take on board seven people, and the Muromets could carry 16 passengers. Those

aircrafts set several records of carrying capacity and flight duration.

But… Sikorsky's planes might have become excellent passenger machines for that age. But it was not realized as «Russkiy Vityaz» was intended to explore possibility of using a multi-engined aircraft for military purposes, and «Ilya Muromets» from 1914 was again released by military means as a long-range reconnaissance and bomber. The First World War, for obvious reasons, delayed the emergence of full-fledged commercial aviation, and in Russia this was additionally influenced by a civil war followed by global public redivision.

The first passenger airline Moscow–Kharkov appeared in the country in 1921, and for its service just six modified, former military «Muromets» were allocated. Most of them were worn on the fronts of two wars, withstood repeated transportation by rail, and more than once were repaired. Only two flight machines left the factory relatively recently and were considered new.

A characteristic detail regarding flight safety: during the first flights on one of the planes, the right engine caught fire, a flight mechanic immediately climbed onto the wing and hit a flame with a leather jacket – on three working engines «Muromets» flew safely to the intermediate airfield. For almost half a year, four accidents happened on the route and 12 engines were replaced, but all the vehicles remained intact, as, naturally, the passengers. In 1922, due to the final wear and tear, airlines closed down, and veteran aircraft were transferred to a new military school in Serpukhov near Moscow (pp. 14–15).

And the second «but»… Due to the fact that the author of the book is inclined to refer to the category of «passenger» only aircraft engaged in commercial transportation, in the table «Passenger versions of military aircrafts» (p. 14) he indicates six «Muromets», exploited in 1921 on the route Moscow – Kharkov, and so limited its status. Until that time, however, a number of serious publications (in particular, V. B. Shavrov's book «The History of Aircraft Designs in the USSR until 1938». Moscow, Mashinostroenie publ., 1985), and Internet sources have indicated that the four-engine» Ilya Muromets «was not only the world's first bomber of this class, but also a passenger plane. I believe that such a qualification is fair – and it is fully confirmed by the photo shown on p. 7 of the passenger compartment invented by Sikorsky of an enviable size and level of comfort for that time. And most importantly, the plane with passengers repeatedly flew. So why should it be denied the status?

In all other respects there is no reason to argue with the content of the book by D. Sobolev. Its «design» if we follow aircraft terms (or composition) is based on successively constructed stages-chapters. If we go from the title of chapters, then first the reader meets the first passenger flying machines, then the new generation of airplanes (before World War II), then the flying boats. Further, the historical narrative switches to development of transatlantic routes, the appearance of jet aircraft in 1950–1960. The last two chapters are devoted to supersonic and wide-body aircraft, which corresponds to the stated chronology and thematic framework for the study.

If we evaluate the direct development of passenger aircraft for about sixty years described, then the first conditional half of them (until 1949) is accounted for by devices with piston engines, and the second by jet aircraft. The author divides these stages into five periods (p. 255):

• 1920s – improved reliability and passenger capacity, transition from a single-engine to a three-engine layout of the motor force;

• 1930s – increased flight speed, replacement of a three-engine layout with a twin-engine;

• the second half of 1940s – using the experience of the war years to increase the flight distance and the number of passenger seats;

• 1950–1960s – development of aircraft flight qualities, due to transition to jet thrust («Comet», Tupolev-104, V-707, DS-8, Ilyushin-62, etc.);

• 1970s – an attempt to master supersonic speeds (Tu-144, «Concorde») and successful experience in improving transport efficiency due to wide-body aircraft (B-747, DS-10, Lockheed «Tristar», Il-86, A300).

The cumulative effect of many years of efforts by people and companies involved in civil aviation can rightly be considered an increase in the number of passenger seats in the most man-intensive aircraft from four to 550 – almost by one hundred forty times!

By the way, in the book one can find quite a few such summarizing figures and estimates, a lot of various curious facts, interspersed with events known to us, but supplemented with unexpected details and nuances.

For example, even in the modern context, it is interesting to know that France was the first to allocate government subsidies for development of commercial aviation, and the British Minister of Aviation Winston Churchill did not want to do this in 1921, but when several air carriers declared themselves bankrupt at once, the British government was forced to resume financial assistance to air transport. In the USSR, development of civil aviation was also supported: the state allocated 100 thousand gold rubles to the Soviet-German society of air transportation «Deruluft» annually in the 1920s (p. 16).

The importance of air security is highlighted by historic cases: in February 1938, PS-9 (modification of ANT-9) pilot Koleukha was captured in the air by an armed passenger and made an emergency landing in Iran. At the same time, the machine was damaged, and for its repair it was necessary to send a repair crew (p. 64).

Or another reminder: hardly anyone will find a reason to think when «pleasant in all relationships ladies» – flight attendants appeared on board the aircraft. Their first appearance took place in 1930 on the aircraft of the American company United Airlines. Selection criteria: slender girls, with experience of a nurse, good character and not older than 25 years. In addition, they can help roll a machine into an aviation hangar (p. 82).

And another moment – gaining «beyond the clouds» speed. Such a figurative language is suitable when passenger aircraft breakthroughs are assessed at heights beyond the zone of a turbulent atmosphere, where they are able to fly at a fundamentally greater cruise speed due to air discharge. One of the achievements in this series is the flight of the American Willy Post in 1935 at height of around 9000 meters. At the same time, he just proved on the Lockheed «Vega» aircraft the very opportunity to develop a much more significant speed in the stratosphere. If on the Earth he could achieve with his machine the speed of about 300 km/h, then with the same engine power at a height of nine kilometers he reached 432 km/h.

In this way or so, the whole aircraft construction industry was breaking through to the transcendental, incomparable progress. The history of development of passenger aircrafts, as the book convincingly shows, reflects this progress in accordance with the conditions and artifacts of time. And it is not necessary for it to hurry and accelerate.

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