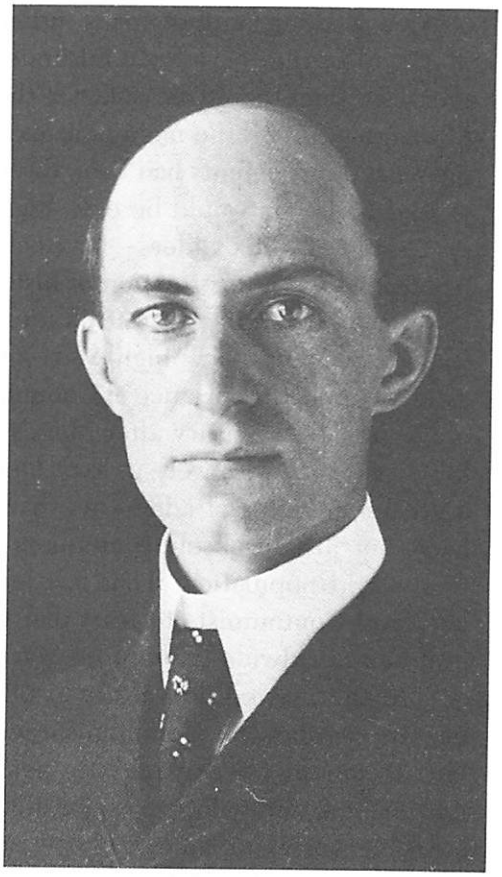


28 ORVILLE WRIGHT

1871-1948

&

WILBUR WRIGHT

1867-1912

Since the achievements of these two brothers are so closely intertwined, they have been combined as a single entry, and their stories will be told together. Wilbur Wright was born in 1867, in Millville, Indiana. Orville Wright, his brother, was born in 1871, in Dayton, Ohio. Both boys received high school educations, although neither actually received his diploma.

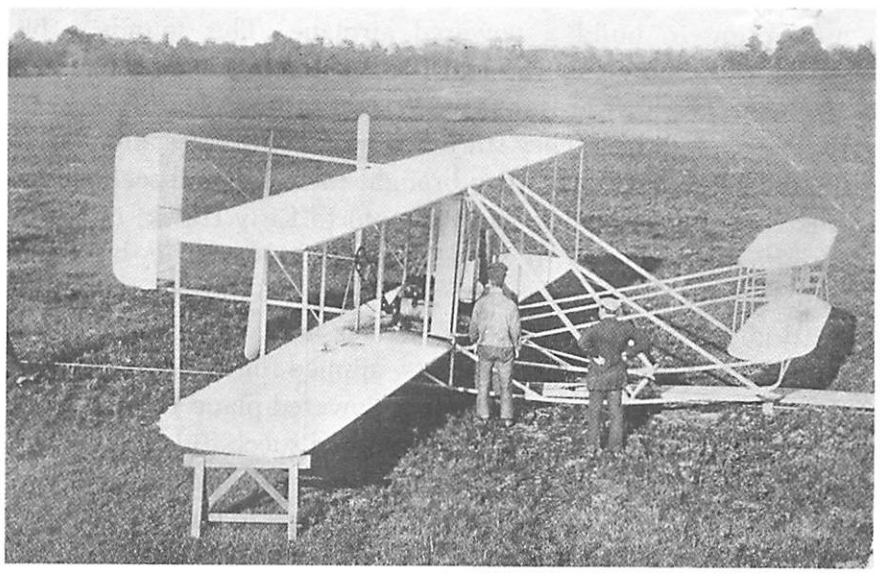
Both boys were mechanically gifted, and both were interested in the subject of manned flight. In 1892, they opened a shop where they sold, repaired, and manufactured bicycles. This provided funds for their overriding interest, which was aeronautical research. They eagerly read the writings of other workers in aeronautics — Otto Lilienthal, Octave Chanute, and Samuel P. Langley. In 1899, they started working on the problem of flight themselves. By December 1903, after a little more than four years' work, their efforts were crowned with success.

One may wonder why the Wright brothers were able to succeed where so many others had failed. There were several reasons for their success. In the first place, two heads are much better than one. The Wright brothers always worked together and cooperated perfectly with each other. In the second place, they wisely decided that they would first learn how to fly before attempting to build a powered airplane. This sounds a bit paradoxical: how can you learn to fly unless you first have an airplane? The answer is that the Wright brothers learned how to fly by using gliders. They started working with kites and gliders in 1899. The next year, they brought their first full-scale glider (that is, large enough to carry a man) to Kitty Hawk, in North Carolina, to test it out. It was not too satisfactory. They built and tested a second full-scale glider in 1901, and a third in 1902. The third glider incorporated some of their most important innovations. (Some of their basic patents, applied for in 1903, relate to that glider rather than to their first powered plane.) In the third glider, they made more than a thousand successful flights. The Wright brothers were already the best and most experienced glider pilots in the world before they started to build a powered aircraft.

Their experience with glider flights provides a third clue to their success. Most persons who had previously attempted to construct airplanes had worried chiefly about how to get their contraptions off the ground. The Wright brothers correctly realized that the biggest problem would be how to control the aircraft after it was in the air. They therefore spent most of their time and effort designing ways to maintain the stability and control of the aircraft during flight. They succeeded in devising means for three-axis control of their craft, and this enabled them to achieve complete maneuverability.

The Wright brothers also made important contributions to wing design. They soon realized that the previously published data on this subject were unreliable. They therefore built their own wind tunnel, and in it tested more than two hundred differently shaped wing surfaces. On the basis of these experiments, they were able to construct their own tables describing how the pressure of the air upon a wing depended on the wing shape. This information was then used to design wings for their aircraft.

The Wright brothers' original biplane.



Despite all these achievements, the Wright brothers could not have succeeded if they had not appeared at the right moment in history. Attempts at powered flight in the first half of the nineteenth century were inevitably doomed to failure. Steam engines were simply too heavy in proportion to the power that they produced. By the time the Wright brothers came along, efficient internal combustion engines had already been invented. However, those internal combustion engines in common use had far too high a ratio of weight to power to be usable in a flying machine. As no manufacturer seemed able to design an engine with a low enough weight-to-power ratio, the Wright brothers (with the help of a mechanic) designed their own. It is an indication of their genius that, although they spent relatively little time on the design of the engine, they were still able to construct an engine superior to those which most manufacturers could design. In addition, the Wright brothers had to design their own propellers. The one that they used in 1903 had about a 66 percent efficiency.

The first flight was made on December 17, 1903, at Kill Devil Hill, near Kitty Hawk, North Carolina. The brothers each made two flights on that day. The first flight, made by Orville Wright, lasted 12 seconds and covered 120 feet. The final flight, made by Wilbur Wright, lasted 59 seconds and covered 852 feet. Their plane, which they called the *Flyer I* (it is today popularly called the *Kitty Hawk)*, cost less than a thousand dollars to build. It had a wing span of about 40 feet and weighed about 750 pounds. It had a 12-horsepower engine, which weighed only 170 pounds. Incidentally, the original airplane is now in the National Air and Space Museum, in Washington, D.C.

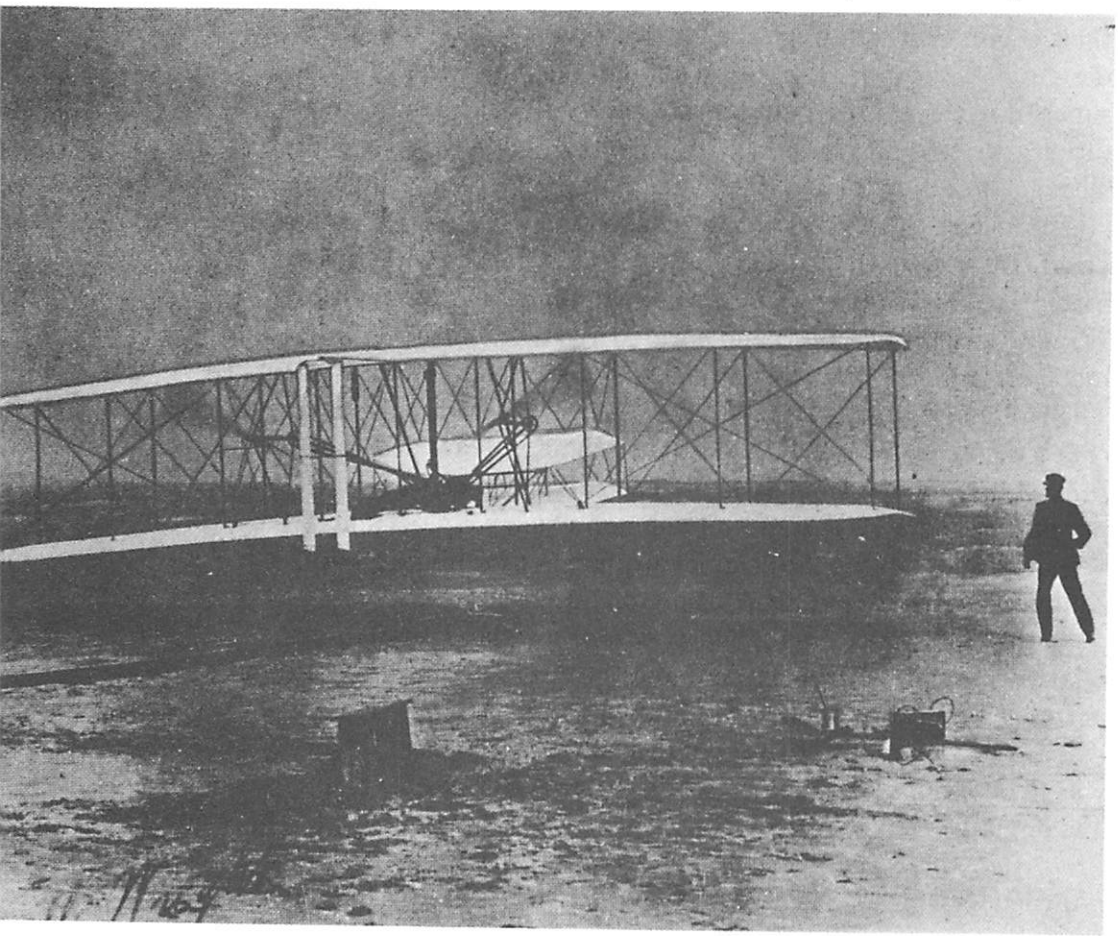
Although there were five witnesses to those first flights, relatively few newspapers reported it the next day (and generally not very accurately). Their hometown paper in Dayton, Ohio, ignored it completely. It was, in fact, almost five years before it was generally realized in the world at large that manned flight had actually been achieved.

After their flights at Kitty Hawk, the Wright brothers returned to Dayton, where they built a second airplane, the *Flyer II*. They made 105 flights in that airplane in 1904, without,

however, attracting much attention. *Flyer III*, an improved and very practical model, was built in 1905. Even though they had made many flights near Dayton, most people still did not believe that the airplane had been invented. In 1906, for example, the Paris edition of the *Herald Tribune* carried an article on the Wright brothers with the headline "Flyers or Liars?"

In 1908, however, the Wright brothers put an end to the public's doubts. Wilbur Wright took one of their planes to France, gave a series of public demonstrations of the aircraft in

The historic first flight of the Wright brothers' airplane at Kitty Hawk.



action, and organized a company there to market their invention. Meanwhile, back in the United States, Orville Wright was giving similar public displays. Unfortunately, on September 17, 1908, the plane he was flying crashed. It was the only serious accident that either of them ever had. A passenger was killed, and Orville broke a leg and two ribs, but recovered. His successful flights, however, had already persuaded the United States government to sign a contract for the supply of airplanes to the U.S. War Department, and in 1909 the Federal budget included an allocation of $30,000 for Army aviation.

For a while there was considerable patent litigation between the Wright brothers and rival claimants, but in 1914 the courts ruled in their favor. Meanwhile, Wilbur Wright contracted typhoid fever and died in 1912, at the age of forty-five. Orville Wright, who in 1915 sold his financial interests in the airplane company, lived on till 1948. Neither of the brothers ever married.

Despite a lot of earlier research in the field, and many prior attempts and claims, there is no question that the Wright brothers deserve the lion's share of the credit for the invention of the airplane. In deciding where to rank them on this list, therefore, the main factor is one's assessment of the importance of the airplane itself. It seems to me that the airplane is a far less important invention than either the printing press or the steam engine, each of which has revolutionized the entire mode of human existence. Still, it is unquestionably an invention of great significance, with applications in both peace and war. In a few decades, the airplane has shrunk our once vast planet and turned it into a small world. Furthermore, the successful achievement of manned flight was an essential preliminary to the development of space travel.

For untold centuries men had dreamed of flying. But practical persons had always believed that the "flying carpets" of the Arabian Nights were only dreams, and could never exist in the real world. The genius of the Wright brothers fulfilled the age-old dream of mankind, and turned a fairy tale into reality.