

### **NYT. They Weren't First, but Their Will to Fly Helped Invent the Airplane By Waren Leary**

The triumph of Kitty Hawk came at the end of almost a century of serious attempts to master the sky, a period studded with progressive advances in engineering and understanding of the principles of flight — and by colossal failures. Experts say that Orville and Wilbur Wright, through their meticulous testing and studies, were years ahead of most competitors. But supporters of other, lesser-known aviation pioneers say that their accomplishments, and due credit, have been overlooked in the attention given the brothers from Dayton.

Although evidence supporting many of these claims is skimpy, some contend that the true fathers of modern aviation hail from France, Germany, England and even New Zealand. Dr. Peter L. Jakab, the curator of the Wright exhibition at the Smithsonian National Air and Space Museum in Washington, said that all of the 19th-century experimenters made contributions. "They all helped invent the airplane, and there was a great deal of cooperation and sharing among them," he said.

The serious push to fly started with Sir George Cayley, an English baronet in Yorkshire who created aeronautical science by being the first to identify the four aerodynamic forces of weight, lift, drag and thrust and their relationship. In 1799, Cayley conceived of the form of a modern aircraft with a fuselage, a fixed main wing, a tail with surfaces for vertical and horizontal control and a precursor of the propeller to move it. He tested his ideas with models and eventually scaled them upward to build the first human-carrying glider, which carried a child aloft in 1849.

The first takeoff of a powered, fixed-wing aircraft with a man aboard took place in 1874 at Brest, France. The steam-engine-powered plane, designed by a French naval officer, Félix du Temple, rose a few feet when it was launched down a hill. The second powered takeoff came in Russia in 1884 in a plane designed by Aleksandr F. Mozhaiski. This three-propeller, steam-engine plane was launched down a ramp and covered almost 100 feet. But both flights were uncontrolled hops into the air that are not considered true flights.

Another significant development reportedly occurred near Paris on Oct. 9, 1890, when a French inventor, Clément Ader, flew a steam-powered, bat-winged plane he named Eole a distance of 160 feet. The flight, for which there were few witnesses and little documentation, marked the first time a heavier-than-air machine carrying a man took off under its own power on level ground.

Controversy also surrounds claims that a German immigrant named Gustave A. Whitehead flew a bathtub-shaped, bird-winged aircraft almost a half mile on Aug. 14, 1901, near Bridgeport, Conn.

There is no physical evidence that the flight took place as described in later accounts, including no photographs of the plane in the air. In addition, Whitehead made few claims himself and left little documentation.

Alberto Santos-Dumont, a Brazilian who did flight research in France, is another aviator considered by some to be the real father of the airplane. He was a pioneer in dirigible flight before turning to heavier-than-air machines after reports of the Wrights' work.

In the fall of 1906, Santos-Dumont made the first observed heavier-than-air powered flights in Europe. Proponents say his short jaunts covering 200 to 722 feet in a box-kite-like plane called 14-bis were the first real flights because the craft took off and landed on wheels under its own power, instead of being launched off rails like the first Wright Flyers.

The list of first fliers also includes an unassuming farmer from New Zealand, Richard W. Pearse, who has become his country's Father of Aviation. Pearse, a self-taught engineer and flight enthusiast, built a single-wing flying machine of steel tubes, bamboo, canvas and wire, powered by an innovative gasoline engine he built. According to reports by witnesses and other evidence, he flew his machine on March 31, 1903, from a road near his farm at Waitohi Flat on the South Island. Pearse reportedly flew 50 to 100 yards before crashing into the top of a tall hedgerow.

Pearse, in letters written years after, said he did not achieve properly controlled flight. The aviator, who died in 1953 at age 75 with little notice, later became a national hero because of his achievements. A replica of his machine is displayed at the New Zealand Museum of Trade and Transport.