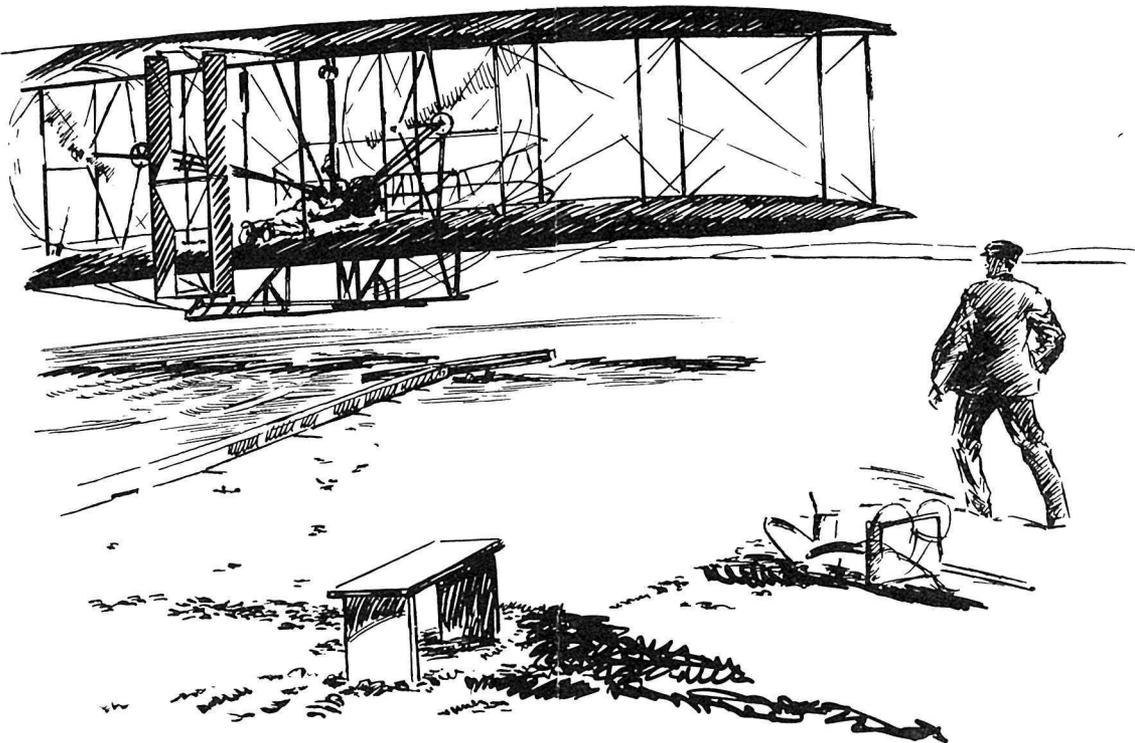


Wright Brothers

NATIONAL MEMORIAL

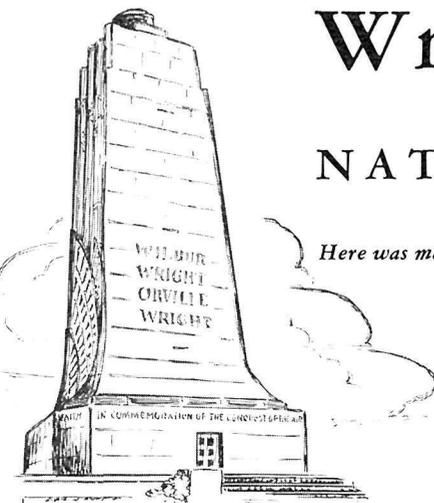
NORTH CAROLINA



Wright Brothers

NATIONAL MEMORIAL

Here was made the first successful power-driven airplane flight in history



WRIGHT BROTHERS NATIONAL MEMORIAL commemorates the achievements of Wilbur and Orville Wright. On December 17, 1903, from level ground at the base of Kill Devil Hill, they took off for the first flights ever made by man in a powered machine heavier than air. It was here, too, on the slopes of this sandhill that they carried on their gliding experiments from 1900 to 1902.

In Europe, experimenters had turned from heavier-than-air machines to dirigible balloons. Most people did not distinguish between a flying machine and a gas bag equipped with propellers, and to those who had read of dirigibles flying over Paris, the first reports of what the Wrights had done, all quite inaccurate, seemed trivial. Only two or three newspapers in the United States printed anything the next morning about the epochal event of December 17.

Wilbur and Orville Wright

Wilbur and Orville Wright were sons of Bishop Milton Wright, of the United Brethren Church. Wilbur was born April 16, 1867, not far from New Castle, Ind.; and Orville, on August 19, 1871, in Dayton,

Ohio. At the time they first thought of trying to fly, they were running the Wright Cycle Co., in Dayton, selling, repairing, and manufacturing bicycles.

Always interested in whatever they read about scientific affairs, they were much impressed by the gliding experiments in Germany of Otto Lilienthal, the father of gliding and the first to explain scientifically why curved surfaces in a flying machine are superior to flat. The Wrights always considered Lilienthal their greatest inspiration.

They believed that a glider should be built in a way that the right and left wings could be presented at different angles to the wind for sidewise balance and they determined to do this by warping or twisting the wings. They built a 5-foot model of a glider to try their scheme for control, and, one day in 1899, tested it. Then they started thinking of a place for testing a man-carrying glider. After a study of wind records obtained from the Weather Bureau at Washington, they picked Kitty Hawk. They made their first trip there in September 1900, and camped in a tent. The next year they returned with a larger glider and built a camp a few hundred feet north of Kill Devil Hill. In their gliding experiments of 1900 and 1901 they got less lifting power from the wings than existing tables of air pressures on curved surfaces had led them to expect, and they

came to believe that all of these tables must be wrong.

After their return to Dayton, they made experiments which gave them knowledge no one had ever had before: they set up a small wind tunnel and tested more than 200 types of miniature wing surfaces. Among other things, these experiments proved the fallacy of the sharp front edge of an airplane wing and the inefficiency of deeply cambered wings, as then generally advocated by others.

In a few weeks they had accomplished work of almost incalculable importance. Not only were they the first to test miniature wings accurately, they were the first in the world to compile tables of figures from which one might design an airplane that could fly! Those wind-tunnel experiments marked a turning point in the efforts of man to conquer the air.

When they returned to Kill Devil Hills in 1902, the brothers brought a glider having a wingspan of 32 feet, built according to their own figures on wind pressure.

It was soon evident that this 1902 glider showed a great advance over any other ever built. The brothers made many glides of more than 600 feet against a 36-mile-an-hour wind. No previous experimenter had ever dared try to glide in so stiff a wind.

In the 1902 glider the Wrights solved most of the problem of equilibrium. Now they felt sure they could build a successful powered machine.

The next year they did build one. It had a wingspan of more than 40 feet. The engine, of about 12 horsepower, weighing 170 pounds, they also built themselves. The two propellers were designed according to their own calculations and were the first propellers ever built by anyone for which the performance could be predicted. With a pilot, the machine weighed 750 pounds. The total cost was less than \$1,000.

The First Flight

It was late in September when the Wrights reached their camp at Kill Devil Hills in 1903. Because of delays from mechanical problems and bad weather, not until December 14 were they ready to fly the powered machine. The first trial was not quite successful. Without enough wind to start from level ground, they took the machine to the slope of the hill where they placed the sled-like skids on a "truck"—a plank about 6 feet long, with runners—which rested on a monorail track. Wilbur won the toss of a coin for what he called the "first whack." He turned the machine up too suddenly after leaving



Looking south at the granite boulder marking the take-off spot from which the first airplane flight was made, with the memorial shaft on Kill Devil Hill in the background

the track, before it had gained enough speed. It climbed a few feet, stalled, and settled to the ground near the foot of the hill after being in the air just 3½ seconds. One of the skids and other parts were broken. Two days were needed for making repairs.

On the morning of December 17, the wind was from 22 to 27 miles an hour. The Wrights waited, hoping it would die down. When it continued, they decided to attempt a flight. They laid the 60-foot track on a smooth stretch of level ground about 100 feet west of their camp and directly toward the north wind. The takeoff spot is now marked by a granite boulder.

By the time all was ready, three men from the Kill Devil Hills Lifesaving Station and two others had arrived.

It was Orville's turn. Before climbing aboard the machine, he put his camera on a tripod and told Mr. Daniels of the lifesaving crew to press the button when the machine had risen directly in front of the camera.

The Wrights did not want to fly at any more speed than necessary in these first trials. Against that strong wind the machine moved at only 10 feet per second.

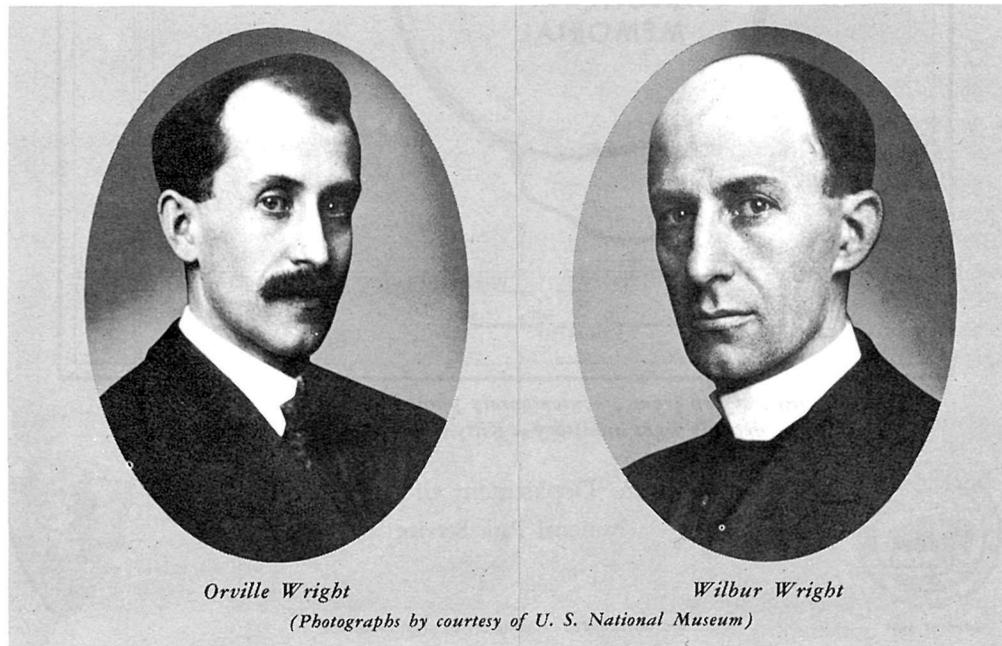
Quoting Orville Wright: "This flight lasted only 12 seconds, but it was nevertheless the first in history in which a machine carrying a man had raised itself by its own power into the air in full flight, had sailed forward without reduction of speed, and had finally landed at a point as high as that from which it started."

The brothers alternated in making three more flights that morning, each longer than the previous one, and the fourth flight, by Wilbur, was 852 feet, in 59 seconds.

As it seemed imprudent to fly at much height at first, it was sometimes impossible to correct the up and down motion of the machine before it struck the ground. This accounts for the flights being so short. While the Wrights and onlookers were discussing the flights, a gust of wind struck the machine and turned it over and over, damaging it badly. It could not be repaired in time for any more flights that year; and it was never flown again.

The Airplane Exhibited

Wilbur Wright died in 1912. Orville always thought the National Museum in Washington, administered by the Smithsonian Institution, was the logical place for the first successful airplane. However, for a long time he was unwilling to entrust the machine there because of a controversy between him and the Smithsonian in regard to the invention of the airplane. In 1928, Orville lent the plane to the Science Museum at South Kensington, near London, England, with the understanding that it would stay there unless he made a written request for its return. Finally, in 1942, the dispute with the Smithsonian was settled to Orville's satisfaction, and the next year he wrote a request to the Science Museum for the machine's

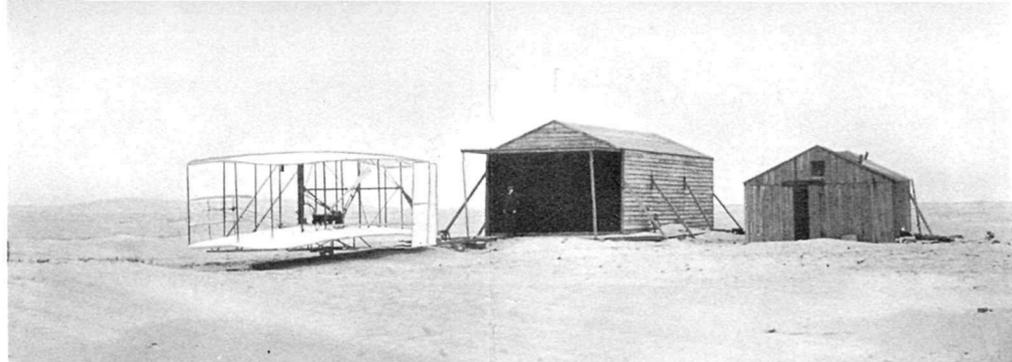


Orville Wright

Wilbur Wright

(Photographs by courtesy of U. S. National Museum)

The National Park System, of which this area is a unit, is dedicated to conserving the scenic, scientific, and historic heritage of the United States for the benefit and enjoyment of its people.



The Wright Brothers' 1903 camp, just north of Kill Devil Hill

return to this country after World War II ended.

After Orville Wright's death, on January 30, 1948, his executors deposited the machine in the National Air Museum, managed by the Smithsonian. It was formally placed on exhibition on December 17, 1948, the 45th anniversary of the first flights.

The Memorial

On March 2, 1927, Congress authorized Kill Devil Hill Monument National Memorial. In 1953 the name was changed to Wright Brothers National Memorial. The area contains 425 acres.

The Wright Memorial Shaft is a triangular pylon of Mount Airy, N.C., gray granite, 60 feet high. Its steel doors and a metal world map inside depict events associated with man's efforts to fly and the first 25 years of aviation history. Stairs lead to an observation platform where there is a beacon capable of throwing a beam many miles. Before the memorial shaft was built, Kill Devil Hill was a shifting dune of sand; it was anchored with grasses adapted to sandy soil.

The two wooden structures just north of Kill Devil Hill were built in 1953 on the 50th anniversary of the first flight. They are reconstructions of the Wright brothers' 1903 camp, based on historical research and photographs of the originals.

The historical narrative part of this folder was written by Fred C. Kelly, author of The Wright Brothers, the Wrights' authorized biography, and editor of Miracle at Kitty Hawk, the letters of Wilbur and Orville Wright.

About Your Visit

The memorial is 75 miles south of Norfolk, Va., at Kill Devil Hills, N.C. You may drive to it via U.S. 17 or 158 to Elizabeth City, N.C., and then via U.S. 158 to Kill Devil Hills. A more direct route from Norfolk is via Va. and N.C. 170 and U.S. 158. There is bus service to the memorial.

Visiting hours are from 8:30 a.m. to 5 p.m. Please go to the visitor center first, and then visit other points of interest. Groups may make advance arrangements with the superintendent for special service.

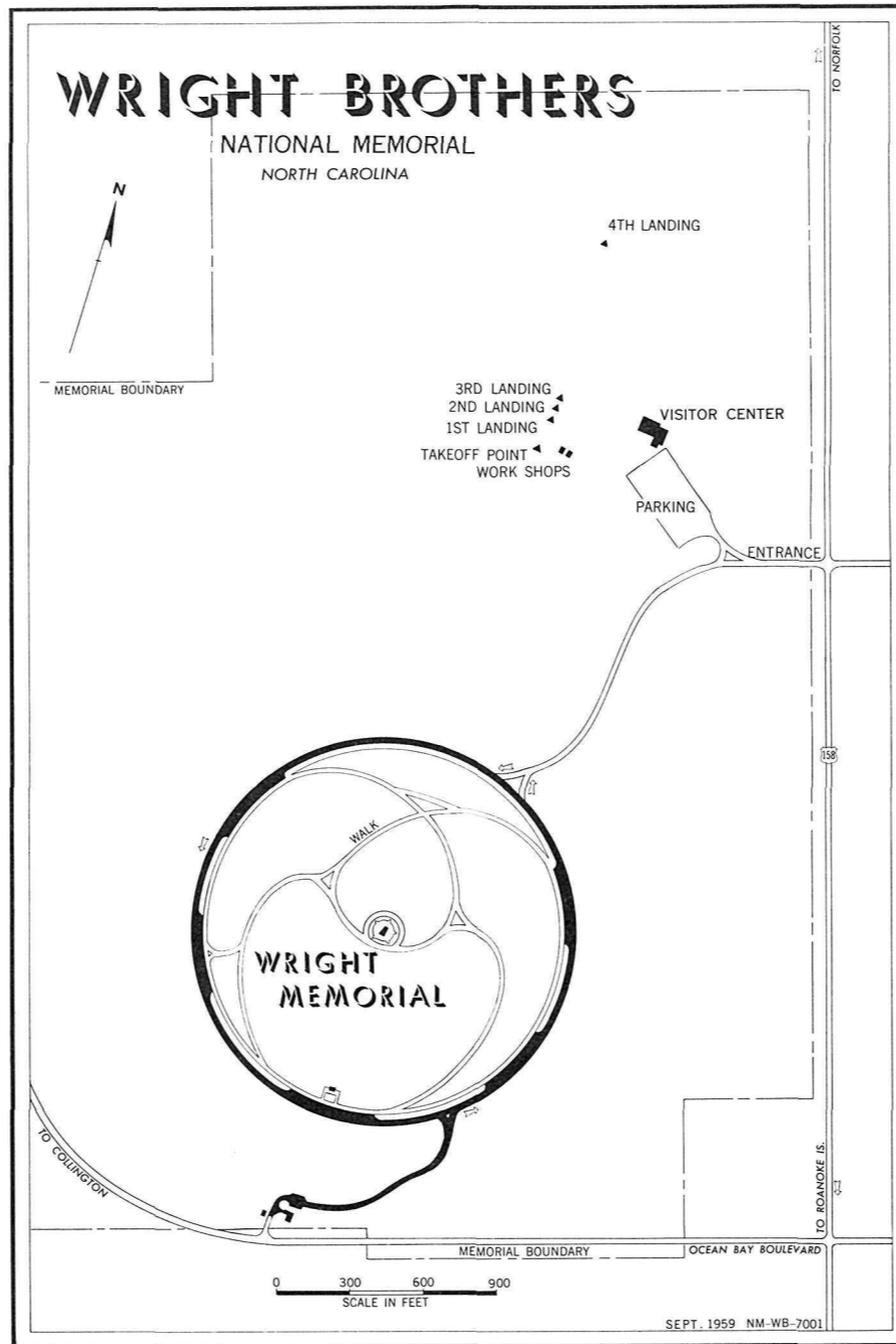
Administration

Wright Brothers National Memorial is administered by the National Park Service, U.S. Department of the Interior. A superintendent, whose address is Kill Devil Hills, N.C., is in immediate charge.

Mission 66

This vital 10-year program is designed to develop and protect the areas of the National Park System and to assure proper use and enjoyment for ours and future generations.

Through Mission 66 at Wright Brothers National Memorial, new approach roads and parking areas have been built, as well as this new visitor center, whose sweeping design hints at the miracle of flight.



Cover: Artist's sketch from a contemporary photograph of the first successful power-driven airplane flight in history at Kitty Hawk, N. C., December 17, 1903.

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