

THE MAN IN THE BALLOON

How Thaddeus Lowe took the skies and invented aerial reconnaissance before the age of airplanes.

As the moon hung high in the morning Cincinnati sky, an eccentric aeronaut blasted one last puff of coal gas into his balloon, the "Enterprise." It was April 20, 1861, and just eight days earlier the first shots had rang out at Fort Sumter and ignited the Civil War, a conflict that would eventually claim nearly 625,000 American lives. But on this day, dressed in a fancy silk hat and a black long frock coat, Prof. Thaddeus Lowe prepared for his latest and most important test flight. He knew that a divided Union would need him—and his balloon.

At a little before 4 a.m., dozens who "so generously denied their rest to assist him" gathered to see the professor off. Lowe signaled for the balloon to be untethered and the Enterprise gently rose into the sky. As man and balloon ascended, the cheers below became inaudible, until the "city of 170,000 sleepers" was nothing more than "tiny lights glittering through the foggy mist." This is how Lowe and the "Enterprise" forever changed aerial reconnaissance—but not before a few goofs along the way (like accidentally flying into the Confederacy).

While Lowe's name may not hold the same position in American aviation lore as the Wright Brothers, Amelia Earhart, or Charles Lindbergh, his impact is just as profound. "The balloon corps was the first military aviation unit in American history," says Tom Crouch, Senior Curator, Aeronautics with the Smithsonian's National Air and Space Museum, "The story begins with the balloon and ends with today's reconnaissance satellites. Lowe set something very important in motion."



Thaddeus S. C. Lowe

Inflating an Aerial Dream

Thaddeus Sobieski Constantine Lowe was born in Jefferson Mills, New Hampshire, in 1832. He claimed to be a Mayflower descendent and that his grandfather fought in the Revolutionary War—claims unproven by his biographers. According to legend, young Thad became interested in ballooning when he attended an 1850 demonstration where he learned about the floating properties of hydrogen gas, and how to make it by mixing a solution of sulfuric acid and metal shavings. Fascinated, he joined up with this traveling chemistry show and within a few years became the star by building his very own hydrogen balloon.

Passenger balloons were no longer a new phenomenon by the mid-19th century, but most people considered them little more than a novelty. In 1783, a sheep, duck, and a rooster became the first balloon passengers when they completed a tethered, eight-minute flight over Versailles with King Louis XVI, his wife Marie Antoinette, and 130,000 French citizens all watching. Months later, French scientist Jean-François Pilâtre de Rozier became the first human balloon passenger—and casualty. His two-balloon system of hydrogen/hot air exploded during an English Channel crossing attempt, killing de Rozier in the process.

Founding fathers like Ben Franklin, John Adams, and George Washington witnessed similar demonstrations and became enamored with this new form of air travel. Washington wrote in 1784 letter that he expected the new country's friends in Paris "will come flying thro' the air, instead of ploughing the Ocean to get to America."

However, it wasn't until Lowe that balloons became valuable reconnaissance aircraft. Because of his traveling show background, Lowe knew how to get people's attention. "He was a whale of a showman," says Crouch, "He was sort of a Mr. Wizard or Bill Nye the Science Guy [of his time], traveling the country giving scientific demonstrations." Adorned with colorful clothes and a formidable mustache, he awed crowds with mini-hydrogen explosions and vinegar volcanoes, demonstrations you might see at today's grade school science fair.

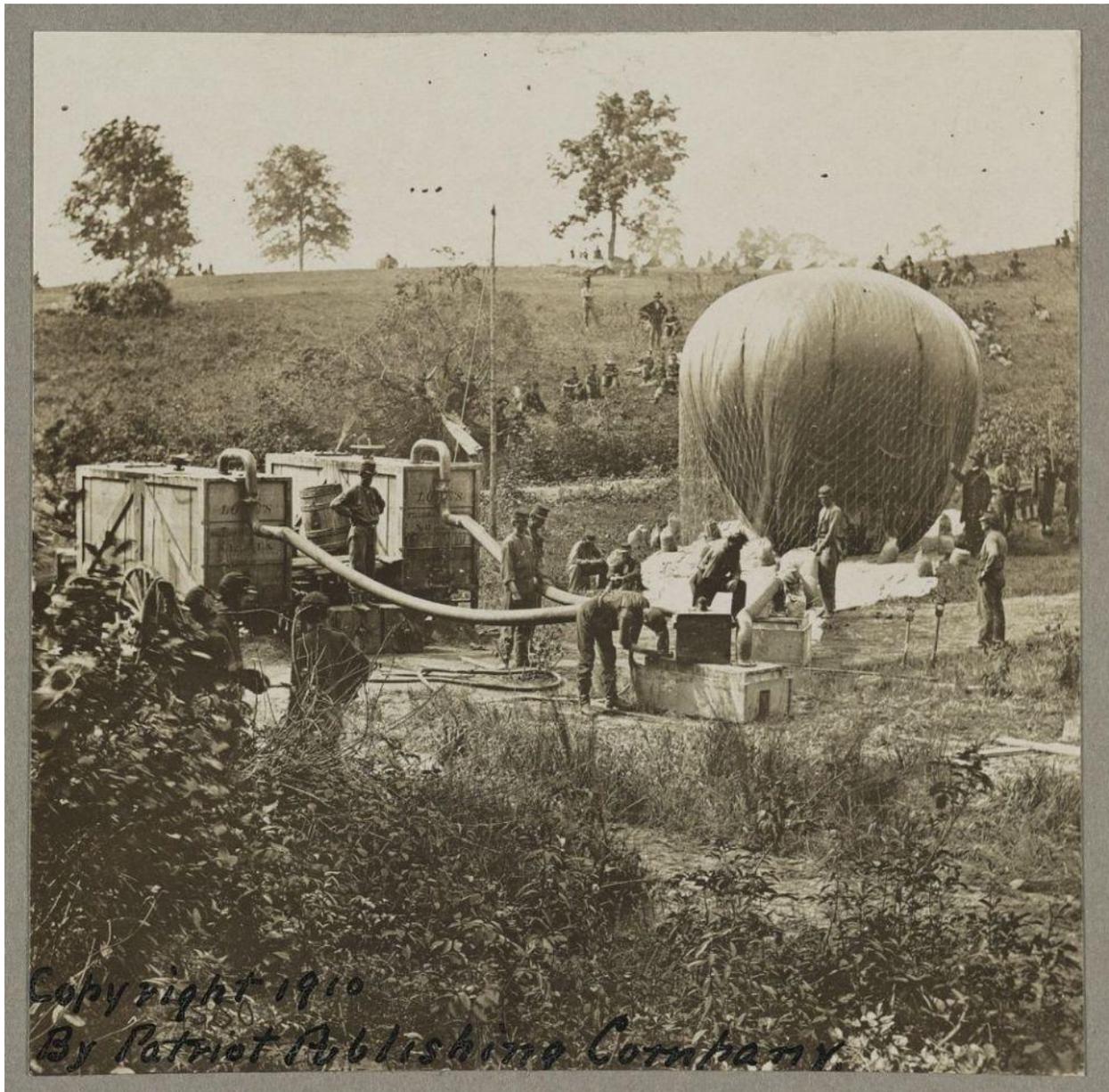
In 1856, Lowe began to integrate balloons into this act. Using a homemade hydrogen balloon, he made a flight from Ottawa to Portland, Maine. Next, he pulled together financing for a mammoth 725,000-cubic-foot, two-hundred-foot-high balloon that he called the "City of New York," a humorous reference to the balloon's massive size. As his balloons got bigger, so did Lowe's personality. He performed so many demonstrations in a big brown fur coat that the press referred to him as the "Russian Bear."

Balloons Go to War

Despite these eccentricities, ballooning was always a serious science to Lowe. He felt comfortable creating gases, gauging wind speeds, and of course, floating in the air. He dreamed of making a transatlantic flight, but several of his bigger balloons were badly damaged while attempting to raise financing for it. However, he was still confident that his balloons could make long-distance journeys.

Lowe also invented mobile gas stations in order to keep his balloons aloft longer. Knowing that gas wasn't always going to be available on long voyages, he experimented with different ways to create and mobilize hydrogen. Eventually, he constructed portable hydrogen gas generators that were essentially

large tanks mounted on a bed of Army wagons. They were filled with dilute sulfuric acid (oil of vitriol) and metal fillings. When cooled and de-acidified, the gas was carried to the balloon in leather pipes.

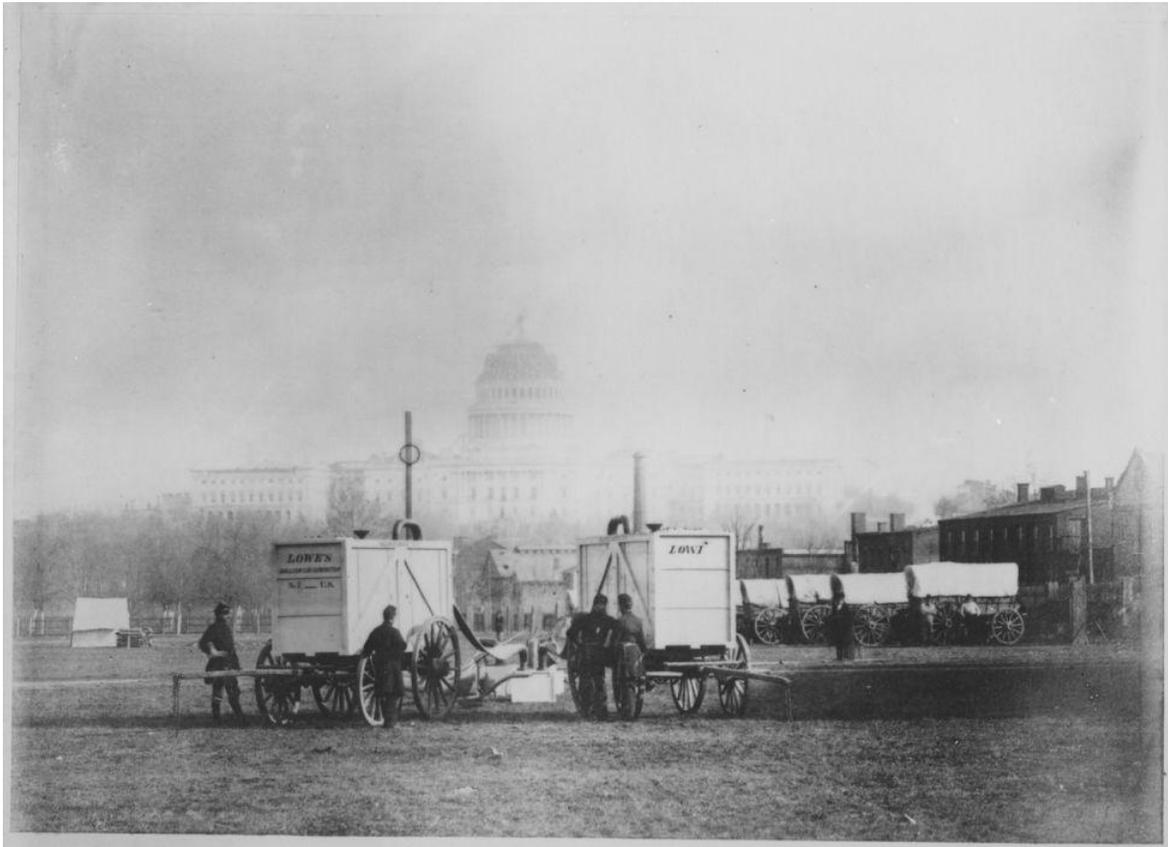


In 1861, Lowe reached out to Professor Joseph Henry, the first Director of the Smithsonian Institution, for funding help. While he responded with an emphatic no, Henry suggested that his "aerial car" could be an "advantage to the Government in assisting their reconaissance of the district of the country around Washington."

Although the Enterprise's Cincinnati takeoff went flawlessly, the rest of Lowe's inaugural journey wasn't exactly smooth sailing. About twelve hours after Lowe launched the Enterprise, he accidentally landed in enemy territory. A southwesterly wind had taken him off course from his original destination. What was

supposed to be President Lincoln's front yard was actually a small farm right outside of rural Unionville, South Carolina. Unfortunately, the town's name was the exact opposite of their wartime leanings.

As Lowe descended from the sky, he was greeted with screams of "devil" as the residents were convinced that the man from above had come from "some... infernal region, who had floated to this earth to do damage and injury to its inhabitants." However, Lowe was able to convince them he was no devil nor alien, but human like them—save for an unmistakable Yankee accent.



Setting up Lowe's balloon gas generators in front of the unfinished capitol building, 1861.

Able to sweet talk his way out of the situation, Lowe and his *Enterprise* were put on a train headed north to Washington. On June 11th, he finally met President Abraham Lincoln. Lowe intrigued Lincoln with his aerial exploits, explaining that his balloon could give a military vantage point that no hill or mountain could match. A week later, directly in front of where Smithsonian's National Air & Space Museum is today, Lowe rose 500 feet in the air in his tethered "*Enterprise*." While in the air, he sent a telegraph to the White House that read in part, "This point of observation commands an area near fifty miles in diameter...I have pleasure in sending you this first dispatch ever telegraphed from an aerial station."

Soon after, President Lincoln told the War Department to create the U.S. Army Civilian Balloon Corps. According to Richard Holmes' book *Flying Upwards*, Lincoln gave Lowe funding to build eight balloons specifically for aerial reconnaissance. Lowe's design was upgraded with enough tether and telegraph cable to go as high as 5,000 feet. He also added searchlights and colored flares for night surveillance. The

balloons were named the "Union", "Intrepid", "Washington", "United States", "Eagle", "Constitution", "Excelsior" and the retrofitted "Enterprise."

The balloon missions began immediately that summer. Lowe and his band of aeronauts gave the Union a decisive tactical advantage, particularly in the early part of the war. In September 1861, the "Union" was a thousand feet in the air near Arlington, Virginia, when it spotted advancing Confederate troops and artillery several miles away. They telegraphed their location and Union guns all turned and fired, creating havoc along the Rebel's line. As Holmes wrote, "This was an ominous first in the history of warfare, by which destruction could be delivered to a distant and invisible enemy."



In Gaines Mill, Virginia, Lowe prepares to ascend as soldiers gather around the balloon car, May 1862.

The balloons were also high in the skies during 1862's siege in Yorktown, the Seven Days Battle near Richmond, and even saved the Union from defeat with battle-changing intelligence at Mechanicsburg. In a moment of levity, Lowe earned the likely aprophracal distinction for being the "Most Shot-At Man in the War" due to the constant pot shots Confederate soldiers took at him and the balloons. "When the balloons were there, the (Confederates) knew they had to be so careful that what they were doing wasn't seen by them," Crouch says.

Despite the success of the U.S. Army Balloon Corps under the command of General George McClellan, the Balloon Corps fell out of favor when Captain Cyrus B. Comstock was put in charge upon McClellan's promotion in 1863. The new, inexperienced Captain cut Lowe's pay in nearly half while also refusing to pay expenses. Predictably, this did not sit well with Lowe. He attempted to go above Comstock's head by writing letters to the Secretary of War, calling Comstock someone "utterly ignorant of aeronautics who autocratically countermands ever order I give and blocks every move I make, simply because he is

clothed in a little bit of authority and thinks this is the way to show it." In May 1863, Lowe resigned and three months later, the Balloon Corps shut down.

A New Age of Reconnaissance



Thaddeus S.C. Lowe in 1890, age 58.

Although the Union was no longer interested in Lowe's balloon corp, Europe very much was. After the General Lee surrendered to the Union in April 1865, several European countries asked Lowe's help developing their own balloon corps. But having enough of war, Lowe passed on most of these opportunities. Instead, he spent much of his remaining days becoming a millionaire by perfecting a water gas process that turned hydrogen steam into a cheap source of fuel. He later became the first to turn CO₂ into artificial ice and revolutionized commercial freezing.

While its lifespan was short, the U.S. Army Balloon Corps' had a long-lasting impact. Throughout the latter half of the 19th century, aerial recon balloons could be found high in the skies in nearly every war around the world. During the Second Boer War, the British flew balloons over South Africa. Brazil employed recon balloons during their 19th century war with Paraguay. During 1898/1899's Spanish-American War, military recon balloons aided Teddy Roosevelt and his Rough Riders' famed charge up San Juan Hill.



Recreation of Thaddeus Lowe's 1861 demonstration, 2011.

Even in World War I, "balloonunatics" floated and spied over enemy lines, though they were now easy targets with the advent of the airplane. By World War II, planes became the aerial reconnaissance tool of choice. However, balloons are still used today as an aerial recon option in no fly zones. "Think about it, you were on an aerial perch more than 500 feet in the air," says Crouch, "It's the ultimate high ground."

Lowe died in Pasadena, California in 1913. Before his death, Lowe wrote in his memoirs that his 1861 flight was a moment of lifelong vindication. "Every great invention, every innovation in the history of the world has been laughed and jeered at. Columbus was denounced as a [faker]; Morse was called a crank; Franklin a fool; Charles Darwin was ridiculed for years," Lowe wrote.

"These are the victorious moments which repay all explorers for the hours of disappointment, ridicule, and attacks."

[Source: Popular Mechanics | Matt Blitz | May 9, 2017 ++]