

Before you dismiss Elon Musk, remember the Wright brothers

History teaches us: Be careful of declaring bold visions impossible

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Some people are fascinated by Elon Musk's vision of building a permanent settlement on the moon within the next decade — and later establishing a self-sustaining city on Mars.

Jeff Bezos has spoken about gradually moving heavy industry from Earth into space. Several companies are already working on space-based data centers.

Others dismiss all these ideas as science fiction. I understand that skepticism, but history teaches us to be careful before declaring bold visions impossible.

Dreams can sometimes seem distant, but they are occasionally much closer than we think. On Oct. 7, 1903, Samuel P. Langley attempted to launch his Great Aerodrome aircraft from a catapult ramp on a houseboat on the Potomac River. The aircraft immediately tilted after takeoff. Its nose dipped sharply, and it crashed into the water, sustaining significant damage.

In a derisive editorial two days later, The New York Times referred to the failed attempt at flight as a “ridiculous fiasco” and made a bleak prediction: “[It might be assumed that the flying machine which will really fly might be evolved by the combined and continuous efforts of mathematicians and mechanics in from one million to ten million years.” Just two months later, on Dec. 17, 1903, the Wright brothers achieved the first successful powered flight in Kitty Hawk, North Carolina. Initially, The New York Times did not report on this milestone. It was not until 1906 that the newspaper published a detailed article about the Wright brothers' accomplishment.

As private individuals, the Wrights had less than \$1,000 at their disposal, equivalent to approximately \$30,000 today. University professor Langley had \$70,000, about \$2.5 million in today's terms. More than two-thirds of his funding came from the U.S. War Department.

The Wrights were fortunate that there was no government agency at the time to impose strict rules and regulations on exactly how they should build and operate their aircraft. George Nield, who was responsible for regulating commercial space activities at the Federal Aviation Administration for many years, once said: “I think the difference is that

the government didn't design, build, own, and operate the Wright brothers' aircraft. Think about how aviation would've developed if that had been the scenario! That's really what we were faced with for space in the early years."

The American Robert Goddard, often called the father of modern rocketry, was the first to successfully launch a liquidfueled rocket. He introduced numerous technical innovations, including staged rockets and guidance systems.

Through his theoretical work and practical experiments in the 1920s and 1930s, he laid crucial foundations for modern spaceflight.

Goddard was a visionary, much like Elon Musk today. At age 16, he immersed himself in H.G. Wells' "The War of the Worlds" and Garrett P. Serviss' sequel, "Edison's Conquest of Mars." At 23, he wrote: "Just as in the sciences we have learned that we are too ignorant safely to pronounce anything impossible. ... The dream of yesterday is the hope of today and the reality of tomorrow."

At 31, he outlined his ideas on spaceflight in the essay "The Navigation of Interplanetary Space." He proposed that the moon could become a manufacturing site of hydrogen and oxygen for missions to other planets and described solar energy as a future source of power for interplanetary travel.

He argued: "From an economic point of view, the navigation of interplanetary space must be effected to ensure the continuance of the race." His motivation closely resembles Mr. Musk's argument today: Humanity should become a multiplanetary species to ensure its long-term survival.

Goddard envisioned a future in which people would travel from planet to planet, producing rocket fuel from lunar resources and using metals from celestial bodies to build new spacecraft.

Still, Goddard was more than a visionary. He was also an engineer and scientist. In 1919, he published "Method of Reaching Extreme Altitudes," becoming the first scientist to demonstrate mathematically that a rocket could overcome Earth's gravity. He also provided the first scientific proof that rockets could operate in the vacuum of space.

Yet he became an object of public ridicule. In January 1920, The New York Times mocked him: "Professor Goddard ... does not know the relation of action to reaction. ... Of course, he only seems to lack the knowledge ladled out daily in high schools."

It took almost half a century for the newspaper to acknowledge its mistake. On July 17, 1969, one day after the launch of the first manned mission to the moon, The Times quietly published a correction: “Further investigation and experimentation have confirmed the findings of Isaac Newton in the 17th century, and it is now definitely established that a rocket can function in a vacuum as well as in an atmosphere.” The newspaper concluded simply: “The Times regrets the error.”

History also shows that the public consistently underestimates technological progress. In 1950, the Allensbach Institute asked a representative sample of West Germans whether they believed that humans would reach another celestial body, such as the moon, within the next 50 years. Only 1 in 4 believed it would happen.

Even in 1965, just four years before Neil Armstrong walked on the moon, only a narrow majority — 53% — believed such a journey was possible.

Time and again, the greatest breakthroughs have arrived much sooner than experts, journalists and the public believed possible. The future has a habit of surprising us.

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