

A Centenary for Rocket Science

By Rainer Zitelmann

It has been a century since Robert H. Goddard launched a rocket that launched modern rocketry. What was revolutionary wasn't the height or distance of his rocket's flight. On March 16, 1926, it rose only about 41 feet, traveled roughly 184 feet, and stayed aloft for only 2.5 seconds. The revolution lay in its being the first successful liquid-fueled rocket.

Until then, rockets relied on solid fuels no more efficient than those the Chinese used 1,000 years earlier. Once ignited, solid fuels couldn't be switched off, and their specific impulse levels were poor. By using pressurized liquid oxygen and gasoline, Goddard achieved far more powerful and controllable rocket engines.

As Apollo mastermind Wernher von Braun said: "In the history of rocketry, Dr. Robert H. Goddard has no peers. He was first. He was

ahead of everyone in the design, construction and launching of liquid-fuel rockets which eventually paved the way into space."

Goddard had endured ridicule. The New York Times wrote in January 1920: "That Professor Goddard, with his 'chair' in Clark College and the countenancing of the

Robert H. Goddard achieved the first liquid-fuel launch on March 16, 1926.

Smithsonian Institution, does not know the relation of action and reaction, and of the need to have something better than a vacuum against which to react—to say that would be absurd. Of course he only seems to lack the knowledge ladled out daily in high schools."

It wasn't until July 17, 1969, that the newspaper

printed a correction, stating, "The Times regrets the error." The big news that day was the launch of Apollo 11, the first manned moon mission.

After Goddard's death in 1945, his widow, Esther, spent years pursuing recognition of his work and legal claims against the U.S. government for unauthorized use of his patented inventions. She argued that key elements of his rocket technology had been incorporated into military programs without permission. The government settled the dispute in 1960, paying \$1 million for infringement on several of his rocket patents.

Goddard was also a pioneer of privately funded spaceflight. Roughly two-thirds of his funding came from private sources, above all the Guggenheim Foundation. That is "a fact that the broader narrative of spaceflight history, with its focus on the heavily government-funded space race, has yet to

fully incorporate," Alexander MacDonald, a former chief economist at the National Aeronautics and Space Administration, has written.

A visionary of the coming space age, Goddard, like Elon Musk and others in our time, looked forward to humanity's becoming an interplanetary species. "The navigation of interplanetary space must be effected to ensure the continuance of the race," he wrote in 1913, when he was 31. "If we feel that evolution has, through the ages, reached its highest point in man, the continuance of life and progress must be the highest end and aim of humanity, and its cessation the greatest possible calamity."

Twenty years after Goddard's death, President Lyndon B. Johnson proclaimed March 16, 1965, Goddard Day. Sixty years later, it's a day still worth noting.

Mr. Zitelmann is author of "New Space Capitalism," forthcoming in June.