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NASA provides this photograph, and this description, of Dr. Robert Goddard (a "Father of Rocketry"): "Robert H. Goddard, with the first successful liquid-fuel chemical rocket, launched 16 March 1926."

After Wilbur and Orville Wright's amazing breakthroughs, aviation technology - including the development of rockets, passenger planes, and supersonic experimental planes - moved quickly forward.

In 1919 Robert Goddard, an American rocket pioneer, imagined a rocket that could reach the moon. Goddard's dream was realized exactly fifty years later when an American spacecraft, sent into orbit by a huge rocket, reached the moon. But the half-century between Goddard's belief and Neil Armstrong's first steps on the moon was filled with many disappointments and failures, not just huge accomplishments.

One of Goddard's most important achievements was his belief that rockets had to be fueled with liquid, not solid (like gunpowder) fuel. After working on the concept for seventeen years, Goddard launched the first liquid fuel rocket on March 16, 1926.

Although primitive - the rocket was at the top where it received fuel from two lines connected to a fuel tank at the bottom - it was a stunning conceptual achievement as important to space travel as the Wright brothers' work was to aviation. The rocket traveled 152 feet - about thirty-two feet more than Orville Wright's first powered flight in 1903.

It was also Dr. Goddard who first envisioned that rockets require several stages. He received a patent, in 1914, for the concept that is an indispensable part of space travel today. The list of firsts created by this modest man is awe-inspiring. Some of his 214 patents still produce royalties for his estate.

But ... Goddard's work was not embraced in his own country. Ridiculed by the American press for thinking - and writing - that a rocket could go through the vacuum of space, his published work was read and admired the year after his death (in 1945) by Wernher von Braun.

Goddard, the pioneer had, in fact, anticipated the awesome power of von Braun's German A4 rocket (known to a stunned world as the mighty V-2). When von Braun's team launched the V-2 on October 3, 1942, it traveled 120 miles and landed on target.

As the first successful ballistic rocket, the V-2 is the ancestor of most rockets flown today. Looking back, one could make an argument that October 3, 1942 was the beginning of the space age. One could also make an argument it was the beginning of the age of mass destruction.

Popularly known as the V-2 - short for *Vergeltungswaffe zwei* (meaning "retaliation weapon 2") - von Braun's A4 (its technical name was *Aggregat-4*) became a much-feared military weapon for the Nazis near the end of the war. Launched from Germany (or German-controlled territories), it killed and injured thousands of people and decimated towns in Belgium (especially Antwerp), the south of England (including London) and elsewhere (such as Paris).

As World War II was ending, the Allies launched "Operation Paperclip" - an effort to find von Braun and his team of brilliant scientists and engineers. When the U.S. Army secretly worked with von Braun and his team - after they turned themselves over to the Americans - it was the best thing that could have happened to the U.S. Space Program.

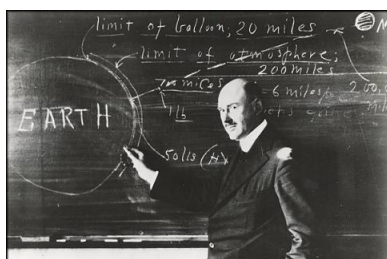
See [Alignments to State and Common Core standards for this story online at:](#)

<http://www.awesomestories.com/asset/AcademicAlignment/THE-FIRST-ROCKETS-History-of-Flight>

See [Learning Tasks for this story online at:](#)

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## Media Stream



### Robert Goddard

Image online, courtesy GRIN (Great Images in NASA).

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### Robert Goddard Photo

Image online, courtesy GRIN (Great Images in NASA).

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### Goddard - First Liquid Fuel Rocket

Photo of Dr Goodard online, courtesy GRIN (Great Images in NASA).

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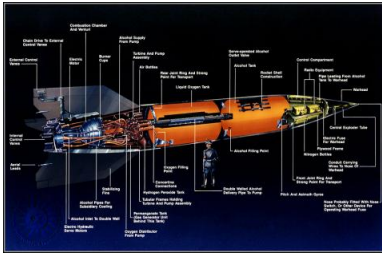


### Wernher von Braun

Image online, courtesy the *Smithsonian Air and Space Museum*, Washington, D.C.

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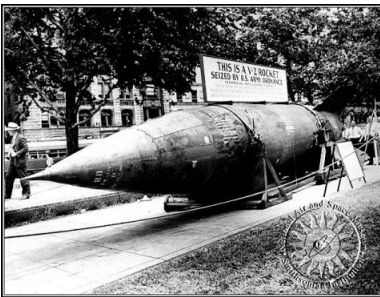


### German A4 Rocket - Illustration Detail

Drawing of V-2 rocket online, courtesy Smithsonian Air and Space Museum.

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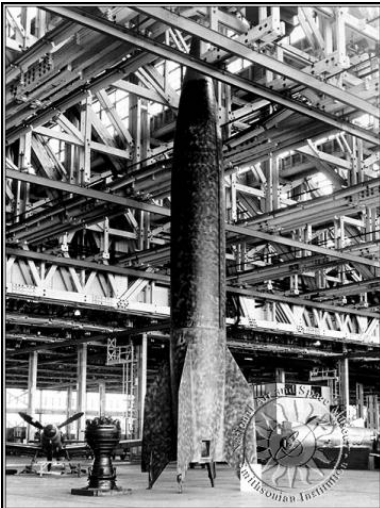
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### V-2 Rocket

Photo online, courtesy Smithsonian Air and Space Museum.

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### V-2 Rocket on Display

Photo of V-2 online, courtesy Smithsonian Air and Space Museum.

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### V-2 Rocket and Its Transporter

Photo of V-2 rocket, reassembled for study in America at White Sands Proving Ground, online courtesy Smithsonian Air and Space Museum.

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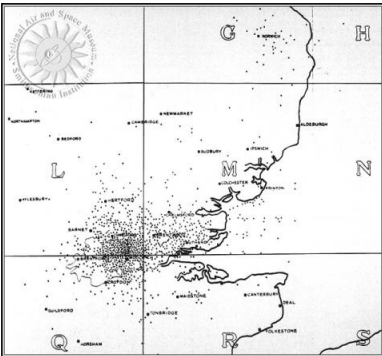


### V-2 Rocket Strike - Antwerp

U.S. Army photo online, courtesy Fred Ordway and the Smithsonian Air & Space Museum, gallery 114 (Space Race).

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### V-2 Rocket Strikes in the South of England

Map - adapted from *The Blitz, Then and Now* (Volume 3) - online, courtesy National Air and Space Museum.

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### THE FIRST ROCKETS

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### Operation Paperclip

Clip from the series "Revealed," episode "The Hunt for Hitler's Scientists," copyright Windfall Films (2005), all rights reserved. Clip provided as fair use for educational purposes.

**Producers:** David Dugan, Mark Radice and Emily Roe

**Narrator:** Paul Brightwell

View this asset at: <http://www.awesomestories.com/asset/view/Operation-Paperclip>



### Dr. Robert Goddard - Rare Video Footage

Archival footage, from NASA, regarding Dr. Robert Goddard. Online, courtesy NASA.

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<http://www.awesomestories.com/asset/view/Dr.-Robert-Goddard-Rare-Video-Footage>