

PERSONALITIES OF THE SCIENTIFIC UNIVERSE: Hermann Oberth



Hermann Oberth

was born on June 25, 1894 in Sibiu, in a family of Enlightenment. His grandfather Friedrich Krasser, wrote several progressive poems which include Antisyllabus and Tabula rasa published in the volume *Open Awnings*. History says that in July

1869 at a regular Sunday meeting in the house of Friedrich Krasser, who was Hermann Oberth's grandfather, he said: "Folks, you can believe what you want, but beware that in a hundred years people will land on the moon". One hundred years later, on July 22nd, 1969 the first man walked on the moon. Hermann's mother, Valerie Oberth was a wise and intelligent woman, endowed with an extraordinary memory. Valerie bought many books for her two young sons. Among them, Jules Verne's novels. Hermann's father was a famous surgeon, he was just, persevering and easily enthusiastic. He was the director of Sighisoara county hospital for 30 years, from 1896 to 1926. With a proverbial sense of duty he contributed to the formation of the bright spirit and remarkable character of his son.

Childhood

Hermann's inventive spirit was manifested from a tender age. It is said that at the age of four he built a wooden locomotive and asked the guests who had come to visit if he could use that engine to reach the moon, as his grandfather had said. He envisioned a water mill intended for the Niagara fall. He was then six years old.

At the age of six Hermann Oberth started studying at the famous "*School on the Hill*". The school is famous because it was documented in 1522 and because many important people studied here. Most of those passing through Sighisoara nowadays climb the 174 steps to the school.

Throughout the school, he studied the problem of space flight. He made calculations and experiments. In 1908, when he was fourteen, he built a centrifuge with 35 meter-long arms, rotating around a vertical shaft to check whether a man can withstand the force exerted at a rocket launch.

Higher education

In 1913 he went to Munich to study medicine as his father wanted, but he often went to hear technical college courses. Meanwhile war broke out and he went to the front. He was wounded and continued his military service as a health sergeant.

In 1917, he calculated the first long-distance missile, which had a length of 25 meters and a diameter of 5 m. As fuel he suggested a mixture of alcohol, water and liquid air. So - liquid fuel. It was the first project in the world of a long-range rocket using liquid fuel.

For what he wanted to do he needed thorough learning, so in February 1919 he joined the University of Cluj, and in autumn he was transferred to Munich. With new knowledge, but also based on the information he had already accumulated in the summer of 1920, he completed the project of a hydrogen and oxygen missile. On this occasion, he made a new invention: the multistage rocket. The lower stage used a mixture of alcohol and oxygen, and the upper stage, a mixture of hydrogen and oxygen. It was the first project in the world of a multi-stage missile with liquid fuel based on numerical calculations. He then designed a rocket for meteorological research and finally a rocket that was supposed to get into space with people on board, being the first which introduced mathematical calculations on the launch of a rocket to the moon and parachute landing. The project was presented as a dissertation at the University of Heidelberg, and then, on 23 May 1923 at the Faculty of Physics of Cluj. The Commission was chaired by Augustin Maior.

Rockets

In 1923, Oldenbourg in Munich published the book "*A rocket to the interplanetary space*" which had the same title as his dissertation. Many of the proposed solutions have already been implemented or are currently being applied: the optimum launch speed and the trajectory of the rising rocket from west to east, bell-shaped nozzles for high speed exhaust, regenerative cooling, hardening fuel tanks by slight overpressure, parachute landing, cleaning the air in the capsule through distillation. In 1925 Oberth family moved to Mediaş, where Hermann took a job teaching mathematics and physics at the Stephan Ludwig Roth secondary school. He continues his research, although financial resources were modest, and in 1929 Oldenbourg published the book called "*Spatial navigation routes*", which

entered the history of science as a model work, often called "*The Bible of astronautics*".

Hermann Oberth's life story began with Jules Verne's fiction. It also continued with fiction. In 1928 he participated as a scientific consultant to the shooting of the film "*The Woman on the Moon*" by UFA studios in Germany. The images in the film forecasted the real 1969 launch of a space missile from Cape Kennedy. The platform of the rocket, the inside of the ship, although fiction in 1928, were arranged as in today's spacecrafts. At that time, he devised the tapered engine and obtained several Patents: Propulsion of the vehicle with devices operated by reactive gas ejection, The rapid combustion process (1931).

After the premiere of *The Woman on the Moon*, he went back to Mediaş as a middle school teacher, but he continued his research with his own financial means. In 1932 he published in the Romanian magazine "*Nature*" the article „The missile flight and the vacuum flight”. In the same year he took over the gymnasium workshop where he was able to realize and experiment many of the solutions he had imagined. Hermann says in a letter that it managed to launch the first liquid fuel rocket. It can be said that Mediaş was the first city in which a missile was launched. The gates were open to space flight. People can now visit the Hermann Oberth Museum in Medias.

The cosmic mirror

In 1923, he designed a cosmic mirror able to concentrate the solar energy into specific points on earth. With an individual mirror facet an entire city could be lit at night, with no need for electrical installations for street lighting.

After 1938 there followed years of hardship for Hermann. There had been years of professional achievements but also psychological deceptions that were related to people's and officials' attitudes.

He passed away on December 28th 1989 in Feucht, Nuremberg, Germany.

*Section which is performed by Prof. Dr. Engineer
Gheorghe Manolea, University of Craiova, Doctor
Honoris Causa of the Technical University of
Moldova in Chisinau*