
ROCKETS INTO SPACE

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and the fact that his ideas were openly published and sparked a widespread movement, Oberth alone deserves the title "Father of the Space Age." Moreover, his book *Die Rakete*, upon its publication in 1923, immediately found a number of "disciples"—researchers who supported his views, disseminated them, and built upon them in their own work.

One of Oberth's first champions was Max Valier, an ardent advocate of the pseudoscientific notion of "glacial cosmogony," which held, among other things, that the moon and planets are coated with ice. Valier was so intent on proving this bizarre theory that he sought to promote Oberth's work in all the journals available, so as to foster the development of interplanetary flight. He wrote to Oberth pleading for a collaboration. Oberth was grateful for any support, but he himself did not believe in glacial cosmogony. Although busy with his teaching, he did provide Valier with calculations which shortly appeared in Valier's *Der Vorstoss in den Weltenraum (Advance into Interplanetary Space)*, published in 1924. One thus sees strange bedfellows in the early history of rocketry. The book contained glaring errors but was indeed enormously successful in popularizing Oberth's ideas, and it went through five editions. Valier afterward conducted sensationalistic rocket experiments with rocket cars, and died in 1930 while working on one of them.

In 1925 Walter Hohmann, a city architect from Essen, published *Die Erreichbarkeit der Himmelskörper (The Attainability of Celestial Bodies)*, which, despite its almost mystical title, was a more technically significant and lasting contribution to the literature. Hohmann, who actually began making his calculations in 1914 as a hobby, focused upon theoretical problems of space navigation and fuel requirements for departing from Earth, orbiting planets, and landing on them. The famous Hohmann ellipses, in which spacecraft take advantage of the "gravity-assist" of planets by naturally flying into their orbits, has been used in U.S. Mariner and other programs.

Another early classic, Hermann Noordung's *Das Problem der Befahrung des Weltraums (The Problem of Spaceflight)*, published in 1929, picked up on Oberth's suggestion of a space station: it was the first engineering study of space station construction, living, and application. Noordung was actually a pseudonym used by Captain Hermann