

# **History of Rocketry and Astronautics**

**Proceedings of the Twenty-Second and Twenty-Third History Symposia  
of the International Academy of Astronautics**

**Bangalore, India, 1988**

**Málaga, Spain, 1989**

**John Becklake, Volume Editor**

**R. Cargill Hall, Series Editor**

**AAS History Series, Volume 17**

**A Supplement to Advances in the Astronautical Sciences**

**IAA History Symposia, Volume 10**

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AMERICAN ASTRONAUTICAL SOCIETY

AAS Publications Office  
P.O. Box 28130  
San Diego, California 92198

Affiliated with the American Association for the Advancement of Science  
Member of the International Astronautical Federation

*First Printing 1995*

ISSN 0730-3564

ISBN 0-87703-395-1 (Hard Cover)  
ISBN 0-87703-396-X (Soft Cover)

Published for the American Astronautical Society  
by Univelt, Incorporated, P.O. Box 28130, San Diego, California 92198

Printed and Bound in the U.S.A.

## Chapter 3

# The Collaboration of Wernher von Braun and Fred Freeman<sup>1</sup>

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In this paper I will focus on the working relationship between Fred Freeman, one of three *Collier's* illustrators, and one of America's greatest historical and technical artists, and Wernher von Braun, perhaps history's most influential aeronautical engineer. During a period of about ten years, Freeman and von Braun collaborated on several projects. For the purpose of this paper, I will concentrate on their *Collier's* collaboration.

Most of us know about Wernher von Braun, but let us briefly consider his earlier years. Born on 23 March 1912, Wernher von Braun was bitten by the space travel bug at the age of thirteen, shortly after his mother, who was an amateur astronomer, had given him a telescope as a confirmation gift. Soon after receiving the telescope, he acquired a copy of Hermann Oberth's seminal volume "The Rocket into Planetary Space" (*Die Rakete zu den Planetenräumen*).

Von Braun was intrigued by the book, yet was unable to understand the myriad of mathematical formula contained in it. At that time, von Braun was only an average student in his studies. The challenge to understand Oberth's book motivated him to concentrate his efforts in school, and he began to excel in the study of both physics and mathematics. During his later teens, von Braun's scholastic ability improved to a high level of proficiency, and he began to assist his professors in teaching his fellow students both mathematics and physics. All the while, he was thinking about creating the means to travel into space.

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<sup>1</sup> Presented at the Twenty-Third History Symposium of the International Academy of Astronautics, Málaga, Spain, 1989.

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Through dedicated academic study, von Braun acquired a comprehensive knowledge in the nascent field of liquid propellant rocket engine development. He obtained a degree in mechanical engineering from the Technische Hochschule in Berlin and later a Ph.D. in physics from the Friedrich-Wilhelm University. Von Braun's knowledge of the field, coupled with his charismatic personality, inspired many of his older colleagues in the German Society for Space Travel (Verein für Raumschiffahrt).

Since the Treaty of Versailles mentioned nothing about Germany's constructing rocket weapon systems, the German Army decided to experiment in developing a long range liquid propellant rocket bombardment missile. In October of 1932, at age twenty, von Braun began to work with the German Army as a technical assistant. This position gave him the opportunity to continue practical experimentation for the development of a successful liquid propellant rocket. Von Braun's work, financed by the German Army, eventually led to the production of the A-4 (V-2) rocket. The A-4 must be considered one of the great technological achievements to have emerged in World War II.

Shortly before the war ended, von Braun and his team of scientists and engineers surrendered to the Americans. They were brought to the United States by the U.S. Army and continued their work in developing military rocket systems. The group first worked in El Paso, Texas, then in Las Cruces, New Mexico, and later in Huntsville, Alabama.

On the artistic front, Frederic William Freeman was born outside Boston, Massachusetts on 20 September 1906 and was raised in the state of Maine. After completing boarding school at the age of sixteen, he decided to move to New York City and did so with only \$15.00 in his pocket. He also brought with him a burning desire to become an artist.

During his first years in New York, he worked at various jobs and pursued formal fine art education in the studios of the noted artists Joseph E. Boston and Henry Rankin Poore. As his artistic skill developed, Freeman began a career as a commercial artist and specialized in the field of advertising. His assignments were wide and varied and included such products and services as automobiles, steamship and airline travel, and fashion. Fortunately, Freeman's artistic skill and drive kept him in demand, even during the depths of the Great Depression.

Upon America's entry into World War II, Freeman enlisted in the Navy, and because he was a skilled yachtsman, served in the Pacific theatre as an officer. Throughout his period of active duty, the urge to create never left him. Whenever a free moment could be found, Freeman pursued his passion for drawing and painting. At war's end, Freeman was put in charge of the Art Unit of the Navy's Bureau of Personnel in Washington, D.C., where his group prepared manuals and course books. Immediately after the war ended, he went back to work as a free lance artist and executed illustrations for all the major American publications including *Life*, *Look*, *The Saturday Evening Post*, *Collier's* and *Argosy*.

In 1946, Freeman was called back to the Navy to create the illustrations, in conjunction with author Theodore Roscoe's text, for the book *United States Submarine Operations in World War II*. Here Freeman's talent was tested to the limit, as his assignment was to graphically depict the trials and tribulations of America's Silent Service in action. The very nature of the name Silent Service rightly suggests that the patrols of the necessarily secretive submarine force were kept out of the public eye. With the war

over, the story could be told. Freeman's artistic skill and experience proved itself, as his fifteen major illustrations for the book are a tour de force that realistically express the relationship between man and man and, man and his machines. This project took three years to complete, but Freeman managed to continue on with his free lance work at the same time.

In 1950, the American public was being introduced to the idea of manned space travel. The print media offered a substantial number of science fiction books and magazines with space travel as the story line. Television space operas abounded, and Hollywood also played a role in popularizing the space travel theme, most notably in George Pal's film *Destination Moon*. The common thread that tied all of this popularization together was science fiction, although some of it was well thought out and would later prove to be accurate.

On 12 October 1951, New York's Hayden Planetarium held its First Space Travel Symposium. Organized by science writer Willy Ley, several top experts convened and delivered papers on the technical challenges that had to be met to set the stage for realizing manned space travel. The attendance to the lectures was limited to 250 invited guests, mostly scientists, the military, and the news media. In the days that followed a few news articles were published about the conference, thus giving the general public some idea of what occurred at the otherwise closed meeting.

Among the attendees from the new media were a few staff members from *Collier's Magazine*. They brought their findings to the attention of Gordon Manning, *Collier's* managing editor. Two weeks later, Manning read about a space conference which was going to take place in San Antonio, Texas, in early November. Always having a nose for a story, Manning sent Cornelius Ryan, one of his trusted associate editors, down to San Antonio so that Ryan might bring back something newsworthy. Ryan knew nothing about space travel and went to San Antonio steeped in skepticism. One afternoon, shortly after the day's sessions had been completed, Ryan got into a conversation over drinks and dinner with Wernher von Braun and two other scientists. By the time the evening was over, the doubting Ryan had been converted into an ardent supporter of manned space travel.

Ryan returned to New York and enthusiastically persuaded Gordon Manning to go ahead with a story. The first article, published in the 22 March 1952 issue of *Collier's*, was well received by the public. During the next two years, Ryan went on to orchestrate a total of eight feature articles that appeared in the magazine. Wernher von Braun and Cornelius Ryan co-authored many of the articles in which von Braun laid out a detailed blueprint for embarking on a well coordinated manned space program.

In addition to writing articles for the magazine, von Braun created a number of engineering design drawings and sketches. Among the astronautical hardware that he designed were a reusable shuttle vehicle, lunar reconnaissance and landing vehicles and a lunar tractor. Von Braun was living and working in Huntsville, Alabama, and he mailed his drawings to Connie Ryan in New York. Ryan then made photostatic copies from the originals and distributed a copy to each artist involved in creating that particular illustration.

Highly skilled artists were needed to translate von Braun's technical vision into understandable illustrations for the many millions of *Collier's* readers. *Collier's* Art Di-

rector, William Chessman, contracted Fred Freeman, Chesley Bonestell, and Rolf Klep for the job. These three well known artists had previously worked with the magazine.

Freeman's first painting for the project is a masterfully executed cutaway of von Braun's wheel form space station. Unfortunately, none of von Braun's design drawings survive and all of Fred Freeman's preliminary and final construction drawings for this painting were thrown away decades ago. (They had been ravaged by a band of merciless squirrels, Fred Freeman told me a few years ago.)

Months later, in two successive issues, *Collier's* featured von Braun's manned lunar mission. Here again, Freeman used von Braun's original concept drawings as the basis for his two illustrations.

In the case of the first illustration, Freeman created a series of detailed preliminary construction drawings of the top half of the lunar landing vehicle. Photostats of these drawings were sent to von Braun, who then made corrections and modifications, after which, they were returned to Freeman so that he could complete the painting. This exchange between engineer and artist ensured a high level of technical accuracy.

In his second painting for the lunar mission, Freeman designed the two major elements of the lunar base. Constructed out of the two halves of the lunar cargo vehicle's hull, the base consisted of separate laboratory and housing modules. Freeman's construction drawings are evidence of the seriousness with which this project was taken. His drawings are in essence architectural plans in miniature. The locations and specifications for the working, eating and sleeping sections of the base are all clearly delineated.

A few days after the *Challenger* disaster, Freeman telephoned and asked me if he should send NASA the design drawings he and von Braun produced for their emergency escape system. The system was designed for the *Collier's* project in 1953. Even back then von Braun had anticipated that a life-threatening emergency might occur during launch into orbit. In such an emergency, each astronaut was to be encased in a self contained "life-saver" capsule. Each manned capsule then drops through a separate emergency hatch and, as it falls, an automatic parachute activates and slows its descent. To slow the capsule further, braking rockets automatically fire and bring the capsule in for a gentle water or land touchdown. By studying Freeman's construction drawings, we can see that the design of the life-saver is workable.

In April of 1953, *Collier's* approaching deadline for its next space article necessitated having Freeman fly out to Huntsville, Alabama for a direct working session with von Braun. The objective was to design a small Earth orbiting space station which could house three primates. Scientists on Earth would have the opportunity to observe the monkeys by way of remote television cameras and monitor their vital signs via telemetric sensors. Most of von Braun's and Freeman's conceptual and construction drawings for this project survive. In them, I have found a detailed and relaxed dialogue that transpired between the two men. The artist asked questions or made comments and the engineer responded in kind. Before quoting one of these exchanges, additional background about the baby space station project is necessary.

One of the three monkeys was permanently strapped into a seat, while the other two were free to roam about the station's animal chamber. An effective biological waste management system for human astronauts presents major challenges in design engineering, even in 1989. Well, Fred Freeman took on this problem back in 1953, and the

design was not for human space travelers but for the two roaming monkeys in the animal chamber. In Freeman's construction drawing number eight he solves the problem and his description to von Braun reads as follows:

There is a feeding station for each monkey so that when the animal compartment is flushed it is certain that both monkeys (the two who roam) are enclosed in the stations. A ray (for a light activated switch) in each station is interrupted when the monkey is in the station and the main compartment cannot be flushed until both rays are interrupted. One monkey is trained to eat at the sound of a bell - the other at the sound of a claxton. When the bell and claxton sound, the doors are opened - the monkeys go to the feeding stations - the rays are interrupted - the doors close - the main compartment is flushed after which the doors open. When the stations are unoccupied they are flushed after each feeding. The feeding stations are of transparent plastic, so the monkeys will be under observation by the two (T.V.) cameras at all times.

Von Braun's response to this was: "Ingenious! You should go into the monkey business!" His candid comment suggests that the two men had become good friends.

The final article of the *Collier's* project lays out von Braun's plan for man's exploration of the planet Mars. The plan called for sending in an advanced team, which would touch down on the smooth polar cap in their von Braun designed "landing boat." After disembarking from the boat and assembling their tractors, the balloon-like structure atop each tractor would be inflated. Freeman's painting illustrates this scene. These structures would serve as living quarters as the advance team made their 4,000 mile journey to the Martian equator. At the equator, a permanent base would be erected, and the remaining teams, who were patiently orbiting Mars, would land and join their colleagues. According to von Braun, such a mission could take place within the next century. He wrote those words in 1954.

The *Collier's* series of articles, and the drawings and illustrations created for them, must be viewed in their proper historical context. The ambitious plan for a manned space program laid out by the practical visionary, Wernher von Braun, and illustrated by the skilled Fred Freeman and his two colleagues, inspired many young people to eventually join America's space effort. These young men and women were emotionally and intellectually moved by the lure of adventure found in the well-written articles and the colorful, yet realistic illustrations.

Many critics claimed that von Braun's plan was little more than a pipe dream, but so far his plan has been partially accomplished and, in time, will be fully realized. Although Wernher von Braun and Fred Freeman are no longer with us, the corpus of work they produced, and the ideas they engendered, will survive well into the next millennium.

Incidentally, most of the von Braun and Freeman material that I have described can be seen in the Frederick I. Ordway III collection at the Space and Rocket Center in Huntsville, Alabama. You need only make an appointment with Mr. James Hagler.