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Chapter 19

WERNHER VON BRAUN AND COLLIER MAGAZINE'S MAN IN SPACE SERIES*

Randy Liebermann†

Since antiquity, the idea of manned space travel has captured the imagination of mankind. But prior to the last quarter of a century our technological abilities to accomplish that goal had fallen short of our capacity to dream about its realization. The fictional writings of some early prophets of space travel, such as Jules Verne and H. G. Wells, helped in fueling the fire in the minds of modern rocketry's early theorists and experimenters: Tsiolkovsky, Goddard, and Oberth.

But when did the average man in the street first become aware of the real possibilities of space travel? During this 25th anniversary of manned spaceflight, let us look back in time and learn how the average American's consciousness of space travel was raised and transformed from the realm of science-fiction fantasy to that of anticipated reality.

For several years after the Second World War, the United States' nascent and as yet undeclared space travel program chiefly consisted of launching captured German V-2 rockets from the White Sands Proving Ground in the desert of New Mexico. The firings provided the U.S. with much needed data crucial for the development of more advanced rockets and the means to study the physics of the upper atmosphere.

Among the engineers and scientists vital to the success of these launchings was a group of Germans who, after World War II, had been brought over to America by the U.S. Army. These same Germans had designed and built the V-2 for the Third Reich's war machine. Leading the group in America, as in Germany, was the brilliant, young, charismatic visionary, Wernher von Braun.

Because most of the rocket work was classified, the general public was kept in the dark about state-of-the-art developments, as most experts in the field were either unable or unwilling to speculate about future possibilities. During the late 1940s and in 1950, von Braun had made a few public speeches on rocket development, and he also talked about a plan for sending a manned expedition to Mars.

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† Randy Liebermann is a writer and consultant, U.S.A.

These non-published presentations were read before small audiences. The general public was not privy to such information.

On 3 March 1950, a symposium on space medicine was held by the University of Illinois at its Professional Colleges in Chicago. Wernher von Braun was among those who presented papers. The title of his paper was "Multi-Stage Rockets, Artificial Satellites and Interplanetary Travel." The paper outlined a plan for the construction of a manned three-stage rocket. Bearing a large payload, the rocket system could ferry into Earth orbit the equipment necessary for assembling a manned space station. This plan was greatly elaborated on two years later.

During the late Spring of 1951, Willy Ley, science writer and founding member of the original German Society for Space Travel, began to organize a space travel symposium which would take place in New York's Hayden Planetarium on 12 October 1951. On the panel of experts who presented papers was Robert Haviland, a research engineer attached to General Electric Company's Project Hermes. He spoke about the Bumper Program, which involved staging a Wac-Corporal rocket atop a V-2. Also present was Fred Whipple, Chairman of Harvard University's Astronomy Department, whose paper covered the latest developments in the study of the physics of the upper atmosphere. Heinz Haber, member of the Department of Space Medicine at the United States Air Force School of Aviation Medicine at Randolph Air Force Base in Texas, spoke on the potential physical adversities that a space traveler might encounter. Oscar Schachter, Deputy Director of the General Legal Division of the United Nations Legal Department in New York City, elaborated on space travel and international law. Willy Ley read his paper on 30 years of space travel research. Wernher von Braun was not invited to this conference.

Admittance to the symposium was by invitation only, and the 250 people present were scientists, the military, and members of the press. Fortuitously, among the members of the media in attendance were several of the editorial staff of *Collier's Magazine*, one of America's most widely read and heavily circulated publications. From their observations at this world's first Space Travel Symposium, the seeds had been sown which would five months later blossom into a detailed accounting of space travel to the general public.

One morning two weeks after the Hayden Planetarium Symposium, *Collier's* managing editor, Gordon Manning, read the morning edition of the *New York-Journal American* while commuting to his office. That issue of the newspaper contained a brief article about a space medicine conference that was going to take place from 6 through 9 November in San Antonio, Texas. It was to be sponsored by the United States Air Force School of Aviation Medicine.

Arriving at his Manhattan office, Manning called in Cornelius Ryan, one of *Collier's* most capable associate editors. Manning told Ryan to go down to San Antonio and see if he could find out anything that might be worth publishing in *Collier's*. Ryan who knew nothing about space travel, was skeptical about the idea but found himself in San Antonio on 6 November, 1951.

Among those attending the conference were Fred Whipple, who had been on the Hayden Planetarium panel; Joseph Kaplan, who was Professor of Physics at the

University of California in Los Angeles; and Wernher von Braun, the Technical Director of the U.S. Army Ordinance Guided Missiles Development Group at the Redstone Arsenal in Huntsville, Alabama.

One late afternoon after the day's proceedings were over, Whipple, Kaplan, and von Braun met with Cornelius Ryan to discuss their views on the feasibility of space travel. Their conversation went on long into the night, continuing through cocktails, dinner, and more cocktails. At the end of that evening, "Connie" Ryan was converted from a skeptic to a true believer in the possibility and imminent reality of manned space travel.

After the conference, Ryan returned to New York City and convinced *Collier's* that there was a story to be written about what he had learned in San Antonio. Managing editor Manning became infected with Ryan's enthusiasm and gave him the go-ahead to organize the project. Little did Ryan know that this undertaking would develop into a series of eight feature articles that would appear in *Collier's* over the course of two years. The contributors to these articles would include some of America's foremost experts in different aspects of space related sciences, including Heinz and Fritz Haber, Hubertus Strughold, Fred L. Whipple, and James A. Van Allen. The pre-eminent participant in the *Collier's* series was Wernher von Braun.

After 25 years of continuous and directed thinking and endless hours of experimentation, von Braun, the world's leading rocket engineer, had the chance to come out of his sequestered military environment and, through a national magazine, inform the general public of his detailed blueprint of realizing manned space travel. For this discussion, we will concentrate on von Braun's contributions to the first three issues of the *Collier's* space series.

To aid its readers in understanding von Braun's plan, *Collier's* employed three highly skilled visual artists, Chesley Bonestell; Fred Freeman; and Rolf Klep, who pictorially illustrated von Braun's concept of the necessary hardware for space travel (Figure 1). The artists worked closely with von Braun, receiving photostatic copies of his original engineering drawings and sketches. Each artist would then construct his own working drawings, which, at every step of the way, would be forwarded to von Braun for his corrections and comments. It was only after receiving these corrections from von Braun that the artists would complete their paintings.

The first article in *Collier's* space series was published in the 22 March 1952 issue, beginning with an editorial that read as follows: "On the following pages *Collier's* presents what may be one of the most important scientific symposiums ever published by a national magazine. It is the story of the inevitability of man's conquest of space . . . what you will read here is not science fiction, it is serious fact."

These were bold words indeed, and *Collier's* ten million readers had the chance to decide for themselves if these words should be taken seriously, for von Braun wanted the United States to embark on a coordinated program to accomplish specific goals in space travel, albeit one step at a time.

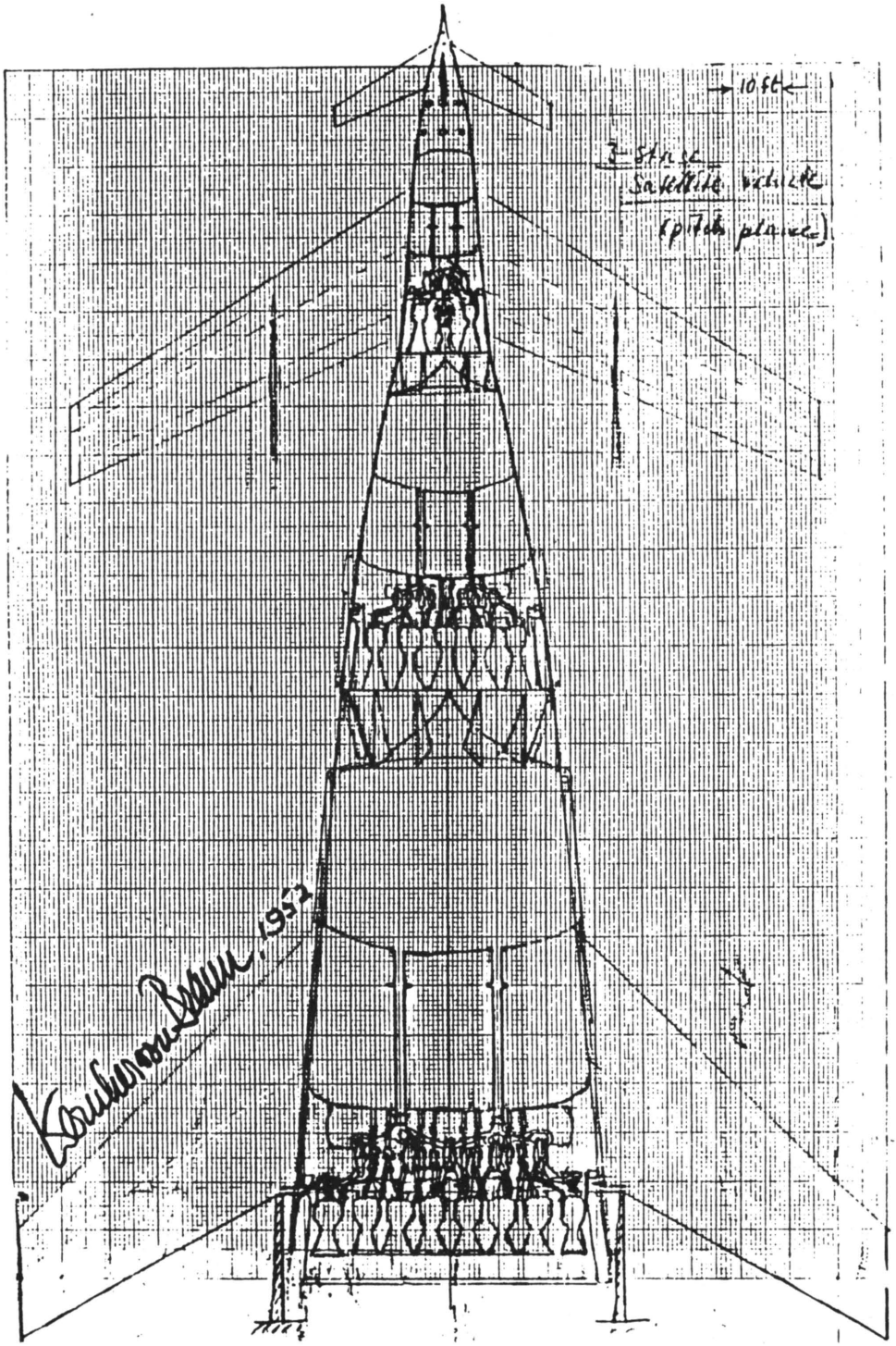

Figure 1 Drawing executed by Wernher von Braun in December 1951, illustrating his concept of a reusable three-stage manned launch vehicle (Actual size reduced).

The first necessary step was to construct a reusable launch vehicle that would have the capacity to ferry a large payload into Earth orbit. Von Braun's rocket design was an extrapolation many times larger and more powerful than anything yet on the drawing board.

The rocket would have been 265-feet high, with a diameter of 65 feet at the base. The first stage would be powered by 51 engines, 12 of which were steerable. The 14,000-ton total thrust from this cluster of engines would have been twice as much as the total weight of the fully fueled three-stage vehicle. After expending their supply of fuel, the first two stages would gently land in the ocean. Their fall would be slowed down by steel mesh parachutes and breaking rockets. Each of these stages would be retrieved by special recovery ships, brought to dry dock, inspected, refitted, and readied for another flight. Here was a plan for a reusable launch vehicle 29 years before the first flight of the space shuttle in 1981.

The third stage continued until it reached its destination of orbiting the Earth at an altitude of 1,075 miles. It is at this point that all of the ten-man crew became active. Thirty-six and one half tons of payload would be unloaded from the cargo area of the third stage. This deposit would remain in space awaiting additional accumulations by these and other astronauts.

The crew then would head home, slowing their ship through descent to Earth with short rocket bursts. A special steel alloy outer skin would prevent the returning third stage from burning up during re-entry. Landing like a conventional aircraft, the third stage touches down at a speed of 65 miles per hour, its outer skin cool to the touch. Similar to the first two stages, this returning third stage would be inspected and refitted for reuse.

A small fleet of these shuttle vehicles would be built, each leaving its payload in the same area of space 1,075 miles above the Earth. The goal is to assemble a permanently manned space station, ferried into space piece by piece.

The completed space station would be wheel-shaped and 250 feet in diameter, comprised of 20 sections of flexible nylon and plastic fabric. Each section would be unloaded in a collapsed form and be inflated once the overall structure was assembled. Three levels in each section would accommodate the equipment necessary to support a crew of 80 men.

Space medicine experts at that time believed that man could not withstand prolonged periods of weightlessness without suffering ill effects. For this reason, the station would rotate on its axis, creating just enough centrifugal force to fabricate artificial gravity. The level furthest away from the station's hub would have the strongest gravitational pull.

The station would be powered by solar energy. A concave condensing mirror, permanently facing the Sun eas attached to the side of the station, and focused the Sun's rays onto a mercury-filled tube that ran through the center of the mirrors. The expanding heated vapor powered a turbo-generator producing electricity. A condensing system would recycle the mercury.

When completed, the station would be capable of facilitating the transfer of men, equipment, and supplies through the air locks located in the station's hub. Small rocket-powered vehicles would be used to ferry personnel and supplies brought up by the third stage. These small space taxis would dock in one of the hub's two landing berths.

The crew members, being made up of scientists, engineers, technicians, and the military, would have many tasks to perform in the station. Meteorological and astronomical observations of the Earth and the cosmos would be conducted using a large space telescope. The telescope was to perform another function. Von Braun emphasized American military security as the major reason for constructing the space station. A large portion of the men and equipment aboard the station would be devoted to military surveillance of potential enemies of the United States.

When the article was written, the United States was engaged in a hot war on the Korean peninsula and a cold war with the Eastern bloc nations. That, coupled with McCarthyism, made the early 1950s a period of psychological instability for the American people and Government alike. Directly addressing the malaise of those years, von Braun championed the idea that a space station would further not only scientific research, but would also serve as a surveillance base, where the United States enemies' maneuvers could be carefully watched.

Another advantage of the station was that it could act as a platform from which interplanetary journeys could begin and end. The first proposal regarding this was for a manned lunar surveying ship. This non-streamlined vehicle would be assembled from components ferried up into Earth orbit. Leaving from the general proximity of the space station, the journey to the Moon would take five days. Nearing its destination, the ship would fire a short rocket burst putting it into an orbit at an altitude of 50 miles above the surface. From this orbit, the crew would photograph the lunar surface looking for future landing sites. Once the mission is completed, the ship would return to the space station.

Von Braun projected that this entire program would cost four billion dollars, and would take 10 to 15 years to accomplish. *Collier's* stressed the point that four billion dollars was a small price for the United States to pay if, in being able to out-race the Soviets, continued peace would be possible.

Concurrent with the newsstand release of this issue of *Collier's*, various television and radio programs interviewed von Braun. An additional 15 million people either heard or saw von Braun discuss his proposal; for the first time the public was informed in detail of the possibility of space travel by such a qualified scientist.

Because the first articles were well received, *Collier's* continued with the series in the 18 and 25 October 1952 issues. Here von Braun spelled out his plan for sending a manned expedition to the Moon. Three lunar landing ships would be assembled in space, having been brought up into Earth orbit piece by piece by the third stage of the shuttle. The ships would not be streamlined, since they need not travel from Earth. Two ships would each carry a crew of 20 men, while the third would be manned by ten. This third craft would carry the cargo necessary for living on, and exploring, the lunar surface for a period of six weeks.

Each ship would stand 160 feet high and have a cluster of 30 rocket engines at its base. Expendable fuel tanks would be discarded after their supply became exhausted.

While traveling to the Moon, the crew would live in a personnel sphere located at the top of each ship. The five levels within these spheres would house the control deck, navigating, living and eating and stowage decks, as well as an airlock. Providing the electrical power for each ship would be a smaller version of the solar-powered turbo-generator used in the space station.

Upon reaching the gravitational pull of the Moon, each ship would be controlled by an automated system for the powered descent and landing on the lunar surface. Four legs, that had been securely folded against the ship's superstructure, now would be lowered into landing position. A fifth leg emerged from the center of the rocket cluster to act as a shock absorber as each ship touched down on the Moon. After the landing and all systems were checked, the crew would unload the cargo ship.

Three track-equipped lunar tractors were lowered from the storage bay of the cargo ship. These hydrogen peroxide and fuel oil powered vehicles would allow the lunar explorers to travel a considerable distance from their base. Each tractor would pull three trailers, thus enabling the explorers to carry the equipment and supplies needed to conduct their various experiments.

The lunar base would be constructed out of the two halves of the cargo ship's hold. Each half would be moved by crane onto a tractor-trailer and moved near a lunar chasm, where it would be lowered into position. By setting up quarters below the lunar surface, the risk of being hit by a meteorite would be minimized, and protection against cosmic radiation would be maximized. One half of the hold would become a lunar laboratory, where experiments could be conducted and lunar specimens analyzed, while the second half would become the crew's living quarters. Each would contain its own life support system and draw its power from a solar-powered turbo generator.

Their foothold secured, teams of lunar explorers could then journey as far as 250 miles from base. During these many expeditions, seismographic experiments would be conducted, lunar soil and rock samples gathered, and selenographic formations studied.

After the last group of explorers returned to base, the six-week visit was nearly over. All the data, specimens and material that would make the return trip to Earth would be loaded into the two passenger ships. Taking off from the Moon, the first lunar explorers would leave behind the remains of the cargo ship.

Von Braun projected that such a lunar expedition could be organized 15 years after the establishment of the space station and would cost 500 million dollars. He believed that the challenge of landing man on the Moon should be met solely for scientific purposes, as it is the destiny of mankind to explore.

Once again, von Braun appeared on television and was interviewed on radio, as the public was eager to listen to this type of scientific and technological speculation. Von Braun and his plan met with a great amount of criticism from fellow scientists. These critics claimed that rocket development was a slow and tedious process, and that the idea of establishing a permanently manned space station by the mid-1960s, and landing men on the Moon by the late 1970s, was an unrealistic proposition.

Von Braun did admit that his writings had been deliberate attempts to arouse popular enthusiasm. He recognized that popular support behind such programs could only help in finding the needed funds to actually conduct such ambitious plans.

It is interesting to look back at this 35-year old proposal and realize that, although actual developments in American astronautical pursuits did not coincide with von Braun's plan, the United States has landed men on the Moon, has developed a reusable shuttle vehicle, and is planning to construct a large-scale, permanently manned space station.

In conclusion, perhaps Wernher von Braun's logically conceived plan was indeed more progressive than the actual United States space program that developed, but I believe that he knew that all along.