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A Pioneer's Manuscript

Krafft Ehricke's Mission to Mars

by Marsha Freeman

During the month of June, three spacecraft will take off on a half-year trip to the planet Mars. Two Mars Exploration Rovers will be launched by NASA, and Mars Express will be launched by the European Space Agency. They will be carrying tools for examining the Martian atmosphere, the chemical composition of the surface, and drills and scrapers to peer into and underneath the soil and rocks.

But all three of these "field geologists" will be robotic, controlled and maneuvered by scientists on the Earth.

As early as the late 19th Century, science fiction writers were imagining manned missions to Mars. After World War II, when the Germans had demonstrated that the practical characteristics of rockets could actually carry man into space, the most far-sighted pioneers were designing missions that were not science fiction, but based upon imaginative applications of the technologies that were becoming possible—or at least, imaginable.

Krafft Ehricke (1917-1984), came to the United States in 1947, and a year later, while helping transfer Germany's wartime rocket technology to the U.S. Army, penned a novelette entitled, *Expedition Ares: A Saga From the Dawn of Interplanetary Travel.* This manuscript, which was just recently discovered, is published for the first time in the current issue of *21st Century Science & Technology* magazine.

Looking Back at 'First Attempts'

Expedition Ares is not a whimsical presentation, nor what today passes for science fiction. It is a road map, an orderly progression of technologies designed to make the dream of the exploration of the Solar System a reality.

The story is set more than 400 years in the future, when mankind has already deployed Earth-orbiting space stations, developed the Moon, explored Mars, landed on Jupiter's moons, and walked on the surface of Pluto. Expediton Ares—the first manned mission to Mars—is described in retrospect, looking back to the middle of the 21st Century from hundreds of years beyond.

Space visionary Krafft Ehricke (left) was interviewed by CBS correspondent Walter Cronkite on Sept. 26, 1966. Ehricke, who worked for North American Rockwell at the time, is discussing the features of a reusable transport vehicle that he designed. The initial stage of the vehicle consists of 12 turbo-ramjet engines. A supersonic ramjet engine allows the vehicle to achieve orbital velocity; the hypersonic spaceplane atop the transport would return to a landing site for reuse.

Ehricke's account of the mission, from that future vista, begins: "We live in the age of fast-flying, far-reaching space ships, and are proud of what human ingenuity has achieved in this field. Research is going on with ultra-fast ships, reaching half the velocity of light and designed as powerful instruments for visiting our neighboring stars.

"But the adult soon forgets the first stumbling steps of childhood, and the first attempts to reach our nearest cosmic vicinity have almost completely vanished from our memory." The reason it is important to look back at those "first attempts," Ehricke writes, is because they were not always successful. But that did not discourage mankind from continuing its journey to the stars.

Setting the Stage for Mars

Ehricke imagined that by the year 2000, men would have "finally shattered the chains which kept them in bondage of time and space. Vigorously, they had invaded the realm of nature, making themselves masters

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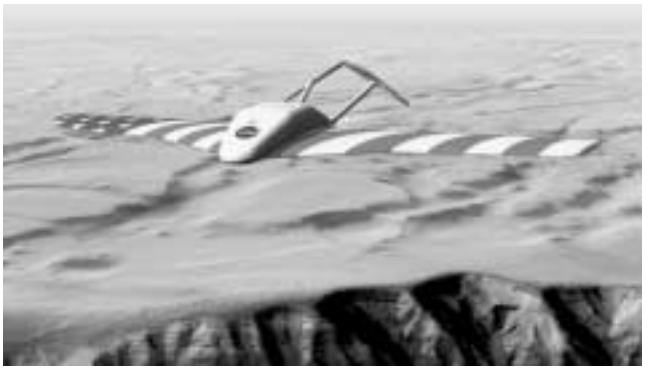
In 1979, Krafft Ehricke imagined Mars to be a planet with an active geologic past, unlike the Moon. He created this painting to represent that concept. Near the top of the mountain—perhaps a volcanic caldera—are gullies, very similar to those found recently on the sides of craters on Mars. They could have been produced by flowing water, or in this case, maybe seeping lava. To the lower left is the faint Sun.



"The gliders are powerful enough to fly to the surface of Mars and return to the orbit in which the main ships are circling." Ehricke envisioned a family of spacecraft for the manned Mars journey, to provide redundant capabilities to increase safety. NASA has been developing designs for a Mars airplane, which would fly in Mars's thin atmosphere, but not be powered to return to orbit.

of energies never dreamed of before. What had been achieved in a relatively short period was really amazing."

In the decades after 2000, in "Expedition Ares," the first real stepping stone to the stars was complete: Space Station I. From there, a scientist in the station's medical laboratory "developed medicine beyond the guesswork of his predecessors." The physical laboratory was the site of orbital astronomical research projects never before possible. The space station was maintained through the use of a ferry, using chemical propellants, which, because nuclear propulsion had not yet been harnessed, was "the only power source available at that time. . .Small wonder that the space ships of the 21st Century were bulky, clumsy, and underpowered," Ehricke remarks, looking "back" while actually looking far ahead from 1948.

Technology advanced, he relates, and "gradually, as ships and navigation improved, the Moon became a world 'just around the corner,' like the inner planets are for us now. The vast area between satellite and Moon became a training field for advanced students of the space navigation school attached to the station. Two agencies even obtained licenses for regular tourist flights around Luna, in small but rather comfortably equipped 'space liners,' as they were then called."

Then, with this infrastructure in place, "In 2040, 40 years after the creation of the artificial satellite, a second and most decisive step was taken. The Research Board of the Association for Space Exploration, the most powerful reearch organization of its time, stated in a memorandum dated March 20, 2050, that within five years, enough surplus propellant of the hydrazine-acid type would have been accumulated in the satellite depot [at the space station] to permit an expedition to one of the nearer plants, either Venus or Mars."

In making the choice between Earth's two nearest neighbors, the Board pointed out that while Venus is closer, less is known about its atmosphere and conditions, which would be critical knowledge for a winged rocket glider to be able to land on the surface. In addition, "there is some evidence of life on Mars; a life which probably sustains itself by a photosynthetic process using carbon dioxide. Conditions for successful biochemical research are likely to be much better on Mars than on Venus."

Taking all of this into account, Ehricke's "Board" recommended Mars as the goal of the first interplanetary expedition. "This historical memorandum settled the matter, and the preparations for 'Expedition Ares' began."

What follows is an extensive discussion about the selection of the eight-man crew, and the training and preparation for the months-long journey to Mars. There is a significant group of specialists, in Ehricke's report, "which strongly opposed the whole project." They argued that "the use of chemical propellants was hazardous, and there was considerable danger that none of the ships would ever return to Earth."

But, although nuclear energy was deemed far superior to chemical propulsion, this would have delayed the trip, in Ehricke's scenario, for perhaps 50 years! Instead, a multiply-redundant system is designed, to increase safety and lower risk. The crew of eight will travel with three separate craft, and individual lifeboat rockets are available to each, in case of emergency.

Ehricke's envisioned Mars mission is full of new discoveries and surprises, including an accident, reminiscent of that on Apollo 13. Although the mission is unsuccessful, Ehricke ends by bringing his crew back, knowing that "this was not the end, but the beginning of a great story."

A Life Yet Unfulfilled

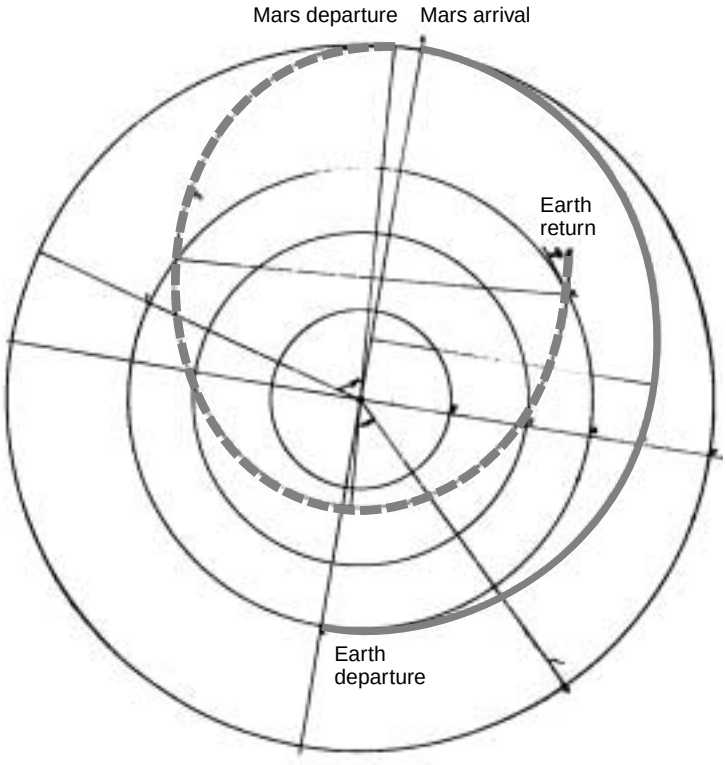
Over his lifetime, Krafft Ehricke initiated the development of the first liquid hydrogen rocket, called Centaur by the U.S. space program. In 1958, he presented a concept to Congress for a four-man space station. He developed trajectories for planetary missions, designed an orbital hospital, promoted space tourism, and studied advanced industrial techniques for space applications.

When Ehricke died of leukemia in 1984, he left behind a body of work and plans for space exploration that have yet to be realized. The last decade of his life was spent creating, in exquisite detail, plans for the industrial development of the Moon. His book on this subject, *The Seventh Continent* is yet to be published.

What distinguishes Krafft Ehricke's work from that of other visionary space architects, is his insistence that there is an historical, philosophical, and moral imperative to space exploration: that it is not just a spectacular extracurricular activity of humanity.

In the 1950s, he developed the concept of the "extraterrestrial imperative": that it is man's nature to explore; and that for man to progress, he must expand his world view, his resource base, and his scientific inquiry to include the entire Universe. This is not a matter of choice, Ehricke explained, for within the closed world system of the Earth, men would eventually find themselves fighting over scarce resources, and enter into a period of no-growth. This would inevitably lead to anti-technology and anti-science movements, economic stagnation, geopolitical power politics, regional economic chauvinism, extreme poverty, mass starvation, epidemic disease, and war—all of which we see today.

The Mission Profile of 'Expedition Ares'



Krafft Ehricke designed his mission using chemical rockets, which limits the flight path to a low-energy transfer orbit, possible only every 26 months, when Mars and the Earth are in the proper relationship. The crew departs from Earth, and meets Mars months later. But the Expedition Ares crew cannot stay, and must make an immediate return to Earth. To do this, they swing toward the inner Solar System, between the orbits of Venus and Mercury.

Ehricke's alternative view was informed by the fact that there are no limits to growth, only to multiplication. When "limits to growth" became popular in the 1960s, Ehricke constantly polemicized against this false notion, counterposing to it, the idea that there is no limit to man's creativity.

When the Schiller Institute was formed in the early 1980s by Helga Zepp-LaRouche, Ehricke joined its board, to express his solidarity with the philosophical view of the poet of freedom, Friedrich Schiller, and the activity of an organization committed to organize society on the concept of Schiller's "world citizen." Ehricke embodied the qualities of the "world citizen" that Schiller so beautifully describes. He believed that a new Renaissance was necessary, and possible. His writings, such as *Expedition Ares*, reflected his optimism that men would conquer, not only the frontiers of space, but the pessimistic and destructive policies of recent history, which he had seen first-hand while on the eastern front in the German Army, during the Second World War. He became increasingly alarmed throughout the 1960s and 1970s at the irrational substitution of superstition for science, and mobilized his own resources to lead a fight for progress.

There is no better time than the present to put forward a multi-decade plan for man's exploration and development of space. Krafft Ehricke's family and supporters have created the Krafft A. Ehricke Institute for Space Development (krafft ehrickeinst@cglobal.net) in order to reintroduce this visionary man's concepts to the public, and promote the specific goals, as well as philosophical world view, that he represented so well throughout his life.

The extensive excerpts from Krafft Ehricke's *Expedition Ares* are published in *21st Century Science & Technology*'s Spring 2003 issue, from P.O. Box 16285, Washington, D.C. 20041; or on the Internet at: 21stcenturysciencetech.com.