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Mars: The Next 50 Years

by Marsha Freeman

KEPLEROPOLIS, July 20, 2059—Today is a day of joyous celebration on Mars. As the citizens of Kepleropolis look back 90 years, to commemorate the historic first steps of human explorers on the Moon, their eyes are fixed on the imminent launch of their newest spacecraft, Kepler II. This will be the first craft to use the revolutionary new, and still-experimental, anti-matter propulsion system. If successful, the spacecraft will reach neighboring stars, comfortably within the lifespan of the scientists who are anxiously awaiting the discovery of new worlds. There is great excitement that Kepler II will open up the universe to mankind, just as 90 years ago, Apollo opened up the Solar System.

While Kepler II will not be carrying a human crew, its mission is to visit Earth-like planets orbiting distant stars, once thought to be impossible to reach in a human lifetime. Over its five-year mission, its predecessor, Kepler I, launched into Earth orbit in March 2009, had identified hundreds of target solar systems to explore. Johannes Kepler (1571-1630), who determined the laws of our Solar System, would undoubtedly be pleased that our scientific instruments will soon be looking for planets around other stars.

While everyone in Kepleropolis is anxiously awaiting today's Kepler II launch, pausing to follow the minute-to-minute progress of the launch preparations on large screens placed throughout the city, researchers working in the Advanced Propulsion Laboratory are especially anxious.

The revolutionary new anti-matter propulsion drive that will take Kepler II to the stars began its development more than 20 years ago on Earth. But it was brought to realization by a scientific team working in the Lab in Kepleropolis. Now it was time see if the system could deliver.

Just as those who came before them nervously watched the first satellite launch, in 1957; the first manned mission, in 1961; the first human footsteps on the Moon, in 1969; and the first manned landing on Mars, in 2048, these young pioneers paced back and forth, waiting for lift-off.

Finally, the moment arrived, chosen to coincide exactly with Neil Armstrong's first step onto the Lunar surface, now almost a century earlier. The booster engines ignited, and Kepler II was easily carried aloft. Once in Mars orbit, the anti-matter drive sprang to life. Kepler II was on its way to discover new Earths.

Very few people living on Mars today were alive when Neil Armstrong spoke those first words from the surface of the Moon. But no one here can forget on

EDITOR'S NOTE

We have excerpted here a very small portion of Associate Editor Marsha Freeman's article, which is posted on the *21st Century* website, and we encourage readers to read and distribute the entire piece. See www.21stcenturysciencetech.com/ Articles_2009/Mars_50-years.pdf. We also recommend readers to view the LaRouche Youth Movement video, "From the Moon to Mars: The New Economics," available at http://www.larouchepac.com/node/11573.

A review of Marsha Freeman's new book, *Krafft Ehricke's Extraterrestrial Imperative,* appears on page 78.

JPL/NASA

Before men are sent to Mars, in 2024, an international robotic mission will be deployed to return samples of rock and soil to be intensively examined in laboratories on Earth. In this artist's drawing, an ascent vehicle is taking off from the Martian surface, to deliver its cargo. The rover, which collected the samples and delivered them to the vehicle, takes shelter behind a rock.

whose shoulders he stands. However, what *is* very difficult for citizens of Keplеropolis to understand, especially those who did not witness or participate in the Second American Revolution of 2010, is how it was that so many decades could have been wasted.

For years after the abrupt end of the Apollo Program in 1972, space enthusiasts would lament that it would take a crisis, like that faced by President John F. Kennedy in 1961, to goad an administration in Washington to make the commitment needed for a visionary, multi-decade program to move human civilization into space. That crisis came in the Fall of 2009.

Perception finally caught up with reality. The global financial house of cards, based not on any physical economy, but on criminal enterprise, speculation, and outright stealing, in order to "make money," finally collapsed. Commerce, production, and life itself came to a standstill. Here was the opportunity to start over, sweep away decades of pessimism and failed policies, and return to the principles which today, on Mars, seem like common sense. The revolution began by "exorcising" the worship of money.

Starting Over

A series of global, credit-based international exchange-rate and trade agreements was quickly concluded, reflecting back to the policies of U.S. President Franklin Roosevelt, and initiated by economist Lyndon LaRouche, who had proposed a four-power agreement among the U.S., Russia, China, and India. Through this arrangement, each nation could contribute to the restart of the overall global economy.

One immediate task was turning what could have been an ugly, violent mob-reaction to the collapse, and descent into a New Dark Age, into a renewal of the letter and spirit of the first American Revolution.

Great projects of infrastructure building got under way on Earth, in the footsteps of the first U.S. Treasury Secretary, Alexander Hamilton, who had designed and implemented the credit policies that built the economic infrastructure of a young United States. The first task in 2010, was the rebuilding of a planet devastated by disease, starvation, and war, and to reverse the decades of accumulated physical decay.

But as space visionaries insisted at that critical moment, only a multi-generational great project could challenge and mobilize the long-dormant creative resources of the human mind. The scientific discoveries of such a project would unleash the next revolutionary generations of technology, and drive economic growth on Earth.

The politicians reluctantly came to agree. And so, in that spirit, the project to build a science city on Mars came into focus. The cultural pessimism that had taken hold in the late 1960s, and kept its grip on much of the world's population for 50 years, began to disappear.

In fact, the natural optimism of humanity had not been extinguished during the dark decades of economic decline, only submerged. With the focus now on the future, socially anomic video games, "reality" television, fixations on sex, violence, and "competitive" sports, and a "culture" of death had no place. Mankind would, once again, find its true nature, in the process of discovering the secrets of the universe. The question posed to every citizen of the world was: What can you contribute to the future of mankind?

And so it was decided, in early 2010, by nearly all of the nations of the world, that through a coordinated effort, enlisting the necessary talents of all of man-

kind, within 50 years, human civilization would move to Mars.

Living on Mars

From the start, moving humanity to Mars had as its central purpose the ability to acquire a greater understanding of the universe, by creating a multi-planet home for humanity. For this reason, scientists explained, there could be no thought of trying to "save money," by setting up an outpost, or an Antarctica-like base-camp on the Red Planet. A science city was designed, with a sufficiently large population, which is now approaching half a million, to support not only the scientific staff and facilities of Kepleropolis, but, eventually, to create an independent new world, as the jumping-off point for developing the further reaches of the Solar System.

Scientists and engineers were optimistic that they could solve the technical challenges to get man to the outer planets. But medical professionals were not convinced that men and women could safely *live* there. They were unsure of how the human body would adjust to the one-sixth gravity of the Moon, or, later, the one-third gravity of Mars....

For decades, scientists had worked within their different medical specialties to find preventive and palliative measures to combat each one of the body's adjustments to microgravity. But this approach left the traveler ingesting a pharmacy-worth of drugs, sometimes with counteracting effects, and spending many boring hours on treadmills.

Then, about 20 years ago, it dawned on the engineers who were developing new exercise equipment, that before returning to Earth, orbital and Lunar citizens could combat just about *all* of the debilitating effects *at once*, by simply spending time in a variable-gravity Lunar centrifuge!...

In late 2018, after new laboratory modules, more advanced equipment, nuclear power supplies, and six additional crew members had been added to the ISS, a proposal that had been made in the 1960s by space visionary Krafft Ehricke, came to fruition.

It had occurred to Ehricke that the adaptation to microgravity which was detrimental to the health of Earth-returning crew members, could be *therapeutic* to whole groups of people, for whom Earth's 1-gravity was a burden. This included those suffering from circulatory ailments, where the removal of gravity could lessen the workload for the heart....

Life in microgravity meant that many of the physical infirmities of old age were no more. The Earth-orbital population grew by leaps and bounds, as seniors moved out of nursing homes on Earth (which, in any case, had become more like hospices, where people were sent to die), and took up residence where they could live comfortably and work productively, while looking down at their home planet, from 250 miles up.

But there was one very serious and potentially life-threatening biological hazard in space that was not so easily resolved: exposure to radiation.

In low-Earth orbit, the Van Allen belts deflect harmful radiation, protecting crews. And on planetary bodies, there is no lack of material to shield people, plants, and animals from the constant bombardment of cosmic rays and solar particles and radiation. The first extraterrestrial living quarters were simply covered with Lunar and Martian soil. More recently, new materials have been developed to blanket the cities, which can filter out damaging rays, while letting in natural light.

But what about the radiation that crew members would be exposed to during the trip to Mars, navigating through up to 50 million miles of radiation-soaked interplanetary space?....

The solution ... was [to] avoid exposing the travelers to dangerous doses of cosmic radiation, by getting to Mars as quickly as possible.

Getting to Mars

Today, families of vehicles navigate the ocean of interplanetary space around the clock, traveling between the Earth, the Moon, and Mars. Only a few miles from downtown Kepleropolis is the Interplanetary Space Launch Center. The space port is responsible for coordinating the vehicles arriving and departing the Red Planet, similar to the function of a busy airport on the Earth....

What made this routine personal contact between the planets possible? It was changing the relative relationship between space and time. Conventional rockets bring people to Earth-orbit in eight minutes, and to the Moon in two days. Extend that technology to Mars, and the trip could take seven or more months. But today, to traverse the tens of millions of miles to Mars, takes the same time as it does to go to the Moon! (See: http://www.onorbit.com/node/1276.)

The development of a fusion-powered plasma rocket has reduced the travel time between Earth and Mars to less than a week. No longer would doctors have to worry about subjecting crews to weeks, or months, of damaging radiation, or the debilitating effects of weightlessness.

The creation of the fusion rocket can be largely credited to the talent and perseverance of Dr. Franklin Chang-Diaz....

Why Fusion?

When it comes to rocket propulsion, the hotter, the better. The efficiency of the rocket engine increases, as the temperature and velocity of the propellant pushed out the rear increases. And the energy produced by the fusing of light ions is orders of magnitude higher than that of any other energy source that has so far been developed....

Parallel to the development of the plasma rocket technology, there was a crash effort to develop a multi-megawatt space nuclear fission plant. This technology had shown great promise decades earlier, but had been abandoned in the early 1970s, in the United States, when there was no plan to go to Mars, and in the early 1990s in Russia, after the collapse of the Soviet Union....

In 2030, a revolutionary 200-megawatt nuclear-powered VASIMR rocket got its first test run in Earth orbit. The nuclear energy source used was an improved version of the Russian Topaz reactor from the 1990s. Just four years later, nuclear-propelled cargo ships were making regular runs between the orbits of the Earth and the Moon. Not long after that, ships were delivering cargo from the Moon's orbit, to that of Mars—in only 39 days. Interplanetary commerce had become a reality....

Throughout human history there have always been naysayers and pessimists. The establishment of the city on Mars is just the most recent proof, that the human spirit can overcome any crisis: that by marshalling his unique creative abilities, man discovers the laws of the universe, and then shapes the universe to the betterment of all mankind.