“Mission Possible?”

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More than four decades ago, John F. Kennedy stood before Congress and asked for the moon. Despite nay-sayers, the American spirit prevailed, and the United States’ fledgling space program, along with the popularity of its new president, blasted off.

As Alan Shepard Jr crawled into the tiny spacecraft, Freedom 7, on May 5, 1961, bound for edge of space, he spent only 15 only minutes in suborbital flight. But that short trip was enough to ignite the nation’s passion for space exploration.

Today, President George W. Bush calls for that same support for his Moon, Mars, and Beyond program. On January 19, 2004, President Bush revealed his vision for the future of space exploration, including a manned mission to the moon as early as 2015, and one to Mars by 2030. Like Kennedy, President Bush faces substantial skepticism. Though the presidential requests bear similarities, the mission to Mars requires significantly more advanced technology, research, and financial resources. However, a permanent lunar base would alleviate some of the risks of future space missions. It would also signify substantial progress toward the realization of human missions to Mars.

“I am a strong advocate for robotic exploration of Mars. I am also an advocate for the human exploration of Mars,’ said Michael Carr, an astrogeologist with the U.S. Geological Survey in Menlo Park, California, specializing in Mars, in his testimony before the President's Commission on April 16, 2004. “I have sat in many workshops where the

rationale for human exploration has been discussed. We've talked about stimulating the economy. We've talked about national pride. We've talked about the effect on education. And I don't think any of those reasons are the real reasons that we will ultimately go to Mars. I think we go to Mars because it inspires us. It fills us with awe and pride and it lifts us above the humdrum everyday concerns of food and shelter. I think this spiritual driving force will ultimately take us to Mars."1

I agree.

Space exploration is a peaceful way to push the technological envelope in a wide variety of areas. In striving to achieve the goals of safe and efficient human exploration of space, our scientists and engineers are challenged to accomplish things they might otherwise never have imagined. Inevitably, the development of new technologies in support of our space exploration efforts spins off technological advances in a variety of industries which benefit everyone, perhaps most notably in the areas of health, medicine, information processing, and materials science.

And if we are serious about sending humans to Mars, we need to go back to the moon first. It is a closer, safer option for working out the details for keeping people healthy for a long-duration mission on an extraterrestrial surface. Long-term space travel involves more than the technologies necessary to send, maintain, and communicate with machinery; it requires the ability to send, maintain, and communicate with humans. Our experiences thus far have proven the severe effects of space travel. After only a year in space, astronauts return severely incapacitated. In the absence of gravity, muscle tone deteriorates, the heart weakens, and bone loss occurs. Considering a round trip to Mars would take close to three years, significant advances need to be made in astronaut health maintenance before we undertake such a mission.

NASA's publicists are hopeful that exploration missions to Mars will uncover clues as to the origins of life in our solar system. The fact is, we are not likely to find evidence of life, past or present, on Mars. Mars is cold and dry, and too small to have enough gravity to retain a substantial atmosphere. The thin atmosphere that it manages to retain (at about one percent of earth's atmospheric pressure) is primarily carbon dioxide, with no molecular oxygen available. With such a thin atmosphere, any water in a liquid state on the surface of the planet would very quickly evaporate. Furthermore, Mars has a very weak magnetic field, so the planet's surface is bombarded with huge amounts of high-energy radiation and charged particles. All this being said, of all the planets in our solar system, Mars is still the least hostile to life. Thus, it remains the focus of NASA's exobiology exploration initiatives.

As is the case with other fields of scientific inquiry, the more we learn about the intricate details of not only our planet, but also the rest of our solar system, our galaxy, and even the rest of the universe, which allow intelligent life to not merely exist but to flourish and enjoy its existence, the more we stand in awe of the Creator capable of designing such a complex and orderly (not to mention statistically improbable!) physical realm.

1. Edited testimony of Michael Carr, President's Commission on the Moon, Mars and Beyond, Washington - May 13, 2004. www.spacedaily.com/news/mars-life-04h.html