

FOREWORD

In 1964 and 1965 it was a foregone conclusion that we would be going to the Moon on a steady basis and establishing a Moon station there. We had also studied a voyage to Mars. In 1967 President Johnson stopped the entire program. We were literally all dressed up with nowhere to go.

I was an enthusiastic participant at the inception of the program, and it was terribly disappointing, to say the least, to watch it grow only to wither. We learned so much, expanded our awareness of the universe, traveled to the cosmic corridor, only to have the door slammed shut. I often wonder how the world would have been affected today had space exploration continued at the rate at which it had begun. If we had stayed on course, we would have been on Mars ten years ago, and we would have established a permanent base on the Moon. Today, the Shuttle and Space Station Freedom are the remaining threads of what was once a rich tapestry. Currently, even these programs are in dire jeopardy of being terminated. What is so ironic is that while politicians give lip service to ecological problem solving, it is scientists and technologists who recognize the necessity of space exploration as a source of solutions to many of the problems on Earth.

We have only to look at the data already accumulated to recognize that the Moon is rich in raw materials. Apollo helped scientists to study the elements of the Moon. These elements may have significant potential in terms of alternative energy sources, manufacturing potential, and industrial use. Helium-3, found in abundance on the lunar surface, may be an energy alternative for use in clean fusion power reactors. Other elements and materials obtainable from the Moon include oxygen, glass, silicon, calcium, iron, hydrogen, and metals such as titanium manganese, magnesium and chromium. Furthermore, the Moon could be used as a natural laboratory for scientific research. It is possible for a high powered telescope to be placed on its surface for deep space astronomy. It is even possible that the Moon holds the key to understanding the origins of the Earth. We may also unlock medical, biological, and chemical secrets from clues found on the Moon. And the Moon might prove to be the ideal place for experiments in superconductivity as well as offering an ideal condition for studying the long term effects of microgravity on the human cardiovascular system. Such a study might lead to our ability to prevent, or, in fact, cure human heart disease. The commitment to space exploration will also yield information on our own planet. We may, through the use of super telescopes and satellites, monitor the Earth and gather data on the environmental problems that daily threaten our existence. A base on the Moon could serve as an observatory monitoring changes in pollutants, tracking and enforcing environmental regulations, and could ultimately lead to relieving some of the burden we are putting on our natural resources.

Space Station Freedom is, I believe, an integral part of the exploration of space. It will serve as a launch pad for expeditions to the Moon as well as a base for further exploration of the solar system. It will also function as an orbiting outpost from which astronauts could conduct a variety of scientific studies. The Space Station is an excellent opportunity to balance manned and unmanned operations. We will not be able successfully to explore, expand, learn, and profit from all we can do in space until we get a balance in the program. Probes will also be beneficial in establish-

ing trajectories and navigating heretofore unexplored areas. We have not had a long duration research base in space since the days of Skylab. So much was learned from the experiments at that time and surely with today's technological advances, the data available to scientists from such a lab would be multiplied a hundred fold. But Space Station Freedom serves another purpose. It is an excellent opportunity for cross cultural participation in the adventure and hence opens the opportunities for global cooperation in space exploration. There is much to be done before the Space Station is complete. Along with the constant mandates for redesign, there are logistic problems intrinsic to the process that need to be addressed. It will be necessary to design more flexible gloves so assemblage of the station might be facilitated. Considering the amount of time spent working in space EVA, engineers must address the issue and spend the time and money to develop both gloves and suits that will allow easy entry and exit, and thereby permit the astronauts efficiency in assemblage, maintenance, and operation of the Space Station.

The future of the Space Station as well as the future of the entire space program is at a critical point. At the core of the problem are financial considerations. Until we can create an economically viable method of space travel, the program will continue to be on shaky ground. The SSRT (Single Stage Rocket Technology), a vertical lift and vertical land vehicle, is currently being developed and tested as a possible solution to the unruly cost of space travel. A 41-foot scale model of the Delta Clipper (SSRT) demonstrator is currently slated to fly at White Sands Missile Range in June of this year. The flight will demonstrate the basic flight capabilities of the vehicle and will lead to the next phase of development. The point of view of the design team has been to create a space faring vehicle capable of operating with the same efficiency as an aircraft. The vehicle will be flown by a flight manager, a deputy flight manager and ground systems service. The design team has used virtually off-the-shelf components and modern autonomous control systems, which should reduce the cost per pound of flight to less than a tenth of the current value (\$5,000 to \$10,000 per pound). The SSRT may successfully provide relatively low-cost manned or unmanned access to space and do so without the expense of developing additional spacecraft. The ultimate goal of SSRT is nothing less than to revolutionize space travel.

I sincerely hope the politicians of this country can clear their vision to see the far reaching positive effects of space exploration. Recently I participated in a film for television entitled "Plymouth." The show was a drama about the next great adventure of our time: the colonization of the Moon. The story line tells of a small logging town in the Pacific Northwest of the United States, whose inhabitants become colonists on the Moon. While on the Moon, they set up a mining operation to mine Helium-3.

Working on this film, I was transported, in my imagination, back to the Moon. It is clear to me that "Plymouth" is not only possible, it is also probable. It is refreshing to see there are some who also believe in this potential and who are earnestly pursuing the adventure with me. I am hopeful that in my lifetime I will see this come to pass for the eventual betterment of all mankind.

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