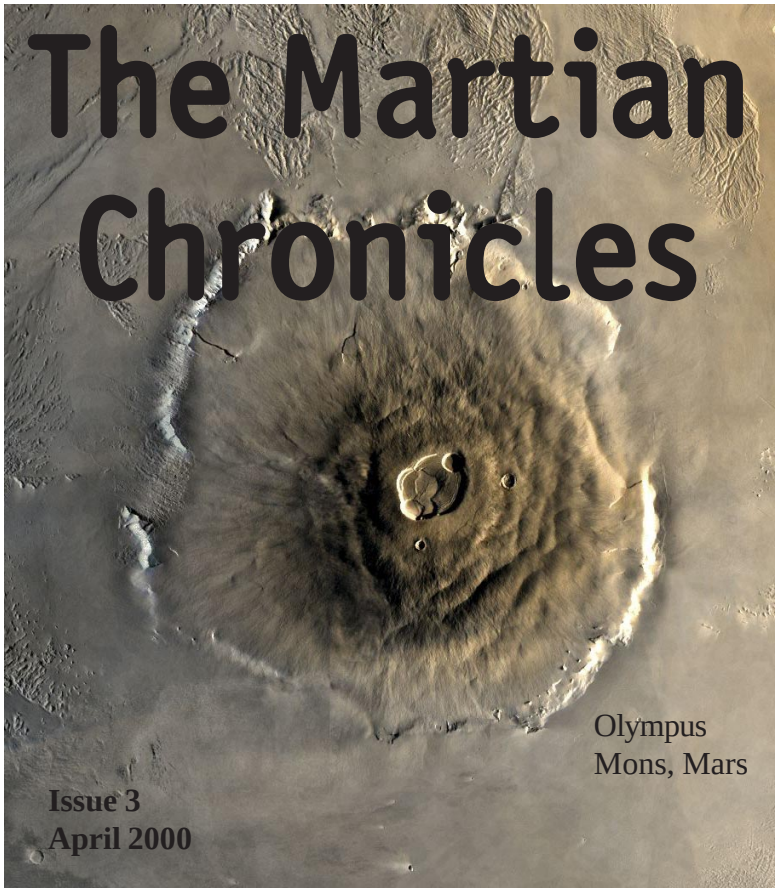
http://chapters.marssociety.org/youth/

The Martian Chronicles



Olympus Mons, Mars

Issue 3
April 2000

Contents

Dear Reader,

This is the newsletter of the **Mars Society Youth Chapter** and the **MIT Mars Society Chapter**.

The newsletter is intended to excite youth about the exploration and near-future human settlement of Mars.

Please distribute freely!!! To be added to the announcement list, or to receive paper copies for distribution, contact Margarita <mmm@mit.edu>.

Send your submissions for the Newsletter!

Enjoy The Martian Chronicles!
Sincerely,
Margarita Marinova.

Mars!

A Mars Anthem

Tony Santana

Red Mars. Dust red. Iron sulfates.
Red spinning evolving in the cosmos.
Mars Red. Mars dust. Silicon rose.
Rust red hills riding rising in space.

From Ares Valles to northern polar sands,
from Valles Marineris to windy Echus bluffs,
in southern polar splendour or meteor blasted sands,
in ominous radiant red and fearsome beauty.

Terrible, brilliant, ponderous, fierce.
Mars.

Produced by: **MIT Mars Society Chapter**
Mars Youth Chapter
Distribution funded by: **Massachusetts Institute of Technology**
International Mars Society

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The Mars Society is an international non-profit organization committed to furthering the goal of robotic exploration and human settlement of the Red Planet. www.marssociety.org

OPEN Mars Millennium Project

Gus Frederick, Instructional Technologist

Imagine yourself in the year 2030. You are visiting a colony of 100 of your fellow humans, on the planet Mars. How would you describe this community? These are questions posed by NASA and others as part of the Mars Millennium Project.

The MMP is an interdisciplinary learning project designed to engage 5- to 18-year-olds in classrooms and youth groups throughout the United States. Besides NASA, the project is being sponsored by the U.S. Department of Education, The National Endowment for the Arts, the J. Paul Getty Trust and the White House Millennium Council.

OPEN, in partnership with local Oregon chapters of two national space advocacy groups, the Mars Society and the National Space Society, is creating a specialized Web resource around this topic. While on first blush, this would seem to be a strictly science-oriented endeavor, it actually has the potential to draw from numerous subject areas besides just science.

The OPEN MMP Web site will host a variety of interdisciplinary resources, tasks, lesson plans and links to assist Oregon students and others in their mission design. A major approach for this site will be the "Scottish Storyline Method," a learning technique developed in Scotland, and modified for use in the United States by the late Kathy Fifield, a Portland teacher, who was introduced to the system while visiting the United Kingdom.

The Storyline Method (known as "Topic Studies" in Scotland) started as a means of moving various subject areas into a common project. For example, with the Mars Millennium project, the students become journalists leaving their Earth home to visit "Pele Base," a colony constructed within a Martian lava tube cave on the North flank of Olympus Mons. The journey requires students to investigate why people migrate, what supplies are needed, how to develop a viable, self-sustaining colony, and what they do to amuse themselves. Carefully planned episodes engage students in actual practice and application of basic skills within the context of the storyline. The story motivates students to extend those skills and refine them for "real life" challenges.

Another unique aspect of this method is that it instills the value of the very human tradition of story telling. Kids become active participants in the lessons as they work their way through the storylines. As a bonus, they also get to learn a great deal about a wide range of various down-to-earth topics. The final project will be a Web-based comprehensive community plan backed up by a host of ready-to-use in-class tasks and lessons covering a broad range of levels and subject areas.

A book on the method was published in 1997. "Creating Worlds, Constructing Meaning: The Scottish Storyline Method" by Jeff Creswell of Lake Oswego is helping to introduce the concept to the Nation.

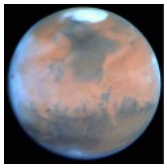
Cool Websites:

OPEN Mars Millennium Project
http://www.open.k12.or.us/mars/mcontrol.html
Mars Society - Oregon Chapter
http://chapters.marssociety.org/or/
Mars Millennium Project Home Page
http://www.mars2030.net/
The Scottish Storyline Method at Thompson Elementary School http://www.open.k12.or.us/mars/marsssm1.html

3rd Annual Mars Society Conference

Ryerson University, Toronto, Canada

August 10-13, 2000



To **register**, visit www.marssociety.org

Reserve a low-cost room for the conference now!
The rooms are going fast!

Have a great time learning more about Mars and meeting fellow Mars enthusiasts!

Conference organized by the Mars Society Toronto Chapter: http://chapters.marssociety.org/toronto/

mars petition

The time has come for humanity to journey to Mars.

Humanity yearns for a challenge, one that will let us exercise the limitless potential, now dormant, that lies waiting within ourselves. The prospects facing our generation have never been greater; with world peace, unprecedented economic growth, and extraordinary technological innovation, we find ourselves at the threshold of a new millennium of opportunity. The human exploration of Mars will be our generation's crowning achievement.

We must go for the knowledge of Mars. Finding evidence of life on Mars would demonstrate that the origin of life is not unique to the Earth, and, by implication, reveal a universe that is filled with life and most likely intelligence as well. This would be the most important scientific enlightenment since Copernicus' discoveries.

We must also go for the knowledge of Earth. Mars, the planet most like Earth, is believed to have had a wet climate and can help us understand the impact of climatic change on our home world. The knowledge we gain could be key to our survival.

We call upon the leaders of the world to commit to the immediate human exploration of Mars. It is our wish that, in the spirit of history's greatest explorers, the first humans will set foot on Mars by 2015, with the ultimate goal of developing a sustained presence. We urge our leaders to have the vision to provide for the citizens they represent a future without limits, one that matches our potential and our country's greatness, and is worthy of the dreams of our children.

Believing therefore that the exploration and settlement of Mars represent the greatest human endeavor of our time, I add my signature to the Mars Petition.

The goal of the petition is to collect 1,000,000 signatures by November, when the petition will be presented to the new President of the US.

Sign the Mars Petition – Support Human Mars Exploration!

http://thinkmars.net/petition

The Mars Youth Chapter Rover **Bumper Sticker** Contest!

Martian, Genetically Modified, and Proud!

Submit an original Mars bumper sticker!

This Rover Climbed Olympus Mons

Prize - a Hug-a-Mars signed by members of the Mars Society Steering Committee.

Send entries to mmm@mit.edu

Bumper quotes and contest idea by Gary Fisher.

Meet the Scientist
Dale Andersen

SETI Exobiologist


Dale Anderson

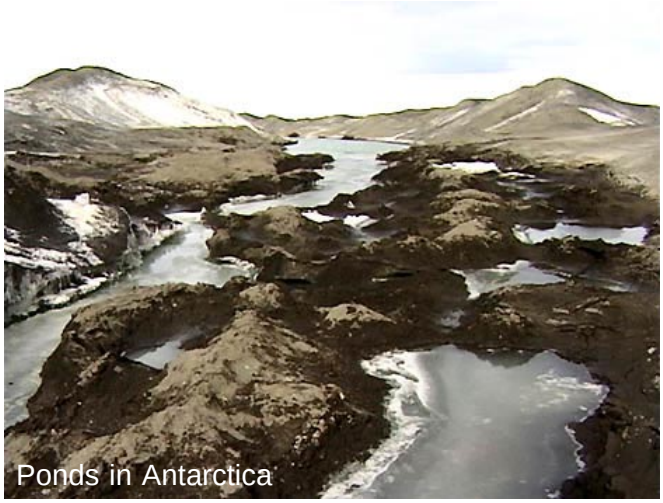
Q: What do you work on and what are your interests?
A: I am interested in the history of life in our solar system and beyond. Are we alone? Did life ever exist on Mars? If so, was Mars life like us or was it rooted in a different tree of life? By looking at life in extreme environments here on Earth, we may gain insight about how life might have existed on early Earth or other planets. I like working in the polar regions - the Arctic and Antarctic.

Q: How did you become interested in diving and when did you start diving?
A: I have always liked the water, and exploration has always been an important theme in my life since I was very young. WW I ace Eddie Rickenbaker and Amelia Earhart were among my first heroes and I often thought about how wonderful it would be if I could only be like them, travelling and exploring far off lands and exotic places. My father was in the U.S. Navy so our family traveled around quite a bit when I was growing up, fueling my desire to see and experience new countries, their peoples and natural settings. Diving has always been familiar to me since my father was a diver in the Navy. For many years I saw it mostly as a tool that my father used as part of his work. During that time I was exposed to many of the technical elements and the training that went along with it. The sixties and seventies were truly wonderful years because so much of the planet was unexplored and there were many new technologies, from submersibles to spacecraft that were being developed to help unlock those secrets. It was not until I was in high school when I began watching many of the underwater documentaries produced by Jacques Cousteau that I realized what I had been missing by not swimming a bit deeper and staying underwater a lot longer.


Home.

His imagery allowed me to see the world that I had heard described so many times before by my father and his friends, and now I wanted to see this strange and beautiful place for myself. I was very lucky during those years because I was exposed to so many different elements of underwater work. I was shown that diving was not just a way to sightsee, but could also be a useful way to do interesting work. I received my formal diving certification from NAUI my freshman year at Virginia Tech in Blacksburg, VA. Once it became clear that I was getting more and more involved in diving, I decided to make sure I received the best training that I could find while studying for a degree in biology at the university. While taking classes in limnology and aquatic ecology, I met Dr. George M. Simmons, a Professor of Biology at VA Tech. “Doc” was using diving as part of his research in several lakes and reservoirs and asked me if I would like to help him. His kindness, gentle direction, and patience provided me with many wonderful opportunities, including the chance to work with him in the Antarctic studying a number of ice-covered lakes in the McMurdo Dry Valleys. I have been working in polar regions ever since.

Q: Where have you dived, and which place do you consider to be the most exciting - personally and from a scientific perspective.
A: I have been diving in many lakes, streams, and rivers primarily on the East Coast of the U.S., the Atlantic Ocean from Virginia to the Florida Keys, many of the springs and rivers in Florida, the Bahamas, the Pacific Ocean along the California coast, Hawaii, Lake Tahoe, and several desert lakes in Nevada, and the Antarctic and Arctic. Each dive experience is different and each environment offers something neat to see. I have tried to visit as many diverse environments as possible. Warm water, clear water, cold water, dark water. Places with very calm waters and areas of high current and rough surf. In order to go to these differ-


Ponds in Antarctica

ent places, proper training is crucial. One cannot observe the surrounding environment if you are spending the entire time battling that environment! So it takes a bit of time and experience to get comfortable in these various underwater settings. Some of my finest underwater adventures have been in rivers such as the New River near Blacksburg, VA. Moving along the rocky bottom and seeing the assorted freshwater invertebrates and fish that live there really makes you appreciate how many different life forms there are just a few meters from the river banks. I have been diving in reservoirs where forests once stood, the trees now just ghosts underwater. It's eerie to swim through the branches of large trees in the dim depths below 80 feet. Among my many adventures with Dr. Simmons were many hours of fun in the coral reefs of the Florida Keys and along rocky ledges thirty miles off the coast of North Carolina in the warm waters of the Gulf Stream. We also spent a lot of time in cool, dark, turbid waters as part of our research efforts. The reefs in the Bahamas and the kelp beds of California and the incredible diversity seen in those delicate ecosystems are among my best memories. But I think of all the places I have been diving, the polar regions have captivated me the most. In addition to requiring new skills and diving techniques, the physical setting of thick ice covers (up to 6 meters of ice!), dark, cold water, these regions provide us with windows to the past on our own planet, and to worlds beyond such as Mars and Europa. Swimming below the sea-ice in McMurdo Sound may provide a glimpse of what it might be like to swim beneath a 'snowball Earth' - a time several hundred million years ago when it was thought that much of our planet was covered in ice, including the oceans. Diving in the perennially ice-covered lakes of the McMurdo Dry Valleys is like going back in time 600 million to over 3 billion years ago when life on Earth was much less complex, single celled organisms. The cyanobacterial mats in these lakes are similar to the vast microbial mat communities built by their ancestors and now seen preserved in the fossil record as stromatolites.

Q: What do you consider the most exciting and interesting aspect of your work?
A: Being able to participate in the search for knowledge - and learning how to go about that search. Meeting so many others who share this same passion makes it an enjoyable experience too.

Q: What did you study throughout school? What were your interests?
A: I have always been interested in biology, environmental sciences, and space sciences. I was simply glued to the television during the Apollo missions to the Moon. Camping, hiking, mountaineering, diving, and photography have been in my life as hobbies and are now part of the repertoire that enables my professional work. It became very important to be able to live and work safely in remote and extreme environments.

Q: How did you first become involved in studying extreme environments?
A: By becoming involved with the professors that were conducting this kind of research at the university I attended and by continuing to pursue this type of research as a profession.

Q: What do you find to be the biggest differences between the Arctic and Antarctic?
A: In many ways they are so very similar, yet they are vastly different. Both see long winter nights and the constant light of summer. They are both cold and desolate and water is rare in the liquid state. It's more common to find it as the mineral ice. Glaciers and ice caps dominate the landscape and when land is not covered by ice, the results of the cold are seen in interesting features such as polygonal cracking or moraines and


Microbial mat community in an Antarctic lake.

eskers and other glacial and periglacial phenomena. But the Antarctic is a frozen continent surrounded by a frozen ocean, and the Arctic is a frozen ocean surrounded by land. Life is nearly absent on the Antarctic polar plateau, whereas the Arctic is teaming with life. In the Antarctic, it's the ocean where life is most abundant. The few ice-free regions are home to mosses and microbes. But they are both very, very beautiful places and the underwater regions are among the most fascinating places I have visited.

Q: You are involved with the McGill Arctic Research Station. What are its main goals and the time line for its operation?
A: McGill University in Montreal, has had a long history of research at Axel Heiberg Island in the Arctic Archipelago. The Department of Geography has operated a high Arctic field station on Axel Heiberg Island (79 degs 26'N; 90 degs 46'W) since 1959. Multi-disciplinary studies are carried out at Axel Heiberg with an emphasis on permafrost, glaciology, climatology, hydrology, ecology, limnology, snow and ice. Normally we work there in early spring (mid April) for about a month, and then later in the summer for another month. But the timing is dictated by the needs of the research. In general it's too cold, dark, and difficult to go to the site during the winter months. It would take a lot of additional planning to get there at that time.


Dale going for a dive under meters of ice

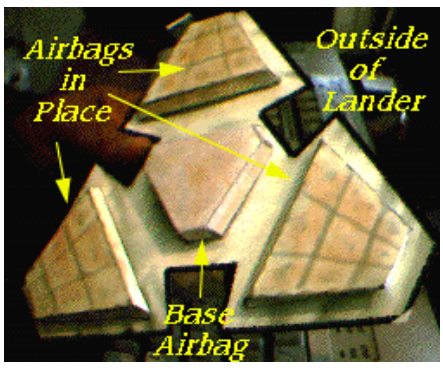
Q: What will you be doing this summer in the Arctic?
A: I am now working on a research project at Axel Heiberg as part of my dissertation. There are perennial springs that occur near our camp. Springs of this type are rare since the permafrost depths reach almost 600 meters. That is a LOT of frozen ground for water to get through! So finding liquid water flowing out of the ground in these places is very special. One reason I am studying the springs is to help us understand what Mars may have been like during an earlier, warmer time in its history - a time when life may have been present and living in springs like we see in the Arctic. If we can understand how springs in polar regions of Earth work, then when we get to Mars, if we locate mineral deposits that were associated with ancient springs, we might be able to understand how they worked too. And very importantly, we may gain insight about how to search for and recognize any life that may have been present there.

Paper Mars!

Stephen M. Glenfield

If you'd like to make models of some of the various robotic spacecraft sent to Mars, there's an inexpensive method available to anyone with access to the internet. They're known as paper kits, and several can be downloaded for free and printed on any handy printer. The complexity of the kits vary greatly - some are very simple, while others require lengthy assembly instructions.

For those wanting to start off with a simple model for their first try, you can find a model of the Japanese Mars probe Nozomi (Hope) at http://www.planet-b.isas.ac.jp/paper.html. Although the instructions are in Japanese, it has few parts and can be assembled rather easily. Originally intended to arrive at Mars in October, 1999, Nozomi used more maneuvering fuel than planned, and will now take a longer path, arriving at Mars in December, 2003.



If you want paper kits that are a little more challenging, you can model the highly successful Pathfinder mission (http://cmex-www.arc.nasa.gov/Education/MPF_Model/Main.html), or the ill-fated Climate Orbiter (http://mars.jpl.nasa.gov/msp98/model.html) or Polar Lander cruise configuration (http://mars.jpl.nasa.gov/msp98/mplmodel.html). Each of these three kits are more time intensive, but will provide detailed replicas of the actual craft with a little patience.

There are also two kits available for very reasonable prices from Space Craft International (www.scikits.com). They offer laser cut, foil printed models of several famous space vehicles, including the Mars Global Surveyor which continues to send back startling pictures of the martian surface, and the Mars Polar Lander in what would have been its landed configuration. These kits are also available from many science stores and museum gift shops, but the company offers many on the website in a "bare bones" format-without the packaging, but reduced in price. Whether you choose the free kits or the SCI kits, you'll have an inexpensive model you'll be proud to display.

The Recluse

Chapter II: The Long Haul

Rich Reifsnyder

Blake breathed deeply and shut his eyes. He realized that this was a mistake; he forgot he was in space and began to feel like he was falling from a great height.

He heard a dull, low-pitched beep and opened his eyes. In front of him was the Mission Control communications light, flashing red. He remembered that he had switched off the radio shortly after the upper stage began its burn, so he could take in the launch experience without the prattle of controllers' voices. That was probably a risk on his part, as anything could have gone wrong with the booster.

He switched on the radio. "Blake, please report in. Your heart and breathing rates are becoming erratic." That was the voice of Dwight Palmer, Blake's doctor and now his flight surgeon. He had selected his Mission Control Team himself, employees he trusted as friends who would look after his safety. After the Cape Canaveral launch operations concluded, they would be his only link to Earth.

Blake started to speak but felt a lump forming in his throat. He knew the effects of zero-gravity, the dizziness, the collection of fluids in the upper body. He was literally falling over the edge of the Earth. He forced the feeling down and commended himself for not eating anything for twelve hours: he was still wearing his spacesuit and couldn't afford to vomit.

"Blake here. Thanks for the warning, Doc."

He could already feel the pounding in his chest subsiding. All he really needed was some contact with Earth. He knew that, six months from now, radio communication would be at least twenty minutes for the round trip and all human interaction would be by voice mail. It would take some getting used to.

Jason Blake had never had formal astronaut training. Acting under the guise of a tourist of sorts, he had paid NASA top dollar for test flights on the KC-135, their zero-gee simulation airplane, and for time in the EVA training tank.

Unfortunately, he was sure that most of the time he had failed the tests. He "dropped" most of the wrenches and screwdrivers in the EVA tests, which technically meant they were irretrievably lost, he was excessively disoriented, and vomitted frequently during weightlessness.

NASA would never had considered Blake as even a guinea pig in a zero-gee experiment, much less a spacecraft pilot. But Blake wasn't about to tell them that he was going to Mars whether they liked it or not.

In fact, he had taken great pains to not let anyone know that his capsule was manned. His engineering team sealed him up inside before decontamination procedures, and he had lived in the capsule for weeks before launching. But at least he had the comfort of E-mail and voice mail and human beings wandering around outside the hull.

His Mission Control team were the only ones participating in the launch who even knew that the featureless bell-shaped pod did not contain a probe.

Standard operations had begun. Blake activated the atmospheric pumps which would siphon nitrogen out of the air and create a low-pressure atmosphere of mostly oxygen which would make EVA operations much easier. Then he flipped the switch which would unfold the solar panels in the underside of the ship and provide power.

He heard an odd clunking noise.

"Blake, we have a problem," said Cynthia Morgan, his spacecraft operations engineer. "One of your solar panels has failed to deploy." Blake was astonished. He was barely two hours into his mission and already something had malfunctioned.

He had understood that things could easily go wrong on the mission. Three American probes and six Soviet probes to Mars had been lost due to trivial mechanical failures. But that happened because they were unmanned, and incapable of self-repair. A skilled mechanic on board a Mars ship could grab a tool kit and, in mere minutes, fix anything from a loose bolt to a fuel line rupture like the one that destroyed Mars Observer.

Blake had used that theory as an excuse to cut costs on hardware and simplify his designs. And it made sense that the solar panels would be the first to malfunction: they had moving parts, and caused the demise of more satellites than he could remember.

Unfortunately, to fix the problem meant he would have to go EVA.

He gazed out the window. Earth was so small by now that he could almost see the entire sphere at once if he leaned way out.

If he slipped and fell away from his ship, he would probably live out his last few hours in his suit looking out at the stars an infinite distance away in all directions.

So much for a nice, relaxing, safe voyage.

To Be Continued...

Mars Q&A

Q: I read Red, Green, and now I'm reading Blue Mars by Kim Stanley Robinson. These books are great! Is the Mars Society going to apply Robinson's vision to its real plans or will the trilogy stay just a dream (no matter how wonderful it is)? - Yakov Faerman

A: Dear Yakov Faerman,

I too have read the Mars trilogy by Kim Stanley Robinson, and I have also found it quite illuminating. The book is well grounded in scientific fact, but like all science fiction, it makes some assumptions about future discoveries which may or may not come true.

In Kim Stanley Robinson's vision, 100 people are sent all at once to Mars to start a colony. While this makes for a good story with lots of political intrigue, it is not likely that an initial voyage to Mars would get enough financial backing to support so many people. We are having enough trouble raising the $20 billion required to send 4 people to Mars. To send 100 people to Mars would require about 25 times as much (if they were sent in groups of four), but probably more if a large spacecraft were assembled in outer space to handle all 100 people. Such an undertaking is difficult to image within the near future.

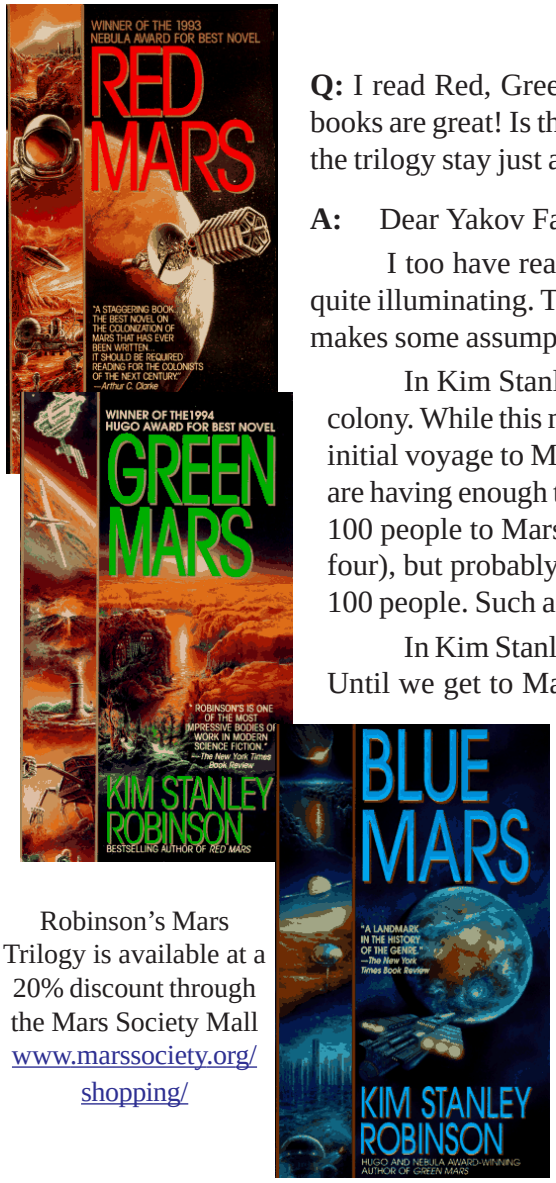
In Kim Stanley Robinson's vision, glaciers and lava tubes are used as living quarters. Until we get to Mars and show that these types of structures can be pressurized without leaking, we must bring our own habitats which have already been tested on Earth.

In the Trilogy, the entire planet is warmed, pressurized and oxygenated in a very short period of time (about 100 years). Any sort of terraforming is likely to take longer than that due to Earth's current political system as well as the magnitude of such undertakings.

So, while Kim Stanley Robinson has certainly given us a dream to follow, the actual plans will have to conform to current political realities, not those of his idealized world.

Yours Truly,

Daniel D Slobig



Robinson's Mars Trilogy is available at a 20% discount through the Mars Society Mall www.marssociety.org/shopping/

The Mars Society Youth Chapter was created to provide Youth the opportunity to become more involved in the Mars Society and other Mars-related issues, and to provide a more effective outreach effort to other Youth.

http://chapters.marssociety.org/youth/

Hakluyt Contest 2000

Win a trip to the **Mars Society Convetion** in Toronto in August 2000 and a **Bushnell Telescope!**

The Hakluyt Prize is awarded to the student who has writes the best letter or group of letters to world political leaders - Presidents, Prime Ministers, Science Ministers, Space Agency Administrators, elected representatives - making the case for initiating a human-to-Mars program.

Eligiblity: students ages 12-22 **Deadline**: May 31

For details visit **http://chapters.marssociety.org/youth/**