

I, Martian ...

A&M scientists work to develop Mars station agriculture

PATRICE PAGES
The Battalion

The world population is expected to grow by 20 percent in the next 20 years according to the U.S. Census Bureau. More animal and plant species are placed on the endangered species list every year, and Earth's atmosphere is getting more and more polluted.

"The earth has a finite number of resources and a finite land area," said Robert Spanarkel, a postdoctoral research associate in horticulture at Texas A&M. "We are using up those resources and that land area very quickly. This is not something that we will have to think about next year or 10 years from now, but maybe 100 years from now."

"We know that there are resources in space that we can use here on the earth," Spanarkel said. "To get to those resources, and to get those resources back to the earth, you have to have ... colonies in space."

A group of A&M scientists is working with NASA's Johnson Space Center to develop life support systems for a Martian base that will use plants and other physical chemical systems for air and water recycling and for food production.

Low-atmosphere plant growth

Plants from Earth will be shipped to Mars to grow there in specially designed greenhouses.

To determine how plants will grow under the extreme Martian conditions, A&M scientists have set up an experiment in which they control plant growth conditions in each of two clear chambers.

"In each chamber, we are able to control the total pressure, so that we can monitor the relative humidity, the water loss of plants, how fast plants grow, how much food they produce, how much oxygen they give off and how much carbon dioxide they consume," said Ron Lacey, associate professor of agricultural engineering at A&M.

By reducing the air pressure to 70 percent of the atmospheric pressure, A&M scientists have shown that plants grow faster under Martian conditions than under normal conditions.

"Besides showing that the plants would grow and develop well, we saw no differences in photosynthesis and the amount of oxygen produced by the plants," Spanarkel said.

"We also found something very interesting. At nighttime, plants take in oxygen and give off carbon dioxide. For some reason, under lower atmospheric pressure, at nighttime, plants give off more carbon dioxide. So we can grow plants

under continuous light, they can continuously be giving off oxygen, and you actually get the plants to produce more food in a shorter period of time."

A&M scientists are now setting up a larger experiment, made of six chambers, to study plant growth in six different atmospheres. The plants used in these chambers are selected by NASA based on their nutritional values, the percentage of the plant that is edible and their photosynthesis rates.

Based on previous missions to Mars, scientists have found that Martian soil, in large part, is of volcanic origin. Spanarkel tried to grow plants using an artificial reproduction of the soil.

"Interestingly enough, plants grow quite well," he said.

Humans and plants on Mars

During the mid-1990s, humans participated in two tests simulating life conditions in a greenhouse at NASA's Johnson Space Center.

In the first test, a person was placed with plants for 30 days at a normal atmospheric pressure.

During a second test, performed two years ago, four people stayed inside a chamber connected to an independent plant-growth chamber, sharing the atmosphere for three months. Within their own habitat, they also grew lettuce.

"NASA discovered, to their surprise, that there was a large psychological benefit to having these green plants growing in their habitat and providing them fresh food," Spanarkel said.

"Nearly all the components re-

quired for human life support were being recycled," said Malcolm Drew, a professor of horticulture at A&M. "There was regeneration of oxygen, human waste was recycled, and water was recycled and resupplied as drinking water to the people involved in the test."

This experiment also tested the ability of humans to psychologically withstand confinement in an artificial atmosphere for a long periods, Drew said. Though the four people could not leave the chambers for three months, they had computer connections with the outside world and access to television and books.

NASA is planning a 425-day test by 2005. The new setup will use five cylinders, each about 45 feet long and 30 feet in diameter.

"The aim is to have a test running for more than a year to prove that the whole system is robust," said Drew. "Also, from the viewpoint of human psychology, it is important for people to withstand these conditions."

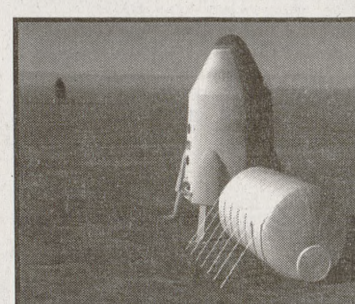
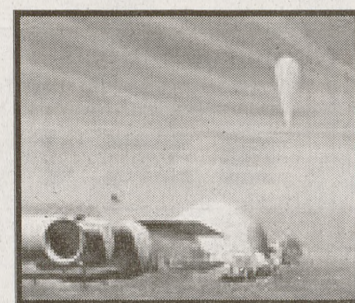
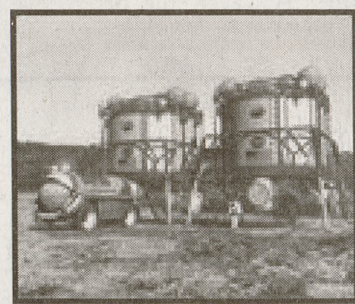
NASA is extending the duration of each new experiment because the first crew on Mars might stay there for as long as 18 months.

Water on Mars

A recent discovery of possible liquid water underneath the Martian surface has been important to the scientists working on future missions to Mars.

Planetary geologists Michael C. Malin and Kenneth S. Edgett, both of the Malin Space Science Systems in San

See MARS on Page 4.



Above: Three possible designs for Mars stations and greenhouses.

Left: Low atmosphere simulation chamber containing a 30-day-old head of lettuce grown at 70 kilopascals (30 kilopascals below ambient room pressure).

SCI F.Y.I.

Question: If clouds are made of water, then why do they appear white or even black at times?

—Rudy Salinas, junior environmental design major



STUART HUTSON

Answer: As you may know, light can be red, orange, yellow, green, blue, indigo and violet. When all of these are combined, you get white light. Take all these away, or block out all light completely, and you get black light.

This is best demonstrated by a prism scattering light into a rainbow.

According to the state climatologist, John Nielson-Gammon, water is really good at scattering and bouncing around all of the elements of light. Therefore, white clouds are thinner clouds that have just blended the colors coming through the atmosphere like a nice daiquiri — thus, white light.

As for dark clouds, I personally used to believe that since dark clouds usually mean rain, their color came from the dust particles which water collects around to form raindrops. Of course, I was just plain wrong.

Nielson-Gammon said the clouds appear gray or black because they are so thick that the light that usually passes through gets blocked off.

Rain usually occurs when a mass of cold air hits a mass of warm air. Clouds carried with the cold air mass are usually more dense because the clouds' water is condensed by the cold temperature. These dense clouds block out more light.

This is why dark clouds are associated with rain.

It's that simple. If you have a question about why, when, or how things happen, just email me at scifi@hotmail.com with your question, name, classification and major, and I'll see if I can serve up an answer.

Web registration poses technological challenge

STUART HUTSON
The Battalion

For Texas A&M students who are tired of dialing in their class selections and being denied by the choppy electronic voice of the computerized telephone registration system, an easy-to-read Web page may seem a better method of adding or dropping classes.

But for A&M Computing and Information Services (CIS), making that method a possibility is far from easy.

"Frankly, I would like to see Web-based registration initiated, but there are a lot of problems that have to be dealt with before that can happen," said Tom Putnam, director of CIS.

Putnam said the first and most significant step toward developing Web-based registration is getting money from the administration.

Universities With Web Registration

- Auburn
- Florida
- Florida State
- Georgia Tech
- Iowa State
- Kansas State
- UC - Berkeley
- Minnesota
- North Carolina
- Ohio State
- Penn State
- Texas
- Texas Tech
- UCLA
- UC - San Diego

"We currently have a proposal for a plan that would cost \$1 million that is up for review by the administration," he said. "But it is hard to convince someone to give \$1 million for one thing when it could just as easily go to any one of a dozen worthwhile projects."

Under the current phone registration system, a student dials into a computerized telephone registration terminal. The terminal then exchanges the entered information (i.e. adds, drops and fee options) with the central mainframe computer that houses the student information management system (SIMS).

SIMS is a database that contains all student records, such as course schedules, transcripts and fiscal records.

See REGISTRATION on Page 4.

The Early Bird... gets the best seats!

Watch your mailbox!

OPAS Season 28 small ticket packages and priority individual tickets will be available soon! You'll want to hurry before the best seats are gone.

Call **845-1661**.

2000-2001 Season Media Partners

Hope Pregnancy Centers

OF BRAZOS VALLEY

I CAN'T POSSIBLY BE PREGNANT, BUT WHAT IF I AM?

Pregnancy Peer Counseling Service
Complete Confidentiality
Full Information on Abortion Risks
Pre and Post Abortion Counseling
Free Pregnancy Test

Mon., Tues. & Thurs. 9-8 • Wed. & Fri. 9-5 • Sat. 8-12

846-1097 3620 E. 29TH ST • BRYAN
www.rtis.com/hope

Want Gifts & Cash?

Then NOW is the time to order your GRADUATION ANNOUNCEMENTS!

- We accept orders until July 31!
- Aggieland Printing can get you ready to mail announcements in one week
- We have our own unique design Licensed by A&M Don't miss it - see them on the web www.aggielandprinting.com

We sell

- Graduation Announcements • Graduation Remembrance Displays
- Thank You Notes • Personalized Graduate Notepads

Order & pay online: www.aggielandprinting.com

Aggieland Printing
1801 Holleman, C.S.
693-8621 M-F 8:30-5:30