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Work, rest and playing on Mars

May 15 2002

In the red dust of the Utah desert, six scientists are dressed in homemade spacesuits and living in a large tin can. Their mission: to prove that sending man to the Red Planet is not really so difficult, after all.

The familiar landscape of Earth - trees, water, buildings, that sort of thing - has long since disappeared from my rear-view mirror and so far there is not much evidence of life. The mission commander told me to follow the track across the stony red desert for about four kilometres



the stony red desert for about four kilometres and keep looking carefully to the left for the "Hab", or human habitation module.

Mars, if this landscape is anything to go by, must be quite a place. The country here almost exactly matches the photographs of the Red Planet brought back by a Mariner space probe. Narrow, flat-topped canyons known as mesas and shimmering plains stretch as far as the eye can see.

Six top-drawer scientists are out here somewhere, living in a large white tin can that looks like a stumpy grain silo with a conical roof - or a drawing of a spaceship in an old comic book - and dressing in spacesuits made from canvas and sticky tape. Whenever they venture out, they don helmets contrived from rubbish bins and plastic light fittings. Behind this odd behaviour lies a serious purpose, or at least an earnest one: to find out what it would be like to live on Mars and whether humans could stand it.

The Desert Research Station has been built by The Mars Society, an organisation that boasts more than 5000 members around the world and branches across Australia. A good few work in the upper echelons of NASA or the European Space Agency. The mission commander, Bill Clancey, is an expert in artificial intelligence.

The society wants to go to the Red Planet for real and is here to put theory into simulated practice. Luckily for its members, wandering about in an improvised space helmet goes more or less unnoticed in the desert of southern Utah. This has always been a refuge for people of a less orthodox inclination. The nearest town is Hanksville, a crossroads settlement named after the Mormon settler Ebenezer Hanks, who in the 1880s chose this as the ideal place to practise polygamy in peace. We are not very far from Roswell, Nevada, where thousands of Americans believe extraterrestrials really did come calling in the 1950s.

I finally find the Hab and boldly knock where few men have knocked before. Clancey, a tall, lanky fellow with a close-cropped black beard, pushes open the plywood-and-tin airlock door and ushers me past a row of neatly hanging spacesuits. He smiles ruefully. He knows the waitresses in town say that, even by Hanksville standards, the latest arrivals seem a bit nuts. "Welcome to Mars," he says.

There is a powerful odour of old laundry and primitive lavatory system. The commander tells me to take off my boots - alien dust could do no end of damage - and we climb the steep wooden stairs to the command centre and living quarters. "We are not pretending to live on Mars," Clancey says. "We are testing living on Mars. We are working out what we need to do and what tools we need to do it." To us, it might look like grown-ups playing at astronauts, or maybe acting in an old-style, low-budget sci-fi movie, but to them, it is what they call "operational analogue".

They want to go to Mars. They are experiencing what it takes to live in exactly the same sort of tin can they hope to take to the heavens. They are breathing Earth air and getting their water delivered in a tanker, but they say this is like conscripts drilling with wooden rifles: you can learn the moves, even if you need a real gun when the fighting starts. "You have to try out your ideas at some point," a crew member says. "You can't go straight from theory to space."

The crew of four men and two women have been on a "sealed" mission for two long weeks, with not so much as a terrestial telephone call. Each crew member has a narrow room just big enough for a bunk and a storage chest. After a few days, they complained they would like windows, too. It is not easy being on Mars.

Dr Nancy Wood, the crew biologist, leads me down the "virtual tunnel" to the Greenhab, a kind of space greenhouse. Her dark eyes, the sort that can still gleam with enthusiasm after 20 years of peering through microscopes, are shining. "We are

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cultivating plants for symbiosis with nitrogen-fixing organisms because we know there is nitrogen on Mars," she says. I do not even ask what this might mean. She goes on: "And people really like green plants. They offer a place to get away from cramped crew quarters and restore yourself a bit."

She reaches across a complex, electronically timed watering system and plucks a single sprout of - appropriately enough - rocket from a seed tray, passing it to me to taste. She plucks another and pops it in her mouth. We munch. She glows. "Doesn't that taste good?" she asks. It does: a sharp and mustardy taste, an earthy taste.

The Mars Society believes it can mount the expedition far sooner and far more cheaply than NASA envisages. NASA says it will not even consider taking humans the 59.5 million kilometres to Mars and landing them there until the next unmanned probe collects its samples and returns to Earth, which it is due to do in 2020. Only when the orbiting International Space Station is complete could NASA use it to build an interplanetary spaceship on a scale greater than anything yet attempted: it would have to carry all the fuel, food and supplies for a journey of at least 18 months.

Yet 2020 is simply not soon enough for Robert Zubrin, the founder and president of The Mars Society, who has published what amounts to a space manifesto in his book *The Case for Mars* (with an approving foreword by the veteran science fiction writer ArthurC.Clarke). Zubrin says he could send men and women to Mars within 10 years and could do it for, oh, only about \$US10 billion (\$18 billion). "If we could just get \$100-a-head from the millions of people who think it is important to explore space, we would be on our way." Membership of The Mars Society is \$50 a year.

Zubrin, 50, is an astronautical engineer - a rocket scientist, you might say - with a serious reputation in the esoteric world of space science. He worked for Lockheed Martin, the builders of some of the hardware that went to the moon, and since 1991 he has run his own company, Pioneeer Astronautics, which has five contracts for research and development with NASA and the Pentagon. "My latest job," he says, "is developing new breathing systems for spacesuits."

Zubrin hopes to create a groundswell of support that might twist the US Government's arm to try it his way, or might produce enough funds for his own private-enterprise rocket to Mars. So he needs to show that such an expedition is a practical possibility.

"I want to do it the same way that successful explorers have throughout history: travel light and live off the land," he says. The key to success is his idea of making the fuel for the return trip rather than carrying it with them. Martian air is mostly carbon dioxide and could be mixed with hydrogen to make rocket fuel. But where to get the hydrogen? There is water on Mars, he says.

The presence of water is why scientists remain convinced that if there is, or has been, life beyond Earth, it should be found on Mars. "That is one of the reasons why we must go to Mars," Zubrin says. "That is the Holy Grail of science. Is life on Earth unique, or part of other life? And we must go because we should establish our first foothold in space. The fate of our planet is unknown and we should start a human culture on Mars. One day we will need it."

So it is that the occupants of the Hab find themselves working on the details - the practicalities of a voyage to Mars. Will their Hab actually work as a place for six people to work, play and sleep? Would they get on better as a military-style hierarchy or as a commune of equals? Should they take one-man Mars buggies on the big trip or something bigger - a sort of space Range Rover or LandCruiser?

The hottest of all topics here, however, is the composition of the crew. Zubrin's wife, Maggie, wants to try an all-female crew for gender harmony. "Realistically," suggests Andrea Fori, 32, a systems engineer from Lockheed Martin who is the crew geologist, "you have to maintain some sort of Earth life. Six strangers to Mars? Three years? It would have to be established couples."

Vladimir Pletser, a 46-year-old Belgian, is a scientist with the European Space Agency. He is also the crew member most likely to travel into space. Having trained as an astronaut, he is second in line to represent his country on the space shuttle. "Of course we should take women," he says. "They smooth things out. Men, they will confront each other."

After lunch, we prepare for a space walk. We tumble down the wooden stairs from the living quarters and head for the airlocks. Pletser and a German colleague, Jan Osburg, start hauling on their spacesuits. The suits are makeshift - the oxygen pack is a Tupperware box big enough for a family picnic, and the air is pumped through vacuum-cleaner hoses by fans borrowed from computers - but the radios are real. The "Mars buggies" waiting outside, however, are quad bikes.

A notice on the inside of the door warns us to beware of cougars: the tracks of a mountain lion have been seen in a nearby canyon. If there is life on Mars, it will be micro - a bacterium, perhaps - and nothing as macro as a mountain lion. Oddly, however, the mere idea of there being a cougar out there jars. A day spent with Clancey and his crew generates a strangely extraterrestrial feeling.

"Check for loose nuts and bolts," reads the first line of the 32-step instructions on the spacesuits, but it is too late for that now. The airlock is about to open.

"Helmet on and green for go!" cries Osburg, any hint of irony muffled by his breathing pipes. Then he turns and solemnly adds: "Once you are out there, you know, this suit is your only chance of survival."

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