

ENDLESS FIRE
Mars Madness
SAMPLE

By
R E Kearney

Also by R E Kearney

Future Furies

Aethon Arises

Limos Lives

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*To Barb, my loving wife, best friend and the Editor in Chief.
Without her encouragement and assistance I could not
and would not have written this story.*

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WE ARE ALL GOING TO MARS!

Hello...Bonjour...Hola...Guten Tag...Marhaban...Kon'nichiwa...Ni hao...Hi world!

My name is Doctor Reine des Abeilles. I am the Genesis Mars colony team's primary care doctor, genetic engineer...and your designated tour guide.

As you and I travel to Mars, you are going to see everything that I see. Because...you see...you will be riding along inside me.

Yes, I know that may be confusing.

So, allow me to explain. At this moment, what you're seeing is a 3D volumetric visual of me looking at me...myself...and I...in a mirror. I'm transmitting me looking at me to you through my right, bionic eye.

Yes, this eyeball I'm now touching with my right index finger. Looks normal, doesn't it? But it is not. My right eye is a bionic eye implant connected to neurograin computer chips in my brain.

Now, hidden in my hair...stuck on my scalp...here...where my right index finger is now pointing...is a thumbprint-sized thin electronic patch that wirelessly powers my network of neurograins. That patch also sends and receives signals. These neurograin computer chips in my brain provide me with a brain-to-brain interface with Artificial General Intelligence quantum computers. My chips integrate me directly into the artificial neural network of biohybrid artificial synapses that allow living cells to communicate with electronics using electrochemical signals.

Or to say it more simply, I am able to communicate with and control all types of computers with my brain signals.

So, some of you may call me a cyborg...others...a transhuman.

But I prefer to refer to myself as a Homo Cyber-Sapien, because, as you can clearly see...even with me enclosed in this biodegradable, lower-body-vacuum suit and power generating exoskeleton...I am biologically...a twenty-seven-year-old, Homo Sapien female.

But, thanks to these neurograin computer chips embedded in my brain that are powered by the friction of my body movements, I am also cyber...connected to Earth's worldwide brain-net, too.

So, that's why I proudly call myself a Homo Cyber-Sapien...a female with double X chromosomes, Homo Cyber-Sapien that is.

But agreeing to become a Homo Cyber-Sapien is not why I'm a member of this Mars colonizing team.

The Society Preserving Endangered Agriculture...or as I call it...SPEA...chose me for Genesis from more than ten thousand volunteer applicants.

The SPEA team...the people directing and controlling the Genesis mission...told me they selected me because of my unique genetic mix of French and Vietnamese and Polynesian descent...my youth...and my advanced training in primary care medicine and genetic engineering.

Also...and very importantly...I possess the low-drama personality and social skills that are believed to be required for our team to survive and succeed in ICE...with ICE being the isolated, confined, and extreme environments of space and Mars.

But that's enough about me for this our first and introductory meeting. You'll learn much more about me in the days, months and...hopefully...years ahead. You and me, we're going to be chatting a lot. At least, I hope so.

Ok, since I've told you a little about myself, I think I will leave this mirror and give you a quick view of my cozy home...the Mars Genesis team's habitat module mockup that I share with three other future Mars settlers.

Now, before I show you anything else, I want you...through me...to look at my mirror...watch it.

Did you notice how the mirror appears to float? Neat, hunh?

Yes? Well you're not hallucinating, because it is floating...a little, anyway.

It's not magic. There are no wires. My mirror is hovering due to a combination of magnets and air blowing downward against the floor.

Because our instructors are attempting to prepare us to live and work in space...where there is microgravity...and then on Mars...where the gravity is only thirty-eight percent of Earth's gravity...they created this low gravity environment here on Earth.

Ok? So, here is how it works. First, we are standing on a perfectly flat and smooth air-bearing floor where a lot of air is constantly pushed down against the floor to create a type of frictionless, weightless environment.

Understand? Now, the second part involves employing the opposing forces of your basic dipolar magnets...magnets with north and south ends or poles.

Just like most of us learned in school, when dipolar magnets are placed in opposition to one another...you know, north against north and south against south...the magnets will repel one another.

Got it? So, appropriately, our ceiling is a giant magnetic north pole while our floor is a giant magnetic south pole.

All the objects in between...including our uniforms and especially our shoes...are embedded with dipolar magnets with...of course...their magnetic north poles pointing up and their magnetic south poles pointing floor-ward.

Makes me feel pretty light on my feet. Just between you and me, I've often been told that I have a flighty personality, anyway. Ha, ha, that's a joke by the way.

Anyway, at this moment, we are sort of suspended in the original center of our habitat.

Watch as I slowly spin so you can view the four meters tall, twenty meters in diameter, graphene-walled, cylindrical container we first entered almost a month ago.

Did I make you dizzy? I hope not. Still, I imagine that you're curious about some of the unique fixtures and devices you may have seen during my three-hundred-and-sixty-degree whirl.

Well, to be truthful, after a month, I still don't know everything about all of these things. So now, let me introduce you to one of the other members of the Genesis team.

This man to my right...smiling at me...or I guess I should really say us...you and me...is our astronautic agronomist, William Ruimteboer. You may have noticed him during my twirl.

William or Willie...as he prefers to be called...was born and raised in Surinam but comes to us from the University of Wageningen in the Netherlands. Willie was also recruited by SPEA.

Like me, he was chosen from thousands of volunteer applicants due to his skills and youth and pleasing personality...and...although he never likes to be reminded of it...also because he is short and thin.

So, like me, he doesn't take up a lot of space, eat a lot of food or make a lot of waste. Besides that...well just look at his cute smile.

We are very happy that Willie agreed to join Genesis. He is a highly knowledgeable biotechnologist, entomofarmer, pisciculturist, synthetic biologist and plant geneticist.

In other words, Willie holds a whole lot of info in his brain. And he isn't connected to an AGI...like me.

Willie is responsible for producing our clothes, our food, our oxygen, our medicinal herbs, and our drinking water.

Yes, Willie is multi-talented. He grew the algal seaweed which he converted into the alga-based fibers, which he then additive-manufacturing or 3D printed into this biodegradable clothing that we are wearing.

I hear that these plant pants will soon be all the fashion on Mars, Willie.

"Well yes, Reine, this alga-based fabric..." Willie pinches a bit of his uniform. "...will be the material we'll use to make all of our clothing in space...and then on Mars.

Not only is this clothing easy to grow...while requiring limited space...but it's also compostable. Compostable clothing. Wear it out. Bury it. Grow your next shirt on it. In a way, you could say that you're wearing the fertilizer for your next ensemble."

Uh no...no you can say that...Willie. I don't believe I'll ever mention that I am wearing fertilizer to anyone.

But let's move along. Perhaps more important than growing our clothes, Willie is experienced in growing edible plants, edible insects, and certain species of fish in the artificial environments of space using aquaponics and genetic editing.

Also, he is an expert at using additive manufacturing bioprinters to cultivate individual poultry, pork and salmon cells into tasty meat and fish muscle tissue.

Willie is the type of man, every woman needs. He is an expert at creating food in his lab and then perfectly preparing it, as well.

Two days ago, he generated and served us a delicious meal of additive manufacturing bioprinted chicken and greens.

Isn't that right, Willie? Why don't you tell our visitors what you are working on here?

"Certainly Reine." Willie places his hand on the supporting end post of a two-meters in diameter by five-meters long rotating, horizontal cylinder.

Visible through the transparent cylinder's walls are four bundles of six, side-by-side, lighted, pressurized, planters stretching from one end to the other. As the cylinder rotates, each, group of planters shifts its position, like a Ferris wheel's chairs so their bottoms always face down and the plants growing out of the holes in their top always face up towards the light.

Willie pats the support post. "This rotating greenhouse is my bio-regenerative life-support system. Using this system, I plan to grow protein rich plants like waterlinsen...you may know it as duckweed...in the soil-free and dimly lit environment of our habitat module during our trip to Mars.

While we are traveling in the microgravity of space, I will lock the pressurized, planter in place and increase the rotation of the greenhouse to simulate Mars gravity. Then...when we land...I'll move it to Mars...expand it...add more types of plants to feed us there."

Willie points at a passing planter of small green plants. "The waterli...uh...duckweed I grow in here will provide us with the protein and minerals and vitamins we need. Also...in addition to feeding us...the plants will produce some of the oxygen we need as well. And in return...this is why it's called a bio-regenerative life-support system...we will exhale the carbon dioxide that the plants need."

"Is that enough, Reine or should I tell them about our *Chlorella vulgaris* microalgae oxygen producing photobioreactor? You know *Chlorella vulgaris* microalgae is..."

Uh, right. Yes, for today, that's enough. Thanks for those explanations, Willie. You can return to your work, now.

Smiling, Willie turns his attention away from Reine and back to his cabinet garden.

So, as you see, Willie is important...very important...to the Genesis team. He is the team's space farmer...growing our clothes...growing our food. Without Willie we would soon be naked and starving.

Now, over here to my left, are the other human members of the Genesis team.

The shorter lady is robotics engineer and our ace mechanic Jiqiren Gongchengshi from California. She can sniff out problems before they happen and fix just about anything that can be fixed.

Next to her is Construction Engineer Abeja Reina Muhandis from the United Arab Emirates.

As you can see, they are also females my age. Like Willie and me, SPEA recruited them for their skills, youth, personalities, and genetics.

Now, you may be asking yourself...or wanting to ask me...why are there three females and only one male on the Genesis team?

Well, there are a number of reasons for this with most of them being biological.

For example, microgravity emasculates men. Really messes with their hormones, sexual organs, eyes, heart, and blood. No matter how hard Willie tries, he will be a weak Willie when we arrive on Mars.

But the most important reason for more females than males is baby making.

As we all know, only human females are capable of carrying and birthing and nursing human babies...or of being surrogates.

So, we three women...Abeja and Jiqiren and me...are people capable of producing people. And aren't more people just who we'll need to colonize Mars? So, in addition to preparing Mars for the arrival of more settlers our other desire and task is to birth human babies on Mars. Like so many things, just how we three women are planning to birth and nurture babies on Mars will be described during future discussions.

MARS SUPPORT ANDROIDS

Now, I am going to introduce you to some of our Mars Support Androids.

Currently...as you can see...uh...actually because I see them...Abeja and Jiqiren are working with two of our thirteen Mars Support Androids...or as we call them...Marssans.

These two are named Marssan-four and Marssan-five...notice the identification numbers on their biodegradable, turquoise jumpsuits. The same identification is imprinted on their chest plates.

Marssan-four and Marssan-five...like all our support androids...are highly advanced Collaborative Robots with human brain cells physically integrated into Artificial General Intelligence microchips or, in much simpler terms, CRAGIs.

Biohybrid artificial synapses within the Marssans allow living cells to communicate with electronics using electrochemical signals enabling Homo Cyber-Sapiens...like me...to communicate with and control Marssans with our brain signals.

Regular humans must communicate verbally. Too bad...so sad...for you.

CRAGI Marssans possess a neuro-symbolic, artificial neural network in their imitation brains enabling them to learn through observing and replicating our actions then self-correcting to eliminate errors.

Our thirteen Marssans are also programmed with neuromorphic chips and algorithms to give them some level of common sense.

So, you might say that mentally our Marssans are similar to children...extremely intelligent children...yes...but still...children that we must constantly teach and supervise.

Now you have probably noticed that the Marssans are nearly identical in appearance...alike yes...but not exactly the same...so they are individually distinguishable.

All of the Marssans' heads and faces are similarly designed to evoke a friendly, supportive, androgynous appearance employing simplistic, symmetric, genial...almost featureless features...which makes us humans comfortable and secure working with them.

You should also notice that the Marssan structure is similar in size and shape to a physically fit human with a height of one point eight meters and an upper body or human shoulder width of one point one meters.

I must tell you that I am quite jealous of the Marssans' waist which measures a slim, trim eighty-six centimeters in circumference.

And just think, they get to keep their tight tummy without doing one sit-up.

Look closer now and you will notice the electronic skin covering them from head to heel, which endows them with a sense of touch similar to us humans.

But different from us humans...as you may have noticed...our Marssans operate octopus-inspired soft robotic arms and hands with vacuum-based biomimetic suckers on their four octopus-mimicking, tentacle fingers.

An opposable tentacle thumb gives Marssans the ability to grip, move, and manipulate objects of all shapes, sizes, and textures.

Additionally, Marssan-one, Marssan-two, Marssan-three, Marssan-four, and Marssan-five are all capable of limited shapeshifting into the special types of construction equipment required to establish and build our Mars colony structures.

The five Construction Marssans will also be working with hundreds of small, assembler robots that will not only build some of our Mars' structures using Mars materials, but then will live on those Mars structures, continuously maintaining and repairing them.

Imagine a bunch of ants that you actually want to have crawling around your home. That's how I view our assembler robots.

But, enough about the Marssans and their assembler robots. Let's talk to my fellow female colonists...Abeja and Jiqiren. Ok?

Abeja! Jiqiren! I certainly hope you are planning some additional modifications to our Genesis team's Mars habitat module mockup, here.

Perhaps, you can enlarge it a little more?

Jiqiren points toward Reine. "That's just what we are considering."

"No. You're the only one still considering, Jiqiren...as usual. I am planning to act." Abeja snaps while scowling at Jiqiren.

Uh...ok then...Abeja what is your plan? Please tell our interested viewers. Are you preparing to enlarge our module mockup, again?

Just to update you all, since arriving, Abeja and Jiqiren inflated and attached four individual, personal living spaces to our original living container. They're small, but actually quite comfortable chambers, as I will show you at a later date.

Replacing her scowl with a smile, Abeja turns to answer Reine's question. "Yes, I have ordered Marssan-four and Marssan-five to complete some additional expansions. After all, the modules we transport to Mars are designed to grow...as we grow...or at least to become as large as the Martian lava tube we plan to inhabit will allow."

Lava tube? Please describe to me and my brain-net companions what you mean by lava tube, Abeja, and why we are planning to live in one of them.

Peevishly pursing her lips and closing her eyes, Abeja hesitates before beginning to explain. "Well, I suppose I can provide a simple description for the naïve newcomers. A Mars lava tube is a large cavern formed by volcanic activity centuries ago. Numerous lava tube openings or...as we call them...skylights...have already been located on Mars. Some of these openings are large enough inside for our compacted habitat. Living inside a lava tube will protect us from cosmic rays, solar rays, Mars' dust storms and Mars' extreme weather. So, once we are inside and I learn how large the tube is, I will enlarge our habitat to fit it."

Aha. So, that is why we've been living underground in this abandoned Spanish Cava wine cave for the last three weeks, so you and Jiqiren can practice constructing our future Martian home.

Abeja nods her head. "Yes, it is best that I test and prove...or improve...our habitat and our life support equipment here on Earth...before I leave Earth...while I can. Certainly easier to acquire that screw or bolt I need now. No parts supply depots on Mars, you know."

Jiqiren steps toward Abeja with her right index finger raised. "Which is exactly why I told you that you should interface with Marssan-four and Marssan-five in order to consider all of our options and to ensure that we select the most effective and efficient plan. Their brain-net connection enables them to instantly calculate our optimal design and eliminate extraneous errors. Trust their algorithms, Abeja. That's why they've been assigned as our colleagues."

"I will welcome the computational support of your fancy androids when I need it, Jiqiren." Abeja arrogantly retorts. "Which I won't! I am proud to be a highly trained and experienced Emirati engineer and I refuse to give up my ability to think and make my own decisions to any android, no matter how many Qubits comprise their quantum computer brains. Digital dependency creates digital dummies. I consider androids to be metal muscle and nothing more."

Jiqiren's face flushes hot red. "They are Marssans...not robots...not androids. Marssans, Abeja! Please, at least insult them by their correct name. And you cannot treat these...my Marssans...like you mistreated your servants back in the Emirates. I will not allow it! I am the cyber organism engineer here. With SPEA's help, I refined these thirteen Marssan CRAGIs to be our partners on Mars...partners...not slaves. Do you..."

Abeja stabs her finger toward the two Marssans. "They are not humans! They are tools...simply tools!"

"No! They are not!" Abeja's maligning of her Marssans outrages Jiqiren. "Nothing is simply a tool. In my world, there is no difference between humans or animals or...Marssans. According to the Shinto beliefs my parents taught me before they died, all things possess a bit of soul. Just like me, each of my Marssans enjoy their own particular kind of kami...human-like behaviors."

"You can believe in your Shinto hocus pocus...your kami...all you want. But I still expect them to perform the tasks that I require." Abeja leans toward Jiqiren. "Just like you."

Insulted and refusing to concede, Jiqiren pushes her face forward to within centimeters of Abeja's nose. "In no way! No way do I work for you! And it is time for you to learn that. I consider every Marssan and every robot traveling with us to Mars to be an extension of myself...my life. So, you insult me every time you malign one of them."

Abeja backs away but does not back down. "You're sad...simply sad. You do understand that anthropomorphizing all your fancy android and robot toys, like you do, is childish and stupid. Why don't you grow-up?!"

Jiqiren clenches her jaw. Her eyes narrow to blazing red slits. She seethes silently.

Abeja's nostrils flare. Snorting like an angry bull, she turns and stomps to the far side of the habitat.

Uh...I think I shall allow Abeja and Jiqiren to discuss this between themselves.

So, allow me to grab my mirror here...

There, I can see that you can see me, again.

So, I hope you all enjoyed our little visit. I attempted to make it fun for you.

However, before you leave, I need to speak very seriously for a moment, because you should...you must...understand that what we are attempting is extremely important to you.

We four Genesis settlers are going to Mars to establish a colony...to safeguard the continuing existence of the human species by spreading the human seed to Mars.

Genesis is also going to Mars to preserve you people remaining on Earth by searching for and providing some of the materials humans need to continue to survive here...here on Earth.

So, are you interested in learning more and even in joining the Mars Genesis team?

Well, if you want to visit me again and want me to personally message you and update you then simply agree to become a Mars Spacefarer.

It is easy. It is simple. And being a Mars Spacefarer entitles you to earn special honors and attend special events.

Methods for becoming a Mars Spacefarer will appear in a moment.

So, that's it for my first getting to know you...or I guess...getting to know me and my fellow Genesis colonists' session.

I hope you all will join us again as we take our next step on our trip to Mars.

Let's all be Mars Spacefarers!

GENESIS CONTROL

The future of mankind is being created in space between Earth and its Moon.

Glowing ghostly grey, the pock-marked Moon encircles a frantic ballet playing out above Earth's roasting, carbon-dioxide and methane choked skies. Four hundred and two kilometers above Earth's polluted atmosphere, three Mars transports are being assembled as they race through space at eight kilometers per second in their low Earth orbit.

The Mars transports under construction are officially named the Mars Colony Spacecraft Adventure, the Mars Colony Spacecraft Resolution, and the Mars Colony Spacecraft Diligence in honor of explorer, navigator and cartographer, Captain James Cook. The Genesis team said they were inspired to name their ships after Captain Cook's ships because he sailed aboard them for thousands of kilometers across uncharted oceans to discover unexplored lands just as they will sail through space to Mars.

In space, six surveillance Cube satellites hover around the three growing, interplanetary transports. The Cube satellites' are transmitting visuals to SPEA's Genesis control center located in the 3D printed community of Venus on the seasteaded island of Kiritimati. There, a three meter by four-meter 3D volumetric display visually reproduces the astronautical construction work of ten Marssans wearing communication helmets, space-work jump suits, and personal-propulsion-packs.

Thirteen astronautical Controllers, sit in a semi-circle around the volumetric display in SPEA's Genesis control room. The Genesis control room was established for their safety and security on the isolated Kiritimati Atoll of the Kiribati Pacific Island chain. They are intently watching the Marssans carefully position the excavator module atop the fusion reactor module of the MCS Diligence. Without uttering a word, the Controllers are mentally coaching their Marssan counterparts in space. They have no need to speak.

Like Doctor Reine des Abeilles, the thirteen Controllers are Homo Cyber-Sapiens. They are directly connected to the Marssans and each other through a neural-network, brain-to-brain interface that generates an Internet of Neuro-electronics or brain-net. Artificial intelligence computer chips embedded in their brains link biological and artificial neurons together enabling communications across global networks.

Along with bits of information their brain-net also transmits emotions, feelings, sensations, and memories. Brain-net members, including the Marssans, experience the anxieties, suffering and fears of all others. Together, human to human to AGI to Marssans and back again, they form a growing symbiotic family.

SPEA's Controllers are monitoring and directing the Marssans, as they magnetic-flux pin module onto module. Tethered to the ultra-light, stronger-than-titanium, carbon nano-tube skin of the excavator module are five Marssans. Simultaneously, they fire their propulsion packs and slide the inverted shallow bowl base of the excavator module over the one-quarter-of-a-sphere top of the fusion reactor module. Fits perfectly.

Another team of five Marssans push against the module's external descent engine skirts and grid fins. Generating a twisting motion, the Marssans lock the modules together, one on top of another. Over the months, the three spacecraft have grown to resemble three long stacks of huge portobello mushrooms.

Resembling a long mushroom stem, each MCS spacecraft's main booster engine, extends from the end of each mushroom stack. Only in the microgravity of space, are the Marssans able to amalgamate the mushroom cap shaped modules into these three non-aerodynamic spacecrafts. They could never have been constructed or flown off Earth.

The three MCS spacecraft are assembled to disassemble in a planned and orderly process. Once in Mars orbit, one after another, beginning at the leading end of each spacecraft, individual modules will separate from the main body to descend and land on Mars. Eventually, Marssans are

expected to transport the human habitation modules into a selected Martian lava tube through its skylight. The remaining support modules will be positioned around the lava tube's skylight on Mars' surface.

"Wow!" Kanaka Waiwai's high pitched, squawky voice shatters the silent synchronization of the Genesis control room. "I've organized and directed thousands of workers over the years building hundreds of thousands of things. But, Robert, watching your team turn my dreams for Mars into reality...well...it is exciting...stimulating. I wish I hadn't waited so long to finally visit you here."

Actually, Robert had been purposely preventing Kanaka from visiting. Kanaka is a notorious, Hawaiian money manipulator, who resides sheathed in self-imposed importance. In truth, he is a slightly shady dealmaker who sponges off the extremely wealthy investors he convinces to invest in his projects. Robert believes the only thing Kanaka knows about science, space and Mars is that there is NUMUS to be made there.

Robert gestures toward his team of Controllers. "I'm happy that you're happy to be here...and now..." Smiling, Robert closes his eyes for a moment. "...and now so are they."

Synchronously, thirteen Controllers turn as one to face Robert and Kanaka. Together, for exactly four seconds, they smile at the two men. Then, without a word, they simultaneously cease smiling. Moving as one, the thirteen Controllers turn away from Robert and Kanaka, returning their attention to the volumetric display and astronautic Marssans.

Kanaka shudders. "Well that was certainly unsettlingly creepy. Why did they act that way?"

Robert chuckles. "Did their smiles distress you?"

"Well yes! I just told you that they did." Kanaka growls.

"And that's exactly why they do it." Robert smirks. "They're all teenagers, after all. Ultra-intelligent teenagers, true. But still teenagers who do normal teenager things...like aggravating adults when they have a brief break in their work...like they do now. So, don't allow them to bother you. Shrug it off or they will just conceive of some other way to torment you."

Kanaka dismissively shakes his head. "I must say mister Goodfellow that I expect better behavior...no...require more respect from people who work for me...teenage geniuses or not."

"Aha, but as Lucius Annaeus Seneca once said, 'No great genius has ever existed without some touch of madness.' And my chip children's slight touch of madness is what makes them interesting and why I love them." Robert announces wearing a proud smile.

Frowning, Kanaka first looks at the thirteen teenagers then at Robert then back at the teenagers then back at Robert. "You never told me that you have children. We've been collaborating together on Genesis for more than two years now and...well. Why didn't you tell me?"

"You never asked." Robert closes his eyes, inhales deeply through his nose, and holds it for several seconds. Poof! He exhales. "By the way, how do you like our positive oxygen today?"

"Uh, yeah." Surprised by Robert's question, Kanaka sniffs distractedly. "Smells great. Best oxygen I've snorted for a long time. Much better than the stench of hot rot outside my home on the mainland."

"Yep, certainly is. Since it is spring, I chemically created and infused a lavender rhododendron scent into our purified sea breeze. Living here in the middle of the south Pacific is great, but my children...they've never smelled...never enjoyed breathing the fresh, flower-filled Canadian air that I loved sucking deep into my lungs as a youth. I think they deserve it. Look at them. I think they like it, too."

"Scented sea breeze? Is that why SPEA built...or seasteaded...as you like to say...the Genesis control center way out here on the half-submerged Kiritimati Atoll?" Kanaka complains. "Took me two full days of travel to get here. You can't be much more isolated than this."

"Isolation is protection." Robert immediately defends his location. "With the climate collapse causing chaos worldwide, controlling all Genesis operations from here in self-supporting Venus on seasteaded Kiritimati enables my Controllers to work without fearing food or water shortages or attacks. Besides, Venus is a beautifully crafted community...rises from the sea like Venus in Botticelli's Birth of Venus. Which is why we named this place Venus. Here, we have everything we need...including peace."

Kanaka scans the young Controllers again, then scratches his temple. "All of these...uh teenagers...they all appear to be the same age...and twelve of them look alike...like twins. Not like you, either."

"Well, I think Aethon resembles me...at least a little. Don't you?" Robert nods toward a dark-haired girl working in the lead position at the front of the control room.

Kanaka stares intently at Aethon for several seconds. "Sorry, I don't see much resemblance to you. But at least she looks different from her dozen coworkers. Why is that?"

Robert smiles proudly. "Aethon is my naturally conceived and naturally born transhuman daughter. Her mother is my life partner, Rita."

Kanaka shakes his head. "Ok. I still don't see any resemblance. But I'll take your word for it. So, what about the other twelve...the ones you called your...uh...chip children. Chip children? I don't know that term. Some clarification would be helpful."

Robert sweeps his hand across the room. "Basically, these twelve duplicates are my artificial progeny. They are genetically modified, transhumans with AGI-enhanced-intelligence grown from embryos containing a mixture of my genomes. In Puerto Rico, Genetic engineer Shengwu Kexuejia designed and developed their twelve embryos through algorithmic manipulations and CRISPR editing of my DNA. She also edited their ASPM gene to radically increase their intelligence and then embedded AGI neurograin biochips in each of their brains. And that's why I call them my chip children."

"So only that female you call Aethon...your daughter...is a real person, then?" Kanaka motions toward the Controllers. "They aren't? Your dozen chip children aren't actual humans?"

Robert is insulted. "I beg your pardon. Yes! My chip children are most certainly humans. Special humans! Better humans...a new species...according to Shengwu. She claimed that they are the next stage of human evolution because she created them through germline genetic changes. So they can pass on their germline genetic changes to all their descendants because they are permanent components of their genomes. Best human beings genetic engineering can create!"

"Hah! Better humans, you say...according to you...and yet they cannot speak." Kanaka waves his hand dismissively.

"Oh, they can speak...when they need to...when they want to. But speaking and listening and then processing what they hear is so much slower and much more prone to misunderstanding than communicating via their neural-network, brain-to-brain interface's direct and immediate thought transference." Robert lightly taps his temple.

"They are a brain-net, after all." Robert meshes his fingers together. "Instantaneously and constantly, they are mated mentally to each other and to their Marssans. No mumbling. No stumbling. No mistakes."

Robert gestures toward Kanaka. "I mean, you...you're the perfect example of why speaking can be just a tiresome waste of breath. After all, you still haven't gotten my point and I've been trying to explain it to you for several minutes.

Kanaka's face flares red at Robert's verbal slap. He glares at Robert for several silent seconds. As an international, venture capitalist and entrepreneur who normally commands hundreds of subordinates, he does not appreciate Robert's flippant attitude and belittling remarks. Kanaka inhales and exhales loudly, attempting to reprimand Robert with his respiratory show of displeasure. Ignoring him, Robert returns his attention to the volumetric display.

Flexing the muscles in his jaw, Kanaka chews his anger into snide comments. "I didn't really want to hire you and SPEA, but I was told that you are the best. So, I trust your crew of speechless, superhumans will have my three transports ready for Earth escape by the Mars-Earth alignment time launch window. We're running short on time, Robert. We cannot afford to wait another twenty-six months to launch, just because you and your crew can't get their ships together."

Without diverting his concentration from his Marssans working in space, Robert snipes. "If your chatty crews on Earth can get the remaining modules up to my silent, space assembly team on time, then yes. Your three Mars transports will be loaded, manned, and prepared to fly the Hohmann transfer orbit to Mars as soon as the launch window opens. Now, where is your sustenance module?"

Kanaka is quick with a sharp reply. “My assembler robots completed the sustenance module some days ago but have had to wait on your group of supercilious teenagers and Marssans to prepare the spacecraft to receive it.”

As if responding to Robert’s call, multi-mission space utility vehicle, Nerio, coasts into orbit below the three Mars transports. Resembling a giant stingray, Nerio appears to float into position near the MCS Adventure. When it is as close as is safe, the vehicle’s commander enters a parking orbit then releases the sustenance module.

With a little push of compressed air, the sustenance module rises free of the Nerio. Having delivered its cargo, Nerio drops out of its low earth, parking orbit. Riding Earth’s gravity, it orbit-coasts back to the Mohammed Bin Rashid Space Centre’s cosmopolis spaceport outside of Dubai to retrieve another module.

Straightaway, the atmosphere of the control room transforms from relaxed to fully alert. Robert and his thirteen Controllers focus and silently shoot their mental directions four hundred and two kilometers into space. The thirteen Homo Cyber-Sapien brains merge with the Marssans’ CRAIGI creating a hybrid. Immediately, SPEA’s ten astronautic Marssans descend upon the free-floating sustenance module. With well-practiced precision, they begin shoving the module into position above the partially assembled MCS Adventure.

“Shouldn’t you be directing them? Giving them orders?” Gripes Kanaka, pointing toward the controllers.

“No directions are necessary. Just watch how synchronized and smoothly my chip children and Marssan team position that module into place. That’s Canadian know how. Building spacecraft in space is not new to us.” Robert brags. “Decades ago, my fellow Canadians employed a humanoid robot named Dextre to help build the International Space Station. We controlled Dextre from Earth, too.”

Snubbing Robert, Kanaka stretches forward ostensibly seeking closer scrutiny. He squints and softly whistles. “Huge. Gigantic. Perhaps it’s a volumetric display visual effect. Possibly, my eyes are deceiving me. But these are the biggest interplanetary ships, I’ve ever imagined. Certainly the largest anybody has ever built. Each new module just makes them...well, I don’t know...more colossal.”

“Oh, yes, what you say is definitely true. Of course, until now, you’ve only been seeing each separate module as you assembled them on Earth. It’s only by uniting your many, oversized modules in the microgravity of space that we’ve been able to create these three behemoths. And they’ll just continue growing...like now.” Robert explains, while never removing his attention from the volumetric display’s activity.

Robert’s clarification is ignored. Twisting and turning, Kanaka attempts to add his muscle to the team moving the sustenance module. As the distance between the MCS Adventure and the module shrinks, he begins barking out orders. “Careful! Careful! Oh, be careful. You’re pushing around over thirty billion NUMUS worth of spacecraft there. Don’t you dare damage my meal machines! Careful of the solar propulsion panels. Easy now...”

“What? What are you shouting about?” Robert angrily challenges Kanaka.

“I’m just doing what you’re not doing.” Kanaka points toward the volumetric display. “That’s possibly the most important module...well, after the habitat module...anyway. No...maybe equally important...the sustenance module supports the habitat module...got to have them together. Can’t have the colonists with no food, after all. Don’t you agree? Of course you agree. So why aren’t you doing anything to make certain it happens?”

Robert stands, turns, and places his hand in the middle of Kanaka’s back. Pushing gently, he maneuvers the diminutive man toward the side door exit. “For your own benefit...and mine, too...why don’t you step into Rita’s office for an update on her promotion program? Ok? Yeah, that’ll be better...much better. Right in here...”

“Rita, allow me to introduce you to Kanaka Waiwai. Why don’t you update him concerning your project’s progress?” After alerting Rita, Robert pushes Kanaka into her office and disappears behind the closed door. Click.

KANAKA

“Now or never! Mars is now or never!” Kanaka angrily shouts toward the closed and locked, control room door. “If you screw this up...miss this launch window...we will never get another opportunity! Earth’s climate is collapsing too fast. Our one chance to colonize Mars will be lost and gone forever!”

After several, silent, seething seconds of glaring angrily at the defiant door, Kanaka indignantly mutters. “I shall never forgive or forget his insulting impertinence.”

“Uh...hello. Yeah uh, hi, I’m Rita.” Surprised and unprepared for furious Kanaka’s sudden, stormy arrival, Rita stammers with confusion. “Oh wait, Robert already told you that. Didn’t he? Sorry, my mind is...I was watching our introductory transmission...for the third time.”

Kanaka is not listening. Having completed his verbal tirade against the deaf door, his attention promptly focuses on the volumetric display of Reine des Abeilles’ introductory tour. After she directs her audience away from arguing Abeja and Jiqiren, Kanaka loudly groans. “Ruined it! Everything was going well, until those two started squabbling. They just ruined it. I spent millions...millions worth of NUMUS installing public engagement payloads in all my Mars Colony Spacecraft. Just wanting to give people insight into the dangers and drama of establishing human life on Mars. But now I doubt if anybody will bother to follow their flight to Mars or join Spacefarers.”

Rita quietly chuckles. “My initial expectation too, but that’s not what’s happening. Just the opposite actually. Their short squabble is drawing the most interest and generating great publicity. People enjoy watching people fight I suppose.”

“Are you joking?” Kanaka questions in surprised, yet happy disbelief.

Rita points toward a floating digital display. “See that counter? Two million three hundred thousand and sixty-three...no...sixty-five...no wait...sixty-nine views so far. Every replay the viewer numbers always increase at the end of the Abeja and Jiqiren row.”

“Views are free, though. Is anybody agreeing to join the Mars Spacefarers and pay dues? Disseminating the human species to Mars is not cheap. We could definitely use some more NUMUS credits.” Kanaka holds out his right hand, empty palm up, rubbing his thumb and index finger together.

Nodding her head, Rita again points toward the digital display. “Currently, we have seven hundred eighty-two thousand, two hundred and twenty-one...no twenty-two...new, dues paying Spacefarers. Not a huge number, but it’s growing.”

Kanaka grins. “Well that is good news. Very good news. I am most pleasantly surprised. Now, I just hope Abeja and Jiqiren don’t kill each other. Can’t afford to lose either one of them.”

Rita traces her chin with her fingers. “True. Their training and skills can’t be easily replaced. Especially at this late date. Could delay our entire program past the launch window.”

“However, when I think about it...best for them to get it out of their system here on Earth. It will be far worse if they physically attack and injure each other out in space during the Mars flight.” Rita suspiciously eyes Kanaka. “But then you tested them using NASA’s select-out system to prevent that. Didn’t you?”

Purposedly ignoring Rita’s question, Kanaka silently watches the visual replay of Reine beginning her description. When Abeja and Jiqiren begin arguing, he grimaces. “I’ll be honest with you. Right now, I’m much more worried about losing the program funding and support those two represent than losing either one of them physically. But then, I suppose I could legally refuse to refund the funds.”

Rita complains. “You talk as if Abeja and Jiqiren are basically just human cargo you’re being paid to ship to Mars.”

Again, Kanaka refuses to respond directly to Rita. He continues concentrating his attention on watching the volumetric display replays. “Hope Abeja’s uncle isn’t offended by Jiqiren’s remarks

toward his niece. In case you don't know, he's President of the UAE and head of the federal Emirati space agency. And even more importantly...crucially...he's the principal financier of the Genesis Mars colony organization. Invested mega NUMUS...majority of the NUMUS actually."

Kanaka points toward Abeja when she reappears. "To convince him to spend a huge chunk of the Emirate's treasury to fund this adventure, I had to promise him that Abeja will secure a place of renown in human and Mars history. So I guaranteed him that the world will know that his niece, Abeja, will be the first person of Arab descent to land on Mars...to colonize Mars...and hopefully have children on Mars."

Tapping his forehead with his fingertip then pointing toward the volumetric display, he mutters toward Rita. "Still Jiqiren...on the other hand...represents an equally important group of contributors from Silicon Valley...our Marssan makers."

"Appears to me that you bet your Mars dream on an Arabian leopard learning to cuddle with a California cougar." Rita quietly chuckles. "I believe you have placed your project in a particularly precarious position, Mister Waiwai."

"Had to." Kanaka rubs his forehead in reflection. "As my grandmother always told me...dreams are free...life is expensive. Or as she would lecture me today. No money honey...no Mars."

"No joke." Rita adds.

"I never calculated that establishing a commercial colony on Mars would cost this much NUMUS." Kanaka gripes.

"Well, at least you succeeded in raising...as you say...this much NUMUS." Rita gives Kanaka a thumbs up. "I congratulate you. And since I'm a paid project participant, I salute you. How did you do it?"

A huge, arrogant smile engulfs Kanaka's face. "I accomplished it because...although truthfully...I actually know very little about Mars and space travel...I am...I must admit...the world's foremost, international, venture capitalist. Your most magnificent money maker man."

After taking a short bow, Kanaka extends his right index finger into the air and continues bragging. "So first, I invested most of my own NUMUS as seed money. That certainly grabbed the world's attention. Then, I sought out and sold my plan to create a revenue generating Mars colony to the one person I knew who was already intending to send colonists to Mars...although far too far into the future I contend...and who also possesses the necessary NUMUS, need, and greed...again Abeja's uncle...President of the UAE."

Rita nods knowingly. "Yes, I know the UAE has been investigating Mars for decades. As a matter of fact, I remember several years ago, when the Emirates announced that it was aiming to establish the first habitable human settlement on Mars. But as I recall they also announced that they weren't planning to begin colonizing Mars until next century. I don't remember exactly what they said, but I recall thinking it was insightful."

After several seconds of thought, Rita proclaims. "Yes. Yes. I remember now. In their official proclamation, they said something like Mars is a seed we are sowing today to reap the fruit of new generations led by a passion for science and advancing human knowledge."

Kanaka smugly smirks. "Yes of course, that's what they claimed...advancing human knowledge. To the rest of the world, the UAE and my other investors are all operating under the guise of altruistic scientists and humanitarians. You know...preserving the human race...saving our species...and all that. Don't be fooled. They're really looking for revenue. Their primary reason for sending spacecraft to Mars remains Earthly greed."

With disgust, Rita scowls at Kanaka before she snidely remarks. "So greed is what you believe all of our effort is about. Greed fuels Earth's spacecraft?"

Holding up his hand to signal stop, Kanaka recants his earlier statement. "Truthfully, I over simplified. Greed is not the UAE's only motivation for colonizing Mars. There is also need...a big need. The harsh reality for the UAE is that the world's oil use has almost disappeared and with it, so have Emirate revenues."

Kanaka gives a double thumbs down sign. "With its petroleum profits disappearing, the Emirati government is constantly searching for new sources of revenue. First, shooting satellites into

space took oil's place. And today...because I pushed them to launch now...instead of next century...they're chasing money from Mars."

"Money from Mars? Now? While we're still on the ground?" With a soft, disbelieving snicker, Rita shakes her head. "How?"

"Simple." Kanaka snaps his fingers. "Sell our Mars colony as mankind's savior."

"Right." Rita asks. "How do we do that?"

"Look ahead and you'll see it is already happening." Kanaka points toward the growing Spacefarers membership numbers. Nine hundred forty-three thousand, six hundred and twelve new, dues payers have now joined Spacefarers.

"It's a multipart process, Rita, starting and relying on Reine and the other Colonists continuously generating lots of general public attention, support, and contributions. Then because of the burgeoning public interest, funding will flow in from a variety of Green Economy financial investors...especially Environmental, Social, and Governance institutional investors. These ESG institutions will finance and promote our Genesis team to gain fame for their names. They'll loudly proclaim and publicize their investments in our Genesis colony to reap rich rewards from their environmentally concerned benefactors."

"They give to get." Kanaka acts as if he is moving money from his left palm to his right palm, then back again to his left palm.

"So, that's why you're hoping people will join Mars Spacefarers. Solely to attract more investors. Appears to me that you devised the entire Mars Genesis colony as a huge Ponzi scheme to enrich you by sucking the blood out of people who truly care and want to help."

With a mocking sneer, Kanaka challenges Rita. "Oh? And isn't that actually why you, Robert, and all of his Controllers from SPEA are here? Doesn't SPEA desperately desire to be recognized for directing the colonization of Mars...preserving the human species...helping stop the climate catastrophe destroying Earth? Won't that bring in big NUMUS contributions for SPEA? Isn't that how you'll be paid, Rita? Tell me that isn't true."

Rita turns away from Kanaka. She realizes that he is correct, but she refuses to admit it. Instead, she retreats into sullen silence. For several minutes, they wordlessly watch the number of Spacefarers gradually increase.

"From greed comes good." Kanaka alters his argument in an attempt to obtain Rita's approval. "Be realistic, Rita. Not only is our Genesis colony probably the last chance for our species to spread and survive, but the colonists will also be shipping vital, Earth preserving materials back to us here on Earth."

Rita cynically eyes Kanaka. "Earth preserving materials. From what? Who? Our colonists? Mars is cold and desolate...perilous. We're not even certain that our four volunteers will be able to survive there. Even with all that we're sending with them...Marssans, robots, materials, structures, supplies...we expect them to be constantly struggling just to establish and maintain a self-sustaining settlement. So, how are you expecting them to find, mine and produce your Earth preserving materials?"

Kanaka's eyes bloom with excitement. "Deuterium...my dear...Deuterium. Heavy water. Yes, almost every element Earth industry desperately needs is known to exist on Mars. And that's important. But Deuterium...well Deuterium is different."

"Different? How?" Rita interrupts.

"Deuterium is crucial. Deuterium and Helium-3 are vital for Earth's fusion reactors...indispensable...and there's almost none of it on our planet. And less every day, with scorching droughts baking Earth into a waterless desert. There is less and less hard water...or any type of water...available for generating Deuterium."

Kanaka raises his right hand extending his fingers and thumb. "As a result, Deuterium is five times more common on Mars than it is on Earth and worth far more per kilogram than gold."

"Yeah, ok, so there's a lot of Deuterium on Mars. What good is the Deuterium there going to do for you here?" Rita is skeptical.

With his hands, Kanaka pulls air toward himself. "But it's coming back to Earth...lots and lots of it...in the cargo modules of my three spacecraft...especially designed for hauling Deuterium."

“After all, they’re colonists.” Kanaka shrugs his shoulders. “They’re staying...never returning. So once they’ve landed and emptied the material and equipment from my cargo modules to construct colony structures, they will refill them with Deuterium and other rare Mars minerals. Then...when the next close approach arrives...the loaded modules take off from Mars, reattach to their orbiting thrusters and fly back to UAE’s cosmopolis spaceport.”

Kanaka smugly smiles. “Thanks to me, everybody will win. My investors will realize a significant return on investment when the Genesis spacecraft return filled with Deuterium that we will sell for trillions of NUMUS. Simultaneously, Earth receives the Deuterium and other elements it desperately needs.”

Rita remains unconvinced. “I still don’t understand how the colonists will be able to do much more than keep themselves alive.”

“Aha!” Kanaka grows increasingly animated. “That’s the beauty of Deuterium and the allure of Mars. All of the chemical processes and all of the equipment they’re going to use to produce the fuel, the oxygen, and the water they must generate to live on Mars require water electrolysis as an intermediate step. And guess what, due to the composition of Mars subterranean ice, Deuterium is a natural by-product from each and every one of their water-electrolysis life-supporting operations. So, you see, they can’t help but produce it, because if they aren’t producing Deuterium...well...they’ll die.”

“Guess they better find a whole lot of subterranean Mars ice, then.” Attempting to return to her work, Rita remains dismissive toward Kanaka.

“Exactly!” Kanaka loudly snaps his fingers. “That’s why it is essential we go to Mars now! I believe the survival of Earth’s civilization...and possibly our Homo Sapien species...depends on the Genesis colonists finding and mining the biggest and richest known repository of heavy water containing ice on Mars...Arcadia Planitia. If our Genesis colonists fail, Earth’s current civilization could collapse.”

BAY ADAM

High into the thick, miasma filled, night sky above the eastern shore of Virginia rises Ennyo, the dream machine of multi-trillionaire Bay Adam. Proudly, he stares skyward. His radiation-blocking, powdered-gadolinium-rust covered, aluminum-lithium, space vehicle towers one hundred and fifty meters above him.

“It resembles a smaller version of our old Gherkin building with rockets strapped around it.” One of his engineers, a London lady, had told him.

Bay funded, designed, and built this huge, interplanetary transporter to carry him and five others through space to Mars. Once there, his transporter will land and be their home until it becomes their Earth Return Vehicle or ERV. So, he named it, Ennyo, in honor of the charioteer who transported the mythological god Mars through the skies.

Lying on the sandy seashore at the edge of Ennyo’s launch pad, Bay stares up into the fetid air. He shifts his shoulders atop the space blanket he spread upon the hot sand to protect himself from burning. This is his end-of-day, relaxation location.

He sighs, knowing that very soon where he lies will be deep underwater. The fast-rising Atlantic ocean is rapidly swallowing it. But until saltwater waves wipe it away, this swiftly shrinking strip of dry shoreline containing Ennyo’s Mars launch center is his personal, private retreat. Here, he dreams the dreams he transforms into reality.

After adjusting his air purifying facemask, Bay slides to his left until the top tip of Ennyo splits the sallow colored Moon from pallid Mars. Over the past few weeks, he has impatiently watched Mars grow a little larger and a little brighter. Each night, he vigilantly monitors Mars rising through the night to reach its highest point around midnight. Then, for hours, he savors Mars’ beauty. Mars is visible for much of the night, so he seldom leaves the beach before dawn.

Day by day, the red planet and Earth are edging closer and closer to each other. Soon, Mars will attain its closest approach to Earth. That is the point in Mars’ orbit when it is a mere fifty-seven point six million kilometers from Earth. And then finally, after waiting and planning for years plus the last, lengthy twenty-six months, Bay’s long-awaited, Hohmann Transfer, launch window will soon open. Through that open window he plans to ride Ennyo to Mars.

He closes his eyes. His imagination blasts off, escaping Earth’s hugging heat and soaring into space. His mind shoots past the Moon. Faster than the speed of light, he hurtles along the Hohmann transfer orbit. Moments later, he is skipping across the rusty-red regolith of Mars.

Bay glumly sighs. His childhood dream of traveling to Mars is now his adult nightmare. He had expected to make his trip to Mars many years ago when he was younger, stronger, and much healthier. Unfortunately, he could not. He did not.

The years raced forward, caring nothing about one trillionaire’s plans. Even the wealthiest cannot buy themselves more time. Now that he is ready, he is old. His aged heart failed today’s physical exam.

In his mind’s eye he again sees his doctor shaking her head, as she warns him that the stresses and strains of eight months of microgravity space flight from Earth to Mars will probably kill him. “The microgravity environment of space will allow your organs to shift around, which will affect the way your heart muscles pump blood through your body. You may experience stagnant or even reverse blood flow in your left internal jugular vein. If you get a clot in your internal jugular vein, the clot could travel to your lungs and cause a pulmonary embolism. Also, by the way, your coronary arteries have a buildup of calcified plague. So, your weaker, older heart is a major, major risk. Ennyo’s crew cabin could easily become your coffin.”

Bay recalls thanking her for her advice and departing before promptly ignoring her. Right then, he also decided to not divulge his heart’s condition to the five other Earthers accompanying him to the red planet. After all, none of them would be traveling to Mars, if he had not personally

sold them on his idea. Each of them paid him billions of NUMUS for a seat on Ennyo understanding that he would lead them to Mars and back. His presence is actually required in their contracts.

Not only does Bay acknowledge that this is his one and only and final chance to travel to Mars due to his failing health, he fears that Earth's crumbling climate will also make any future flights impossible. Earth's high fever and failing health is causing governments and societies to collapse. Time is running out. So, as long as he is breathing on Earth, he is going to Mars.

"The doctor told me that you'll probably become my casket, Ennyo." Bay informs the massive metal monument to his personal passion. "Well, I'm going to die sometime...soon I understand...so why not die fulfilling my lifelong vision...eh? Besides, being the first Earther buried on Mars...well that would be quite an achievement. Be my one opportunity for true immortality. Wouldn't it?"

With a groan, Bay struggles to his feet. "We'll keep this just between the two of us. Ok, Ennyo?"

He shakes the sand off his back to begin his hike back to his Load and Launch Control Center. "As much as I'd enjoy continuing our conversation, Ennyo, duty calls. Time to update my five fellow travelers on the final stages of your preparation. I'll be right back. Going to give them their first tour of you, tonight. So, look sharp."

To keep any possible competitors, like his former, minor partner Kanaka with his Genesis group, from learning too much about his Mars plans, Bay built his spacecraft as covertly and as privately as possible. Several, strong disagreements about publicizing their plans is why Bay and Kanaka are now vehement competitors instead of compatriots. While Kanaka, sought the spotlight, Bay shunned it. Due to his demand for confidentiality, even his paying passengers have not been allowed near Ennyo until tonight.

Stepping into the briefing room, Bay finds his band of space voyagers impatiently waiting for him. All of them are extremely successful, incredibly wealthy, self-absorbed, alpha males. As flourishing, entrepreneurial, risk takers, they thrive on overcoming daunting commercial challenges through ingenuity and innovation. They live to accomplish things that people tell them they cannot do. So now, bored with mastering the business of Earth, they have contracted with Bay to conquer Mars.

Like Bay, they are all family free. No wives. No children. Few, if any, friends. Life to them is all about them, whether it is on Earth or on Mars. So, except for continuing their enterprises, they have nothing and nobody tying them to Earth.

Initially, entrepreneur Bay believed their ability to pay was more important than their ability to perform. But the more he learns about them and encounters their individual idiosyncrasies, the more concerned he grows. These are crafty men, but not craftsmen. Scheming, maneuvering, manipulating, and most of all, exploiting people are their schemes of success.

They obtained the NUMUS they needed to purchase passage to Mars through the labor of others. However, once they leave Earth, there will be no – others – just the six of them. Mars' harsh environment cares nothing about their power and reputation on Earth. So, Bay worries and wonders if they will subdue their individual egos and make sacrifices for the survival of the group or will they quarrel themselves and him to death.

Ameer Aadamee, as usual, is the first to voice his complaint. "I hope you have a good reason for being late and forcing us to wait."

"You just arrived yourself, Ameer. So, stop complaining." Rajul Ghani immediately rebukes Ameer. Rajul is Ameer's long-time business compatriot. They squabble like an old married couple.

"Well, I would have been here earlier, except for being strip searched by Bay's security thugs. I know your rules, Bay, so they didn't find anything on me." Ameer scowls at Bay. "But I think they enjoyed searching me far too much. Denigrating for a man of my station."

Bay has learned to expect these bickering interactions to begin each of their meetings. They remind him of five growling dogs circling the last sliver of meat. He knows that each of the five men will claim their own moment to gripe before he is allowed to continue. He turns to face Rikas Mies, who regularly demands to be heard third.

Rikas does not disappoint him. "Sett en stopper for denne tullet."

“Speak English Rikas. Let your Norwegian die in Norway.” Barks Joukas Mees, longtime industrial rival of Rikas. “Just tell them to stop this nonsense and let’s get to the real reason for this gathering.”

Being Japanese and the youngest, Kasei Kanemochi always waits until the others, who are his elders, have spoken before he speaks. “Punctuality is always desirable, Bay.”

“Yes, Kanemochi, I agree, and I am sorry for my tardiness. I spent entirely too long inspecting Ennyo in preparation for tonight’s tour.” Bay quietly apologizes to soothe everyone’s exposed egos.

As is normal, Rikas is impatient. “I have another meeting tonight, so let’s not waste my time. Show me my multi-billion NUMUS ride to Mars.”

“In a moment Rikas.” Bay motions for Rikas to sit and relax. “First, I have something I want to say. Before we begin our tour of our chariot to Mars, please allow me to remind you as to why I spent so much of my fortune and life building the Ennyo. And hopefully why you are going to Mars with me. Ok?”

Bay straightens to his full height. One by one, he locks eyes with each of his confederation members. Then he begins what he hopes is his inspiring speech. “Gentlemen, I believe our mission is to find and mine the materials on Mars that will keep Earth’s civilization civilized. As industrial leaders you, like me, understand that the elements, minerals, and other materials desperately needed for humanity to survive are rapidly being depleted...disappearing. Going...going...gone!”

Bay pauses for effect. After receiving no reaction, he continues. “If we fail to find Earth’s essential materials on Mars...mine them...return them to Earth...the odds of humans being able to continue are slim to none. We are in a race against time and we are starting far too late...far behind...because our trip to Mars and back...every trip to Mars and back will require more than three years. Three years! When we return in three years, human civilization’s fight for life may be over. There may be little for us to return to. So, Gentlemen we cannot fail. Do you agree?”

Excitedly, Bay shakes both of his fists in front of his chest. His audience’s reaction is disappointingly unmoved. All except Kanemochi, nod their heads with a grumbling, “yeah”. Smiling, Kanemochi gives him an agreeing thumbs up.

Somewhat disillusioned, Bay frowns at them before summoning them with a wave of his hand. “Ok, well then, follow me gentlemen. We’re just a short walk and an elevator ride away from your future home. Personally, I believe you will be impressed when you see your investment. Stretching thirty meters higher than the Statue of Liberty, Ennyo already pierces the heavens without leaving the ground.”

Immediately, the five men jump to their feet. Except for Kanemochi, they bump and jostle each other to position themselves next to Bay. Being first, whether it is in a line behind Bay or in a line for the shower, is forever their priority. Always be first.

“Tonight’s air is particularly choking, so I advise you to wear your air purifiers.” Bay warns his followers, as he exits. “Serves as an excellent reminder for why we’re all traveling to Mars. To retrieve a remedy for mother Earth’s ills.”

ENNYO

“Now that’s the largest, erect phallus I’ve ever seen.” Joukas jokes from the back of the six pack.

“Good, I am pleased that you’re so awed by Ennyo’s length and girth. I believe you will find its interior equally impressive.” Bay replies ignoring the juvenile giggling of the much younger others.

Upon entering Ennyo’s access tower, the six men remove their air purifiers and strip allowing showers of disinfectant to sterilize them. In the next room, they don their clean suits. In seconds, a swift, silent ride on the magnetic elevator shuttles them above the nineteen-stories-tall booster rocket then the sixteen-stories tall service Unit to the ten-stories-tall Mars Voyagers Unit.

Shush. The elevator slides to a halt opposite Ennyo’s entrance portal. A few steps across the connecting corridor and they arrive in the six-story human habitation section of the spacecraft.

To facilitate loading supplies and other materials, Ennyo’s entrance portal opens through an air lock into the interplanetary transporter’s cargo bay. The bay is filled from deck to overhead with provisions and necessities. In a tight, single file, the six men worm their way through the walls of cargo to the bottom of the ladder ascending to their living spaces above.

“Look around, gentlemen.” Bay circles his right hand above his head. “Surrounding you is every life support item...thermally stabilized and irradiated foodstuffs in edible containers, bio-degradable clothing, smart-fiber spaceflight jumpsuits...and...uh...other things, my behavioral scientists determined we’ll need to meet our daily requirements for our voyage.”

“Since we’re sailing through space on an interplanetary voyage to Mars, we’ll use Navy terminology for some areas and items. So, call this area this transporter stores.” Bay motions toward the area behind him.

Bay gives the others a few seconds to survey the cargo before he clambers up the ladder. Reaching the top of the ladder, he twists open the overhead hatch and climbs through. Loudly groaning and complaining, the five other men follow him upward.

Bay rebukes his five followers. “Oh, stop whining. Only while we’re here on Earth, will we be required to climb these ladders to reach the next deck. In the microgravity of space, we will float forward or aft or up and down, according to each of our desires.”

Inside the personnel quarters, Bay spreads his arms with a flourish. “Gentlemen, welcome to your future home away from home. We are currently standing in our common area. To keep the ship light while protecting our electronics from magnetism, here is the only steel in Ennyo. At this floor-secured, spun-steel table is where we can eat, meet and uh...do other things.”

Watching for reactions, Bay scrutinizes each of the five other men encircling the central table. None of them react, so he continues. “Now, as we tour our individual quarters, consider carefully if you will be capable of living with each other within these confining chambers for at least the next three years.”

Bay points toward the tightly, surrounding sidewalls. “Behind these six hatches, each of us has a personal space equipped with a sleep cradle, space illumination, a portal window to the outside, personal electricity, and individual connections to Ennyo’s internal and external communication equipment. Between the exterior walls of our personal spaces level and Ennyo’s exterior hull is an encircling tank containing our drinking water. Coupled with the layer of powdered gadolinium rust wrapping the outside, this wall of water should shield us from most harmful cosmic rays.”

“What do you mean, harmful cosmic rays?” Rikas asks surprised.

Immediately, Joukas grabs the opportunity to belittle Rikas. “Are you joking or are you really this ignorant? It’s an established fact, Rikas that in space cosmic rays from the sun can cook your DNA, if you don’t block them. After enough cosmic rays hit you, you can suffer various cancers,

cardiovascular disease, and ultimately, death. Cosmic rays can even affect your brain causing confusion, depression, and a lack of focus. But then I doubt we will notice any brain change in you.”

Rikas silently answers Joukas by flipping him the obscene Norwegian gesture of the Ok sign.

Swiveling his head left, then right, Rajul frowns. “Where is the ship’s crew? Where do they stay?”

Before admonishing Rajul, Bay clears his throat. “As your duties clause of your passenger contract stipulates, Rajul, we’re the crew...you five guys and me. Anyway, having a crew would just be a waste of space and food and an unneeded burden on the life support system. Ennyo is almost totally operated and controlled by an artificial intelligence, quantum computer. Until we land on Mars, basically, all you have to do is feed yourself, clean yourself, keep the living areas livable, and use the toilets properly, so they recycle your waste. Think you can handle that?”

“I don’t recall reading anything about...” Rajul grumbles.

“Then you didn’t read the section entitled expeditionary behavior!” Bay snaps. “Because if you had, you would know that the expeditionary behavior requirement you agreed to follow is very simple. It’s basically being able to take care of yourself, take care of others, to help out when it is needed and to stay out of the way when necessary. Four actions that are easy for those who are not self-centered and selfish.”

Scowling, Rajul silently stalks away from Bay to inspect one of the personal spaces. Quietly, Kanemochi follows. Upon climbing through a privacy hatch, they quickly discover that their living space is extremely Spartan. They also find that the personal space is circular with a small, four drawer cabinet and a slim locker embedded in the water tank wall. Above the cabinet every personal compartment is fitted with a single, small porthole for exterior viewing.

The circular chamber is dominated by a single person, sleeping cradle – a centrifugal cocoon. The head end of the centrifugal, sleeping cradle is attached to a pole in the chamber’s center that reaches from the chambers floor deck to its ceiling. Two small wheels secured in a circular track support the foot end. By rotating around the pole, the cradle is designed to create an artificial form of gravity.

Rajul presses a button on the side of the sleeping cradle. The cradle’s opaque canopy opens revealing a pressurized sleeping bag attached to a thin mattress surrounded by restraining straps to enable weightless sleeping. The interior of the upper third of the sleeping cradle canopy is the occupant’s communication system.

“Well Rajul, what did you think of it? Big as your hotel suite?” Ameer snidely probes when Rajul completes his chamber inspection.

Rajul shakes his head. “Small...very small. Cramped. Just a sleeping platform, really. No facilities.”

“Small yes, but not any smaller than an average Tokyo apartment.” Kanemochi adds.

Bay nods his head in agreement. “Yes, it is small, but our personal spaces are basically only for sleeping. Now, follow me to the health and hygiene level where our two self-cleansing chambers, two microgravity bidet toilets and our water purification, water recycling equipment are located. There’s also an especially equipped exercise bicycle, resistance rowing machine and a treadmill.” Bay begins pulling himself up another ladder.

“Well now, I want to see this. Sounds like the deck where I’ll be spending much of my time.” Rikas loudly declares while flexing his biceps.

“Doing what? Filling the toilets?” Joukas teases, partially squatting.

In agreement, Bay nods his head. “Well that will actually be good. We’ll need his waste...especially his urine...all of our urine...to drink and eat.” Using human waste compression, separation equipment, water will be squeezed out of our feces. Our urine along with the freed fecal water will then be purified before recycling through the life support system for drinking or use in the hydroponics lab on the next deck. Our waterless feces will be bagged then periodically ejected into space.”

“Wait a second, are you saying we’ll be leaving a trail of turds to mark our route from Earth to Mars?” Rikas probes with surprise.

“Why? Do you want to keep yours as souvenirs?” Joukas immediately counters.

“Bay, your space waste had better not interfere with the infrared-laser transmissions of the communication relay satellites I will be streaming between Earth and Mars.” Ameer warns.

To silence their bickering, Bay ignores them while continuing his tour. He halts for a moment on the ladder and points toward the exercise equipment. “Besides using the personal hygiene facilities, each of us is required to spend a minimum of two hours each day using this exercise equipment. Otherwise, our muscles and bones will deteriorate and disappear due to space microgravity.”

Bay does not stay long on the exercise deck but continues climbing the ladder to the garden deck. “Ennyo’s hydroponics farm is more for maintaining our morale and helping us avoid menu fatigue by supplying us with some fresh greens than it is to provide us with a sustainable food source. Eating only thermally stabilized and irradiated meals or reconstituted powdered foods for three years will feed us, but a few fresh salads will please us.”

“What! No steak!” Ameer expresses disappointment.

Kanemochi grins. “I expect some dried fish is included. Fish with fresh greens...I can live on that.”

Bay nods his head. “Yes, there will be some dried fish, but I’m not certain that you’ll recognize its flavor. Our food is designed to taste similar to what you would find on Earth, but not the same. After a while, it won’t matter anyway. Space oxygen will quickly deaden your taste buds, making our food edible, although not particularly enjoyable.”

A collective groan arises from the other four. Still grumbling, one after another, they follow Bay up the ladder through the hydroponic farm and onto the bridge. The bridge is the domain of the interplanetary transporter’s controlling artificial intelligence quantum computer.

“Hello valiant voyagers. Have you enjoyed your visit? Are you prepared to travel the journey of your lifetime?” Ennyo’s AGI quantum computer controller greets the six men when they arrive on the bridge.

Rikas immediately begins complaining. “So this is it? This is the top tip of the ship? Well, I certainly expected more for my billions. How am I supposed to conduct my geological surveys? I’m not just expecting to see Mars. I’m planning to search Mars for mineable minerals. Where is my equipment?”

“Yes, twenty-six months will be intolerable, if this is all we have. I agree with Rikas. I understood that there would be more equipment.” Rajul quickly adds. “I need my equipment. I’m not going to give up three years of my life without some prospect of profit. If I didn’t believe that there’s a NUMUS fortune to be from Mars, I wouldn’t be going.”

Bay waves his hand, and a volumetric visual appears. “Once again you failed to examine the information, I provided you earlier today. So if you will please take a moment now to view the volumetric display, you can watch our supporting supply spacecraft being loaded for launch at my Canso, Nova Scotia launching site. As with Ennyo, I kept construction of our support interplanetary transporter, Phobos, hidden from my competitors and the public...and you.”

Pointing with his finger, Bay directs their attention to a group of workers carrying containers into the side of Phobos. “As you can see, right now, my technicians are packing a duplicate load of thermally stabilized and irradiated meals, drinking water and other supplies in its cargo holds. Actually since, we aren’t riding Phobos, it will carry a food and water supply that is triple the amount we have here on Ennyo. We’ll need it for our stay on Mars and our return trip.”

Bay turns to face Rikas. “Rikas...you...well each of you will be responsible for stowing your own Mars equipment aboard Phobos. I will provide you with loading schedules and loading equipment. Also, I request that you continue to support my rules of confidentiality. Understood?”

Quietly, Kanemochi steps through the others toward the volumetric display. “Thank you for our tour, Mister Adam. I found it very reassuring. But what is most important to me is that we are the first to land on Mars. Second is not acceptable. Anything but being first will cause me great shame...mentsu wo ushinau...loss of face. Better to be dead.”

ZHULONG

“Ladies and gentlemen ignite your engines! Looks like we have a full-fledged space race to Mars.” Robert Goodfellow directs Kanaka and Rita’s attention to a news dispatch display hovering at the front of the control room.

WENCHANG, April 24 (Hainan) –China’s Advanced Space Vehicle Corporation...the ASVeCorp officially christened its Mars human transport spacecraft, the Zhulong, during the opening ceremony of China's Space Day.

Hangtian Kexuejia, head of the China National Space Administration, a Chinese government partner with ASVeCorp and Sino Space Ventures, announced the selection of the name Zhulong at China’s Wenchang Space Launch Center.

Zhulong, which is Chinese for red dragon, stands one kilometer tall and weighs more than seven-hundred metric tonnes.

Zong Gongchengshi, chief engineer at ASVeCorp, said Zhulong is constructed of a lightweight, steel composite-metal-foam or CMF that is designed to absorb the energy of high impact collisions from small meteors.

ASVeCorp engineers wrapped the steel CMF interior with boron carbide ceramics to shield interplanetary voyagers from the hazards of space travel by blocking X-rays, gamma rays and neutron radiation.

Powered by a combination of chemical rockets for Earth launch and nuclear propelled engines for Mars landing, Zhulong will transport two women and two men to Mars where they will establish a scientific research complex.

China's exploration and research of Mars is aimed to improve mankind's scientific understanding of Mars, expand, and extend the space for human activities and advance the sustainable development of human civilization.

China’s team of four Mars settlers is led by experienced Sino Space Ventures yuhangyuan, or space navigator, Cheng Ho, who directed construction of the Sino Space Ventures lunar complex near the Moon’s South Pole.

On Mars, Cheng Ho will construct a complex to be named, Huoxing Zhimindi or Mars colony, that will be capable of housing the additional Chinese scientists, Sino Space Ventures plans to send to Mars during its next close approach.

Mission commander Cheng Ho and the other members of his team, Tianwenxue Jia. Taikong Nuren and Nushi Lingxiu are completing a period of instruction and preparation at China’s Mars training base in Mangai city in the Qaidam Basin.

Within the week, Sino Space Ventures’ four Mars settlers will return to the island of Hainan for familiarity training at Wenchang aboard Zhulong in preparation for launch into the Hohmann transfer orbit when Earth and Mars are properly aligned.

Following the launch of Zhulong for Mars, two additional ASVeCorp interplanetary cargo transport spacecraft will launch from Sino Space Ventures’ Moon complex for an in-space rendezvous before voyaging to Mars together.

“We predict combining chemical and nuclear propelled rockets to power our three spacecraft will enable our brave, Chinese explorers to be the first from Earth to land on Mars.” Hangtian Kexuejia declared.

“Sino Space Ventures of China established the first permanent settlement on the Moon and Sino Space Ventures plans to be the first to construct and maintain a permanent settlement on Mars.”

Kanaka turns away from the dispatch, rubbing his forehead while shaking his head. “Boom! China didn’t just announce their spacecraft’s name. They declared war!”

Growing more and more distressed Kanaka shouts. “Scientific research! Hah! Total scam! I can see it already. The Chinese are plotting to land on Mars first and stake claim to all of the abundant ice water and richest mineral veins. Crap! That’s it! Just like they took over the dark side of the Moon, Sino Space Ventures and Cheng Ho will build several fake, science research stations so they can say...this land is our land! Keep Out! No trespassing!”

Robert nods his head. “For once I agree with you. Appears they are simply following through on the plan Chinese leaders announced years ago to go to Mars to create wealth through habitation and resource extraction. Clearly, China and Sino Space Ventures are rushing ahead to establish first presence and zones of non-interference to block us out of Mars.”

Robert points toward the visual of the Zhulong. “Otherwise why would they risk racing to Mars in an untested, unproven spacecraft? Definitely appears that China plans to repeat its land-grab Moon strategy of we come in peace...to grab a piece...the biggest piece.”

Rita frowns questioningly at Kanaka and Robert. “Why are you two so convinced China will land first and take over Mars? Our three spacecraft will be ready to go before Earth and Mars align. And since our ships are already in space, it only makes sense that our Genesis team should get to Mars before them. Why is landing on Mars first, so important anyway? There’s plenty of planet for everybody.”

“What!” Outraged, Kanaka howls. “What do you mean, why is landing on Mars first, so important? Have you already forgotten what I told you about the Deuterium? If our Genesis colony isn’t established on Arcadia Planitia first, we could get nothing. Be squeezed out of Mars’ best Deuterium ice fields. I...my investors will lose everything.”

“But they said that this is a scientific, research mission.” Rita continues.

Turning toward Rita, Robert attempts to explain Kanaka’s alarm. “The thing is, Rita, This so-called scientific research mission to Mars is actually nothing more than a military operation concealed in civilian clothes. China’s space planning and directing organizations...the ground infrastructure supporting its space programs...and this team of alleged scientists are all under the control of China’s People’s Liberation Army.”

Robert interlaces his fingers. “It’s all part of their military-civil fusion strategy. Additionally, earlier this century China designated space as a military domain which means the Mars mission is just another step toward China achieving space dominance.”

Again, Kanaka jumps at another opportunity to belittle Rita. “It’s really very simple. So simple that even you should be able to grasp it. More than fifty years ago, then chief scientist for China’s lunar program, Ouyang Ziyuan, officially declared that whoever first conquers the moon will benefit first. They did...so they did. Now China...through Sino Space Ventures again...is apparently preparing to execute the same scheme to claim Mars.”

Disregarding Kanaka’s derogatory outburst, Robert continues calmly coaching Rita. “Perhaps a little background info will help. See, decades ago, the eight, space exploring nations wrote the Artemis accords to provide rules for peacefully building long-term settlements on the surface of the Moon and other celestial bodies...like Mars. And to avoid having nations on Earth go to war over mineral mining rights on the Moon, Mars or anywhere else in space, they adopted the concept of safety zones around those settlements.”

“Ok, so you have a few settlements or Moon bases with safety zones. What’s the problem?” Rita chooses to ignore Kanaka with his condescending tone by focusing on Robert.

With a loud groan, Kanaka bullies his way back into the conversation. “Well, I thought it was common knowledge. Evidently, I was wrong. So, pay attention Rita.”

Kanaka extends his right index finger. “First, China never signed the Artemis Accords. They didn’t sign, but they certainly like to use them to fit their needs. So just as fast as he could, Cheng Ho constructed Moon base after Moon base after Moon base until all of Sino Space Ventures’ Moon base safety zones merged into one huge non-interference...keep out zone. Following Cheng Ho’s guidance, Sino Space Ventures now rules the dark side of the Moon calling it their Special Economic Zone.”

“One man...Cheng Ho...did all of that? How could one man or even his company...uh...Sino Space Ventures accomplish that?” Rita is badgering Kanaka, now. She is enjoying aggravating him with continual questions. “How is he going to accomplish all of what you two are worried about when only he and three others are traveling to Mars on the Zhulong?”

Robert quickly responds, mistakenly thinking Rita wants him to shield her from Kanaka. “Because those three are not the only ones going with him. Those two cargo ships launching from the Sino Space Ventures lunar complex will probably be filled with Cheng Ho’s trained and experienced cybernetic biological robots...his Moon miners...eager to become his Mars miners.”

“Remember Rita, Sino Space Ventures has unlimited financial resources. So, I have no doubts that all the materiel required to establish fortified Mars mining bases is loaded on those two spacecraft. And since the Moon’s gravity is only one sixth of Earth’s, Sino Space Ventures can cram those two space transports full of Cheng Ho’s Cybiobots, equipment, supplies, and Moon grown food and still launch them into space. Loaded like that it would be impossible to launch them from Earth.”

“So, you don’t think that our three ships can still beat their three ships to Mars, Robert?” Rita turns her back to Kanaka.

Robert reassuringly places his hand on his wife’s shoulder. “Well, that’s the problem with both of us flying the Hohmann Transfer orbit, we will probably arrive in Mars orbit simultaneously, Rita. At best we can only safely enter Mars orbit a few hours or maybe even a day ahead of them.”

“So, what I hope to do is land our craft first.” Robert releases Rita’s shoulder. “Then I hope that Cheng Ho adheres to the United Nations space properties resolution of first come, first served, with regard to mining rights and ownership of the mined resources.”

Robert rubs his chin with his right index finger. “But what I fear is that Cheng Ho’s team lands where we’re planning to land before we land there. If they do, then he and Sino Space Ventures could legally claim they own all of it and we could get nothing.”

Robert forms his fingers into the zero sign. “Nada.”

“Nothing...except four landless, lost Mars pioneers, crushing expenses and many very angry investors. Course, even if we’re there first, Cheng Ho and his Cybiobot thugs may still grab all the good water ground. My four colonists and thirteen Marssans can’t fight Cheng Ho’s Cybiobot army.” Head down and muttering, Kanaka shambles from the room. “Just can’t...can’t do it. Don’t stand a chance. Will be slaughtered.”

With a sigh of relief, Robert watches Kanaka leave. Lovingly, he returns to massaging Rita’s shoulders. “I hope you realize that Kanaka’s irritation and nasty comments weren’t actually directed at you. You did nothing to deserve his treatment. But you need to remember that he has invested everything he has into his Mars Genesis project. It is his dream...his life...his legacy. And now, with Cheng Ho and China’s PLA backed Sino Space Ventures team jumping into the mix, he is facing losing everything he has as well as everything the UAE and other financiers have invested. He is terrified.”

“Yes...ok...I appreciate his concern, Robert, but Mars is not the Moon. I mean, I know that the Moon is actually not much larger in area than Africa, so I can understand Sino Space Ventures being able to take control of the Moon’s dark side. But Mars is much bigger. Doesn’t Mars have the same amount of dry land as Earth? So surely, there’s room there for Kanaka’s Genesis colony and Cheng Ho’s team, too. Isn’t there?” Rita slides Robert’s left hand to another part of her shoulder where she desires that he continue his massage.

With a swipe of his right hand, Robert displays a volumetric visual map of Mars. He directs Rita’s attention toward a compilation of Mars SHAllow RADar sounder observations displaying what is beneath the Martian surface of regolith. “When you say Mars has the same amount of dry land as Earth, you are speaking more truth than you may realize. Mars’ middle...which contains most of Mars’ land...is desiccated dry. Any ice there is buried too deep to be usable.”

“So far, we’ve found that most of the readily harvestable ice on Mars is in the northern hemisphere near the pole in that area there.” Robert points to an area outlined in red. “Arcadia Planitia.”

“So, are you telling me that like Kanaka, you believe that if Cheng Ho’s group arrives first, China will take control of the most desired regions of Mars like this...uh...Arcadia Planitia and prohibit all other settlers? But that is still a lot of land, Robert.” With her left and right hands, Rita traces the borders of Arcadia Planitia. “Isn’t it almost fifty-two thousand square kilometers?”

Robert shakes his head. “Well, that may seem like a lot of land, but I doubt if it will be enough to satisfy China’s resource hunger. Especially when you consider that for decades China has been executing a three-step plan to plunder the resources of Mars...commit resource robbery.”

“Three step plan?” Rita asks innocently.

“Their plan’s first stage...” Robert extends his index finger. “...has been going on for years with Chinese robots exploring Mars for minerals, ice, and sites for human installations. And I consider it an ominous omen that this last year all of China’s robots have been reconnoitering Arcadia Planitia.”

“Now today China officially acknowledged that they are in the plan’s second stage...sending humans to construct permanent bases. We didn’t expect them to be ready to send human taikonauts for at least five more years.” Robert scratches his chin. “I am impressed. ASVeCorp must have really rushed construction of those three spacecraft to have them built and ready to launch now.”

Robert holds up three fingers. “Then in stage three, China envisions forming something called an econosphere with Earth-to-Mars-to-Earth cargo fleets transporting supplies and workers there and hauling crucially needed Mars elements, minerals, and materials back to China.”

“Ok. That is scary!” Rita nods her head. “But do you actually agree with Kanaka that Cheng Ho would use his Cybiobots to shove our Genesis colonists out of Arcadia Planitia? What are these Cybiobots anyway? Have you ever seen them? Are they military? Soldiers? Killers?”

Robert taps his fingertips together in thought. “No, I’ve never seen the Cybiobots. Actually, I don’t know anybody other than possibly a few Chinese officials who have. I’ve just been told that they are huge and powerful. And yes, the more I analyze the situation, the more I fear he would and possibly...no...probably will force us out...if it suits China and Sino Space Ventures.”

“Besides, China is growing more and more desperate...urgently needs the mineral wealth of Mars. And unlike the Moon, Mars is far beyond the enforcement of Earth’s laws and treaties. Mars can be considered a lawless frontier.” Robert acts like he is shooting his fingers. “Shoot out on the Arcadia Planitia.”

“But Robert, you said earlier, if we land on Mars first then using force like that would make China look bad back here...and China never wants to look bad.”

Robert nods in agreement. “That’s true, China cares deeply about how others perceive its achievements in space. Everyone on Earth scrutinizes what China does on the Moon. But the Moon is close and Mars is far. Difficult to monitor their actions there. I expect China to take full advantage of being outside of Earth’s legal reach.”

“But, if we ensure the world is watching, Sino Space Ventures and Cheng Ho will be reluctant to commit international crimes. Let’s make it happen.” Rita points the first two fingers of her right hand toward her eyes then toward the volumetric display. “Watch out China these eyes of Earth are upon you.”

SEEKING SIGNIFICANCE

An angry red scar slashes across the Penedes wine country of Spain. Glowing, growing, growling - pulsing with life - a raging range fire claws across Catalonia devouring all life from the mountains of Montserrat to Francas on the Mediterranean. Roaring ahead, leaping from tree to tree, razing vineyard after vineyard, the inferno charges toward Barcelona.

Hovering weightlessly, Reine pulls herself closer to the habitat module's Earth viewing scope. "Wow! We escaped the Freixnet caves with only minutes to spare. Escaped Earth just in time, too. From here, looks like the fire has already destroyed Sant Sadurní d'Anoia. I hope everyone got out of town in time."

Abeja air-swims across the cabin to join her. "We're in low Earth orbit four hundred and two kilometers above Spain. How do you know how close that fire is to Freixnet?"

Smiling, Reine taps her right temple causing herself to drift away from the scope. She grabs a restraint. "Whoops! Still not acclimated to living with microgravity, yet. Anyway, thanks to my brain-net connections I see many things through many more eyes than just these two in my head."

Disregarding Reine, Abeja slowly glides around in a circle scanning their habitat. "Where's Willie?"

"Still vomiting. Filling our emesis bags, I believe. Or as Robert at Genesis control says, he is discovering stomach awareness while experiencing space adaptation syndrome." Reine acts as if she is vomiting. She begins to tumble.

Grabbing the side of the scope, Reine pulls herself back into viewing position. "I could certainly use a pair of the Marssans' air-jet, space-stability boots, right now."

"Hah! You almost killed yourself the one and only time Robert allowed you to wear them." Abeja taps her head. "Your skull doesn't contain the robots' gyroscopes or guidance systems. So, I don't think your brain possesses enough coordination for you to safely use them. Be smart. Just do what your human body is created to do."

Reine does not appreciate the fact that Abeja is correct about her human limitations, so she changes the subject. She jerks her thumb toward the other side of the module and sails a full meter upward. "As you can see, Jiqiren is directing Marssan-six, Marssan-seven, Marssan-eight and Marssan-nine with installation of Willie's bio-regenerative life-support system since he presently appears indisposed with space motion sickness."

Abeja frowns. "I believe she's more comfortable with those fancy anthropomorphized robots than she is with real humans. Makes me wonder if she's really human or just an android in human clothing."

Reine grimaces. "Don't you mean Marssan not android?"

"No! I said exactly what I meant." Snarls Abeja.

"Ok...well...anyway, do you remember when she was gone for two days last week?" With a soothing tone, Reine attempts to defuse Abeja's anger.

Abeja nods her head flipping herself forward.

Reine grabs her shoulder steadying her. "Yes, well during those two days, SPEA inserted a neural-network, brain-to-brain interface, neurograin, bio chip upgrade into Jiqiren. So, I guess you can say that she is indeed, at least part Marssan, now. And I can assure you through her brain-net, thought transmissions that she is thrilled about it."

Scowling, Abeja floats backward away from Reine. "Thought transmissions? Oh no, so now it is you and her and the andro...uh Marssans. I don't like this situation. I don't believe my uncle will approve of it, either. It is unnatural."

"Hah! I believe your uncle will approve of anything that makes him NUMUS." Reine snidely retorts before returning her attention to viewing the Earth. "Well there's another fire. Now, Italy's

Parco regionale del Partenio is ablaze. Wow, Siberia is aflame, too. Record high temperatures and this unending drought are igniting blaze after blaze. No place on Earth seems safe. One endless fire”

Reine muses as she continues scanning Earth. “It’s like Earth is one of my sick patients. A one or two degree increase in a human’s body temperature is a fever indicating an illness. With every fraction of a degree of warming, the illness worsens with increasing likelihood of the patient’s death. So, I fear Earth is very sick...has a high temperature...burning up with fever...nearing death.”

“Makes establishing our colony on Mars all that more important, doesn’t it? Of course, if my uncle wasn’t spending trillions, you’d still be sweating it out in your little island hut. Oh wait! Your entire island was swallowed by the ocean. Wasn’t it. So, if you’re not here, you’re nowhere.” Abeja scoffs then launches herself toward the habitat’s other side.

“For once, you are almost correct, Abeja. Your uncle’s financial support of the Genesis colony is why I’m able to move to Mars. I have nothing left and nobody to lose here. But this Mars mission gives me a purpose...a reason to live. Would not make sense otherwise. Would it? Would it?” Reine shouts at Abeja.

“Save your breath. I doubt that she’s listening. Anyway, she never seems to hear anything I tell her. She’s different from you and me. Like you, I’m a global warming orphan. While I was working in the city, a wildfire destroyed my family, my home, and my life. After years of hellish dry and hot weather, a lightning strike ignited a firestorm in my valley. The blaze was so great it created its own weather system, sucking winds in to feed the flames.” Jiqiren waves her hands in front of her face simulating a windstorm.

“I returned to find my parents’ charred bodies in the street where they fell dead as they ran from the flames. The firestorm sucked the air out of their lungs.” Still hovering next to Willie’s space farm, Jiqiren sadly swipes at some tear bubbles clinging to her cheeks. *“But unlike us...Abeja still has some family and a home. I don’t understand why she’s abandoning Earth.”*

Reine fashions an encouraging smile, adds a subtle wave, and shoots her a mental message. *“Yes, Abeja still has a family...of sorts. But I do know that while my home island is flooded, her nation is burning up. Nobody there can survive outside of its air-conditioned buildings. Heat kills them within minutes. Fries them. So, just like you and me, her family...her nation...her people are facing extinction, too.”*

Reine returns her attention to the habitat module’s Earth viewing scope as they pass over the Persian Gulf. *“Worse yet, they’ve trapped themselves inside cities that cannot survive much longer. They’ve almost exhausted the natural gas keeping them from burning up. Solar and wind power can’t compete against the heat. So, they desperately need Mars Deuterium for fusion power. It’s possible her people won’t even last the time required to get Deuterium back to Earth from Mars. In reality, she’s actually not much different than you and me. We’ve all got nothing left to lose here and everything to gain there.”*

Appearing pale and unsteady, Willie stumble floats across the habitat toward his equipment. Not knowing how to stop, he bounces into Marssan-nine, then ricochets into Jiqiren. Jiqiren flies backward into Marssan-eight. Air-jet, space-stability boots planted, Marssan-eight stands stone solid against her. Jiqiren crashes to a bruising, immediate halt.

Willie hugs Marssan-nine. “I’m so sorry Jiqiren. Ik verontschuldig me. I really hate being weightless. Everything seems to be moving...swirling around me. Makes me sick. My head aches. Give me some good old gravity any day.”

Rubbing her shoulder, Jiqiren floats between Marssan-eight and the bio-regenerative life-support system. “You know you have at least eight months of microgravity space flight ahead of you, don’t you Willie? Then when we land on Mars, it isn’t much better. Gravity on Mars is a little more than one third of Earth’s gravity. So, if you can’t handle living without it, you should head back to Earth, now.”

Willie’s surprised expression morphs into a frightened face. He releases his grip on Marssan-nine to glide to his beloved space farm. “Oh no, I need to go to Mars...must go...escape from...”

Jiqiren waits for Willie to complete his statement. He turns his back to her and busies himself inspecting his space farm’s plumbing. She loudly clears her throat. He ignores her.

Finally, she can wait no longer. She coughs to attract his attention. “Ok Willie, what do you need to get away from?”

Willie slides to the opposite end of his botanical life support system. Without looking at Jiqiren, he mumbles his response. “Myself...I need to escape from myself. On Earth I’m useless. Jobless. Nearly homeless. I’m just another member of the Surplus population...the superfluous people...that swelling swath of society that has become productively and economically redundant. My skills...my knowledge...my experience...my life means nothing on Earth. Has no meaning. Because there are millions of me...no billions just like me...doing nothing...accomplishing nothing that matters.”

“Oh, but you do...you do matter. To us you are extremely significant.” Jiqiren reassures him.

Turning to face Jiqiren, he smiles. “Yes, and that is exactly why I must go. On Mars, there won’t be billions of me. There will only be me...just me. I’ll be needed on Mars. On Mars, I’ll be the one and only. My life will finally mean something – be worth living again. I’m desperate for significance. I swear, I’ll commit suicide on Earth if I don’t move to Mars. I will die of despair. Mars or die!”

SPOILER

“Run! We don’t have much time!” Rajul Ghani commands.

Waving his hand, Rajul summons his corporation’s technicians to follow him to the Ennyo control room. With Rajul leading the way, the three men and one woman stealthily climb up from the cargo hold through the life support chambers to Ennyo’s bridge. They are short of breath and perspiring heavily when they struggle through the final hatch and onto the bridge.

Rajul swings his arm around above his head. “Get all of the visuals, you’ll need to recreate this at headquarters. Be quick about it.”

One after another, the technicians don their 3D image transmission glasses. They carefully inspect each panel and piece of equipment. Up then down, left then right, they explore every millimeter. Nothing remains unseen. Bit by bit, they transfer Ennyo’s control room to their headquarters.

Having completed capturing the control room, the three technicians remove their glasses and nod toward Rajul. Silently, he directs them out. He follows them down the ladder, closing each hatch behind them. Four minutes later they are on the access tower’s ground floor walking toward the exit.

Their escape is suddenly interrupted. Standing in their way is the embarrassed appearing security guard, Rajul had bribed for entry. Behind him are two additional security guards with an extremely irate Bay Adam.

Bay shoulders his way past his security guards to confront Rajul. “Why are you here? In our contract...the contract you apparently refuse to read! I specifically prohibited any unauthorized access to my spacecraft. Nobody! This is still a secret operation. Not you, and especially these three strangers with you, are allowed entry without me. Nobody!”

“A simple tour...” Rajul lies. “...for these three ingenious individuals who were instrumental in the development of the quantum AGI computer guidance and control system for our ride to Mars. That’s all I wanted.”

“All you wanted!” Bay growls in disgust. “Do you realize the damage your little tour has caused?”

Rajul lifts his hands, innocently. “Damage? What damage? I don’t see any damage.”

“Of course, you don’t see it! You can’t see the bacteria, the viruses, the germs, or any of the hundreds of other possible contaminants that you have introduced into what must be a sterile environment.”

Rajul shrugs his shoulders. “So, clean it...sterilize it. Send my company the bill. No big deal.”

Bay clenches his fists. His face flares red. “No big deal! Don’t you understand that a germ or virus, which our bodies can ignore here on Earth where they are strong can kill us when we are in space and our bodies’ immune systems are weakened? Remember, Rajul, there are no doctors...no clinics...no hospitals in space. You get sick. You die!”

Derisively shaking his head, Rajul smirks. “Ok. Ok. Ease up on the drama there, Bay. Look, I made my billions by getting things done. Making things happen. So, I’ll just call in one of my clean teams from my manufacturing plants and they’ll sanitize, sterilize, and purify your precious Ennyo better than it was before we entered it. Ok?”

Frustrated, Bay runs his hand through his thin grey hair. He grabs the back of his skull, pressing his thumb and fingers into the sides of his neck. Eyes closed, head bowed, he squeezes his neck hard and holds it.

After several silent seconds, Bay releases his grip on himself. He sucks in a deep breath. Pain seizes his chest. His heart bangs against his ribs. Fighting to conceal his misery, he keeps his head down hiding his grimace contorted face. He struggles to capture some composure.

Slowly, Bay raises his eyes to meet Rajul's. "I don't understand you. Don't you realize that you may have delayed our launch time. Given away any advantage we have...had...to Kanaka or China...jeopardized any chance we have of landing on Mars first...claiming my...our place in history...our immortality?"

Rajul snickers. "Being first is your dream...yours and Kanemochi's. Not mine. I don't need to be first to be a winner. To me this is a three-year sales trip...an outstanding product promotion opportunity. Can you think of a better way to advertise and market my advanced, quantum computer technology than by having it fly us all to Mars? Paying several billion NUMUS for this trip is nothing. I've already charged it off to marketing costs. So, I need to publicize it. And that is exactly what I am planning to begin doing now and throughout our voyage."

"So, you are actually willing to risk all that I've worked to achieve, and possibly your life just to market Mars merchandise?" Bay questions in disbelief.

"Oh, don't give me your more laudable than thou routine. We all know you're a businessman just like me. You're planning to make mega NUMUS off our trip to Mars, too. Besides..." Rajul shrugs his shoulders. "I'm not taking any bigger chance than Ameer is to promote his satellites, Rikas to show off his mining equipment or Joukas to demonstrate his experimental energy production facilities. And don't think for a moment that Kanemochi is any more admirable than anybody else. Kanemochi plans to publicize every little project his robots accomplish on Mars."

Rajul retrieves his air purifier and slides past Bay toward the exit. "We've poisoned Earth into overheated convulsions. Might as well make some more NUMUS before it all ends. Die here. Die there. Die getting there. What is the difference?"

Bay steps back to allow Rajul and his three technicians to pass. "Well, Rajul, you die your way and I'll die mine. Personally, I am attempting to end my life according to the words of Ralph Waldo Emerson, 'Death comes to all, but great achievements build a monument which shall endure until the sun grows cold.'"

TOILET TRAINING

WE ARE ALL GOING TO MARS!

Hello...Bonjour...Hola...Guten Tag...Marhaban...Kon'nichiwa...Ni hao...Hi down there, Earthers!

And a very special welcome to all of you supporters and members of Mars Spacefarers...especially glad that you are joining us up here in space aboard the MCS Adventure. And lucky you, you are here with me without riding a rocket up here.

Anyway, as most of you already know, I am Doctor Reine des Abeilles, and I am your official tour guide...as well as the Genesis Mars colony team's primary care doctor and genetic engineer.

See, it even says **Doc** on the front of my very important cap, here. I call this my very important cap because it not only identifies me, but it also holds down my hair.

Being in microgravity means my hair floats here...floats there...floats everywhere...all at once. Trust me. It's scary. Like looking at the snakes of Medusa. It's a sight you don't want to see.

Oh, and just as a warning, I am also my team's worst, microgravity floater. So, if I drift away from my mirror during my personal introduction don't worry. Just wait. I will return...at least I hope I will...eventually.

So far so good. I see with my bionic eye implant that I am still hanging around in front of my mirror. So, let's continue before I disappear.

Now, many of you Mars Spacefarers have asked me about our food and what we will eat during our trip to Mars and then...when we are living on Mars.

Well, I think that is the perfect question to answer, since we are now living in our habitation module, which is attached above our sustenance module, and also because we will soon be blasting free from our current orbit around Earth to begin our approximately eight-month trip to Mars. Very soon, I have been told.

But I am not our food producer. Which is a good thing, so we won't all starve.

As I told you before...and I hope you remember...providing our food is the job of our astronautic agronomist, William Ruimteboer and his four Marssan assistants.

Hi Willie.

"Hello Reine. Your hovering is very stable, today. Much better than mine." Willie smiles at Reine while he is held in place by Marssan-seven, Marssan-eight, and Marssan-nine.

What are we having for our next meal, Willie?

Willie's smile slides into a frown. He scolds Reine. "Well, for your next meal, I suggest you chase down and capture all of those food particles that you let escape from your last meal. Marssan-six and I found more than enough crumbs floating around to fill any average person's stomach. Your sloppiness is contaminating our habitat, you know. Clogging the sustenance module's ventilation system."

I apologize, Willie, but it's not easy eating neatly when there's only microgravity. Besides those food particles you found, I still have food in my hair, in my ears and up my nose. And, I will say that I'm more than a little embarrassed that you just announced to our millions of Spacefarer friends that I'm a space slob.

Wide-eyed surprise grabs Willie. He begins stuttering. "Oh...oh...oh my...I am such an idiot. It is me, who should apologize not you. You shouldn't apologize."

That's ok Willie. I'll forgive you, but only if you'll answer this question...this very important question for the Spacefarers.

"Uh...well...ok...I guess so." With apprehension, Willie agrees.

Have you mastered using the space toilet, yet? I suppose men have it easier in space just like you do on Earth. So, having any problems, Willie?

Mortified, Willie's face flares scarlet. Then, just as quickly, a devilish grin erases his blush, as he answers Reine's attempt at revenge embarrassment in his native language of Dutch. "Ik heb een paar problemen. Mijn eerste keer een beetje rommel gemaakt. How about you, Reine? Please, you must tell our Earth friends. Are you experiencing any toilet troubles?"

Oh you sly, crafty man, you. No Willie, I certainly am not enjoying using our space toilet. It's not a clean process. It's not a comfortable process. But it's a necessary process.

"Oh? Please. You must tell us more...much more." Willie goads her. "I'm certain our Spacefarers are anxious to know all about it. They've paid their dues to join Spacefarers, so they deserve to understand your daily challenges."

Ok, Willie, you win. But, for everyone's benefit, I'm not going to give too many personal details. Ok?

Willie nods his head in agreement. "Yes, I believe we all agree with you concerning you not providing tooooo much information."

Good. Just so we all agree. First, it's important that everyone understand that when there is microgravity, liquids don't flow the way they do on Earth. In fact, they don't flow at all. In our bodies, liquid waste and solid waste are...how do I say this...uh...sort of stuck in place in our insides...constant constipation. So, for urination, we women must use a special, personalized bottom cupping attachment connected to a type of suction hose. The suction is necessary to help my urine flow out of me and to pull the urine away from my skin once it is out. Then, I'm told, my urine is recycled and cleaned for drinking water.

"Yes, that is correct, Reine. I return some of our urine to us as our drinking water. Also, I recycle some of our urine to grow our food. On Earth it's called peecycling farming because human urine is packed full of the phosphorus, potassium, and nitrogen that every Mars plant will need." With a flushed face, Willie quickly adds. "...along with our solid wastes...uh you know our feces."

Are you talking about our poop, Willie?

"Yes, as a matter of fact, I am. To survive on Mars, it is imperative that we practice circularity..." With his hands, Willie forms a sphere. "...create a closed-loop system of reuse, sharing, repairing, refurbishment, remanufacturing, and recycling. We're going to find a very limited number of resources on Mars, so we must minimize our need for resources. All our waste has to become food for another process then food for us."

"And that's why we have separate systems." Willie extends his index finger on his left hand and two fingers on his right hand. "When you were young and you wanted to use the toilet, did your parents ask if you had to go number one or number two, with number one being urination and number two being defecation?"

Well yes, of course, then they knew if I would need their assistance or not. When I was a young child, that was important.

Smiling, Willie nods his head. "Well it's even more important to know here in microgravity. As you have...no doubt...already experienced, our urine and feces are collected and dealt with in uniquely separate manners. Now, Reine, you've already told everyone how your urine is sucked out of you, but you didn't tell them about how your uh...poop...is blown away from your bottom."

No! Of course, I haven't! And I don't appreciate you bringing up the subject. I find it embarrassing and unpleasant to have a chilly, wet whirlwind whipping around my bare bottom while I'm simply attempting to relieve myself.

"Just so those of you on Earth understand what Reine is complaining about, allow me to explain. Instead of the strictly water flushing toilets that you probably use, here on the MCS Adventure, we use special, microgravity, bidet type toilets that combine strong squirts of water followed by high-speed air drying. So, what happens up here in microgravity is that when we're ready, water washes our bottom then..." Willie sucks in a deep breath then blows it out. "...WHOOSH...bursts of air push that wet, solid waste away from our bodies. WHOOSH...off our feces fly."

Yes, and I certainly wish you would at least warm up that water.

Willie shrugs his shoulders. "Sorry, Reine, I have no control over that particular part of the waste removal system. My part of the system begins when the blasts of air carry our solid waste out

of the toilet and deposit it inside my fecal fertilized soil generation storage tank attached to the exterior of this spacecraft.”

So Willie, I guess I can say...you really blow my...shhhhh...excreta away.

Cringing at Reine’s attempt at humor, Willie sighs. “Uh yes, I suppose. But let’s get back to my engineering explanation. Ok?”

Willie forms a ball with his hands then presses his palms together, “So, once inside my tank, the water is squeezed out of our feces to be purified and recirculated. Next, a special type of bacteria is added to our feces converting it into enriched fecal fertilized, potting soil. Then, when we are on Mars, I will simply detach the tank, move it into a larger greenhouse the Marssans and I construct on Mars, and use that soil for growing our food. We must create our own soil because none of our plants will survive in the perchlorate saturated Martian soil or regolith. I know this will sound disgusting, but for us if there are no feces there will be no food. So, after all of that, Reine, do you have any more problems with how we whoosh your waste away?”

No. No, I think that’s more than enough discussion about my bathroom battles with flying feces. So, why don’t you show everyone some of the other things you’re doing?

“Ok, I guess I’ve tortured you enough for today.” Willie laughs, sending himself flipping backward.

Marssan-eight and Marssan-nine swiftly grasp Willie’s arms, halting his unexpected departure. “Thanks. Now, since you two have me under your control, take me to our photobioreactor.”

Shuffling along on air-puffs, Marssan-eight and Marssan-nine escort Willie toward two ceiling-to-floor panels of an interconnected, closed-loop system of forest green tubes. Trailing Willie is Marssan-seven towing Reine. Marssan-eight and Marssan-nine steady Willie next to the green, light-receptor tubes of his photobioreactor. Floating two feet away, Reine clasps Marssan-seven’s shoulder for stability.

Willie lightly taps a green tube in the nearest panel. “This is our multi-purpose liquid wastewater digester and oxygen producer. Inside this tube...well all of these tubes...the photosynthetic microalgae *Chlorella vulgaris* is busily cleaning our liquid waste by feeding on it. As a matter of fact, Reine, your latest urine deposit may be nourishing millions of these microalgae, right now. Of course, there’s more steps...”

Well, Willie, I’m happy to know that in my own little, piddle way I’m contributing to our mission’s success. It’s the least I can do.

“Yes, Reine, as long as you keep going my microalgae will keep growing.” Willie jokes.

Ok, very funny, Willie. Good joke. But...uh...let’s move on. I also understand that we may also eat the microalgae.

Scrunching his nose, Willie shakes his head. “Well *Chlorella vulgaris* is not really for human consumption, but yes, we’ll be eating several varieties of microalgae along with bone growing lettuce containing parathyroid hormone. For example, I’m growing the microalgae, *Scenedesmus*, in my bio-regenerative life-support system. *Scenedesmus* accumulates lutein, which is essential for human life and particularly for the eye’s retina.”

Aha! Yes, I can SEE...definitely SEE...why growing *Scenedesmus* is important.

“Ha. Ha. Doctor joke?” Willie smirks. “So, do you want to see the genetics lab where I’ll engineer and grow our cell-cultured meats and milk protein? Or how about the ecosystem services compartment where I’m growing our biodegradables decomposition microbes? It stinks a little, but I believe it’s very interesting.”

Noooo, Willie, I think you’ve given our Spacefarers enough to chew on for now. A lot of food for thought. So, I think it’s best if we give them time to digest all of this.

“Speaking of our digestion, do you know that each of us will produce and expel approximately two liters of flatulent gas each day?” Willie adds with a devious grin.

Flatulent gas? Willie, don’t you know that women...ladies don’t...uh...pass gas?

“Oh, yes you most certainly do. And I’m not certain our *Chlorella vulgaris* microalgae oxygen producing photobioreactor can eliminate that much odor during our long Mars voyage.” Willie continues teasing. “Could make our trip a real gasp.”

KEEP READING