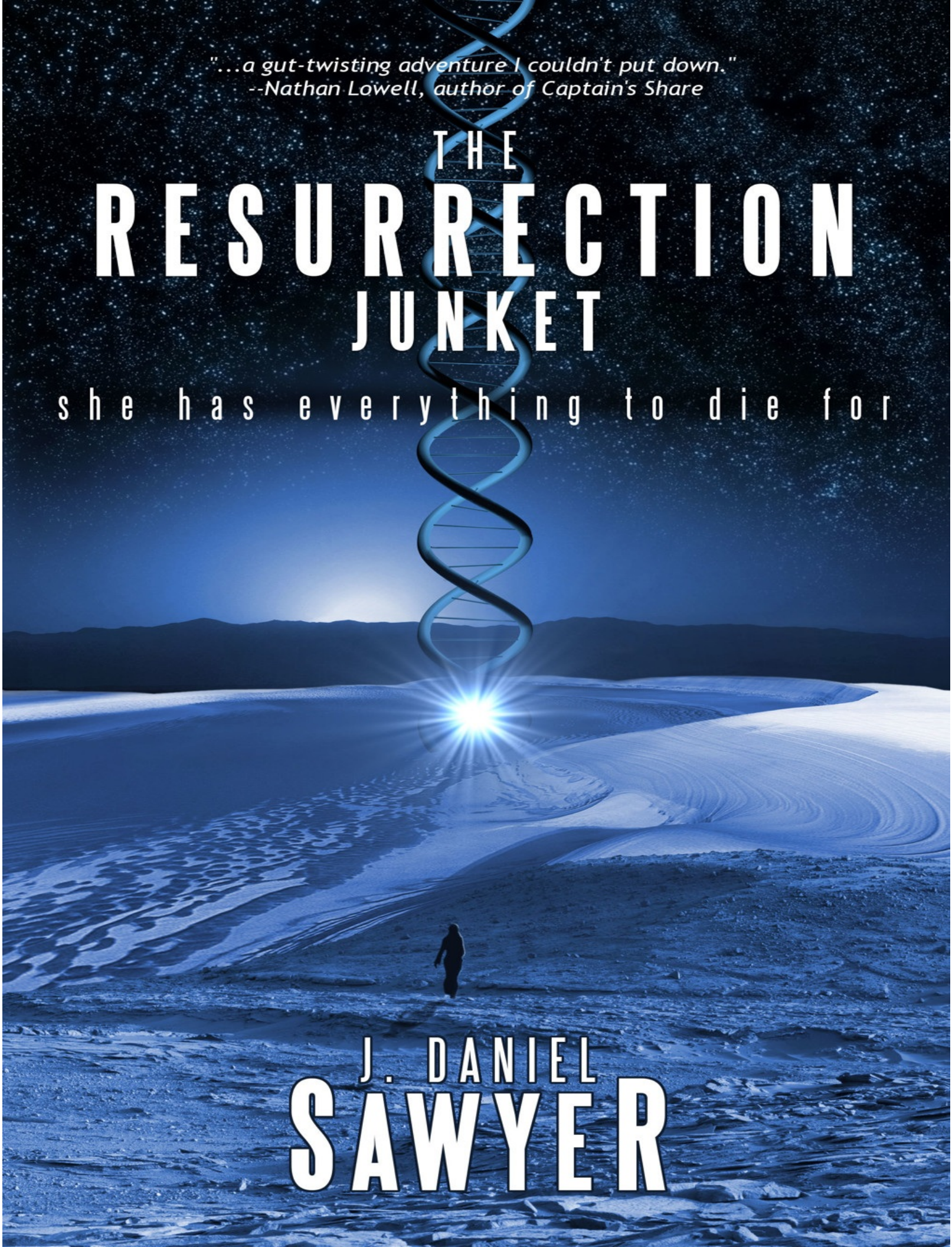
"...a gut-twisting adventure I couldn't put down."
--Nathan Lowell, author of Captain's Share
THE
RESURRECTION
JUNKET
she has everything to die for
J. DANIEL
SAWYER

The Resurrection Junket
J. Daniel Sawyer

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Digital painting “Filbert” © 2013 J. Daniel Sawyer and Kitty NicIaian

DEDICATION

I wrote this for you, the reader, in honor of the infinite horizon before us
May humanity continue to hold her nerve.

THE RESURRECTION JUNKET

J. Daniel Sawyer

“What a piece of work is a man, how noble in reason, how infinite in faculties, in form and moving how express and admirable, in action how like an angel, in apprehension how like a god! the beauty of the world, the paragon of animals—and yet, to me, what is this quintessence of dust?”
—William Shakespeare, *Hamlet* Act 2, Scene 2

“All life is code.”
—Juan Enriquez

CONSEQUENCE

IT USED TO BE A BRIGHT CITY, LIT WITH A hundred billion little lights. Each one a signal.

A thought.

A feeling.

An impulse.

A physical instantiation of meaning.

Then, more quickly than she might have expected, the lights winked out. When the last axon failed to respond to the last electrochemical impulse flowing over the last synapse from the last dendrite, the city went dark.

And Xiyi died.

CHAPTER 1
A NEW VANTAGE

Introduction
Expedition: Filbert
Mission Historian Personal Perspective
Mission Day 30
Year 2253 of the Common Era

I, CHAN XIYI AYA, AM NUMBER THIRTY-SIX.

That should be a nice round number. It is not. Thirty-six is the number of exclusion. It marks me out as the one who does not really belong.

Eight weeks ago, I emerged from quarantine. Last in line for awakening means last in line for release—they have to prod your immune system so it can handle the native hazards, at least the ones that they know about. Growing the super-Ts, then testing them, is said to take some time. We were warned, but hearing about a thing and doing a thing are not the same. By the time I saw the sky, the rest had already sorted out the living situation, divvied up the responsibilities, implemented the initial organization of the expedition. As the official tag-along, I do not get a voice. Given everything else, I prefer it that way.

My title is "Official Civilian Observer, Expedition: Filbert." It is not exactly a military expedition, but the word "Civilian" fits. The Americans have a saying about "Jack of all trades, master of none." Well, you play a lot of cards sitting around in quarantine, and within two days of my release, I put together that I am more of a "three of all trades" who might make Jack if she sticks with this project for the next twenty years or so, and doesn't go spare from boredom.

The mission gods planned it that way, of course. That is what a Civilian Observer is supposed to do. I am a sort-of quality control measure, in beta-test form. This round of missions is the first time they have used people like me, in various quantities. Me, here, on this mission? I am the only one. Lucky me. The theory is that we designated idiots will spot problems that all the specialists and the commander do not notice.

Filbert is the name they picked for our fair planet. Someone in the home office determined that a playful and stupid planet name would make the job feel less daunting for the sorts of people they send out.

I am not sure how the other teams decided to organize their quarantine period, so here's how we did ours. The commander—Dr. Darren Galbraith—was the first to get released into our ground station, and from there he decided in what order everyone else should come out. Since he did not find anything amiss that might need specialized attention, he chose to bring people out in order of authority. Department heads first, then the research scientists, then the physical plant team, then me. By the time I saw my first glimpse of sky, the colony was fully functional, and I had a duty roster.

They made me the designated floater. When the waste team needs an extra pair of hands to perform a task they haven't yet built a robot for, they call me. And when I'm not doing the work of a *dalit*, I spend my time looking over shoulders, asking questions, trying to understand what everyone is doing.

Most of that data will not make it into these journal reports, but I need to understand it much

better than I do at present, if I am to make anything useful out of myself. Being useful is not an easy thing to do when you are stuck in the middle of a quarantine zone on an uninhabited planet, surrounded to suffocation by the thirty-five most boring people Earth had to offer.

Perhaps "boring" is not fair. "Emotionally stable" is what they selected for. But it *is* boring. And old. They all have well-maintained bodies, just like anyone else, but youth is just a cellular matter. Age, the sort that matters, seeps into the soul. I am the youngest person on this planet by at least fifty years, and every conversation I have reminds me that I am little more than a schoolgirl sitting at the adults' table at a wedding feast. I never felt so out of place, not even at school. Now, as I did then, I spend my free moments walking outside, trying to locate myself in the world I can only see through the plasma fences that keep out the local flora and fauna.

They also keep us, the visitors, in. Our own human zoo. The animals that come to visit, attracted by the field—the small ones come right up to the fence, but sometimes we see the larger ones hiding back, just behind the flora, watching us. We cannot see them so well, cannot classify them. But what we can see, and what our probes show us, give us a body plan for their chordate animals. They have backbones, or something that serves the same purpose straight down the middle, with segmented strutted rib cages, and organs and muscles positioned all around the body in a spiral pattern, making their necks and backs less vulnerable go breakage and changing the dynamics of everything they do. I trust that Dr. Sansa will forgive me if I have made any errors of terminology.

But we go to the fence to see them. I go every day. And they come, drawn by the electrical fields, and they see us, trapped inside. Us, and all our pathogens and botanicals. For safety, ours and theirs whatever lurks out there beyond what we can see through the brush.

The mission gods—I assume it was the mission gods—chose for our home base a marvelous vista. The compound was built by the robots between the landing and the end of our quarantine. We were not conscious for most of it. They have located us on a high hill, backed up to a sheer cliff. They burned down to bare dirt the hilltop around us, sterilized it, and cultivated it for Earth-type vegetation. We need to be able to live safely and in biological isolation until the team finishes phase one, and has the data to make its decisions about our integration plan.

Expedition: Filbert
Mission Day 43
Mission Historian Personal Perspective
Year 2253 of the Common Era

UP UNTIL THIS MORNING, THINGS WERE GOING as well as could be expected, operationally speaking—which is the reason it has taken me this long to put together my first proper entry. Everything has progressed by the numbers, according to the schedule they laid out back home, so I have not had much to report.

This afternoon, after rotating the agar plates in the culture lab, I walked the perimeter. Inside the boundary are the five domes and the small farm. Outside, dense forest stretches its amethyst fingers up from the valley's broad floor, gripping the hills like a prize. Between them, a broad river of phosphor-rich water snakes its way down into a spectacular canyon stretching all the way to the horizon. At night, it glows faintly, like a glow worm. The canyon is surrounded by high plateaus furred with vegetation that, like the forests, tends toward the purple, with bright green and yellow splashes here and there.

We have not yet seen any flying creatures. The first time I asked about the lack of birds, Dr.

Sansa—Christiana—gave me a forty minute lecture on cladistics, over breakfast. Never again will I dare utter aloud that word in connection to this planet's flora.

"Birds are impossible here," she'd said. "The entire notion of 'bird' presupposes an evolutionary history concomitant with...okay, look. It's like calling bats 'birds' because they fly, even though they're mammals. Trust me on this one. It doesn't come from Earth's evolutionary tree, it's not a bird, ipso facto. If we found flying animals here, they'd be 'avian life forms', maybe. Flying creatures, that is fine too. But birds? Not a chance."

Now, I really love Christiana. She is so sweet, so caring, you will never find a better person in any five planets. But after forty minutes of that I was ready to put a dozen eggs under her sheets so I could hear her scream when she got into bed.

But at least I can say it here, since they all think what I do is some kind of pulp fiction enterprise. Birds birds birds birds. Whatever you want to call them, they do not exist here, at least not on this part of the planet. Nearest they come are enormous flying bugs about as wide as a large man's hand.

Bugs. That's another cladistic mistake, I'm sure. Christiana, if you ever read this, think of those eggs, and hold your tongue. I'm trusting you with this.

So, walking. Yes. Along the fence. The view has yet to bore me. The afternoon sun shot through the hazy atmosphere, broken up by the clouds, like laser spears from our orbiting base station. They ignited little blooms of bright color, which burst out from the surrounding deep purple like bunches of overripe berries. I wish I could say it would always look that way, but I can't. We might have to change it, and then this, and the images and videos and holos stored with it, will be the only record.

I hope we do not have to change it.

As I walked, one of the robotics technicians—Lundi—flagged me from the main building, where we keep the assembly hall and the mess. Histology had an urgent announcement.

Tomorrow was supposed to be our first day for preliminary departmental reports, so an announcement from Histology was not unexpected. Their first round of experiments was a sample catalog of the local floral and fauna, evaluating them for suitability for cultivation and domestication. The more that humans can do in-situ, the better the news for the civilization that the colonists will eventually build here.

The early urgency must mean something exciting, I thought, which suited me quite well, as I have been going out of my mind with boredom—which, come to think of it, is another topic that I need to do a report on. The Foundation has some serious re-thinking to do with the way it selects and manages its personnel.

Dr. Prescott—he has asked me to call him Hal, but he is not my friend, and is seventy years older than I am, has five doctorates, and left his great grandchildren behind to join this junket—plodded into the mess and did not bother to take a seat:

"Ladies and gentlemen, I've got the results back on the protein analysis from the first swath of the native biome. Not to put too fine a point on it, but we are officially screwed."

When he said that, my stomach dropped into my pelvis.

He went on to explain that there seemed to be a quirk in the local evolution that happened early in the planet's history that rendered everything he had analyzed unfit for human consumption. Maybe even unfit for human contact. He said: "It's chemical warfare on an apocalyptic scale."

Nobody said this would be an easy job, but they are now trying to decide whether it is even

possible to make this place suitable for human habitation. It may not be worth the attempt.

REFLECTION

DYING WASN'T SO BAD, SHE DECIDED, once you got used to it.

Granted, it wasn't the world's most entertaining hobby. Frankly, it hurt like hell. The delirium had its good points, though. Not that she'd remember much of it. That was the point of being dead, after all. When your brain stops working, not a lot of thinking goes on—or if it does, there's no way to remember it.

Is there a difference between thinking something and forgetting it, and never thinking it in the first place?

If an axon fires and no dendrite feels it, does it make a thought?

CHAPTER 2
THE PROGRAM

WANDA LAIRD'S OFFICE AT THE SAN DIEGO FACILITY was as bellicose and ostentatious as the woman herself. A sharp-eyed bat who had arrested her aging in her early fifties, and as big around the middle as she was tall, she did not manage to conceal the cruel smirk behind her diplomatic grin. Not that she really tried.

She sat behind an old, grizzled wooden desk, filled with knots and twists, sanded and polished to a mirror sheen. It was the kind of desk good only for intimidating underlings like Xiyi. Under Laird's withering gaze, she felt even smaller than the one hundred fifty-five centimeter frame bequeathed to her by her Himalayan ancestors.

Xiyi, who at this point had not yet experienced the dubious pleasure of her own death, took careful notes, determined to put a parody of Dr. Laird into her next book as revenge for forcing her through this tiresome meeting when she could have spent the afternoon not-working on greeting the non-existent visitors that theoretically might materialize outside the Foundation's front doors.

"It *is* quite a promotion, Ms. Chan." It wasn't the words, so much, as the tone that sounded a warning in the pit of Xiyi's stomach. If ever there was a person regarding whom "human" was a useless adjective, it was Laird. That was what made her a good department head, and it was a quality that Xiyi had always respected. Until now.

"And you are offering this to me? Why?" Sitting in the beam of that clinical gaze made her feel like a specimen being readied for dissection. "I am no planetary scientist. You have people here who have worked eighty years just for this chance, and you wish to send me?"

"It has come to our attention," the head's corpulent frame leaned toward Xiyi, looming over her without ever stirring from her quasi-throne, "that you've carved out quite a name for yourself in the fiction world. Not an easy game these days. Not exactly reputable."

Xiyi became—though she'd not have believed it possible—even more acutely aware of her minute stature, but she kept her voice level, without a hint of a quaver. "My time is my own. My stories are my business."

"And when your stories include confidential information that you obtained through abusing your position? When they feature caricatures of respected businessmen, and hectoring depictions of your coworkers, who come through that door and complain to me about it?"

Xiyi's chair seemed to grow six sizes—just enough to make her feel like a rabbit in a wolf's cage, not enough to let her hide under the cushion.

"You are a drain on this company's resources, a scourge on its morale, and, frankly, an embarrassment to anyone possessing even a modicum of self-respect. We've reviewed the available options. You have a good eye for detail. Almost a journalist's eye. At the moment the pool is made up of specialists in the relevant fields. However, it has been a matter of some concern that the Foundation has never provided for the presence of a biased observer. Someone who might bring out the elements invisible to the data crunchers. They asked us to help create a pool of chroniclers for the experiment. Since we have not yet filled the slate, I've decided to offer you a choice. You may stay here, and we will prosecute you to the fullest extent. Or you may go, and chronicle one of the missions."

“But, why must...”

“This is a long-term experiment. Success means you’ll be away for decades. A return ticket means coming back to a world that won’t recognize you.”

“And if I wanted to...”

Ms. Laird cocked an improbably pointy eyebrow, managing to look rather like a wizened toad affecting vague amusement at the misfortunes of her pollywogs. “If the experiment is a success, you will have every opportunity to travel wherever you want, even back here. Though I doubt very much it’s an experience you’ll wish to embrace a second time.”

Xiyi didn’t know what to make of that. She’d never learned the details of the new travel process, but assumed that it must somehow involve cryonics, which had a nasty reputation for coma terrors. She frankly wasn’t enthused about going through that experience even once.

THE FIRST SERIES OF CLASSES IN THE INDOCTRINATION program (they called them “cycles,” for reasons which escaped Xiyi) had laid her groundwork in the scientific background she would need to establish even a basic understanding of the mission, and flew by easier than she—an artist by temperament and education—had expected. A few months after her uncomfortable encounter with the Laird of the Slugs, she found herself sitting in her second cycle classes as if she were a freshman all over again.

The Marathon Planetary Foundation had learned through long experience that, for their purposes, the most effective method of indoctrination was the Socratic workshop. Part interactive lecture, part group discussion, it recalled ancient educational traditions long since abandoned. For conveying information, the format was woefully inefficient. But for encouraging evaluation and solidarity, it remained unbeatable, and in the eyes of the Foundation, those were the things that really mattered.

All their low level corporate training was conducted this way. It had the added advantage of allowing the Mission Stability Engineers—or “the gods of the mission,” as the candidates referred to them—to spot potential personality conflicts and avoid future trouble.

It had worked since the first successful Mars expedition, and they didn’t intend to change their process now, even if they were venturing into novel waters by bringing in the neurotypicals.

The lecturer, George—who, being strictly a mouthpiece and not a group mentor, was not afforded the dignity of a surname—paced the stage idly while performing his well-practiced lesson.

“Today, we start from first principles. All other things being equal, the transmission of information over intrasystem distances is limited to the speed of light. A signal from here to Mars, bounced and boosted through any of the orbital stations, faces a round trip of between eight and forty-eight minutes. With standard packet verification, this means that a single bit of information will take approximately sixteen minutes at opposition. That’s your best case.”

“But sir,” Xiyi shouted out, “I visited Phobos Station when I was twelve years old, and we had no problem with network access delays.”

“A clever workaround. Interplanetary mirror nodes sync every day across the solar systems. Redundant Internets, to provide the illusion of quick access. Nothing on a non-local node happens in real-time, as you’ll have noticed if you attempted a coms linkup. It all flows over the same network—since text browser access is asynchronous, we can use asynchronous tricks to give people the illusion of real-time access.

“Now, in any network, over vast distances you’re confronted with the problem of information

verification. The back and forth necessary to recover dropped packets and verify the integrity of the received information eats up a spectacular amount of time. The farther away you get, the more you're subject to the laws of diminishing returns." A giant graph appeared on the screen behind him, plotting ascending astronomical units on the y axis and descending transmission efficiency on the x axis. "Once you pass a certain point—and that point varies according to the nature and amount of the information being transmitted—it becomes faster and more cost-effective to move information storage devices from one place to another. All the verification is done at the point of transmission, so the fidelity is assured at the point of receipt. And, of course, you don't have to worry about interference disrupting the signal along the way. Solar storms and gamma ray bursts don't disrupt shielded media.

"I know this must sound very pedestrian to all of you. I can hear you asking yourselves 'What? I sold my soul for *this*?' Well, that's because what I've just explained to you is the entire basis of our proprietary long range space travel technology."

Xiyi, and the six hundred other members of the audience—other excursion candidates, trainees, Foundation folks studying for promotions, donors, and old hats bringing themselves up to speed with parts of the Foundation's vision normally invisible from their narrow specialties—collectively shifted in their seats, as if a small tsunami had just passed under the floor.

"I must remind you that everything you're hearing in this session is strictly confidential, and any leaks, even to your nearest and dearest, will result in prosecution to the fullest extent. What you're about to hear may disturb you. We're doing this class the old-fashioned way so that we can deal with those feelings and ensure that you actually understand what you're signing up for. Because we're about to turn your world upside-down."

Another slide appeared behind him that obligingly read: *Everything you think is upside down.*

"Everything you understand about the world, from your day-to-day experience, is wrong. In fact, it's *exactly* wrong. Now, this isn't going to come as news to most of you. Most of you know that you're made of atoms, which are mostly composed of empty space and probability, but you also know that it doesn't matter at our level. We're not subject to quantum effects the way a photon is, and that's probably a good thing. It's a chaotic world down there, after all."

The slide changed to another single line caption: *Matter Does Not Matter*

"Ever since Socrates, philosophers have debated whether matter was real or illusory—good, or evil, if you will. Materialists held that it's all that there is, while Platonists held that it was a corrupting force that debased the noble content of the spirit. You'll find further reading on these in your orientation materials, if you're someone who gets into philosophy. Chapter six is a pretty complete digest, so we won't cover it in depth here. Suffice it to say: good or bad, matter is the basic point of contact between all the different traditions that have, over the millennia, tried to figure out what the hell all of this," he made a sweeping gesture to encompass the entire universe, "is here for.

"But what if..." he paused for emphasis, "what *if*...matter didn't *matter*. Oh, we're still all made out of it. It's still what the accessible part of our universe is made of, but do you think it *really* matters which atoms are in your body, as long as they're in the right proportion? You shouldn't. You're changing out atoms all the time. Your body runs on molecules. The *particular* stuff you're made of matters exactly as much as the *particular* pieces of sand in a sand castle." He paused for a moment, to let the thought sink in, then continued. "It's not the *stuff* you're made of that matters. It's how it's *arranged*."

Another slide: *First Principle*

“The arrangement of matter is information. Information by itself isn’t privileged. *Chaos* is information. Even *noise* is information. *Everything* is information, so information is not special. Information is not rare.

“But information *is* king. Who you are, what you think, how you’re shaped, none of it is defined by the stuff you’re made of—it’s all defined by how that stuff is arranged. The essential you, the thing that makes you *you*, is information.”

Another slide: *Second Principle*

“Information, any information, can be read. This is axiomatic. If it can’t be read by something, it’s not information. You all know your DNA, and its expressions and epigenetic inflections, can be read. You all know that your neural map can be read. Anytime you go in for surgery, both get backed up in case there’s any mishap.

“This isn’t to say it isn’t information if *we* can’t read it. Science’s only job is to reduce our illiteracy.”

A hand shot up.

“Yes, Doctor Ansari.”

“I believe you’ll find the consensus view, as expressed first by Popper, is that science is an error detection mechanism to minimize the possibility of misapprehension...”

“Yes, yes, critical realism.” George waved at the air as if swatting flies. “But error detection for what?”

“For the testing of conclusions based upon empirical observations.”

“And how does one reach those conclusions?”

“Based upon previous experience.”

George looked at the whole audience and shrugged theatrically. “We could go on all day like this, couldn’t we? An infinite regress taking us all the way back into the history of science. Thank you, Doctor Ansari. I believe you’ll find that what I’m saying is perfectly compatible with Popper.”

Doctor Ansari sat down. From where she sat, Xiyi imagined she could distinguish a skeptical scowl on his face.

“You see,” George started pacing again, “those empirical observations are meaningless in and of themselves, unless they can be plugged into a theory that gives them meaning. We find the limits of our theories when the meaning we think we’ve discovered ceases to fit the observations we’ve accumulated—that would be Kuhn’s insight, Doctor Ansari...”

A ripple of uncharitable laughter swept through the room. Ansari’s scowl lost what little bit of openness it previously held.

“...and we discover that thanks to the critical realist’s toolkit propounded by Popper. But the reason that we’re able to construct theories at all is because things truly are systematic in nature. Physics has its own language, which emerges from theory and then becomes independent of theory as it begins to express and critique the theory. Biology is the same. We have learned some of the algorithms—the axioms and grammar, if you will—that comprise nature, through the kind of research you all do here on this very campus. You are, at bottom, linguists of the universe—because each sort of information is written in its own peculiar language.

“The entire object of scientific research is to learn more languages, so we can read more of the information out there.

“But for something to be information, it must, in theory, be readable. Maybe not by us, but at least by *something*. Other atoms, the universe itself, anything else you care to imagine, as long as

it exists.

"Information that is not readable is not information. It only becomes information when a system, or a mechanism, exists to read it. This is important, because..."

He summoned the next slide: *Third Principle*

"Space is very big. Even with the Mannix-Alcubierre drive, it can take decades to get to some points even in our corner of the galaxy. This is the reason all our major expeditions have either been generation ships or small satellite space probes. And, as we learned with the Proxima One disaster, coming out of transition can expose everyone to catastrophic doses of radiation if things aren't handled exactly right.

"We've gotten better at it since then, but we've still not sent any major long-range human explorers out past the first perimeter. Mass is still an obstacle, and we've run up against a wall in the laws of physics when it comes to being able to pack enough juice to make those transitions viable. We can send probes, but anything bigger than about four tons can't get beyond the first perimeter.

"But this isn't news to any of you, I'm sure."

Another slide: *Fourth Principle*

"Given the right machinery, information—any information—can be rewritten. Again, not controversial. We've had some pretty publicized cases, starting with the Harrisburg Twins, where we've restored neural maps from backups. Most of you right now have domestic robots with wetware CPUs that were written in at the factory."

Xiyi found herself nodding along. Even she, growing up as a refugee in bases from Morocco to her final stop in Salida at age nineteen, had always had wetware bots around. They were cheaper to maintain than traditional pets, and could be re-tasked for household chores at the push of a button. Everyone had at least one.

"Fifty years ago, we here at The Foundation realized that if you put these principles in the right order, they add up to a novel method of transmitting information over vast distances. We've spent the last five decades perfecting that method, and now, we're ready to deploy it."

The speaker let the room catch up with him. He waited for the collective gasp. When it came, he smiled.

"I think that's enough for the morning session. Go get lunch. The discussion groups will convene back here in two hours."

AFTER THE BREAK, SHE JOINED HER ASSIGNED discussion group to hash through all the procedures related to transmitting information over vast distances, including biological information. Even for a highly educated laywoman, the conversation quickly spiraled out of her depth. By the end of the afternoon she felt as if she'd been forced to drink a waterfall. When her head hit the pillow, she entered dreams filled with a melange of words, none of which seemed to fit together.

The next day, they toured some of the facilities, and got to view the vehicles, and her mind got a chance to latch on to tangible things, and connect them to the torrent of words and ideas. The three stages of her fate:

The launch vehicle, squat with engines like flower-petals arrayed around its central fuel tank, with contact rails laid into the surface to give it better grip against the launch catapult's impeller field for its trip out of the atmosphere. Its head, flat and with grappling points, designed to attach to the second stage: The drive-ship.

Bright, polished silver everywhere—long and needle-shaped, about ten meters across, designed to dock to the drive unit already waiting at the construction depot in high orbit, topping off its fuel tanks with antimatter harvested from the Van Allen belts. Xiyi listened to the impressive technical specifications that, thanks to her classwork, she could mostly follow except on the finer theoretical points of field control, and, while she listened, she watched. The skin of the ship seemed to change color and texture as she watched, cycling from bright silver to deep black, from smooth to crenelated to ringed and ridged. The tour guide explained, when he saw Xiyi and several others watching, that the changeable skin allowed for fine-grained control of drive field interactions, and for more efficient energy harvesting, and—for reasons Xiyi did not quite understand—for better navigation.

And then, to fit inside the drive ship, the lander module. Smaller than she would have expected, even considering that most of their equipment would be built on-site by the advanced robot expeditions that were, even now, preparing the ground before them.

Her mind latched on to the shapes, the textures, and paired them with the ideas they represented. They melded in her mind, settling down into her consciousness, sewing in her disquiet and anticipation bundled together as if they were two names for the same feeling.

That night, her dreams were cold and bright, like a serene cleanroom in a cryo facility.

THE INDOCTRINATION PROGRAM WAS A MONTHS-LONG intensive affair. In the time since she'd been encouraged to enroll, Xiyi had developed a close knot of compatriots. At the center of that knot was Solly, a scrubby-headed Ethiopian boy who could make anybody laugh. Xiyi had found herself secretly hoping that he would be assigned to her mission.

The next day, after meeting with her writing coach to review her previous week's output and get some new exercises, she made her way to the dormitory to see if he was available for a walk around the grounds.

When she knocked on his door, it swung inward to reveal a rumpled bed with a half-packed bag on it.

"Solly? You here?"

His smoked-caramel voice came from the bathroom. "Yeah, be out in a minute."

A flush. A little rush of water in a basin. The door opened and Solly stepped through, half dressed in his business slacks. "Xiyi. Need something?" He gave her a quick little half-smile and pushed past her to the bed, where he resumed stuffing his duffel.

"I thought a walk..what are you doing?"

"Getting out of here."

"What? Why?"

"Have you been around this week? Paying some kind of attention?"

"Yeah, and?"

"They're going to kill us. Well, those of us they pick to go out. And the rest of us are party to murder."

"They didn't say that, they just said...it was about information transfer to outer colonies."

"Including biological information."

"Of course," Xiyi shrugged. "Livestock, cultures, crops..."

"And us. They said we are information. Hell, Xi, weren't you listening at all?" He recapped the mass/distance equation describing the Mannix limit on drive travel. He did a theatrical recap of the four basic principles. "So that's how they get us to that distant star."

“Don’t be a puce. They put us in cryo...”

“With those mass limits? Have you done the math yet? They’ve either got to copy us and send out the copies and leave us normal people to schlep around here, or kill us. I don’t know about you, but I don’t want a thousand Solly’s wandering around the galaxy sharing the same soul, and I sure as hell don’t want to die for these wackos. No, no, I intend to live a long time, and when I die I want to go to heaven...”

Xiyi couldn’t help rolling her eyes. Even great people like Solly could cling to outdated, boneheaded ideas.

“Oh, no. Don’t look at me like that, Ms. ‘Reincarnation.’”

She flashed hot. “Asshole.”

“Ah, hell. Look, I’m sorry, okay? But look, if you thought...oh never mind. Anyway, this is not for me, not no how. So I’m going home.”

“But, your grandmother...”

“There are other ways to get rejuvs. No no no, Xiyi, these bastards aren’t gonna nail Solly Abate to the scanning table. They’re not gonna kill me or clone me and turn me into some kind of drone slave. No way no how. I’m outta here.”

Xiyi didn’t have a good answer. She didn’t like the idea—didn’t fancy not being able to actually experience the trip. She didn’t believe in Solly’s version of a soul—some single entity wedded to her body, something that might get confused if she changed bodies all at once instead of one piece at a time like everyone else did as they started aging—and the thought of going into microstorage for a spaceflight bothered her less than the notion that they might send a clone and imprint it with one of her neural backups. But nobody did that kind of thing. “Illegal” didn’t even begin to cover the seriousness of the offense.

“But they don’t do that. It’s illegal. They’d shut this place down in a heartbeat and sell all the assets to SystemCorps or some other competitor, right? I mean, remember what they did with The Sigma Five Foundation?

“Xiyi, they’re not doing it *here*. They’ll do it *out there*. Do you really think the law applies halfway across the galaxy? Who’s gonna prosecute it, huh? You think there’s some kind of galactic district attorney that’s gonna say ‘Oh, gee, look at those scofflaws out in the next cluster. Perhaps we ought to bring the civilizing hammer of justice down upon them with the queen’s good law.’” His lip twitched in contempt. She caught it, and part of her heart cracked open. Up until that moment, they’d been buds. “They’ll do it and they’ll get away with it and there’s nothing you or I can do about it. You can’t be that dumb. Come on, think!”

Xiyi’s stomach washed hot with anger, then a dead chill followed as her mind caught up to the full horror of what he was saying. What if they *did* just turn out copies? What if there wound up being dozens of her roaming the cosmos? Would they all dilute her share of spirit? Would her life fade to dull gray?

She didn’t want to think about it, and now she was too angry to care anymore that Solly was leaving.

A knock from behind interrupted her brooding.

“Howdy campers!” Xiyi turned to see Dar, one of the second-cyclers on his third PhD, and probably the most bored human being she’d ever met. “Time to roust those bones and get down to the athletic field.”

Solly grumbled.

“Oh, don’t be like that. We’ve got naked croquet and mud wrestling scheduled for ten

minutes from now, we can just make it."

Solly flipped him off.

"Okay, I lied. But there is food."

Solly didn't come. Xiyi muttered a vague goodbye and accompanied Dar to the buffet-style cookout in the evening air.

The Foundation had decided, in their infinite wisdom, that everyone needed something homey and grounding for the mid-week recreation. If Solly had come with them, the distraction might have worked. He and Dar made great entertainment, and on most evenings she bounced between them like a ping-pong ball in a high-energy verbal game. It kept her language skills sharp and her mind sharper, and when their other friends joined in, things could go on all night.

It didn't seem to matter that she was one of the youngest and least educated people here—everyone was young in body if not in mind, and all were getting their concept of the universe stretched out like a lump of taffy while committing to memory an insane and complicated set of social rules, experimental protocols, and a completely new sense of law and justice, custom designed to help them all survive the years they were about to spend in dangerous environments.

She seemed to belong, and that helped to quell her disquiet.

At least, temporarily.

REGRET

THE LAST REAL MEMORY, THE ONE THAT HAPPENED before her brain started to swirl and bend and slip into the light, was the bullet. It tore through her abdomen, a burning numbness spreading through her body faster than the hot rip of the hollow-point could shred her organs.

She'd chosen that part. A childish obsession with ancient weapons that she never dreamed she'd indulge. Thrill death wasn't exactly her thing. She didn't even like eating synthetic beef—you could never quite tell that some sentient animal hadn't been slipped in on the side, to enhance the taste.

But she had to die. That was her part of the bargain. They did allow her to choose the circumstances of her demise. So she asked to be shot before they put her down. Leave her with one less unanswered question as she faced the long darkness.

Chapter 3
The Colonists' Dilemma

Expedition: Filbert
Mission Day 237
Mission Historian Personal Perspective
Year 2253 of the Common Era

IN ORDER TO EXPLAIN THE EVENTS OF THE PAST six months, I should give you the definitive recipe for creating a science colony:

Take one team of mission resource specialists, and add a committee of centenarian psychometricians. Put a full slate of AIs at their disposal, and turn the entire mix loose on your pool of candidates. This cabal is what we call "The Mission Gods," since they create the world we have to live in, and, by Byzantine rules of responsibility, we get to find out if it works.

They put the candidates under a microscope, observing all the little interactions. Every facial expression, change of pulse, change of breathing, and stray swallow. They learn everything about everyone, including the things that the candidates don't know about themselves.

Then, they go through their evaluation.

First, they prefer age and expertise—important when entering a challenging environment. They want people with old minds and long memories. Experience is the survival capital of a science colony. They explained it to us at length during indoctrination.

After that, they filter people for stability, since the last thing you want to experience, a hundred light years from nowhere, is a psychotic break. Schizos and borderlines can fool you at coffee, but they can't fool the brain scan. Neither can psychopaths, but the mission gods decided that every mission needs at least one good psychopath on staff. The official mission manual, which the Foundation considers classified material, reads:

"A healthy pro-social psychopath is indispensable to the survival of the colony. A normal social ratio (one psychopath to one hundred residents) shall be maintained at all times, whenever possible." It goes on to point out that, in a survival situation, you need someone who can make crisis decisions without panicking, and there's nothing like a good psychopath to fill that job.

During indoctrination, we heard the stories about the first Mars mission, and how they had the two psychopaths along before medical instituted their screening processes. Two psychos to a crew of fifteen. One of them was an anti-social, and there was the rape/murder of the astrogator that put everyone at risk. The trust in the crew fractured, they broke into armed camps. It was the pro-social that spotted the murderer, proved him guilty, spaced him, and saved the mission. As the lecturer told us when he informed us how the teams would be comprised: "It really matters that you've got the right psycho on your team."

I'm still not quite convinced.

Once you've filled your psycho slot, you have to fill up all the others, and all the others have to pass the stability tests with flying colors. Even the smallest blip will get a candidate eliminated. The gods will delay a seed expedition by decades waiting for the right candidate to come along, and have. In our case, we got to the far end and found they'd shipped four people who hadn't been in our indoctrination class; they'd been tracked into the program thirty years ago, then had to wait

until the Foundation found enough stable, qualified people to fill the rest of the quota sheet.

"Stability" is a euphemism for "Autism." I wish I was joking. Well, a particular kind of it, anyway. When they said they needed a chronicler, they forgot to mention that the reason they needed one is that, between the psychopath and the thirty-four Autism-spectrum scientists and technicians, I'm the only neurotypical on this crazy planet. I only got to find out about it right before we shipped. They wanted to make sure I was not harboring any prejudices before they broke the news.

Imagine being the only person you know who can *both* feel empathy and communicate it. Imagine being the only person you know who has normal emotional responses. You are locked in a cattle pen with people who have never had a normal relationship in their entire lives, and that pen is surrounded by the most dangerous, gorgeous landscape you have ever seen, and everyone you can talk to finds it "fascinating" or thinks it's "an interesting puzzle." Some of them say "whoa" and look amazed, but they cannot tell that you feel the same way unless you say so, and then repeat it, and then mount a campaign to convince them that you are *not* just trying to make them feel like you care. And the one who *can* look at you and see your feelings, who can make you feel like a human in the company of other humans instead of a babysitter in the company of squalling brats, is neurologically incapable of caring about it.

Thank God my parents were the enlightened kind that got their daughter a reversible tubal when she hit menarche. At least I will never have to worry about pregnancy. Not that sex is very available around here, not for someone like me. The scientists have their own language around that. Besides, I doubt that I could deal with having to stop in the middle to say "No, really, I do like it. I promise I am not just faking to make you feel better. Yes, that feels wonderful—why do you ask?" And I know I would too. I share a room with one of them—Dr. Bosch, our chief botanist—and I can hear them talking everything out. It sounds to me of football commentators sitting on a porn set.

Proper football, not American football.

But that "disability" is what makes them great at working in these colonies. Stable, unflappable, altogether decent people.

These are the ways the mission gods make sure there will be no power struggles, no matter what. We got that talk the day they put us down for the trip. The strategy has worked perfectly on planetary pioneering missions and long haul space flights for two hundred years. When a system works perfectly for long enough, people stop building in failsafes. There was no plan B for power struggles, because there would not be any power struggles.

Personally, given what transpired over the last couple months, I think the system could use a little work.

By the time we hit the bump, I was already wondering if I might need to go crazy just to stay sane. Make the place feel alive, or at least me, you know? On the other side of our little plasma fence I could see a whole world getting on with the business of being a world. In here, I'm trapped with a collection of stable people doing their stable work. I have never been this bored in my entire life. If this colony were a drink, it would be a glass of warm distilled water with a sprig of parsley in it, for color. A right barrel of laughs, as you say.

Always in my life, I have hated that place in news stories where the journalist, who assumes that no one in her audience earned a passing grade in toilet training, says things like "the turning point came when..." or "that was when everything changed..." or "when he revealed the shocking truth..."

It is insulting. And it is lazy. And I will have no part of it.

It would also be a lie. Because I do not know exactly when the turning point came. I suppose I could guess, and say that it happened when they discovered the planet was poisonous.

"We." It would maybe be better if it was "we." Since they sent me to this god-forsaken end of the universe to provide some human perspective, I will tell to you what happens when thirty-five-plus-one get sent halfway across the galaxy to a planet that has only been surveyed with probes, to sink or swim.

What happens is that we wake up, one by one, and find their place as designated by the mission gods. Acting singly, according to a preordained agenda, they spin up their individual laboratories and projects, and they get on with the work they have come all this way to do. And, during work hours, everything works smoothly, as long as we can stick to our mission.

Our mission is this: We are to conduct a complete analysis of the biosphere so that it may be made safe for human habitation.

Considering where we come from, "safe" is a pretty elastic term. About ninety percent of the surface area of the Earth is unfit for human habitation, and it took us about two hundred thousand years to figure out how to beat our home planet into shape without beating it to death. I imagine that it seemed pretty endless and dangerous to our first grandparents, looking out across endless lands shaped by volcanoes and continental collusions, and then sculpted and softened by grasses and cape buffalo.

It was not something they gave us in the indoctrination packet, but as I have interviewed the worker-bees these past several months in between playing shop assistant, I have built up a scale in my head from "Mars safe" to "Hong Kong safe."

A "Mars safe" environment is one where we cannot survive without bringing our own atmosphere and radiation shields. It's about as bad as a planet can get before it is completely unusable to us.

Above that, you have a Sahara environment, where survival is possible with great ingenuity and lots of biomech assistance—the Berber had camels, we have our robotic labor force to fetch our necessaries.

Moving up the list, you've got the Himalayas, and the Carpathian mountains, and the Aboriginal outback. All very hostile, but completely survivable if you have a clever head and friends with clever heads. It is the definition of our species: humans are the life form that can hack.

Next up the ladder, you find the Amazon and the Congo and the Indian jungles—still hostile, but bursting with food. You just have to make sure not to become food yourself, for predators either macroscopic or microscopic.

After that are the tropical and subtropical islands, with their plentiful fruit and easy game. New Zealand, Hawaii, the Bahamas. A single person with a sharp stick could pretty much make a good life without too much trouble in those places, once upon a time.

But at the pinnacle of habitability, we move into the towns, then into the cities, until you reach Hong Kong level. An environment completely made for and by humans, completely domesticated, filled with living buildings and served by the surrounding lands in a way that puts far less stress on them than trying to beat out a small scale survival. The trick to integrating humans into their environment is to get them to build as high and fast as possible. The more people are in a city, the less toll they take on the surrounding natural land, per capita.

I thought that last part was pretty much crap the first time I heard it, but watching Dr.

Wasserman—our planetary ecologist—map out food webs over the last months has made me a believer.

But a poisoned planet? Nobody saw that coming. Nobody could have guessed what it would do to our little boring family.

The trouble we had was that you cannot make a planet filled with neurotoxins fit on the habitability scale. It has breathable air and a magnetic field, so it's no Mars. But it is also bursting with so many proteins to melt your skin, and heavy metals to poison your blood, and prions to rewire your wetware that only a complete idiot would even go out for a walk without a whole body hazmat suit.

When Dr. Prescott briefed us on the situation six months ago, he said we were officially screwed. I'm not sure how official it was. I don't know if he filed a report with the orbital base station for its next probe launch home, scheduled for a year from now. I do know that he made a note in his log about needing to re-evaluate the mission rationale. I like to think that it read "Official: Our entire mission has been sodomized sans lubricant by the capricious whims of evolution. Mission footing re-evaluated."

Because "re-evaluated" is a bang-up euphemism for "redesigned to provoke a civil war."

Well, not exactly a civil war. It wasn't all that civil, and it wasn't much of a war at first. Frankly, watching it unfold was a little bit like watching a box of wet matches trying to light off a fireworks display. Stable, mature people take a long time to get hot under the collar. Which is what the mission gods intended.

It started with the re-evaluation of the mission. Since the notion of making Filbert suitable for human habitation by mapping out the biosphere and finding our niches was clearly ludicrous, our little dysfunctional family gradually explored more radical ideas.

The gods designed the mission to operate in stages:

Stage one: Perform a comprehensive analysis of the biosphere, planet-wide.

Stage two: Deliberation. Everyone (well, everyone not counting me) would argue, at length, about whether to open the planet up for colonization now or later. If now, they would argue about which of the four prefabbed plans we should pursue. If later, when and why, and what it would take to get to "go."

Stage three: Communicate the decision (and all mission records) back to base, then return home if we were so disposed.

Since that was not going to work here, we needed to improvise. And since all the previous colonies had been established in the Sol system—the Proxima disaster notwithstanding—we were in unexplored territory philosophically as well as practically.

I trust you will excuse the discursive style. I am attempting to collate and compile notes and recordings from a very eventful time, and I find I have to jump around to make it all coherent.

So, there was the announcement. And, after some initial not-quite-shouting, Dr. Prescott ceded the floor to Dr. Galbraith, the official mission commander, and our resident psychopath, and the only person here I can't stand. It's a personal matter, not important to anything, so I won't dwell on it here. According to mission law, which we all swore to abide by, the mission commander is the king of our little country. A despot. An absolute monarch. At least, provided he confines his despotism to the territory defined in the (thankfully narrow) mission protocols.

He stood in the center of the circle and waited until the rest of us gave up and stopped trying to talk over each other.

"Look," he said, "we can dance and sling all the crap we want, but we're not going to solve

anything. We need answers and some serious ideas. How deep does this go..."

"All the way down. It's in the goddamn *soil*, Darren."

"Maybe. Maybe. Or maybe you've just let your fingers do the walking so your rectum does the talking. The soil back home is a stew of pathogens and lead and cadmium and we managed to evolve perfectly well there. So try pulling your fingers out of your ass and give 'em a good lick and hold 'em up to the wind, and get me some bloody data and some creativity. That goes for the rest of you too. That's what they picked all you people for, right? Brilliantness and methodicalness and creativeness and all that other messyness, right? I hope so, cause they sure didn't pick you for your personalities. Stop jumping to conclusions and get me some goddamn options."

He looked straight at me. Sitting in my little seat in the back, I got chills. He always knew exactly when to abuse them and exactly when to coddle them. Now I was the target, and I half dreaded what might next come out of his mouth.

"Xiyi, this includes you. Come up with anything you can. Bring it. We'll meet back here in two weeks, and we'll sit in this room until we come up with something. I don't know about all of you, but I didn't come here for the scenery and I sure as hell don't want to retire here. We got a job to do, so get to it and don't let me catch you talking hopeless."

Nobody grumbled after he left. We simply each looked at the other for a moment or two, then began breaking up into our different teams. Nobody asked for my help, and nothing urgent seemed to be happening, so I went to walk the perimeter to make sense out of what Dr. Prescott had just told us.

I remember looking through the fence and thinking it was all a bad dream. The whole expedition. I could feel the wind off the mountain cool against my neck, and it chilled me clean through, even though it was summer. Above me, the midday sun painted the patchy overcast with the spectrum of depression.

I did *not* sign up for this. I did not exactly sign up for any of it, to be truthful, but I did have a choice. I could have found another job somewhere. In some part of the world, there would have been someone who would see a novelist as an asset instead of a security risk. I remembered sitting across from that human slug Wanda Laird, and how she made me feel like a bug she wanted to squish, and tried to make me think she would ruin me if I refused.

But I also remembered thinking about what my name would look like in the history books. How it would be my account you all would read. My voice that would give narrative cohesion to the dry collection of logs. My observations that would give substance to the characters.

No sane, intelligent person would refuse. I came because I wanted to.

As storm clouds gathered in the valley below me, I wished I had found the courage to admit that to myself before I came. It might have made a difference, somehow.

It was supposed to be a heroic tale, like the *Ramayana*. I was Valmiki, bringing the great tale to all who came after. If I knew it was going to turn out this way, if I even thought it was possible, I might not have come.

Now, we would go down as a footnote. A failed expedition. "The official record shows that the Filbert expedition never stood a chance. Fortunately, all of the other ten expeditions succeeded." The world outside the shield was trying to kill us all. And maybe there was no way to stop it. No way to win. But it looked so bloody beautiful, I wondered if I would really mind. When my soul melted back into the universe, would I think it was a waste? Would I miss my name?

That was six months ago. Things, since then, have changed.

Expedition: Filbert
Mission Day 237
Mission Historian Personal Perspective
Year 2253 of the Common Era

A WEEK ON FROM THEN, MISSION DAY FIFTY DATING from when I was released from quarantine, I was collecting the food for my lunch from the mess line, when I spied something wrong.

Or, well, at least unusual.

Drs. Stella Bosch and Jonathan Davidson were not what I would call friends. The nature of their work demanded the semi-frequent intercourse of their routines—she being the chief of our botanical sciences division and he being the head of molecular bioengineering and fabrication—but they had never developed the familial affection that the rest of us had acquired during our boot camp time and our stay here on-planet. They normally treated one another with icy professional courtesy. When I found them huddled together at lunchtime mess a week later, I considered it my duty to intrude.

"I hope not to be intruding," I said, setting my plate down next to Stella. Asserting roommate privilege flummoxed her a little, and it took her a moment to figure out what to say, by which time I was already on my way. "Something is going on here. As mission chronicler I demand confidential access, as authorized by general order sixty-two." They shifted uncomfortably. I smirked. "I may be persuaded to pay with chocolate."

"Oh, well, if you're gonna pay in chocolate, I..." Stella stopped, reconsidered her words, and gave me a dirty look. "Wait, where the hell did you get chocolate way out here?"

"I brought the formula in my personal data allowance. I can print out about ten grams during my weekly time allotment."

Stella pointed her fork at me. "We're going to have to talk about the roommate's code, you and me, girly."

"After." I looked at Jonathan. "You too. I am entitled to know what you two are doing. Deviations from normal routine. You both hate each other. What draws you into cahoots?"

They exchanged nervous glances, then made a set of hand signals at one another. It was not a sign language, not exactly. It was a gesture-based vocabulary that the ASDs had all learned to communicate emotions without words, in the same way that neurotypicals read facial expressions. I knew enough of it to recognize that their fingers were roughly approximating the emotions on their faces. Trepidation, frustration, dread. I found myself wishing I had failed to ask.

"Stop dithering. Tell me." Not for the first time, I wished I had the facility with spoken English as I do with written. I find it embarrassing now as I write, listening to the recordings, hearing the stilted mangle I make of words that fill my head with such clarity. I have never quite been able to shake the tonal grammar of my native language, and my tongue does not cooperate with the speed it should, and my wit always lags three seconds behind my mouth. "Jonathan. What vexes you?"

"We found the problem this morning." He rubbed his face, shaking his head against his hand, as if he had just discovered that all was lost in the world. "Well, at least, I think it's the problem. And we should have spotted it before we ever came here. I designed the probe, I should have… dammit. One of those things that is so simple, so uniform, it never occurred to me to build in a control. I didn't even find it by checking for it, I just stumbled onto it this morning..."

“So, what is it?”

He held up his left hand, pointed to it with his right. “This.”

“Your hand?”

“The left hand. We’re on a left-handed planet.”

“I am left-handed,” I said, “I think more than half the people here are left-handed. Why is this a problem?”

“Not you and me. The planet. The molecules. Everything. It’s called ‘chirality’. You’ve heard of it?”

I shook my head.

“It’s a bias in how molecules form in a given environment, and nobody knows exactly why it happens. Maybe something to do with the stellar nebula, or the planet’s magnetic field, or maybe to do with the crystalline structure in deep sea vents where life forms, or the order of reactions in the way a planet self-organizes. Nobody knows for sure. We know there are about a thousand ways to induce structural polarity reversals in chiral molecules and...”

He stopped. I had made the ASD finger sign that meant “huh?” The most useful ASD sign I had learned up to that point, that was.

He cleared his throat. “Okay, short layman’s version: in the Sol system, and everywhere else, the molecules that make life up—the proteins, especially—are overwhelmingly right-handed. They all fit together in a certain way, because of their shapes, and this fit is what makes life work. It governs the way they react, the metabolism, everything. Sugars are usually left-handed, but since they’re easy to break down, that’s not as big a problem. For some reason that we don’t know yet, this planet is almost all left-handed proteins and right-handed sugars. That means that the proteins fold differently, and everything works like it was in a mirror. When those molecules line up with our molecules, some things have no effect at all, because nothing fits. Sometimes, they have a neutral effect, where enough works that the reaction can take place. I’ll bet some of the sugars will wind up working this way. And some things, maybe most things, will be poisonous, because they’ll react half-way and leave us with weird metabolic waste products, or they’ll make a normal energy exchange a leech exchange...”

I made the sign again. Stella took pity on me.

“Xiyi, do you know how carbon monoxide poisoning works?”

“I think so. The monoxide bonds with hemoglobin and crowds out oxygen, and you suffocate from the inside out.”

“Right. What Jonathan’s saying is that a wrong-handed protein or amino acid could screw up cellular metabolism in that same kind of way.”

“And that makes them poisonous.”

“That’s the theory.” Jonathan took a drink of his synthetic coffee, then grimaced at it as if it had betrayed him.

“So, what can we do about it?”

“That’s what I’m working on.”

He brought me up to speed. By the time he had, I felt sick to my stomach.

End Of Sample

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About the Author

WHILE *STAR WARS* and *STAR TREK* seeded J. Daniel Sawyer's passion for the unknown, his childhood in academia gave him a deep love of history and an obsession with how the future emerges from the past. This obsession led him through adventures in the film industry, the music industry, venture capital firms in the startup culture of Silicon Valley, and a career creating novels and audiobooks exploring the worlds that assemble themselves in his head. His travels with bohemians, burners, historians, theologians, and inventors led him eventually to a rural exile where he uses the quiet to write, walk on the beach, and manage a pair of production companies that bring innovative stories to the ears of audiences across the world.

For stories, contact info, podcasts, and more, visit his home page at http://www.jdsawyer.net