

Michael Carroll

# On the Shores of Titan's Farthest Sea

A Scientific Novel



 Springer

## Science and Fiction

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Michael Carroll

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A Scientific Novel

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Michael Carroll  
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# Quotation Page

*It is the dark thread that runs through every sea-faring culture. The Homeric poetry of the Archaic period of Greek history [is] the first to speak specifically of the practice, but even the Minoans, whose sea-going fleet was unmatched in the ancient world, suffered at the hands of coastal marauders. Wherever the elements of humanity, travel and commerce combine, there has always been—and will always be—piracy.*

—Alexander T. Grouthe, *Of Seas and Men*, Volume II



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# About the Author

**Michael Carroll** Award-winning space artist and science writer Michael Carroll has written 26 books, ranging from children's devotionals to titles that include *Drifting on Alien Winds: Exploring the Skies and Weather of Other Worlds* and *Alien Seas: Oceans in Space*, both published by Springer. He has done art for NASA, the Jet Propulsion Laboratory, and dozens of book and magazine publishers internationally. Mike is a Fellow and founding member of the International Association for the Astronomical Arts. One of his paintings is resting at the north pole of Mars—in digital form—aboard the Phoenix lander. He is recipient of the Lucien Rudaux Award for lifetime achievement in the astronomical arts, and the American Astronomical Society's Division of Planetary Sciences Jonathan Eberhart Award for the year's best planetary science feature article.

**Part I**  
**The Novel**

# Chapter 1

## Encounter

The dawn struggled to claw its way through the orange gloom, with little success. Even on the brightest of Titan's days, dawn hung on tenaciously until mid-morning. Sometimes you could see a faint glow from Saturn, beyond the mist and always amorphous. But not today. Not in this soup. It was all so ironic. It had only been a few years since Kevin Nordsmitt had taken the job in San Diego to get away from those lousy Washington, D. C., winters with all that ice. Now he was living on an ice ball. And cold? *The nation's capital had nothin' to compare. Just my luck, ending up in a place like this*, he thought, as the sweat trickled from his forehead into his left eye.

Nordsmitt had been slogging his way across methane bogs all morning, taking care to miss the subtle hollows filled with quicksand. The hike to the cave was not an easy one, and the methane drizzle only added to the challenge. But he had to get up there. He had suspected that he wasn't alone, and now that he knew it, the cave might be his only chance. A dark entrance stood at the top of a steep hill, gaping like a monster's maw. Scrambling up the loose scree, Nordsmitt tried to concentrate on where he was going, not on what he knew he shouldn't have seen.

He lunged into what he hoped was the safety of the cave, but as he turned around, he saw that they were out there, on the plain below, and they'd seen where he was headed. He twisted back into the darkness, beaming his flashlight only sporadically, still hoping to lose them in the cavern. The walls were smooth. If he didn't know better, he could convince himself that the place was made of stone. But the ground and mountains and boulders of Titan were water ice, frozen to the consistency of granite.

The path looked flat and straight for another 10 meters. He shut off his light and made his way, slowly, through the darkness. Suddenly light flooded his surroundings, casting wild spikes of surreal shadows, the walls glistening like diamonds. He turned around. Three hulking figures loomed behind him, wearing pressure suits very different from his own. One of them held up three fingers. He switched his receiver to the frequency indicated.



“...Look, pal. We know our way around this place better than anybody, including a rock hound like you.”

“I’m here for Colorado/Arizona University’s field research,” Nordsmitt stammered. “I’m a river guy.”

“Rivers, huh?”

“Whether it rains methane or water, you still get rivers.” He looked from the behemoth in front of him to the ones in back, searching for some sympathy behind their faceless visors. His faceplate was fogging up. “I don’t know what you guys think is going on, but I’m just doing my job.”

The large man in front held some sort of sharp tool in his hand. He handled it like a dagger. “Me, too, my unfortunate friend. Just doin’ my job.”

## Chapter 2

# Abigail Marco

When the light caught her just right, Abigail Marco could see her reflection in the wall-mounted monitor. She shifted and let it fade away. The screen's glowing numbers told her the air was warmer than it felt: 70°F interior temperature. It always felt colder to her.

She kept her distance from the reflection. That face had come a long way from the innocent little kid who loved to play among the ancient ruins of Mars. She supposed it was only natural. Her parents had pioneered the field of interplanetary archaeology with their study and preservation of the first Martian settlements. She had spotted, in that fleeting reflection, her father's heritage—both the rich dark hair of the Italian and the heavier build of her terrestrial roots. Both aspects intrigued her. As she looked out into the cold desolation, she wished she had made it to Earth more than just that once, perhaps to Europe. She had traveled off-world a little, to the moons of Mars and to the port city of Dardanus on Ganymede. She liked Ganymede. She liked the oddness of it, the black sky and the strange customs of the people, and the elegant parallel mountains. But Mars was home, and she had tried not to stray too far. Until now.

These days, Abby found herself about as far from home as a human could be. Her life had not taken the same path as her parents. History didn't charm her in the least. But the sky did. She loved the clear Martian firmament, loved how the heavens turned from that metallic blue-gray in the daylight to that midnight blue just after sunset. The glowing clouds entranced her, along with the sundogs and haloes that crowned the bright Sun. When she realized that she could actually make a living by researching the sky of this and other worlds, her course was set. And exotic Titan was any meteorologist's dream.

Saturn's largest moon had far more atmosphere than Mars. It even held more atmosphere than the genesis world, Earth. The sky was dark, a lot like tomato soup with Worcestershire sauce mixed in. Within the brooding fog, bizarre chemical effects played across the sky, casting a drizzle of methane, ethane and propane into the frigid lakes and rivers below. That chemistry, that weird and wonderful mix that led to complex organics, brought her across the void to this faraway world.

Abby made her way down a succession of corridors, each bracketed on either end by an open hatch. Living at Mayda Research Station felt like living on a train, moving from one car to another. As she headed toward the station's galley, she glanced out another window, at another mirror image. For a brief moment, she saw her sister looking back at her. Janice. So far away. So long since they had talked. So unlike herself in her talents, but so much alike in other ways. And beyond that reflection, that ghost face, the weather was the same as it had been the day before, the week and month before—foggy with scattered methane showers.

"Were you hoping for a nice day?"

Abby pivoted to see a burly, rugged man with close-cropped auburn hair and a wayward soul-patch. Troy Fels served as comic relief for Mayda Research Station. Beneath the comedic façade, though, he was a darned good scientist, not to mention easy on the eyes. "I've given up on nice days," she told him.

"Nonsense, Apps! This is nice, for Titan."

She smiled weakly. "It *is* monsoon season. And I do love the rain. It's the best chemistry an atmosphere geek could want. But the dark gets to me after a while. And the fact that everything smells like turpentine."

"What do you expect? It's a regular backyard grill out there, with all that ethane and butane and all that other stuff. And then you've got all these people contributing to the methane. I heard a rumor that when they served that three-bean casserole last week it set off the atmosphere alarms, but I don't know if I believe it." He feigned concern. She could tell he was trying to be funny, but there always seemed to be an uncomfortable edge to the guy.

Abby rubbed her hands together. "Gee, you've really got me in the mood for breakfast."

"Mind if I join you?"

"Sure." What could she say?

As they passed through the hatch into the galley, a twiggy woman stood to the side to let them through. Her strawberry blonde hair, normally pulled into a ponytail, hung forward, disheveled. "Hey Troy. Hey Abby."

"Hi Tanya. Where you headed?" Abby asked.

"I..." She leaned against the wall.

"Hey, hey, you okay?" Abby reached for her. "Come sit down."

Tanya stared at the floor while the two ushered her to the nearest chair. "Thanks, guys. Just little bits dizzy," she mumbled. She looked up. Tears filled her eyes.

Abby put a hand on Tanya's. "What's going on?"

"Did you guys hear? About Kevin?" They shook their heads, puzzled. "They found him this morning in his bed. He was dead, Abby. Dead."

"Oh...n-no." Abby was shocked.

"What happened?" Troy asked. Tanya buried her face in her delicate hands and made indecipherable noises.

Troy leaned toward Abby. "Between her blubbering and that Russian accent, I can't understand a thing she's saying," he whispered.

Abby glanced at Troy. He looked like he was fighting off a panic attack, and losing. *Poor guy*, she thought. *Typical male. No clue what to do with an emotional outburst.*

“Why don’t you get Tanya some water, Troy?”

“Yes, yes. Good idea.”

Troy launched himself from the table. He slalomed across the room, dodging the maze of identical, cafeteria-style furniture reflected on the clinically clean floor. The place reminded Abby of the canteen in her college dorm. It smelled of disinfectant and yeast.

Abby put her hand on Tanya’s shoulder, felt the sobbing ebb, and handed her a tissue. Troy, sensing that it was safe to return, sat down with a cup of water and put it tentatively beside Tanya’s elbow.

Tanya blew her nose. She said nothing. Abby said nothing. Troy studied his boots. “Apps, would you like a water?” he tried.

“Never drink the stuff. Coffee is my drink of choice. Hot tea. Hot cocoa. Just hot, ever since I got here.” She shivered.

“Can I get you some, er, tea then?”

Abby had to smile. He was trying. And he was avoiding staring at Tanya.

Tanya sniffled and spoke quietly. “He died of, you know, cold—*hypothermia*.”

Troy did a double take. “He froze to death?”

She nodded her head behind another tissue.

“*In bed?*”

“That’s what Doc says.” The tissue muffled her voice.

Abby cut in. “That’s ludicrous. How could somebody freeze to death asleep in their own heated room?”

“It is nature of life here. We have seen accidents, no matter how we are careful of things. Titan is not place that forgives.”

Tanya didn’t have to remind Abby of the past year’s events. There was Levon Danfield, the journalist, who died when his rover stranded him. He broke the primary rules of thumb: have a buddy, have a backup plan, and always check your communications equipment, including the emergency batteries. And that scientist from Solus Lacus on Mars, Jenine something. Simple suit leak. She probably hadn’t sealed it correctly. She just went to sleep on a dune out by the shore and never regained consciousness. Then there was the organic chemist from Oxford—the Oxford in England, not the one on Ganymede. He had simply disappeared. His body was probably a popsicle at the bottom of a methane lake, or he might have slipped into one of the quicksand pits.

“Guess it’s just part of life’s rich pageantry on Titan,” Troy grumbled. He slapped his palm against the tabletop. In the low gravity, everyone’s drinks rose into small stalagmites, quivered midair, and sloshed back down, threatening to breach the rims of cups and glasses. “This is, hands down, the weirdest place I’ve ever been. And it got weirder when they started drilling that big hole out in the lake.” He tipped his head toward the window. Beyond it, in the tawny fog, loomed a great, dark tower, reflected in the shimmering waves of Kraken Mare.

“Don’t blame us,” Tanya said, her Russian accent bleeding through. “That will be big science, very big science, when we break through to the water ocean. You will see.” She said it with little enthusiasm, and let out a slow breath. “But for this monument, I think I will take day off.”

“Moment,” Abby corrected. “For this moment. You want company?”

Tanya waved her off. “Thanks, but I am okay now. This *moment*. You guys eat.” She stood and wandered, zombie-like, through the hatch.

Troy leaned toward Abby conspiratorially. “I’ve always thought there was something weird going on with that guy.”

“With Kevin?” Abby frowned as she sat back down. “He was such a sweetie.” She thought about his gentle demeanor, his quietness despite the fact that there was so much he had to say, so many deep things, and followed through on anything he offered to do. He listened to you like you were the only person in the world, even when you were surrounded by people. He certainly made Abby feel that way. Maybe that’s what set him apart, that willingness to take time, even when the world was spinning out of control and the deadlines were looming.

“He was a nerd. Apparently a careless nerd.”

Abby glared. “I’m not a superstitious person, but it is tacky, at the very least, to speak ill of the dead.”

Troy’s hands fanned the air in front of him. “No, really, check this out: why would a university send a hydrologist—a water expert—to a place where water behaves like rock? Kevin was always scraping up ice samples and melting them. Not something a hydrologist would do. A geologist I could understand. Not a hydrologist. I may be a lowly organic chemist, but that strikes me as just crazy.”

“I assumed he was studying what’s in that water, like a geologist would study what minerals are in a rock.”

Troy was shaking his head before she finished her thought. “That’s my point. That’s not what a hydrologist does. A hydrologist studies what water *does*, not what little beasties it’s got floating around in it. Isn’t that right? They would have sent a chemistry expert. Or somebody familiar with the ice moons. Not someone who charts rivers and sediments on the terrestrials.”

“Titan has lots of rivers. They’re methane, but liquid is liquid, right? Maybe that was it. I never really talked to him specifically about it.”

Abby scoured her memory of Titan rainfall pattern studies. Rains washed across Titan’s polar regions with totals adding up to about 100 hours each Titan year. Since Titan’s year lasted 30 Earth years, that was a pittance of precipitation compared to the green world. But the dry equatorial regions had it even worse. Those regions could endure droughts lasting a millennium. The gentle rains that Mayda had been experiencing were not typical of some areas farther north and to the south, where violent cloudbursts were the order of the day. Dry river channels flowed from mountainous regions like Xanadu into broad drainage basins. Some of those deltas fanned out in a scale similar to the River Thames. The icy moon’s surface was not as heavily eroded as that of Earth. For some reason, the methane rivers did not cut through the ice in the same way that water rivers cut through Earth’s rocky landscape. Still, they had familiar forms: oxbows, meanders, serpentine pathways, dendritic valley systems. In them, Abby saw echoes of other rivers: the Earth’s Nile, the Mississippi, the Amazon, and Mars’ Naledi, Ma ‘adim and Reull rivers, full to the banks since terraforming. Her Norwegian colleagues would be perfectly at home on the shore of some of those more northern Titan “waterways,” where liquid methane had engraved fjords into coastal cliffs.

Troy brought her back to the moment. “Yeah, but Kevin never went anywhere near the riverbeds. They’re all south of here, right? He spent his time in the hills to the west, beyond the dunes. And I asked him once about the erosion in the Grand Canyon on Earth—how it compared to Valles Marineris or the canyons south of Xanadu here—and he got this panicked look, like he was trying to remember some speech he’d memorized but couldn’t quite recall.”

“I know that feeling.” Abby said.

“Something’s up, Apps.” Troy stared at her and waited. He reminded her of an owl, unblinking.

She tapped a finger on the table. Kevin was her friend. Surely he would have confided in her, wouldn’t he? Heat inched its way up the sides of her neck. Why had Troy always been so gifted at making her feel cornered? Finally, Abby blurted, “Well, what do you want me to do about it? I’m just a gas girl.”

Troy stood and began to pace between tables, alarming the handful of fellow diners in the room.

“I—I don’t know. You’re the one who’s always doing stuff, leading the pack, organizing things. This thing needs organizing. The whole Kevin Nordsmitt thing was irregular from the beginning. He was always sneaking around with his little filters and microscanners and stuff that would fit a bio guy more than a water scientist.”

“He was shy.”

Troy stopped mid-stride and fixed her with his remarkable green eyes. “He was secretive. There’s a difference.”

The silence between Abby and Troy stretched. Abby let out a long breath, let it puff up her cheeks for a moment. “Maybe you’re right. Think I’ll go have a chat with Doc Mason, see what she’s got to say about all this.”

“I’ll pass. I’ve got work to do. Besides, I don’t think she likes me much.”

“Doc Mason? Why do you say that?”

“Just a feeling, Apps. But let me know what you find out. It would probably be good for us to know how he died, why he died. The whole thing creeps me out.”

Now that she thought of it, the whole thing crept her out, too.

## Chapter 3

# Baffled and Bewildered

“So just how could someone freeze to death in the confines of a heated science outpost, under their covers, in bed?” Abby stood in the medlab, hands on hips. Above her, a forest of scanners, tubes, and cones nested in the ceiling, awaiting the doctor’s orders to come down and prod away at patients. Abby didn’t look up.

Doc Mason sat behind her desk, interlacing her fingers. She looked puzzled. “I asked myself the same thing. And that’s not all. He had burns on his hands, as if he’d taken his gloves off out there. Shoulders, too. Upper back. Cryogenic burns. Like frostbite on steroids. I am completely baffled, I don’t mind telling you. I just don’t get it. He was so popular around here. Everybody liked Kevin.”

“You could always count on him to do just about anything. He fixed my microwave food generator in the middle of the night once. Very handy guy.”

“Generous. Talented. I suppose we should save all this for the memorial, if they have one.” The doctor glanced toward the back of the room, in the direction Abby had been avoiding. A single gurney glowered in the corner, a form hulking beneath its sheet.

Abby tried to anticipate Mason’s suspicions. “So, you think it was—”

“Foul play? Maybe, maybe not. Am I going to do anything about it? We need to put controls in place over our team members when they go out. We need to restrict people from going out alone. We need a better system for checking out the rovers and boats.”

“And what if Kevin’s death went beyond that? What if he didn’t stumble into bed and die of delayed hypothermal symptoms? What if it was no accident?”

Mason pushed herself up from the desk and walked over to the small porthole in the wall. Tawny light softened her striking features. Her high cheekbones and narrow eyes betrayed a Mongolian ancestry. Gray streaks wandered through her black hair like milk poured into coffee, framing her rich, bronze skin. Flecks of amber floated within her ebony eyes. Abby had always thought of the doctor as stunning. *She should have been a model*, Abby thought. *Models don’t need bedside manners.*

The doctor stared out the one small window behind her desk, as if willing the orange fog away. She seemed to wilt before the porthole. “Abby, I am up to my eyeballs in work and government red tape. I’ve been asking for backup for nearly a year, and nobody’s on the horizon. Not a med student or an RN...at this point I’d even take a first-year veterinary student with a felony rap. Somebody’s got enough bucks to drill that big hole in the ice—” She nodded her chin toward the dim outline of a massive tower in the distant fog. “Wish they’d send some our way. If I go telling the authorities that somebody was murdered here, the documentation will be twice as bad as the mountain I’m already facing. We might as well hang up the science we have and become bureaucrats, all of us.”

“Come on, Doc. That doesn’t sound like you.”

The doctor turned from the window, her hair undulating in the light gravity. Suddenly, she looked older, the subtle creases around her eyes and mouth accentuated by Titan’s twilight. “The bean counters are running the place now. They’re far less concerned about science than about us crossing our I’s and dotting our T’s.”

Briefly, Abby wondered what alphabet the good doctor was using. “And you want to protect the station,” Abby said. “But at what cost?”

“At just about any cost. Still, for Kevin...” She put her hand on the windowsill. The orange light gave the doctor a supernatural glow.

Abby huffed. “If he froze to death, he must have done that outside, right?”

Mason nodded, then shrugged. “He could have been exposed to toxic levels of gases through a bad suit seal, or chilled down to a point of no return before he hopped into bed. Look, Abby, when something momentous happens in life, we sometimes attach significance to it beyond what it really merits. An accidental death takes on deeper meaning when it becomes premeditated.”

“Or a tragic mishap becomes foul play,” Abby added. “I hope it was an accident. I would hate to think that someone—”

“Yes, well, don’t. Someone didn’t. Titan is a place just waiting to kill its visitors in a multitude of ways. Kevin just got caught in one of them. Sadly.”

“But there must be a record from the airlock cameras, something showing him coming in from outside.”

Mason frowned. “I thought of that, too. No good. I asked Piers to show me the feed. There’s a blank section in the records for about twenty minutes during—”

“The power glitch,” Abby moaned. “That was convenient.”

“Wasn’t it?” the doctor said blandly. “They still don’t know the cause. Somebody clearly needs to look into that power failure. Brian told me he and his techs found some suspicious footprints out by the main cabling that leads to those west transformers.”

“Suspicious footprints? Like Bigfoot or something?”

Mason seemed deep in thought. “But who to call is the other question. Technically, Mayda Research Station falls under the supervision of Port Dardanus on Ganymede, but the nearest real authority for something like this is down on Mars.”

Abby wasn’t sure if Mason was talking about the mystery of the power or the death of Kevin Nordsmitt, but either way, she felt better taking some kind of action. The mysterious demise of a friend, no matter how accidental it might seem, needed



to be investigated, didn't it? What if the cause of Kevin's death might happen again to someone else? What if he had run into a problem that somebody else might stumble into? Was anybody safe, really? "I have a—a—friend who used to be with the TriPlanet Bureau of Investigation. He once probed a case back on Mars for us; somebody made off with a million bucks worth of meteorology equipment. He's a private investigator or some such thing now."

"Oh?" The doc raised an eyebrow. "So you worked together, huh?"

"Yes. What?"

"You just sounded like it was more than a working relationship."

"Nothing romantic. Friend of the family. He's my parents' age. And very discreet. Would that help?"

Mason squared her shoulders. "Former TBI sounds good. Discreet sounds even better. I'd prefer that to sending out the alarm and getting some incompetent fed from Ganymede. I'm skeptical of all this cloak and dagger stuff. Titan throws enough deadly barbs at its residents without us needing to call upon Jack the Ripper. But we might as well have you make the call. You'll have to wait a week or so. I think we're at opposition, aren't we?"

"Someone really needs to do something about celestial mechanics. This business of the Sun getting in the way is annoying."

"Mars will be back out soon enough. And a few days before, you can relay through Vesta center."

"I'll get in touch, see what's up with good ol' Jeremy. I want to find out what happened here. We owe it to Kevin."

The doctor walked over and put her hand gently against the mound on the gurney. "That we do," she murmured.

With a start, Abby admitted to herself just what was on that gurney, under that thin veil of plastic sheeting. That mound of cold flesh, that inert vessel, used to be someone, a person with warmth and energy, dreams and plans, someone with a mother and father and friends. She shook her head, tried not to think about it. It was time for some distraction, or at least a channeling of her feeling of helplessness.

Abby headed for the researchers' quarters. She stopped at a door that was plastered with bumper stickers and posters of various equations and puns. "Support Random Acts of Science." "Can't be two places at once? Try Quantum Physics." "Io is Gnarly." "Aristotle was Right." "Newton Had a Concussion." "Are You Sirius?" She didn't understand some of the more obscure references, but she liked the cartoons that went with them. A large, tattered poster hung askew near the transom, a photo of an ice skater on one of the melt ponds on Europa.

She knocked on a small patch of metal that wasn't covered by plastic or paper. "Yo, Troy. You in there?"

"No," the muffled voice behind the door replied, "but I'll be back just as soon as you leave."

He opened the door a crack.

"Gave yourself away." Abby pushed her way in.

"Come in, please," Troy said to her back. As she glanced over her shoulder at him, he motioned to the only chair in the room. "Something on what's left of your mind?"

“Yeah.” Abby sat on the floor. “You take the chair. You look like you need it.” She frowned. “Seems to me there is one way to get to the bottom of all this stuff about Kevin.”

“Which is?”

Her eyes drilled Troy. “We need to find out what he was doing in the western hills.” She stood. “What are you doing right now?”

“Anything but that. I have two words for you: luna, tick. If you’re planning on going out to regions not on the work map without backup and travel plans and—”

“And you *know* you want to. You want to find out as badly as I do.” She let the quiet grow between them, and then added, “Am I right?”

Troy nodded in surrender. “Yeah. Somebody needs to.”

“Look, Troy, I know you weren’t that crazy about the guy.”

“I was in the minority, apparently.”

“Stop pouting. You said yourself, his death creeps you out. You want to know what happened. So let’s find out.”

“But should we run it by the Director?”

“She’d have kittens. She’s under the gun about silly things like profitability and accountability and all those other ‘bilities. Donors are watching. Doc Mason just gave me the same sad story. Doc’s feeling the economic pinch these days.”

“So is the Planetary Science Foundation. All the Director needs are a few more government rules and regs.”

“Just what she told me last time I saw her,” Abby said. “So let’s not trouble her unless—or until—we have something concrete.”

“Can’t we wait until it warms up? Oh, wait, this is Titan.”

Abby scowled. “You like doing that, don’t you? Reminding me of how rotten the weather is out there.”

“Only because I can tell how much you love it. Besides, you should love it. You’re the atmosphere person.”

“Let’s suit up.”

“I’ll sign out a rover. But Apps, there are good reasons for people to file route plans.”

Abby grinned and raised her eyebrows. “Hey, we’re going out across treacherously slick ice on a very used rover less than a thousand miles from the north pole, with nothing but an environment suit between us and asphyxiation or instant cryogenic freeze. What could possibly go wrong?”

Troy hesitated. “Actually, how about if we get some more data first. A good scientist gets data before conclusions, right?”

“Right. And you’re being a chicken. How do you propose to do that?”

“We need to see what’s in Kevin’s room. What he was really doing. Maybe there’s a clue.”

“Clues are for murder mysteries.”

Troy lowered his tone. “Apps, maybe that’s just what this is—a murder mystery.”

Titan’s chilled air seemed to roll down her spine. “I suppose I’m still hoping it was an accident, natural causes and all that. But I can’t do anything important without coffee.”

## Chapter 4

# Demian Sable

“You really should get some nicer furniture. I would think the warden of a place like this would rate something better.” Demian Sable sat on the worn couch in the Spartan office of Warden Dennis Delvin, head of the maximum-security campus at Morrow. Sable leveled a calculating stare at a second man, seated in the corner. “And you must be Lucas Messier.” Messier reached over to shake Sable’s hand, then flinched with a look of embarrassment. Sable caught it, and reveled in the fact that the overseer with the Tri-Planet Bureau of Investigation would act in such a submissive way to a mere convict. But then, Demian Sable was no mere convict. The thought brought a smile to his face.

Messier consulted a pad. “Well, let’s see, now: Since the incarceration of its illustrious leader here, it appears that the Spiritual Enlightenment Network has survived.”

“Oh, they’ve thrived,” said the warden. “Despite the fact that Mr. Sable is in the hoosegow for some time to come.”

“Mr. Sable, it looks like you’ve got quite the list.”

Delvin ticked off the items from memory. “Convictions of illegal mining, conspiracy with the Ishtar ecoterrorists, and attempting to export Martian artifacts across interplanetary lines.”

“Not to mention manslaughter for the unlucky people who got in the way of the bombing. C’est la vie.”

Sable spread his hands generously. “As they say, there are no guilty ones in prison. There were extenuating circumstances surrounding each of those incidents.”

The warden turned to Messier. “Quite the celebrity here. For his part, Mr. Sable plays up his position to advantage. He compares himself to Gandhi, the apostle Paul, and that twenty-second century guru from France.”

“Maharish Tala,” Sable said. “It is not I who draws that parallel, but them.”

“Yeah, that guy. He especially likes that one, because of the guru’s associations with battles against oppression and totalitarian rule and all that.”

“I’ll bet the parallels aren’t lost on his happy band of followers,” Messier said, but his tone was gentle, almost respectful. He was staring at Sable, sizing him up. Could this man possibly be involved in the many activities that the Tri-Planet Bureau of Investigation suspected he was? He seemed so calm, relaxed, self-assured. In short, this incarcerated prisoner seemed on top of the world.

“My followers run an active campaign to secure my freedom. They have legitimate issues.”

“It also seems that your personal economy has not been bruised too badly by your stint at Morrow, either. You seem to crank out a new book just about every year, and your shares in the various stores and coffee houses associated with the SEN look like they’ve grown handsomely.”

“You’ve been keeping track,” Sable said with a sly smile. He stood and began to circle the room, much as a hawk circles its prey. “Gentlemen, I’m gratified that you wanted to have a chat, but I have a visitor coming this morning. Just what was it we were meeting about?”

Messier lowered his pad and said, “I’m required to check in periodically with—”

“Your celebrity inmates? Is that it? I’ll bet you don’t give this treatment to just anyone. I am truly flattered, but I feel we must bring this meeting to an end. Unless there was something else?”

Messier looked at Warden Delvin. “Could I have a word?”

“Certainly,” Delvin said, puzzled. He left the room.

Messier pulled out a small remote wand and clicked a button. Leaning conspiratorially toward Sable, he lowered his voice, despite the fact that he had disabled the room’s monitoring devices. “I just had a question about your latest book. About personal fulfillment.”

“I didn’t realize I had fans in the Tri-Planet Bureau of Investigation.”

(\*)

Today, it would be business as usual for the spiritual leader. He waited for a few minutes before asking to be led to the visitor’s windows. He liked to keep his visitors waiting, especially the important ones. His image passed across a monitor along the corridor’s ceiling, looking fit and trim. The workouts in Morrow’s gym had paid off. His dark hair, sculpted by the prison’s top stylist, framed his strong jaw nicely, if he said so himself. As he took his seat, he gazed through the glass at a tall man in a nondescript gray jumpsuit. The man probably liked to be as nondescript as possible, Sable supposed.

Sable steepled his fingertips and looked at the visitor without expression. He waited.

“Mr. Sable?” the man said through the port mic.

Sable smiled. “Mr...James, is it today?”

The visitor looked around nervously. Sable waved a hand.

“Don’t worry, Horf. They trust me here. I have a certain influence. You will note the absence of people watching.”

“They listen.”

“Of course they do. But we have nothing to hide. Now, Horf, to business.”

“Don’t use that name,” he hissed through clenched teeth.

“As you wish, Mr. Smith, er, James. Very creative: ‘James.’” The lanky visitor was right where Sable wanted him—off balance.

Sable knew all about him already. Horf was a Vesta man, born and raised. The low gravity had gifted him with a tall, thin frame so common to those who had matured in a low *g* environment among the asteroids or smaller moons. Training had draped steel-strong muscles on his bony scaffold. According to his files, his deceptive appearance had gotten many an attacker in trouble. It seemed Horf usually had the upper hand. But not today. Not if Sable could help it. He said nothing, letting his visitor simmer until the man couldn’t take it anymore.

“Look, I feel like I’m talking to a room full of people. Am I having a meeting with Demian Sable, spiritual leader, or is it the entrepreneur’s hat you’re wearing? Or the terrorist?”

“Terrorist,” Sable mused. “Such an overused term. I happen to be spiritually gifted, and many people gain comfort from that. My business dealings are varied—shall we say?—and pay me well. I can’t help it if I’m a talented man in that arena, too, now can I?”

“You mean selling books or trading in contraband?”

Sable didn’t deign to answer. Despite his condescending tone, there was truth to what Horf said. Sable’s link to the Spiritual Enlightenment Network dovetailed nicely with his smuggling operations, and provided a nice cover for other clandestine operations. When things got hot in one area, he was always able to shift seamlessly back to his role as popular teacher/writer. His affiliation with Ishtar was occasionally unfortunate, but more often advantageous.

Still, Sable could not let the man think he had a point. Horf’s connections in the world of piracy and smuggling would prove invaluable. Much as Sable hated to admit it, he needed him. Sable studied him with cool eyes.

Horf fidgeted some more, and then leaned forward. “Well? Are you interested?” His baritone seemed incongruous with his steel-wiry form. As his breath fogged the glass, Sable noticed a scar running from the man’s chin to his left ear.

Sable folded his hands indulgently. “What interests me more is how you’re going to keep it out of the hands of our competitors.”

“We have the authorities figured out or paid off.”

“Not them.”

“If you’re talking about Montenegro, the guy’s crazy. A complete loose cannon, if you believe what they say. All we can do is cruise with guns loaded and radar on.”

Sable let out a long breath, shaking his head. “That does not give my people much confidence. Several of these shipments have been lost—allegedly to Montenegro and the ‘Family’—in recent months. Mineral-rich shipments from Chiron and Pallas, maybe even one or two from Vesta. Your old stomping grounds, if I’m not mistaken.”

“Yeah, and I’ll tell you one thing: nobody’s getting anything off Vesta directly. Security’s too tight. They are really, really good at what they do. Their mines are the best, and they have security to match.”

“Be that as it may, our mineral-poor friends back on Earth and Mars really can’t afford much more of these supply interruptions, can they?”

“Agreed,” the man said.

“Of course, we are offering a sweet deal for you and yours. The outer system is poorly patrolled. The authorities’ concern is with getting things into the terrestrials from out there, not the other way around. So attention is already pointed away from where we want our goods to go.”

The scarred man leaned toward the glass. “Yes, but that’s balanced out by the distance and the cold. The distance takes costly fuel, and the cold is hard on equipment. Makes it all quite expensive.”

“We have already come to a more than generous agreement on compensation, wouldn’t you agree?”

Horf paused, then nodded silently.

“Just what kind of guarantees will we have?”

The Vesta man smiled. “Mr. Sable, this business does not deal in guarantees. It deals in track records and odds. Ours is a good record, or you wouldn’t be chatting with me now. And as for this Montenegro, seems like no one has ever seen the guy. He’s just a ghost, an imaginary hero for the pirate entrepreneurs to rally around.”

“Perhaps. You know, of course, that if you start knocking over cargoes in the Main Belt, people will believe it’s the work of Montenegro’s ilk, imaginary or not.”

“Let them think it’s pirates. Fine with me.” Horf spat the words. “Sometimes I think you worry too much, Sable.”

“Sometimes I think you forget your place, Horf. I’m a successful businessman. Very successful. On several planets and moons. I have a lot of experience in such things. You know your situation, don’t you, Horf? Your, shall we say, choices? Riches beyond the dreams of Croesus, or something far less appetizing. Yes?”

Horf fidgeted in his chair. After a moment, he said, “Sorry, Mr. Sable.”

“But you are correct on one count,” Sable said, holding up an index finger. “We can use this to our advantage. While the corporations are arming their transports against piracy, the pirates themselves have let down their guard somewhat. I’m thinking of a slightly different strategy.”

“What did you have in mind?” Horf said skeptically.

“You see, once the pirates and privateers do the heavy lifting, our job is that much easier.”

“You mean hit the pirates instead of the transports?”

“And why not? It saves sorting cargo. The plunderers will take only what is most valuable, and in the current market, that’s asteroidal minerals. No shopping for us. Just picking up after the fact. I am assuming your people are up to that?”

Horf nodded slowly, as if awakening from hibernation. “Yeah. Yeah, I see that.”

“Tell the others,” Sable said. “I understand you have a contact on Ganymede.”

A look of panic washed over Horf’s battered face.

Sable smiled and leaned forward, as a cobra studies its prey. “Let me give you a little advice. Never, *never* underestimate me.”

Horf interrupted. “Don’t start with that spiritual drivel.”

Sable raised his eyebrows in mock surprise. “Don’t tell me you lack a spiritual side, Horf. How surprising.” He pushed his fingertips together, prayerlike, with a reptilian smile. “Aside from *those* connections, I have at my disposal an entire interplanetary network. You have no idea. Now, let’s get that cargo flowing our way, shall we? Toward the outer system, away from the home world, where I can make use of it. And please communicate with me through Circe. It will be so much easier for the both of us.”

“Kay.”

“Report as soon as you are organized.” Sable stood, pivoted, and exited through the back door of the visiting cell. He could just hear Horf in the intercom.

“You’re welcome, Mr. Sable,” Horf growled.

Sable knew, from his many and varied sources, how much Horf enjoyed intimidating people. But Sable was certain that Horf would leave the penal facility disappointed. That suited Sable just fine.

## Chapter 5

### Break-in

Abby and Troy stood in the shadowy passage between the main habs and crew quarters, the light of the concession unit painting their faces in green and yellow. Abby sipped at a cup. Troy scanned his wristchip and leaned in toward the machine.

“Double caramel macchiato latte white Russian, dark—*tall*—extra vanilla, with the cinnamon on the side.”

The machine dispensed a small cup of something black. He grabbed it and slurped. “Ahh. Just as I expected.”

“Coffee?”

He nodded. “Black.”

She pointed at the dispenser. “It does say ‘coffee’.”

“Yeah, well, I keep hoping. They have a real Delilah’s Coffee House with robot baristas at the Sino-European launch complex.”

“I’ll keep that in mind next time I’m in Belet. Shall we?”

Abby led the way down a corridor. Their footsteps echoed off the metallic walls and floor. These walls were curved; engineers had made no attempt to disguise the original shape of the 4-m-high by 20-m-long tubes. Apparently, the space architects reserved their homey facades for the living areas. Overhead lamps spilled pools of light on the floor, creating a slow-motion strobe as they made their way toward the living quarters. The passageways of Mayda Station smelled like machine lubricants, ozone, and recycled air with that stale edge one always found in closed habitats. Air fresheners were also reserved for the living areas.

They passed through an airlock hub. As one door closed behind and another opened ahead, the air became warm and fresh. They counted off room numbers. A poster hung askew across Kevin’s door. The scene was of a great stone sculpture covered in glyphs and freakish creatures. Across the top scrawled the words, YEAR OF THE JAGUAR.

“Was he into archaeology, too?” Troy asked.

“Yep. northern Native American and Mayan stuff. Said he went down there as a tourist a lot.”

“You sure seem to know a lot about the guy.”



She hesitated. “We...spent some time together. After.” Troy was studying her, and she didn’t like it much. She never had. “If this is the ugly green ghoul of jealousy rearing its head, that ship has sailed.” She said it with more of an edge than she had intended.

“Don’t I know it.”

Abby frowned at the closed door to Kevin Nordsmitt’s quarters. “I guess I’ve never actually broken into someone’s locked room before. I grew up as a good little girl. Have you had any experience in that dark past of yours?”

“Stand back and learn,” Troy said. “And keep an eye out, Miss Innocence. It’s been a while since I had to jimmy an encrypted lock.”

Troy removed his wrist-top monitor and took the back off. Pulling the tiny power pack from it, he glanced around. “Do you have something like a hairpin?”

“Nothing so feminine. How about a chunk of my phone frame?” She removed her earpiece and peeled off a thin strip of metal along its border. She handed it to him furtively.

“Perfect.” He placed the metal strip against his power pack and shoved it into the lock’s port. Abby looked down the hall in both directions. By the time she looked back at Troy, the door was swinging open.

Troy handed her back the small shard of metal. “See? You’re still good for something.”

Abby’s jaw tightened, but she said nothing. The two amateur sleuths stepped into the room, shutting the door behind them. Kevin’s room was sparse. He had no paintings or photos on the wall, save one poster of a Mesoamerican ruin looming out of a rainforest somewhere. Next to the poster, on the book kiosk, lay a traditional paper-based book called *MesoAmerican Mural Art*. Kevin’s desk unit glowed with a collage of photos. One showed Kevin and Abby, side by side, posing in front of a fuming volcanic vent at one of Titan’s hydrothermal sites. The image, the memory, made her smile.

Troy wandered off to the kitchen. “You can tell a lot about a person by their eating habits.”

Abby sifted through the contents of several files on Kevin’s deskpad. She found bank accounts, travel records, and archives of letters from friends and family.

“There’s not anything in here about his work,” she called to Troy.

“Check the bathroom. That’s where I do all my important reading.”

Troy was right. In a basket next to the toilet, under an entertainment emag, lay some papers. That was suspicious in itself—papers were harder to follow than electronic files. And these papers had an incongruous letterhead: CoAz U, *Dept of Bio. Biology?*

Troy peeked through the doorway. “Hey, lookie what I found.” He held up a mug. Emblazoned on its side was the logo of the University of Colorado/Arizona.

Abby held up a page from the basket. “They match. He’s got a lot of docs from CoAz, which makes sense. Just like he said.”

Troy snorted. “But do they even have a hydrology department?”

“Not sure, but I bet they do.”

“Probably so. That was his cover story, and he was careful. But I think Kevin was doing something besides what he told everyone he was doing.”

Abby leafed through the pages. “Cover story,” she muttered. But it was beginning to look like Troy might be right. What would that mean? If Kevin really was here under false pretenses, he would have needed an inordinate amount of help. Simply getting onto this ice ball was next to impossible unless one had very good reason to be here. Aside from its remote location, the moon-world had been declared an international pre-biotic reserve. The declaration brought with it many cautions for those planning to spend time there. Contamination by terrestrial microbes was a major concern, despite the fact that no Earth life could survive under Titan’s extremes. Organic material of any kind had to be carefully monitored so as not to confuse in situ chemistry with that from visitors. This meant more paperwork, more administrative hoop-jumping, and training in working in biologically sensitive environments. No simple environment suit would do, for example. All suits at Mayda were sealed in multiple layers designed to keep out Titan’s atmosphere and cold while keeping in any biological elements associated with the living being inside the suit. Abby and her colleagues thought it extreme—some even suggested unnecessary—but the biologists had won out.

Which begged the question. With all the trouble, why would someone send Kevin out here? There must have been a darned good reason.

She pulled out another sheet. “This one’s a chart of routes or something.”

“Titan road map? Ship routes? Why would a hydrologist have a chart of ship routes?”

“No idea.”

“I found something else in the kitchen drawer that might be even more useful: a second wrist-top. Shall we have a look?” Troy swung the tiny computer at the end of its band, as if he were trying to hypnotize her.

Abby blinked at him. “In his personal wrist-top? That’s got to be illegal.”

“And breaking and entering isn’t?”

“Guess you’re committed,” she said.

“Me?”

“You did the breaking.”

“And we did the entering.” Troy brought the little computer on line. “Now, let’s just see who Kevin was chatting with.”

“Are you as good with passwords as you are with locks?”

Troy held up a piece of paper. One word scrawled across the top: **PASSWORDS.**

“You must be living right,” Abby said. “Where was it?”

“Taped to the door of the refrigerator, right next to the grocery list. People really shouldn’t write things down like that. You never know what fiend is going to be hacking into your computer.”

As Troy stepped out of the bathroom, the top of the wall caught his eye. “Hey, look up there.” Along the wall just under the ceiling ran a long line of faux petroglyphs. Some took on the appearance of stick figures with geometric, boxlike bodies. The small forms danced in and out of swirls and spirals. Tiny gollywogs carried bows or spears. The silhouette of Kevin’s hand glowed in several places just below

the ceiling. Other forms had a distinctly animalistic look, with big ears, antlers, tails and spots. “Whoa. Look at those. That thing must be a deer. These Mayan, too?”

She craned her neck to study the little murals. “I don’t think so. I’ve seen them somewhere before. Somewhere else. And a—what do you think—rabbit?”

“Yeah, and look next to the hand outline, the flute player.”

Abby nodded energetically. “Right, right. Kokopelli. These are Fremont culture. I remember seeing some just like these on that biking trip I did in Utah. The square shoulders and big owl eyes and spirals and dots. Pretty cool. See what you missed?”

“Kokopelli, right. Got it. Yeah, the biking. I remember.” Troy said, heading for the other room. “Didn’t know you had it in you.”

*So much support for me*, Abby thought. And that was only one of Troy’s problems.

“I didn’t know Kevin was such the decorator,” Troy said.

“Yep. Did them himself. Hand painted.” Suddenly, a look of panic crossed Abby’s face. She blushed.

Troy shrugged. “Look, I know you guys had some history. After, as you put it. Let’s just move on.”

Of course, Troy was the one who kept bringing it up. He always could hold on to things, and he had a mind like an elephant. He never remembered the good times. All he was left with was the fact that Abby had called things off after three dates. Three stinking dates! And he thought he owned her? But if she had it out with him, as she had tried to before, it would tear open past wounds and make things worse. She knew from experience.

A thought occurred to her—memory like an elephant. Where did that come from? Gray and wrinkly? She smiled to herself.

Troy rooted around Kevin’s files for nearly half an hour. Abby browsed through the medicine dispenser and surveyed the programmed channels. Nothing of interest there. She returned to Troy at the workstation.

He leaned back in his chair and rubbed his eyes. “I got nothin’.”

“Let me try for a while.”

Abby scrolled through a few files. She pointed to a message. “That’s odd. This one went to a Henry Davidson on Ganymede.”

“Who’s Henry Davidson?”

“According to this, he’s a traffic controller on Port Dardanus.”

They both leaned into the screen, puzzled. Abby scrolled further. Lines of data tumbled down the screen, each with a coded label of some kind.

Troy spoke over her shoulder. “Look at all that. He was pretty circumspect. Who do you suppose ‘#21’ is?”

“Or ‘Major J,’” Abby said, pushing her chin toward the little screen. “He’s got lots of contact with Major J. But what about that one? It’s a bigger file.”

She hit the icon. It opened a video. The image was murky and hard to decipher. Its edges were fuzzy, as if looking down a long tunnel. In the shadows, a long column extended from one side of the screen to the other. The camera zoomed in on some etched lines.

“Calligraphy gone bad,” Troy mumbled. “What is this thing?”

“More squiggles.” Abby shook her head. The column bifurcated into a set of arm-like extensions. The video came to an end. “Looks like it’s alive. Or was.”

Troy squirmed. “Like in a microscope or something. Look at the caption.”

“MECTRODEX. Aren’t they the big pharmaceuticals guys?”

Troy nodded silently. “Drugs again.” He shifted from one foot to another.

Abby’s fingers flew as she said, “What? Relax.”

“Wait a minute. Shh!”

Footsteps approached in the corridor outside. Someone was passing. Abby listened as the steps paused outside the closed door. Troy looked at her, eyes wide. She held her finger to her lips. In a moment, the steps resumed down the hallway.

“You know, Apps, I don’t think we should be doing this. Let’s get outta here.”

She glared at him sideways. “You were so hot to get in here. Now we find that Kevin was chatting up some guy who’s dealing drugs on Ganymede—legally or not—which I would guess confirms what you said, and you want to leave? What’s up, guy?”

His face reddened. “I told you Kevin was no hydrologist, and that’s enough for me. We’ve ventured into dangerous waters here, and I’m not talking hydrology. If Kevin’s death was something to do with foul play, somebody besides us might be coming in here to dig around.”

Light flickered across the monitor. She leaned in, trying to ignore his urgent tone. “Weird. Whatever the file was, it sent to Ganymede and copied to some research facility on Earth.”

His tone became animated, almost urgent. “You were always stubborn.”

She looked up. “Stubborn? Just because I’m making some headway here? Who says I was stubborn? Get the plank out of your eyeball, bud.”

Troy fidgeted in the doorway. She turned back to the monitor. Through clenched teeth, she hissed, “I hate it when people aren’t what they say they are. I hate it.”

Troy cleared his throat.

She shrugged. “Okay. Maybe you’re right. But I still say he was *not* involved in any nasty illegal anything. He certainly was no drug smuggler. And I still say we should try to prove it by—”

He held up his hand. “An outing. Okay, okay.”

## Chapter 6

# Crash

In the low gravity of Jupiter's largest moon, everything seemed to happen in slow motion. Even the crash of a spaceship.

Three traffic controllers stood in Ganymede's primary spaceport tower, staring intently out the window. "You are cleared for emergency landing," one of them repeated into his headset. "Do you read me?"

Above the icy horizon outside, a ship flashed against the night sky, defying the darkness and coasting toward the landing pad. Closer and closer it came, looking like some immense, crippled whale. Fins and shining silver skin hung from tangled masses of metal and dangling cable.

The control room door swung open. A man in a suit strutted in. His nametag read "Supervisor" in gaudy red letters.

One of the controllers leaned over to the other and muttered, "Oh good, the cavalry. We're safe."

The supervisor jabbed a finger toward the window. "What happened to them?"

"Can't tell yet," said the traffic controller. "Their transmitter's out. All we've had was the emergency beacon. Got that even before they made Jovian orbit."

"Wait a minute," the other one said. "Here comes something over the screen—from their emergency antenna."

Words flashed across the monitor.

major oxygen leak\*\*\*engine failure on left outboard\*\*\*  
request emergency landing at Port Dardanus

The craft lurched dangerously as vapors erupted from its torn side. Slowly, carefully, the great ship stabilized as its crew struggled to land safely. Only a dozen meters from a safe landing, something went horribly wrong. The right wing dipped, and the entire cruiser twirled around. It spun out of control like a leaf in a wild whirlwind, and then slammed into the icy surface. Slurries of ice and mud flew into the airless void. The huge ship settled in a cloud of ice crystals. Immediately, an emergency team ran out through the airlock to the ship. They attached a flexible tunnel to the side of the craft and sealed it against the door. As soon as the pumps

filled the tunnel with air, a medical unit dashed through it and banged on the hatch. The door flew open. The ship's captain fell out against one of the medics. He said only one word:

"Pirates."

Even before the report was in, one of the controllers went on break. He stepped briskly into the men's room, pulled a bulky device from his coat pocket, and punched a few spots on a small screen. His message was brief.

"Family at it again: another pirate attack. Another load of lost minerals. Slim pickings this side of the Asteroid Belt. Suggest you concentrate closer to Mars."

When the controller returned, his colleague said, "So where've you been?"

"Just had to take a leak."

"You have to do that a lot, Davidson. Maybe you ought to get that checked."

"Maybe so." He smiled to himself. "I'll look into that first thing."

## Chapter 7

# Tanya and Abby

“You look about a thousand percent better.” Abby sat beside Tanya on a hard galley chair, plunking down a steaming heap of oatmeal next to Tanya’s dainty yogurt cup.

“What kind of math do you atmospheres people make, a thousand percent? You are crazy, my little Anya.”

Nobody else called Abby *Anya*; it was Tanya’s endearment for her. She liked it. Not many people called her by nicknames or cute little endearments these days. She knew it was her own fault. It was the simple result of keeping people at arm’s length. Titan was that way, would have to be that way. A place to accomplish, to make up for lost time, lost opportunity...other losses. But the loneliness made it all the more difficult. True, she was surrounded by people, but one can be in a crowd and still be alone.

“Da, it is amazing what a little sleep will do for person. But I am not over it.”

Abby stuck a spoon into her breakfast glop and inhaled its cinnamon aroma. “Nobody will be, not for a long time. Kevin was a sweetie.”

“Yes.” She looked off toward the window, but her eyes were focused somewhere else. Abby could see momentary fury there, but it seemed to melt away into something else, something softer. “I help him out in north one time. On to far shore of Sevan Lacus. He needed help with some weird equipment. I never knew hydrologists use stuff like this.”

“Like what?”

Tanya shrugged. “Similar to electron microscope, but different frequencies, he said. It was helpful to finding underground flows.”

“Did he find any?”

“Not while I was there. We mostly talked about our childhoods; mine in Munich and his in Maui. Did you know he was Hawaii boy?”

“Nordsmitt doesn’t sound very Hawaiian.”

“Nope. Still, he likes ocean always. Likes rain and rivers. Won lots of kayaks races and other boat things. I never went to Hawaii. Have you?”

Abby pointed with her spoon at a spot in midair. "It's a whole lot greener than it is here. Green is what I miss most, I think. That, and my mom's lasagna. I spent one summer on the islands. Once I got used to the gravity I loved it."

Abby remembered the oppressive air, like molasses, when she first arrived on the green world. The first night is always the worst, they say. But it's worse for some than others. She thought of her friend, Maria, from grammar school days at Meridiani. Maria had gone on a trip to Earth a few years before her, said the adjustment was a cinch. Not for Abigail. She flopped around like a beached fish, trying to get a breath in the middle of the night.

"For a Mars girl it was quite the adjustment" Abby said. "Everything was heavy and wet, but those storms!"

"You speak with love, like true meteorologist."

Abby shrugged. "Some things you just can't hide."

"Maybe," Tanya sounded skeptical. "But sounds more than love. You are driven, girl. How come?"

"Driven? No." Tanya was smart.

"Hours you keep?"

"What else is there to do around here but work?" It was a weak rationale. Perhaps Tanya would let it go.

"How much time you spend on reports and not on people? Or exploring?" She jutted her chin in the direction of the window, and the fairy-tale scene outside. The ember glow of the horizon shimmered in the sullen undulations of the sea, oily and dark. In the distance, a curtain of methane rainfall draped across the sky. To its left, low over the hills, the golden glow of Saturn simmered behind layers of fog and scattered cloud. "There is something else. Something you make up for, or something you want. No?"

Abby's cheeks warmed despite her veneer of a smile. Time for a deflection. "And what about Bavaria? What was being a kid like in the southern capital of the Neo Russian Confederation?"

Tanya shrugged, turning back from the window. "I suppose like anyone's. I had good parents, mean sisters, protected by brother, who I am still very close with. And I loved visit the castles. Kevin said he once sees Neuschwanstein."

"The one that gave Disney his ideas, right?"

"Yes, lots of history there." Tanya pulled up her sleeve and tapped her wrist. The pad glowed under her skin. She scrolled through some photos and held her arm where Abby could look. "See? I am six here."

A red-headed, freckled girl posed on a log with the white turrets and towers of Mad Ludwig's palace sprouting behind her, framed in a rich evergreen forest.

"Beautiful," Abby said. She pointed toward Tanya's wrist. "What's that pink thing you're hugging?"

"Dmitri Dragon. You guys not have Dmitri Dragons? Very popular where I grew up. Pink toy dragon, long neck, sequins on furry back of shoulders—" She gestured to the nape of her neck.

"Right," Abby said. "Mane. Like a lion."

"Da. Mane. Purple mane. Pink dragon. You western kids missed out."



Abby looked out the porthole. A slurry of organic soot was drifting down from above. She let out a long breath. Her trip here had been an elaborate tour across much of northern Titan. From her arrival at Port Antillia, just south of the equator, Titan had been a series of surprises. Antillia itself reminded her of some of the small mountain towns in the Colorado Rockies: independent, self-reliant in the face of stark wilderness, a small island of civilization in an untamed world. At the edge of the dusky plains and the Adiri rise, Antillia had a striking view of the flatlands to the north. Her shuttle had taken her northwest across the vast dune seas that reminded her of Africa's Namib. A surly sky had painted the undulating landscape in a glowering red, the dunes like a giant's black fingerprints on a flesh-colored table. Here and there, an island of bedrock—bed-*ice* in Titan's case—reared up from the dunes, causing the drifts to bend and slither around themselves. Some of the braver sandbanks made their way up the bases of the buttes, fighting a losing battle to bury the outcrops in their dark blankets.

The umber hydrocarbon dunes gave way to the glistening ice hills of Aaru as the shuttle headed north of Kosovo/Taishan, the Sino-European launch center. In some places, the dunes died out among wandering features that looked like ancient lava flows. Where Aaru's hills came down to meet the sandy plains, river valleys cut branching canyons into the frozen landscape, reminding her of winter maples lying on their sides. The river valleys did not look gentle but had the appearance of scars from flash flooding. The 2,000-meter high cliffs gave way to broken bedrock where rivers had once poured onto the plains. Many channels spread out into the plains as deltas, forming broad fans. Piles and drifts of fine material rested within the river bottoms and deltas, fading into the more gravelly flats beyond. Bright blemishes streaked across the bleak lowlands, marking wind trails.

All the civilization lay to the south, along the equator: Russia's Novum Baikonur, Austrazeland's Warawoona Station, the Brazilian Federation's Cuzco and China's Xanadu Mountain Research Station. Further west lay the great impact crater Sinlap, a relatively fresh feature 80 km across. Abby had seen Sinlap before, on a short trip in preparation for her Mayda expedition. Sinlap's rim and bowl reminded her of some of Ganymede's craters. Its knobby ejecta blanket, draped over the surface as the meteor dug out the crater eons ago, spread in great lobes over the landscape, a record of vaporized ice that refroze into icy spherules in Titan's thick air. A small central peak crowned the center of the crater, rounded and fractured.

The farther north she traveled, the more pocked and irregular the terrain became. Bedrock reared up in great blocks where the crust had faulted along parallel east-west patterns. Complex semi-circular depressions marked areas of subsurface collapse, perhaps like the tundra she had seen in Alaska or the Martian north. The rolling plains seemed battered by sinkholes and kettles. As the craft pushed on into the northern lake district, some of the kettles filled with dark methane lakes and ponds. Finally, spreading before her like a purple bruise on the gray landscape, Kraken Mare stretched across the horizon. The shuttle crossed the convoluted shoreline at Okahu Sinus, where irregular cliffs sawtoothed along the methane waves. The flight continued northwest over the irregular island called Bimini Insula, and finally descended upon the scattering of habitats marking Mayda Research Station nestled on the shore at the straits of Bayta Fretum.

Which brought her back to the present. In the distance, the massive drilling project continued to progress out beyond the shore. Long tubes rocked up and down as lights flickered in the methane drizzle, reflecting in the undulating ruddy waves below. She shook her head as the monstrous machine kept up its hypnotic swaying. She shivered. “Why do we do these things?” she mumbled.

“Gravity maps.”

Abby glanced at her. “What?”

“Gravity maps. We found a thin place in ice crust here, so this is best place to drill down to water ocean. Deep Core is sealed, perfectly sterile, in case we find—why are you look like that to me?”

“It was a rhetorical question.”

“What kind?”

“I was just wondering why we are all here, in general. Not specifically. Never mind.”

She spooned some cereal into her mouth and chewed with more energy than she needed to. Sometimes it felt as though humans—poorly designed to live in a place like this—should have just stayed home where they belonged. But with that approach, Abby supposed, everyone would still be knapping flint in northern Africa. As it was, the migration into Europe and Asia and the New World was just the beginning. Her home on Mars was proof of that. She missed the blue sunsets and the rusty sky, so different from this one. There was a moment on Titan, just at twilight, when the sky reminded her of Mars at night. But there was nothing like the jewel-like metallic firmament of Mars, when the Sun poured from the sky and illuminated the fine dust at high altitude. Just a scattering here and there of the olden days, when the skies were a subdued salmon color and the rains never fell. She preferred the new Mars.

Tanya rolled her sleeve back and brought Abby out of her thoughts with a simple comment. “I could tell Kevin loved being away from Earth more. He says he always want to see ice flows on Ariel and Ganymede, ever since he studies the outflow stuff in remnant Antarctic glaciers. I guess they were the only big icy satellites he never saw. He gets around.” She dropped her gaze downward. Was she struggling with the language, or with the loss? “Got around.”

A dusting of goose bumps made their way across Abby’s shoulders. She leaned toward Tanya. “Are you sure he said those two? Ariel I can understand, but Ganymede?”

The Russian thought for a moment and glanced up. “Yes, because he mentions the big chasms on Ariel and then he says that Ganymede is more bigger than Mercury, which he has been to two times. He was for sure. Something like, ‘Never been to Ganymede, never knew anyone who has, never knew anyone there.’”

Abby’s pulse raced. *Could Troy be right? Was Kevin hiding something? Did he lie to Tanya? Why would he? Who was this guy on Ganymede?*

“Vell, speaking of Kevin and sweeties, what about that Troy?”

Abby rocketed back to reality and realized that Tanya was watching her...closely. “What about him?” she asked suspiciously.

“He is not bad to look on, and the two of you spend a lot of times together.”

“Just the hazards of the work. He can be—” she searched for a word, “abrupt, at times.” *Read that as ‘a jerk.’*

“And why he calls you ‘Apps’?”

Abby smiled and waved her off. “Long story.”

“Eat your oatmeal and share. I got time.”

She took in a long breath, as if bracing herself against some terrible embarrassment. “It’s silly really. We have some history. We actually met back at Syrtis.”

“Mars? I did not know that part.”

Abby smiled. “There’s a lot that people don’t know about Troy and me. When I first got a research assignment post grad, it was for some cirrus studies at Elysium, and Troy was headed out there to do some organic studies of the ancient fumaroles. I was checking in at admin, and I knew the woman there. Chelsea.”

“Chelsea, Da. Who worked here for a while.”

“That’s the one—we’ve got a small community. So she and I knew each other from before, and we’d been chatting on vid coms leading up to my transfer, and she always called me ‘Abs,’ but Troy couldn’t hear over all the background noise. He thought she called me ‘Apps.’ He came up and tapped on his wrist monitor and said, ‘Apps? As in Applications?’ and I had no idea what he was talking about. It took us a while to straighten it all out, but the name stuck in his little pea brain, so there it is.”

“Apps. Cute. So you two did a tiff?”

“Had a tiff.”

“Had. Thank you.”

“I suppose,” Abby said. But it was more than a tiff. Troy simply wasn’t being a nice person. Or maybe he just couldn’t be nice to her any more. If he didn’t feel about her the way he had before, that was fine. She was neutral on the subject, wasn’t she? Still, she needed him, needed his help. She had a mission now, a task to discover what had happened to her freeze-dried friend, to find out what he had been mixed up in and what it all meant. She needed to get out there, preferably with the Grinch of Mayda Research Station. But there was something else to do first. Mars was rising.

## Chapter 8

### Vesta Valentines

“Strange place for a honeymoon,” the brawny workman said. Next to him stood an unlikely couple. She was tall, sinewy and athletic. He was diminutive and mousy.

“My wife and I come from mining families,” the man explained. “My dad was in uranium.”

The woman holding his hand added, “My mom invented a refining technique for lunar processing.”

The little man said to the big miner, “So, you were saying about copper?”

“Iridium and platinum are the biggies here, along with yttrium and neodymium. They don’t call them ‘rare earths’ for nothing! But not much copper. You get more copper from Mars.” The burly tech led his two charges through a cramped, unlit tunnel. Each of the trio wore headlamps atop their pressure suits to light their way.

“I visited Gaspra once,” the bride said, “and all the processing was on top. The place was basically a giant strip-mine. How come you guys are doing all this underground stuff? Seems like it would be easier to just scrape off the surface.”

“It would, if all the good stuff was up there,” the miner said, shoving his thumb toward the ceiling of the tunnel. “Problem is, Vesta is what they call differentiated. Like a planet. When it formed, the heavy stuff settled to the center, and the light stuff stayed up. So the good stuff we want is buried deep. Those other asteroids like Gaspra and Lutetia and Steins are just all mixed up. It’s all for the taking anywhere on the rock.” He paused and turned to face them, grinning proudly. “But they don’t have the same stuff that Vesta does. Not by a long shot.”

“That’s all well and good,” the woman said, “but I haven’t seen a lot of heavy machinery in these lower tunnels.”

“Right,” the guide said. “We use bio mining down here. Takes virtually no energy on our part. The bugs do all the work as long as we give ‘em something to drink.” He waved his hand toward the end of the tunnel. The passageway opened up into a large underground arena. Along its walls lay heaps of pulverized rock.

“The dump?” asked the thin man.

“Low grade ore. But it’s not just junk. We’ve seeded these mounds of debris with bacteria. If you look at your wrist pads, you’ll see that this area is pumped up a bit.

Low pressure, but enough to keep bacteria alive and happy. We irrigate the tailings with diluted sulfuric acid. *Acidithiobacillus* and *Leptospirillum* are the miners. They use the sulfur in the acid to break down the rocky material. What's left is the really good stuff."

"Fascinating," the woman said. "And where would that go?"

The miner pointed toward the ceiling, then nodded toward some tracks at the far side of the chamber. "Topside, in those robotic trams. We try to automate most of the operations that have to take place in vacuum."

The woman looked at her companion. "Wise," she observed.

"Very efficient," he agreed.

The miner looked at the couple. They didn't act like newlyweds, but then again, the mines of Vesta weren't the most romantic of places. Still, something just seemed off. He pushed.

"So when did you two tie the knot?"

He could see the man's shoulders shrug inside his suit.

The woman said, "Recently."

The man added, "We're touring a few out-of-the-way places, and then it's home to Mars."

"I thought your passport had you coming from Earth." He was getting suspicious.

"He's from Earth," the woman cast a glance at her companion. "I'm from Mars." She seemed more confident than her partner. "We're going back to Mars after this. I won the coin toss."

"Oh, I see," he said.

"So I hear you do more than dig rock here. Vesta seems like a pretty important place if you're going out to the Galileans or Titan or something."

"Yep," he said quietly, not volunteering anything more.

"We were thinking of going out to Titan sometime," the groom said, "or maybe on one of those geyser sightseeing trips to Triton. Guess we have to go through here, right?"

"Just about everybody does who goes to the outer system," their chaperon said, "at least in an electronic sense. We handle the traffic control, even if you're on a route that isn't physically close."

The woman said, "It must be difficult to watch all these operations at once. Do you have some kind of secure control center?"

Now he was beginning to panic. Newlywed tourists didn't take any interest in security, did they?

"I'd love to show you, but I'm out of time. I hope you enjoyed your tour of the Vesta underground." He encouraged them to move back down the tunnel.

"Ah, yeah, great," the little man said without enthusiasm. "We should be all set with that Bed and Breakfast at the surface village. What was it, Raymantown?"

The woman reached over and shook her guide's hand. She gushed, "Thanks so much. Wait 'til I tell Mom what we've seen here."

He let them through the airlock first, waved them on, and stayed behind. He watched through the porthole, checking to see that they had doffed their pressure

suits. He tapped a goodbye on the glass, watched as they entered the elevator, and then radioed security on his private channel.

“Donny? Make sure that couple gets back on their transport, will ya? They just don’t sit well with me.”

“How do you mean?”

“Just do it. I’ll fill you in as soon as I’m back topside.”

He looked down the corridor toward the tunnels and the bacteria and the valuable ores. The battered landscape of Vesta lay some 8 miles above, but this was his world, a realm of talus and tunnel and veins of riches. The mine flowed through his arteries, gave comfort when no person could. The hard work felt good at the end of the shift. Here, one could see what they had accomplished, in concrete form. None of this abstract computer stuff or theoretical science. At the end of the day, he could point to something substantial, something solid, and say, “See what I did?” It was a special job, a special place, like no other. No one could get down here to do any harm, could they? Vesta was a strategic place. Most productive mines in the Asteroid Belt. Best med facilities, better than Ceres (which, in his opinion, was overrated. Ceres was an ice ball, basically a Ganymede too close to the Sun. Too much water and too little ore, except around the cryovolcanoes and a few faults). And, as his bosses kept reminding him, Vesta served as a critical hub for comms and traffic control to the outer system, a sort of gateway. What were those two up to, anyway, nosing around like that? *Honeymoon, my ass*. He knew he would sleep lightly tonight.

(\*)

The woman leaned furtively into her communicator, her alleged groom watching over her shoulder.

“Horf? The tour went quite smoothly. It’s perfect, as you guessed. Just perfect.”

Minutes later, Horf responded by voice. “Thanks, Wendy. You’re the best sister a guy could ask for.”

## Chapter 9

# Titanic Invitation

At 60, Jeremy Belton was just entering his middle years. Mars had been good to him. He enjoyed law enforcement, and he loved the wide-open desert vistas. He'd found a nice little house in the canyonlands of Kasei Valley. From his living room bay window he could see the mountains rise from the chocolate-brown valley floor, looking like undercooked biscuits dusted with cinnamon and powdered sugar. Beyond, walls of salmon and tan stone stood as bastions against the glowing metallic sky. Farther out, chasms scored the plateau into freestanding buttes and mesas. Belton had been widowed once and dodged the bullet twice. He had friends. He was happy on Mars, happier than he had ever been on Earth. He considered himself lucky. He wasn't in the mood to go anywhere, and he couldn't imagine anything that would change his mind. Not even Abigail Marco.

Her text came in the early morning hours local time; the message was awaiting him at the breakfast table. When he pulled it up and saw that there were no visuals, he knew it was probably something serious. No goofy greeting or comical snapshots, just a short blast of letters that had sailed across 900 million miles of emptiness. Abigail was obviously saving her bandwidth for the Thanksgiving window.

Jeremy: Long times! Hope u r well. A frnd of mine has died here on Titan under very suspec crcmstncs; need someone who can b discr. I tld boss here u r good; they want u if u can cm. CAN U? Fvr 2 me? Abs

"Favor to me," he mumbled. "Unless she meant fever."

He walked over and had his refrigerator pour him some orange juice. Rubbing the back of his neck, he stepped onto the rear deck. A condor rode the currents along the far canyon wall. The sunlight was just painting the stone with the gold of morning, bleeding down the cliff faces in molten ribbons. He pulled in a long breath of the fresh air, the smell of wilderness edged with dry desert sand and pine. The northern slopes of Kasei had been some of the first places on Mars to establish a viable pine forest during terraforming. The forests stood firm and ancient now, lining the canyon rim like gray-green sentinels against the sky.

In a way, he was glad her message was text rather than visual. The distance to Titan precluded much in the way of full visual bandwidth, and he couldn't face those fierce eyes. She held so much in, wouldn't let things go. Over the years, a small weight could become a millstone. How heavy did those things, the things they shared in common, weigh on her these days? She could seem so innocent, so unspoiled and childlike. But she was tempestuous. He had seen her turn on someone as quickly as the storms she studied. He reminded himself to be patient with her, to remember her hurt, her psychological injuries. The death of her parents at the hands of Demian Sable still stung. It even stung him after all this time. Abby's sister had buried her sorrows in her art. Janice painted from an early age. She showed a dancer's athleticism at a far younger age than most. And she wrote poetry.

For Janice, in a paradoxical way, a sort of inner joy had arisen from the appalling catastrophes of her childhood. Her anguish became the springboard, the inspiration for her art, as her art became its balm. She had told Jeremy that this world had granted her grace to survive the ordeal, and that grace was simply a reflection of the grace the Creator had given her.

Jeremy could feel Janice's sorrow, the loss, the agony build in those literary lines, or the painted ones, and he could sense its ebb as it bled out onto page or canvas or stage. But for Abigail, there had been no outlet, no release. She was the one he worried about.

He turned back to face the table monitor. He sat, slowly letting his breath out.

Dear Abby: Long times indeed. I wish I could help you, but you know I absolutely hate to travel, and I especially dislike the dark and cold beyond the Main Belt. I know there are good resources at Ganymede and even at Port Antillia in Adiri just a few hundred miles from you guys. Happy to make recommendations, but it would take a lot to get me on another interplanetary transport ever. Maybe I'm getting old. Sorry, girl. Hope you have satisfaction in finding out what happened to your friend. Sorry for your loss. Plans to come to Mars? Please come by. Guest room always open. Jeremy

He felt guilty as soon as he hit SEND. His message would not arrive for over an hour. By then, maybe he would feel better.

(\*)

Abby sat on the edge of her bed. It was time to sleep. It should have been easy, with that sulking winter sky always just outside. But Tanya's words pricked at her.

*"...sounds more than love. You are driven, girl. How come?"*

Tanya was right, of course, and Abby had to admit it.

*"Hours you keep?"*

There was more to Mayda Station, more to Titan, than work. Who was she trying to kid? Her father had taught her that, taught her that people came before work, even though he was incredibly dedicated. And yet, in a way, it was her father's untimely death that urged her on.

*"How much time you spend on reports and not on people? There is something else. Something you make up for, or something you want. No?"*

But no. If she spent time on people, or on joy rides around the Titan wonderland, her work would slip, and Titan had so much to teach. The work was paramount.



At least it had been, until Kevin's murder came along. Kevin's death was a game-changer. She had her plans all in place and humming along nicely, and then this came along to rearrange her priorities. She couldn't let that happen. She had her parents to think about.

Her mother and father had been brilliant by any yardstick. Pioneers, trailblazers, innovators, catalysts; all were Marques bestowed upon them at one time or another by historians and fellow scholars. Her father had been called the architect of modern archaeology. But he had just begun when he was cut down. He and Mother had been working in Hesperia, at the abandoned early Chinese settlement. The place was Mars' own Roanoke. And he had theories—they both did—possible solutions to the ancient mystery of the vanished settlers. Yes, the worlds had been robbed by their deaths.

Three thieves. Why do things always come in threes? There was the thief of Time, and that one she could do nothing about. Then there was the thief of Knowledge, of the things they might have found, the things they were working on to share with the world. The last one, of course, was the thief who took their lives. That thief had never had to pay. So she waited, and hoped something would change for him.

## Chapter 10

# Skyward

Abby seldom ventured to the west. She had deployed several meteorological stations on the craggy tops of outcrops to the east and on the shore of Kraken Mare just north of the science outpost. But to the west lay a scattering of dunes, and blowing organic powder wreaked havoc with electronics. She had avoided the area. Now that she was out of the rover, she could take it all in.

She followed Troy as he trudged through the low-lying umber drifts, newer than the big dunes and fine as confectioner's sugar. "Ever been to Belet?" his voice crackled in her earpiece.

"Troy, really, it hasn't been that long. Don't be so dramatic." She panted, and realized she should have been saving her breath for the tiring trek through the mushy sand. She always liked to walk, and the smaller rovers like theirs didn't do well on methane-saturated ground. But this stuff was tough. "Wouldn't mind a caramel macchiato thingy from one of those robotic baristas of theirs right about now."

"Personally, I'm glad we're not there. Those equatorial dunes are huge. Go for miles and miles and miles."

He had to be contrary. Was it revenge? Sour grapes? Everybody thought of him as so happy-go-lucky, but she knew another side. Intimately. And what was with the macho uber-hike? What happened to stopping to smell the benzine roses? She would try something neutral.

"These little sand piles are hard-going enough." But even as she said it, the sand was becoming more coarse, the dunes more shallow. Soon, the ground took on the undulating form of packed gravel. The walking grew easier. In the distance, through the sienna haze, hills rose into the afternoon twilight.

Troy paused and turned to face Abby. "This is more like it," he wheezed. "I gotta get out more. I'm out of shape."

The dunes seemed to be sinking away into the organic sand, slithering downward until the ground was all that was left. Abby looked northeast. The dark, slow-motion ripples of Kraken Mare sliced a tarry line along the base of the low hills on a distant shore. Sludge rimed the shoreline, reflecting spectral colors in the dim light. Further to the north, across Skelton Sinus beyond the great island of Mayda Insula, the shore

rose in ragged cliffs, icy promontories stained by sooty methane rains. Beyond them lay the no-man's-land of the north pole, a great emptiness uninhabited and scarcely explored save by robotic drones and orbital observatories.

She realized that she'd stopped walking. Troy was pulling ahead. Again.

"Hey Troy!" she hollered instinctively. Her radio voice was probably painful in his ears.

"Yeah?" He stopped and turned toward her.

Abby pointed toward the sea, working her way toward him. "See the west end of the island out there?"

"Of Mayda? Our namesake?"

"Yep. The peninsula just there? I went out on it once."

"Out *there*? Voluntarily? What was the occasion? Did you commit some heinous crime?"

Abby gazed at the rugged landform rising from the subdued methane swells. It was the color of custard, matching most of the shoreline in the region. Rain and wind had scoured the top clean so that a blue-gray rampart of pure water-ice crowned the island. It looked like it needed a Cape Cod lighthouse on top.

"My crime was wanting another data point in my weather patterns. I went out on an inflatable with an assistant. It was like sailing through thin molasses, sort of a golden brown below us. You could see way down, maybe fifty feet down."

"How'd you get to the top?"

"Climbed. It's not as steep on the other side. So now one of my little weather stations is perched atop Mayda Insula."

She could just see him nod behind his visor. "Actually, I'd love to go out some time. Maybe next time you do maintenance?"

"Sure thing," Abby promised. At least he was making an effort. "But in the meantime, I'm not seeing a whole lot of river action out here."

"Map says there's a drainage system between those two hills up ahead. If Kevin was really researching hydrology, my money's on that place."

"I guess it's time we stop pretending," Abby grumbled. "I kept hoping there was no 'dark side' he was hiding."

"Maybe it wasn't a dark side. Maybe he was just quietly trying to make a few extra bucks on the side doing something like...like..."

"See, that's the thing. Like what?"

"I don't know." Resignation tinged his voice. "But we know he was in this region on that third logged traverse, so it's worth a gander."

The hike became a stroll as the landscape sloped gently down in the direction of the shoreline. Low hills rose up to block their view of Kraken. The yellowish mounds rising from the dark organic soil reminded Abby of bumblebees.

Troy's voice brought her back to the hike. "I can't believe your guy said no."

"He hates interplanetary travel," she said somewhat defensively.

"It's practically painless these days. Besides, if you wanted me to do something, I'd travel a ways. A little ways. But just a little, so don't get any big ideas."

If he meant to compliment her, it just came out as attacking her best friend. Bad timing all around.

Troy pulled up a map on his heads-up display, then pointed to the left. "This way, I think."

As they crested a mound, a strangely earthlike panorama opened ahead of them. A vast floodplain defined the serpentine wanderings of a river delta. Teardrop-shaped islands pointed upstream toward what must have been a dramatic methane flow in some past downpour. The rich chestnut sand looked like poorly ground turmeric. *What a strange place this is, where the sand of the earth has fallen from the skies.*

Troy whistled. "Hate to be here at the height of monsoon season."

"I'd kind of like it," Abby countered.

"You meteorology geeks." Troy pointed downstream. "Watch those low flat spots. Looks like it could be quicksand."

Abby shivered. In the extreme north and south of Titan, that alien combination of powdery hydrocarbon soot and methane mist led to hidden traps, soupy sludge that could trap a rover or an unwary hiker. Two researchers had been lost only the year before she arrived. That was when somebody put up all the MIND THE GOOP signs.

They followed the streambeds uphill until the delta narrowed into a sharply cut canyon. Abby stopped and put her hands on her hips, surveying the gorge. "No sign of anyone here."

"Maybe down by the lake," Troy suggested. In another half hour they had descended back into the floodplain. The saturated ground sucked at their boots. Along the shore, Kraken Mare's pseudo waters seeped up into rivulets like dark snakes slithering across the oily sand.

Abby let out a long sigh. "You'd think he would have left something around. A tide marker; a flow meter. Some sign."

Troy froze in his tracks before Abby heard the sound. It began as a low rumble, ramping up to a sharp crackling. In Titan's thick air, sound carried farther than it did on Mars or Earth. The two wanderers looked north, in the direction of the sound. They felt it in their feet now, and in their chests. Behind the distant shore rose a ship on a glowing trail of smoke. It was a large rocket, the kind that could make it directly into orbit and be on its way. It arced northeast, away from the direction of the scattered habitations of Titan, disappearing quickly into the gloom overhead.

(\*)

Abby burst into the Comm Center and nearly tripped over the officer on duty, who happened to be Piers Wellington. The room was cramped, even by Titan standards, and there was no place else for the poor guy to sit. At the end of his little desk rose a small shelving unit with stacks of old-style books. To make matters worse, she and Troy still wore their bulky environment suits. In front of his main desk unit, a small plaque read: "I'm just the messenger."

"Hey Piers," Abby barked as Troy bumped into her from behind.

"Ooh, you have books," Troy said.

"Take care, ladies and gents!" the Comms officer said in a soft British accent. "There's just enough room for me and the coffee maker, and bugger-all else." He

frowned, gauging Abby's urgent expression. He looked at Troy, who seemed equally perplexed. "You two look like Frick and Frack. What's all this, then?"

"Could you pull up a global Titan map for us?" Troy asked.

Piers clucked his tongue and gave them a pitying look. "Did somebody confiscate your personal terminals?"

"Just—you know—" Abby motioned toward the wall screen.

"For you, Abigail, anything. In all its glory," Piers said as the map came up. "Are you looking for anything in particular?"

Abby leaned past Piers and tapped the screen in the general area of the launch. She traced her finger over the pole and to the opposite hemisphere. "Looks pretty busy back here. The Russo-African base at Antillia, the complex at Tortola Facula..."

"The Bacab colony," Troy added. "All this stuff in eastern Adiri and Ching-Tu."

"Unlikely they'd go that way," Abby murmured.

Troy nodded and turned to Piers. "Did you guys see anything on radar in the past hour? Anything flying?"

"Wasn't any."

"There wasn't any what?" Abby prodded.

"Radar," Piers said. "We seldom run it between scheduled flights. It takes a lot of juice. Our next supply autodrop doesn't arrive for another week, so we're only monitoring radio frequency. In case somebody has a big emergency, like needing to look at a map."

Troy ignored the comment. "What about somebody to the southeast? Could they have seen something?"

Piers shook his head even before Troy finished. "No good. Xanadu Mountain Research Station is essentially automated, visited once every three months for maintenance or by someone with a research grant. I suppose the closest thing besides that is the Australian station over in western Senkyo."

Abby looked at a vast expanse between what passed for civilization centers on Titan. From the sand seas of Belet to the rugged uplands of Adiri, the remote terrain had effectively kept settlements at bay. "So anyone leaving across this path would be unobserved."

"Leaving?" Piers said, chewing on a memory chip. "As in departing Titan itself?"

"As in launching. Surface to orbit."

"Conceivably, unless they said something over radio, or kept a low orbit long enough to be picked up by New Ontario. It takes quite a bit of energy to clear Titan's gravity well directly, though. Most ships go into orbit before they leave for good, to optimize their departure."

"But it could be done, right?" Abby encouraged.

"It could be done. But who would want to keep something like that a secret?"

Abby tapped her chin in thought. "Right. And why?"

Abby and Troy dropped their suits off at the north airlock. Above the door, a hand-scrawled sign spoke the familiar words: MIND THE GOOP. As she swung her airpack onto a stand, Abby said, "I'm calling Mars at this evening's relay."

“Gonna talk to your TBI buddy?”

“Jeremy. Roger that.”

“Twist his arm. They say things are weird at the north pole of any planet. Titan’s got it in spades. First Kevin freezes to death in bed, and then a ghost ship leaves from the other side of Kraken Mare. Next we’ll be seeing Santa’s sleigh up here.”

“After our mystery launch, I think he’ll come.”

“Santa, or Jeremy?” Troy mumbled, “Hope you’re right”. But he sounded unconvinced.

# Chapter 11

## The Villa

Horf had never been to Demian Sable's villa on the outskirts of New Tucson. Only special people got invited, and Horf was used to not being special in that upper crust way. The cultured life was never for him. But if Circe wanted to meet there, meet there they would, even at this ungodly hour of the night.

A uniformed guard admitted Horf through an imposing wrought-iron gate. Two alabaster lions cast baleful eyes in his direction, observing from atop 3-meter pedestals on either side. The guard gestured toward a pathway. Apparently, Horf was expected.

The place was less a mansion and more a compound, sprawling across acres of manicured gardens, statuary, and fountained reflection pools. At the south end loomed a 20-meter crystalline pyramid, supposedly patterned after a Martian structure revealed to Sable during one of his famous trances. Horf didn't know what he thought about trances, or even about style, but he knew money when he saw it. The place dripped with it.

The villa itself spread out at the terminus of a curving driveway lined in Italian cypress and marbled walkways. The edifice bristled with columns, cupolas and balconies. Floodlights cast wild shadows across its imposing face. Another security guard met Horf at the front door, ushering him into a cavernous atrium. Murals decorated a domed ceiling. Gold leaf encrusted a set of sculpted capitals atop a colonnade that encircled the entire room.

"More columns," Horf grumbled, but the guard was gone.

Out of the corner of his eye, Horf caught movement above. The gowned figure of Circe glided across the balcony and floated down a winding staircase. She looked like a figure right out of an old flat-flick, like *Gone With The Wind*, or that babe in the classic holovideo *Into Our Numb Minds*. They didn't make them like that anymore.

Circe drifted down the staircase until she settled, like an autumn leaf, on the polished floor. Now there were two of her, one upside down beneath. For an instant,

Horf got the dizzying sensation of standing on glass, peering down into a vertiginous mirror-image world. He felt exposed, off balance.

Circe's gown plunged in the front, white silk glowing against her mahogany skin. Her cleavage was subtle, but her makeup was not. Her eyes held the painted black and peacock blue of a pharaoh's bride, with dark stripes stretching around to her temples. Her wine-colored lips were full, glossy. The corners of her mouth twitched as she nodded her head toward him.

"Please," she said in a voice like butter, "have a seat."

Horf heard the settee rising from the floor behind him. He stepped back and sat at one end. Circe stepped toward him and sat at the other, her knee nearly touching his. Her smile widened slightly, more on one side than the other. Its lopsided quality added to her seductive magnetism. Before Horf could say anything, Circe took control of the conversation.

"Demian tells me you need to chat. I assume this is about your progress in the outer planet trade, yes?"

Horf said, "Yes, we—"

"Your contact on Ganymede," she interrupted. "Has he been helpful?"

Apparently, Sable's assistant had as much knowledge as her boss. The power of their intelligence network made him want to cringe. "Yes, he has. There was another transport attack. Not my people."

"Yes, we know."

"You know which part?"

Circe cast a genuine smile, the first of the encounter.

"No matter. Mr. Sable would like you to change your strategy slightly." A man entered through an ornate doorway near the back of the great hall. He paused at Circe's side. Horf detected what might have been a subtle bow. It was all very formal, very dramatic. Just like Demian Sable.

"Tea?" Circe asked.

"No thanks."

"Coffee, then? We get it from the domed tropo-fields of Hesperia."

Hesperia grew the finest Martian coffee, and Horf couldn't resist. "Sure, thanks."

Circe nodded to the man. He pivoted smartly and disappeared.

"Now, as I was saying, Mr. Horf, we need you to make a slight change in plans. The pirates are no longer your target. Go directly to the transports, especially the ones from the outer belt and the small Jovian and Saturnian moons."

So much for Sable's brilliant strategy, Horf thought. "What happened to letting the pirates sort the cargo for us? What happened to the pirates letting down their guard and—"

During Horf's discourse, Circe had closed her eyes. Now, she held up her hand for quiet. Horf stopped.

"There are changes in plans that you are not a part of, Mr. Horf." She opened her eyes and looked at him. That look nearly plastered his back to the wall. Her glacial blue eyes had a laser-fire to them. "But you will play an important part, if you are willing to play."

"And if not?"



Circe's mouth tightened. "It's a bit late, don't you think? You started those cogs turning already. To back out now would be to put out Mr. Sable. I would think carefully before doing such a thing." Her voice was mellifluous, but there was a dangerous edge to it.

The assistant returned with a tray of drinks. The coffee's aroma filled Horf's nostrils, momentarily distracting him. As Circe stirred honey into her Earl Gray, Horf leaned forward.

"So what does Sable want, exactly?"

Circe stood in a fluid motion and began to float along the floor, back and forth, her reflection mingling with the mirrored images of the columns beyond. "You can begin by focusing on those transports that get through to the inner system. Those are the smart ones, the well-equipped ones, and they will be the targets with the best cargoes. Those that slip through the pirate network tend to be the richest."

Horf thought for a moment. "Makes sense, I suppose. But what's with Sable, anyway? I've just started to get things in place, and now this."

Circe stopped her wafting and faced him. Her gown swirled slowly around her long legs. Horf caught a glimpse of her sandaled feet beneath its long train. "Please, please Mr. Horf. Where is your trust?" She pointed her teaspoon at him. "I must tell you to be patient. The Teacher has things just where he needs them. There will be news." Her coyness was beginning to get on Horf's nerves.

"News?"

"Soon."

Horf was letting her calm get to him, and it was having the opposite effect. "And another thing's been bugging me. This Montenegro. Is he the real thing? I mean, everybody talks about the big shot entrepreneur, or is he a ruthless murderer this week? And when everybody's done trying to keep track of him at the end of the day no one agrees on anything. Makes me wonder if Montenegro reads from the same playbook as Peter Pan."

Anger flashed through her eyes. "Montenegro is no murderer," the self-possessed Circe suddenly turned on him. "He does everything for a reason. He is real flesh and blood and I've met him, so don't start quoting fairy tales. It will end badly for anyone who does. And he's no pirate. He has far more in mind."

The flash of anger on her face melted into a soft expression of perfect peace. She turned and slid toward the stairway. At its base, she paused and looked over her shoulder. "Thank you for coming, Mr. Horf. It has been a pleasure. We will be in touch."

As Circe embarked upon her heavenly ascension, teacup in hand, Horf felt as though he was a schoolboy who had just been dismissed by the principal. Whatever "news" was coming, he wasn't looking forward to it.

(\*)

Sable listened once more to the secure message. He always double-checked before responding over such distances.

We have over 5 tons of pure ore, mostly copper, indium, unrefined zinc and some really high-grade palladium. On the hardware side it's a real gold mine, so to speak, with a host of mining equipment and weapons. Our intelligence reports were good. Standing by.

Sable ticked off the items on the list. Copper and indium and palladium. Useful in not only trade but high tech manufacturing. Zinc. Great for lasers and some propellants. And the weapons might come in handy quite soon. Riches with which to build his empire. All in all a good haul, and just in time.

Sable keyed the encryption program. It scrambled the source of his transmission and disguised his voice. The bandwidth was good here; he could afford voice, which always lent an element of drama. "As far as the disposition of the crew, you have instructions, I assume. No change. The ore goes to the outpost on Iapetus and the weapons to the Northern Quadrant Base on Titan. Nothing is to go to the inner system from now on. Montenegro will be in the outer system within the next few weeks with further instructions. Wait for him before delivery to Titan. Transmission ends."

"Good," Sable mumbled, rubbing the back of his neck. "Good."

## Chapter 12

# Talking Trash

Abby couldn't find Troy anywhere. He wasn't in the secondary galley. He wasn't in his room. He hadn't checked out a research rover or even an environment suit. All of his equipment was stowed in the lab. She knew of only one place left to look.

The hallway leading to the researchers' quarters was cold, dark and unwelcoming. A thin ray of light painted a stripe across the floor up ahead. Abby knew whose door was open: Kevin Nordsmitt's. And she knew who was inside.

She peered into the cramped quarters. Troy sat on the floor, a pile of tablets, maps and portable display screens fanned around him. The light of a dozen mini-screens accentuated his rugged features. She wondered how he kept that athletic physique these days. Clearly, it wasn't from hours at a microscope.

"You look like a peacock," Abby said, letting herself in.

Troy jerked, dropping a small monitor. He grabbed it, frowning at her. "Thought I'd do some...follow-up. Shut the door, will ya?"

"Follow up?" Abby looked doubtful.

"You weren't followed, were you?"

"Yes, I tried to attract every shady character I could find in the galley, but there just weren't any takers."

Troy's face flushed. "Sorry; I'm just a little jumpy. Still. But with good reason, I think. Turns out our friend had quite the curriculum vitae. Worked with CoAz teams in Asia and at the L'Anse aux Meadows Viking coastal site up in Newfoundland. And at some government facility in northern California that I couldn't cross-reference anywhere."

"That last point is pretty bizarre. What was he doing with all these illustrious teams?"

"Not hydrology, that's for sure. He's got a boatload of articles printed in various journals and stuff. Look at these: *Microbial Mats in Antarctic Dry Valleys*. *Fungal Colonies in Martian Fluvial Formations*. *Parallels Between Amazonian and Martian Delta Basins*."

"Finally something on rivers."

“Well, sort of. Except he’s way down the list of authors, as if he’s been added as an afterthought or an observer or something. Not only that, but the article seems to be more about bacterial ecosystems in those river basins than their morphology.”

Abby banded her arms across her chest. “A renaissance writer, and only one of those articles having anything even remotely to do with why he was supposed to be here.”

“Yeah, I noticed. Good cover story, though, as far as it went.”

“Something went too far,” Abby mumbled. The image of Kevin dead in his bed flared in her mind. She leaned toward a digital photo album on the floor next to Troy. Holo-snapshots of Kevin and his friends and family back home, water skiing in what looked like Lake Powell, snow hoverboarding at a ski resort on Earth or Mars (who could tell?), parasailing over Candor Chasma with its rusty cliffs.

“He’s spent some time on Mars,” she observed.

“Probably had to, with all that research comparing Brazilians and Martians—is that anything like comparing apples and oranges?”

Abby shook her head. “I don’t get it. Why the secrecy?”

Troy shrugged. “People don’t keep secrets about rivers, but they do keep secrets about drugs. Somebody must have found out his secret here, whatever it was.”

Abby glowered. “I just can’t believe Kevin was the type to be involved in the drug machine. What did they find—whoever ‘they’ is? And would they kill over it? It still makes more sense that he got stranded outside for too long, or distracted, or had a suit malfunction.”

“My money is on MECTRODEX, big gorilla of the pharmaceutical universe. I found some more references to them in the other room.”

This wasn’t good, Abby thought. MECTRODEX had their fingers in more than one pie, and those pies weren’t all good recipes. Reports of insider trading, fixed pharmaceutical pricing, clandestine manufacturing off-world, and other nefarious rumors continued to make the rounds. The corporation’s tentacles spread throughout the system, with centers on Mars, Ganymede and even Ariel—figure that one out! It seemed to Abby that MECTRODEX was working its way up to becoming a poster child for bad business. If Kevin were involved with them, she would be hard pressed to understand why. It just didn’t fit the Kevin she knew.

“You seem pretty convinced,” she said, keeping her tone even.

“Oh, he was up to no good, all right.”

“How well did you know him?”

“Just enough to say hi to. We didn’t hang out at the robo-cantina or anything. Our research went in different directions. Why?”

“I knew him pretty well, and this kingpin-of-the-drug-world isn’t sitting well with me.”

Troy folded his hands and spoke in the patient tone of a teacher talking to a wayward student. “Are we letting our emotions contaminate our data stream?”

She could feel herself blush. She clamped her jaw shut.

Troy stood, trying not to step on any of the little screens and tablets around his feet. “One thing’s for sure: Kevin didn’t leave any notes about some secret launch facility beyond the lakes. That’s got to be the key to this, don’t you think?” He

started scanning along a bookcase. Most were electronic flats, but a few were traditional.

"Maybe they're separate things," Abby said, getting her breathing under control. "It was pretty obvious that Piers didn't know anything about some secret mission that Kevin was on, and in his position he'd have to, wouldn't he? If that launch was some sanctioned event? Maybe Kev was after something else and stumbled onto that place."

"It's a long way off," Troy objected. "He'd have to do a lot of directed stumbling to get up there, way around the lake."

"Maybe competition in Titan hydrology is fierce," she offered, a last ditch effort at painting Kevin as an innocent.

"Fierce enough to knock somebody off?" Troy wrinkled his nose.

Abby shook her head slowly. "Fact is, I've got to admit he was no hydrologist, despite what we were told by the university. Somebody popped for a very expensive travel fare and sent him all the way out here for a good reason. I'd love to know what that reason was. It just might clear up a whole lot of stuff."

"Ooh, how quaint. Look at this."

"What is it?"

"Diary."

"What's so quaint about a diary?"

"For starters, this one doesn't need an energy pack." Troy held up a leather-bound book. He began leafing through it.

After a few moments, Abby said, "Mind if I peek?"

Troy tossed the little tome to her. She rifled through a few pages. Sketches filed past her fingertips, carefully drawn diagrams of local Titan landscapes, small maps with personal notes, pages of observations: ice, sky, lake, dunes. Each little drawing was a masterpiece, carefully crafted in ink or neographite.

There were more names. "And who is this *Major J* that keeps showing up?"

"I'll bet he knows G. I. Joe," Troy offered.

As she turned another page, a wave of winter air wafted across her shoulders and down her arms. Kevin had carefully mapped out the location of Kraken Mare's southern coastline, along with the entire island of Mayda to the north. On the next page, arrows pointed to amorphous blobs. At first, Abby took these to be more islands, but then she saw the labels: *organelles, possible flagella? double nuclei?*

"Troy, take a look at this. They're diagrams of penicillin or something."

"See? Drugs."

She clenched her teeth. "I'm telling you, he was *not* into drugs."

"Penicillin's a drug." He said it in a nursery rhyme voice.

Abby pointed at the sketches. "These aren't drugs. More like bugs. These are, you know, molds or microbes or something."

"Germy things, like what drugs are designed to kill off."

Abby's phone rang. She tapped her earpiece. "Marco."

"Abby, it's Dr. Mason."

"What's up, doc?"

"One of the cleaning techs found something. I think you should see it."

All sorts of nasty scenes assaulted Abby's imagination: a weeks-old moldy sandwich, medical refuse, toxic puddles leaking from some discarded container. All she could muster was a simple, "Oh?"

"Can you come to my office?"

"Sure. On my way." She clicked off, looking at Troy. "Sounds a bit urgent."

"Mind if I come?"

Although she did mind, she said, "Okay with me." In a way, it was a relief to get out of that apartment. She hated sneaking around. She would never have made a good spy.

In the hallway, Troy grabbed Abby gently by the shoulders. "Apps, listen. You need to be open to the possibility that we're going to find out something about Kevin that neither of us likes."

Abby's gaze dropped. "I know, Troy. I know." She turned and headed down the passage.

Despite the organized layout of the Mayda Research Station, the hallways seemed to wander in a disorienting labyrinth. The outpost consisted of two dozen habitats docked together, end to end, in long rows, short hallways, or clusters that provided more open areas for the large labs, main galley, and common atrium. Their modular nature only added to the confusion. Every wall looked like the last. Signs posted on partitions and hung from ceiling braces pointed toward various facilities.

Abby and Troy passed beneath a sign reading "Medical Bay" and turned down a short corridor to the glassed-in airlock. The smell of antiseptic mingled with aromas of real flowers. The inhabitants of a little flower box just inside the door included tundra blossoms imported from places like Iceland, Scandinavia and Antarctica. The little plants provided a nice touch, but there was no mistaking the medlab ambience.

Doc Mason stood up from a green stool as they entered the room. She had obviously been watching for them.

"Hey kids." Her cheery tone was forced.

"Hey, Doc, so what did they find in the garbage?"

"Something that shouldn't have been there. Something that tells a story you won't like. Brace yourselves." She paused and locked eyes with Abby. "I'm serious. You might want to sit."

"I'm fine," she said impatiently.

"We're fine," Troy added.

Doc Mason crossed the room to a plastic bin. She popped the top open. Air hissed from the container. Reaching in, Mason pulled out a blue standard-issue environment suit. She spread it across the floor.

"There was no helmet, no backpack. Just this."

Abby bent down, reaching toward the suit. Her hands shook like aspen leaves. She took in a deep breath and pulled the suit up by its collar. The collar ring, which usually formed an airtight seal against the helmet, was torn and ragged. She examined the nametag on the chest pocket. It was one of the temporaries. Most of the writing had rubbed off, but she could make out the first two characters: "K. N-".

At the right edge of the nametag were two more letters, the last in the series. They looked like a “tt.”

“Oh,” Troy said, his voice cracking. He stood on the other side of the suit, his face ashen. “Have a look at the back, Apps.”

Abby turned the suit around. She felt as if her knees might buckle. She leaned hard against the wall. The suit had been sliced open across the shoulders, and then ripped vertically down the spine.

Abby looked up at Troy. Beyond him, the ceiling tipped from one side to the other. He was saying something about water. Doc Mason handed her a glass. She frowned at it.

“May I have something hot?”

“I’ll get it,” Troy volunteered. Mason stayed close. In moments, Troy shoved a steaming cup of something into her hand.

“I guess I was hoping it would turn out to be something more innocuous,” Abby muttered into the mug, “some accident someone was trying to cover up.” Tears threatened at the corners of her eyes.

“This was no accident,” Troy said, unhelpfully.

Doc Mason sat down next to Abby and took her hand. “They say that dying of the cold is one of the easiest ways to go. With the kind of temperatures we’ve got outside, you simply—”

“Kevin didn’t die of the cold,” Abby snapped, ferocity in her tone. “Somebody did this to him. They ripped him out of his suit to let him suffocate and freeze to death. My guess is he didn’t just fall asleep. He died afraid. He died fighting.”

She knew she had to do something. She would call Jeremy, convince him to come out. She couldn’t breathe. She couldn’t move.

She imagined Kevin in some dark, cold place, with the frigid talons of Titan raking his back, burning his skin, draining the warmth of life from him.

Abby buried her face in her hands. Finally, the tears came.

(\*)

Darrel Jones leaned against the polished wall, grinning at his fellow prison guard. “I dunno. The guy just seems like something’s not right with him. He’s not himself, ever since they found him in the mess hall sprawled out on the floor.”

“And he still doesn’t remember how he got out of his cell and in there?”

“Nope. Not according to him. He used to spout a lot of big college words and long sentences and just loved talking about spiritual dimensions and all that tripe. These days he’s clammed up.”

“Doesn’t sound like the Demian Sable I know and love.” The other guard scratched beneath the edge of his collar, just by the nametag that read MEL. “Still, you said you wanted a quiet job.”

“Oh, yeah. I’m not complaining. I like it. It’s a relaxing stint, much quieter than that school bus route I had to endure for the past three years.”

“What about your wife? She mind the extra money?”

“No, we can both learn to deal with that, and I don’t mind not bringing home the germ of the week from those runny-nosed kids, either. This place, once I heard there was an opening, I jumped at it. Ad said something like, ‘The secure campus at Morrow is the most peaceful site in the corrections system,’ and they weren’t kidding.”

“Campus. Don’t you love it?” Mel snickered. “They’ve got so many systems and barriers and personal alarms, only the true idiots make a fuss. It *is* a peach job.”

The screams began just then. They came from the private quarters of Demian Sable. Jones hit the *assistance required* button on his lapel. The guards both turned down the hallway and dashed toward the ungodly sounds.

Demian Sable lay on his back on the cold floor, his body rigid. His face contorted into bizarre ridges and wrinkles, eyes squinted shut.

Jones hit the wall monitor. “We need a medic, stat.”

“On the way,” the monitor squawked.

The guards held the man down. Darrel watched in horror as Demian Sable’s face warped and transformed.

“Hey, wait a minute,” Mel said. The prisoner’s face smoothed, his breathing calmed. “Great,” the guard grumbled.

Darrel’s gaze stayed with the prisoner’s face, refusing to move. “What’s going on?” he whispered.

“Streamer.”

“What d’ya mean?”

“Guy had a streamer. Puts a synthetic retrovirus in your system. Changes your genes or somethin’ for a while. Gets right into your tissues and transforms things, but it wears off in a few weeks.”

“How could he—how could they—” Darrel’s stammering trailed off.

“Oh, I’m sure the questions are just beginning. Warden Delvin’s going to just love us. One thing’s for sure: Demian Sable hasn’t been here for some time.”



## Chapter 13

# Submersible

“I think a little technology will cheer you up.”

“You can’t out-engineer someone’s personal loss, Troy,” Abby grumbled.

“No, no, that’s not what I meant. I just thought I could show you something that might lift your spirits a bit. I know you get as much of a rush from a good science experiment as I do. Besides, there’s nothing you can do for a few hours until you hear back from your secret agent.”

She looked at him broodingly, with tired, bloodshot eyes. His playfulness seemed incredibly inappropriate to her, but he was trying to help, and that was a good sign. “I suppose I need to stop moping. What have you got?”

Troy put his finger to his lips. “Shhh. Secret! Follow me.”

The two clomped over metal grating down a narrow tunnel, ducking beneath low-hanging equipment and ductwork. The dark passageway led to a substantial hatch with a glowing control panel on the side. Above the hatch glowed a warning: OUTSIDE ACCESS BEYOND. Below it, a handwritten sign proclaimed, MIND THE GOOP. A few heavy jackets hung on a rack beside the entrance. As Troy unsealed it, he called over his shoulder, “Grab a coat; it’s cold in here.”

They stepped in. A fog of their own breath billowed around them.

“It just arrived on yesterday’s autodrop from Earth.”

“Long trip,” Abby said, but her voice trailed off as her eyes registered the object before her. “It looks like a racecar.”

“Shiny, yes, but pure science, my dear. Pure science.”

“I want one.”

“It only cost about a zillion bucks. But worth every penny. Rated for a cryogenic methane bath. Nuclear powered. We could tool around in this baby for weeks without coming up for air, which you wouldn’t want to do on Titan anyway.”

“I thought nuclear submarines made oxygen from water.”

“Every analogy breaks down at some point. But you get the idea.”

Abby couldn’t help but smile in admiration. “A Titan submarine. Not bad, Captain Nemo.”

The submersible hung from a small crane that barely fit under the ceiling of the domed storage hab. Polished to a gleaming cobalt blue, it was big, perhaps the size of a three-person rover, with fins in the back and two engine fans embedded in wings that swept around seamlessly to the blunt nose. A glass dome crowned the craft. Broad windows draped across the front, imbuing it with a shark-like demeanor. A menacing robotic claw hung from a bay in the belly.

“What’s this thing good for?” Abby asked.

“All sorts of things. I’m supposed to make it available to the core drilling gang to service the big rig as needed, but mainly I get to map the seafloor, chart geologic forms under the ocean surface, study my organics, take core samples—you know the *drill*, har har.”

“Funny man.” Actually, he was being funny. Surprisingly so. She had to face it: Troy still held a flame for her. But she had made things quite clear, she thought. He used to be so sensitive to the needs, the views of others. These days, it was if he had gotten lazy. He often didn’t seem to care what others thought or how his actions impinged upon their lives. She wondered what went wrong along the way. People change, yes. That was natural. But with Troy it was something else: Troy had soured.

He placed his hand gently against the smooth skin of the craft. “It’s got the same advanced nuclear power plant that runs Mayda station, an Ingermanson. That makes it only the second one on Titan.”

“Hope it works better.”

“Oh, they’re getting the wrinkles ironed out.” As he spoke, he moved in front of a ceiling light. His red hair glowed like a halo. The only part of his face that showed in the dim light was his baboon grin. He patted the side of the submersible. “Of course, we had to make a few modifications for this place.”

“Like?”

“The tanks. At these temperatures, we can’t just blow out the tanks with air. The nitrogen just condenses out, and you don’t go anywhere.”

“Not very convenient,” Abby said.

Troy shrugged as if it was nothing. “Since when was anything about Titan convenient? We have to use a high-pressure helium tank and recycle each time we descend.”

Abby walked over to the belly of the craft and gazed up into the bay. A host of instruments awaited deployment, each nestled within its own cradle. “Impressive,” she said quietly.

“I’ve just about got all the subsystems checked out. Everything looks good. It’s about time to go for a little perambulation.” His head was cocked at a slight angle, a smirk on his face.

“You want company?” Abby couldn’t keep the enthusiasm from her voice. It was a sweet-looking ride.

“Hey, we’ve both got our work cut out for us, but I could use a hand on the aft robotics. I’ll trade you some time on my boat for a few hours of me helping you sniff the air with your rudimentary and outdated meteorology equipment.”

“Deal.”

The place was pretty cozy, for a cavern dug into the side of an ice cliff. Acrylic-sealed walls held in a warm nitrogen/oxygen atmosphere. The air was dense, as it was everywhere on Titan, but one got used to the heaviness in the way one got used to humidity in New Orleans.

The outside airlock led to a central causeway. From the main thoroughfare, a series of small rooms branched to the sides. At the end of the walkway, a cavernous great room had been hollowed out from the heart of the mountain. Furnished with tables, makeshift chairs, and wall screens, it served as the communal meeting place. Somewhere beyond it, on the other side of a metal bulkhead, lay the pumps, tanks, generators and fuel lines necessary to run the secret spaceport.

Marv Holliman spat on the floor and shook his head, preparing to rant. Across the table from him, Jessie Flannigan and Kinto—last name unknown—smirked at him in amusement. “Why would he come here, after all this time?”

“I told you he was real,” Jessie said, flicking her wayward bangs from her eyes. No tattoos blanketed her chiseled arms, just a deep tan and several scars.

“Have to see it to believe it,” Marv said. “There’s been lots of rumors ‘bout Montenegro this and Montenegro that, and how inspiring the guy is and how much he’s fixed things to be easier for the Family, but why don’t he never show up to things? Why don’t he be the point man on any high profile heists? That’s what would inspire me. Action, not bedtime stories.”

Kinto, a bulldog of a man with a permanent grin, pointed a finger at Marv’s chest. “If Commodore Clark’s right, you’ll get your chance to be plenty inspired soon.”

“In person,” Jessie added.

“Like I said, gotta see it with my own eyeballs.”

The door at the back of the great room clanged open. A blustery man in a helmetless environment suit called across the tables. “Marv! In my office. Now.” He was red-faced, and the blush spread all the way across his clean-shaven scalp.

“That can’t be good,” Jessie said, frowning at Kinto.

“Definitely not,” Kinto agreed. He squinted at Marv. “Commodore’s got a bee up his bum about something. Good luck, mate.”

Marv closed the door behind him and stepped through a maze of pipes and wired machinery to another hatch. Cautiously, he knocked, and then unsealed the metal door. The hatch opened into a well-appointed office. Behind a small desk, the bald man cast a baleful eye at Marv.

“Sit.”

“Yessir,” Marv said, scooting into the only other chair in the room. “What’s this about, sir?”

“It’s about stupidity, mainly. Were you or were you not in charge of launch control last Thursday?”

“Thursday?” Marv squeaked. He glanced around the room, searching for something that might help his memory. What happened last Thursday?

“Shall I give you an overview of the rules of conduct? Rules like, if someone wants to launch during the day, it has to be cleared by a sweep of the area first, not after?”

“Yes...” Marv drew the word out. He knew the protocol as well as anyone. “Did something happen?”

“Oh, I’d say so. Our sentry spotted two people on the southern shore about ten minutes after a flight left here—that one bound for the Galileans? The really important one? Ten minutes! If they had been spotted before the launch, they wouldn’t have known about a launch. Or about a launch facility. Get my drift?”

“Will they make trouble?”

The bald man slammed a meaty fist into his desk. “What do you think? They must be scientists from the Mayda outpost. Scientists like to ask questions. Like that guy in the cave. After your dolts ‘took care’ of him they had to risk going to Mayda Station and cutting the power while the idiots dropped him off.” He looked at the ceiling dramatically. “Why in heaven’s name would they do that?”

“They told me they panicked.”

“And went *inside*? With a corpse? Am I crazy or is that...insane?” The veins in his neck bulged. His eyes reddened.

“They thought that if it wasn’t clear where he had died, they wouldn’t be able to tie it to any specific—”

“No, Marv. Actually, they didn’t think at all. Oh, yes, this just keeps getting better. See, these scientists, they enjoy mysteries as long as they can solve them. This is one we don’t want getting solved.”

“I understand that.”

“Maybe you could start acting like it. Mayda has nice communications equipment and regular contact with other Titan centers and Iapetus and Hyperion, not to mention the Galileans and an occasional postcard to Mars. We’ve got a security crisis on our hands, and the timing couldn’t be worse with Montenegro on his way.”

Marv lowered his voice. “I thought Montenegro was like a mascot, a rallying point for the Family. Not a real guy.”

“Someone is on that ship that’s heading for the Saturn system, and that somebody purports to be him, in the flesh. It’s Montenegro all right, and he makes land-fall here soon.”

“What can we do?”

Commodore Clark stood slowly, his hands balled into fists, his knuckles resting on his desk. He leaned forward into Marv’s personal space, and then some. “You are going to come up with a plan that addresses that question. Clear?”

“Yes sir.”

“Not tomorrow. Not tonight. I want you back here with a solution on my desk in an hour.”

*That should be just enough time to write my will,* Marv reflected as he exited the Commodore’s office.

(\*)

Tanya’s Zodiac bobbed in the methane swells. The waves had calmed since the last time she was out, but she still tended toward nausea. Better to get off fast. She keyed her mike as she rammed her inflatable boat against the ragged outcrop.

“This is Tanya, coming up to see if you lazy bums are still doing working.”

The security gate at water-line—they still called it that out of habit—chimed, and she swung it open. Slamming it behind her, she clambered up the icy trail. Above her, the great arm of the core drill rocked back and forth, in and out of view, against the hazy orange sky. The sound reminded her of the breathing of a thousand slaves on a galley ship, the basso drumming keeping time in the background.

At the top of the trail, the flat staging area seemed deserted. She could see lights inside the control cab at the base of the tower. She waved through the window and entered. There was no airlock; everyone was fully suited.

“Hey, girl,” a burly engineer said through the radio. He hunched over dual monitors.

A woman peered over his shoulder, nodding slightly at Tanya.

“Dr. Tanya Yampolskaya, this is Dr. Jasmine Major. Dr. Major is here in case we find any fossils in our ancient ice or clay samples.”

“Fossils?” She tried to hide her skepticism.

“I’m from Colorado/Arizona U’s Paleontology department.”

Tanya reached out to shake her hand. “And I’m here for wanting more ice samples. Stanley?”

“Your wish is my command.” The bear at the monitor kept his eyes on the screens. He was using a joystick, directing some delicate operation somewhere in the deep core. “It’s still solid down there,” he murmured.

Stanley turned to Tanya and waved at the corner of the little cab. “Over there, all for you.”

“Just like Christmas,” Tanya said, scooping up several sealed cylinders. “Should I bring swimsuits next time?”

“Let’s hope.” Tanya hoped so, too. Titan’s deep internal ocean, sequestered from the surface by 60 miles of ice mantle, had much to tell. This global sea was thought to be a sort of cap on the storehouse of Titan’s methane. If its water was seeded with ammonia, the water might be fluid enough to migrate toward the surface, freeing pockets of methane trapped within the ice crust. And if the water was in direct contact with the rocky core, at least in some places, the minerals of life might be mixing with the currents. But since the days of the old Cassini Saturn and LeVerrier Saturn/Neptune flagship missions, researchers had to settle for gravity maps to plumb Titan’s depths. Now, just perhaps, Tanya’s colleagues would be able to touch it directly.

“Nice to meet you, Dr. Major,” Tanya said, juggling the cylinders through the door. Tanya made her way back down the slick slope, preoccupied not with Titan’s ocean but with the good Dr. Major. A paleontologist? Was she hired on April First? It seemed reasonable to search for fossils in rock, but in ice? Tanya stepped gingerly into her boat, wondering how a paleontologist could get to the front of that long queue of esteemed scientists wanting a stab at Titan’s deep ocean.

## Chapter 14

### Partly Cloudy

The trip to New Tucson by airvan lasted barely an hour, but the summons annoyed Jeremy Belton anyway. Why couldn't Director Rao just phone? It was obviously something important, but this was a bit dramatic. And as always, Abby's call came at the worst possible moment. He would have to deal with it, whatever it was, on his return home. In these days of long light-time communication, one had to learn to wait.

Belton's van had passed over *Noctis Labyrinthus* half an hour ago. Ahead, New Tucson spread across the dark lowlands of *Solis Planum* like a white spider web on rusted charcoal. He punched in the coordinates for headquarters and leaned back in his seat, trying to relax. In a few minutes, he stood in the open doorway of Sanjay Rao's office. A cloud of blue vapor wafted around his desk.

Belton stepped in. "Are you actually *smoking*?"

Rao pointed an old-fashioned pseudocigar past Belton, toward the door. "It's not actual smoke. Close that thing, will ya? I only do this when I'm desperately depressed. I had Alice disable the fire suppression lasers in here."

"That explains it." Belton eyed the ceiling suspiciously. "What's got you so depressed, Sanjay?"

"Demian Sable. Sit."

"He is a depressing character."

"He's a missing character."

"Missing?"

Rao nodded.

"I thought he was sitting pretty at inescapable Morrow."

Rao nodded again. "And the Titanic was unsinkable."

Belton suppressed a small cough. "So what happened?"

"The operation was done professionally, using sophisticated techniques, some only available—legally—to the military. Morrow has complicated layers of outer security he had to get through. The place is like an onion. He should have been secure anywhere in campus. Exit requires biokeys, electronic passkeys, software passwords, you know the drill."

“He obviously had help,” Belton said.

Rao frowned. “Obviously. But from whom?”

“Are you kidding? Sable’s got an army of followers on two planets and half a dozen moons and asteroids. Quite a few are tech savvy.”

“Or is it ‘from who’?” Rao was still thinking about his grammar. He focused. “Yeah, and those are the ones we’re looking into now. I figure you’ve got a built-in background for tracking down some of the thugs from Sable’s past. Maybe start with former Ishtar members.”

“I assume you guys have been keeping track of them since we disbanded their happy little group?”

“You know terrorists. Disband them here, they pop up somewhere else.”

“But you have been watching, yes?”

Rao blew a small wave of fog into the room. “Not us, specifically, but your friends at the Triplanet Bureau of Investigations have. I presume you still know the way?”

“You know what happens when you presume. You make a *pre* out of *zu* and *me*.”

Rao looked momentarily baffled, but Belton continued. “I’m sure somebody there still remembers me, fondly...or not.”

Rao brought up a video loop on the table monitor and cleared his throat dramatically. “To continue: No human eyes or robot software noticed the little glitch in the closed-circuit monitors. There were no witnesses to see the one man come in, and the other one leave. One moment, Demian Sable was reading contemplatively in his cell, the next he had vanished. Poof! And somebody looking just like him was out cold on the floor of the mess hall.”

It was Belton’s turn to nod. “Nicely done.”

“Whose side are you on, anyway?”

“I appreciate good technology.”

“Then you’ll appreciate this.” Rao tapped the table surface and brought up a photo of the man in Sable’s cell. “Here’s whose face came out when that DNA mash finally settled down.”

“Hey, I remember that guy. Danny Kendrow.”

“Yeah, speaking of Ishtar.”

“Right. Bad apple.” Belton struggled to remember. “Conspiracy. Arson. Assorted other tidbits. Associations with the mob out on...Europa, was it?”

“Callisto. Close enough.” Rao stabbed his cigar through the air at Belton. “Jeremy, I need you on this case because you’ve already done the legwork. You know Sable and his illustrious network.”

“His network on Mars,” Belton cut in. “But I understand he’s been spreading his wings.”

“You’ve had professional dealings with Kendrow and a few others who must be in on this little escapade.” He lowered his voice. “And look, Jeremy, you are outside of the official organization these days, which makes you invaluable to me for extra-curricular activities, if you get my drift. This thing’s going to be all over the news in a gnat’s burp. I can just see it: *Spiritual guru-turned-criminal escapes max-security facility on Mars*. The department’s going to make the Marx brothers look competent.”

“This is bad,” Belton agreed. “Sable’s certifiable, and the guy has delusions of grandeur. I’m afraid if he gets his hands on a few good resources—”

“Like he did last time,” Sanjay reminded him. They let the thought linger in the blue air.

Belton sneezed. He glared at Rao’s polluting stogie. “That thing is going to kill us both.”

A claxon sounded. Light flashed from the ceiling. An incandescent beam cut across the room and popped the cigar from Rao’s hand.

“Geez!” he whined, rubbing a freeze blister on his thumb. “*Alice!*” he hollered toward the door. Turning his attention to his thumb, he whined, “Thought she turned that thing off.”

“I feel safer already. Okay, Sanjay, I’m in. But you owe me some kind of seriously fancy dinner or something when we get done.”

“Yes, I do. Read these files and dive in. I’ll try to get you anything you need. Sable is on his way somewhere, with a good head start, and you can bet he’s not waiting around for us to find him.”



## Chapter 15

### Encounter II

“It definitely isn’t the kind of ship most pirates are using these days. It’s...fast. Fancy and expensive, from the looks of it.” The ship’s Second squinted into a lens. He flicked a switch. The image appeared on the main screen. “And that cargo transport next to it looks crippled. Like it’s being—”

“Towed.” The Captain finished the sentence for him. He sauntered around the control room, his hands clenched together at the small of his back. “It’s darned irregular. Makes me nervous. This would be our second time this year.”

“It may be perfectly innocent,” his Second said.

The Captain paused, frowning. He plopped into his chair next to a touchscreen, and tapped a button. “And chickens have lips.” A klaxon sounded. “General quarters. General quarters,” a recorded voice intoned calmly.

“Break out the firearms, Bill.”

“Great,” the Second said.

The Captain hit the communications tab again. “Cruiser to our stern, this is transport vessel JJA-42 out of Phobos/Stickney. Our ship is unarmed. We are a supply ship only. Are you in need of assistance? Please respond.”

The static sounded more ominous than any threat the silent ship could have radiated to them. The mute cruiser continued to gain on them.

The Second traipsed back into the control room and lay a pulse weapon across the Captain’s lap. “You know, if it is a bunch of those ‘buccaneers of the void,’ these will just make them mad.”

“If we get the chance, we’ll defend ourselves.” A jolt rocked the ship. The Second fell to the floor, explaining with a few very short words how he felt about the situation.

The screen blinked. A tall, slight man materialized in the viewer. He looked more like an accountant than a privateer. He also looked like he meant business.

“I see you’ve pulled out a few pulse weapons. Let’s play nice. We need you to leave those behind, open your cargo bay doors, and take the entire crew—except for the Captain, of course—to the galley. If we see anyone but you, Jorgensen, we’ll kill them on sight. Is that clear?”

“Yes, it is,” the Captain said. He wondered how they had found out his name. If they knew that much, they must have done their homework on the ship’s layout, too.

“Your crew has three minutes before we board, Captain. You have that long to meet me at airlock number two. I assume you know the way. I do.”

“How do they know all this stuff?” the Second grimaced.

“Bill, just get everybody down to the galley.”

“What are you going to do?”

“Open the cargo bay doors, of course.”

(\*)

The entire crew sat at tables, quietly. Someone had broken out the coffee and hot chocolate, but the few takers sipped their drinks lackadaisically, worry furrowing their brows. For his part, Bill couldn’t sit. He paced back and forth, pausing with each pass of the hatch to listen. He heard no gunfire, but he did hear the machinery cycling the air in the airlocks and the cargo bays. Below decks lay a treasure trove from Asteroid 21 Lutetia: rare metals, gold, copper, and a host of minerals to make life on Earth—and throughout the Solar System—easier. And the crew a lot richer. It made him want to cry.

The wall speaker came to life. “Bill, are you all down there?”

The Second lunged for the speaker button. “Yeah. You okay?”

“Fine. Our unwanted guests are gone, along with most of our cargo. I need everybody back to work. We need to take inventory. Bill, up to the Comm.”

“Yessir,” the Second said, a slight quaver of relief in his voice.

The crew filed out, expounding various theories about what had transpired and when they might hear the details. The Second stepped into the control center as the Captain took his station. “You okay?”

Jorgensen nodded. “Yeah, just a bit shaken up.” He took in a deep breath and hissed it out, letting his shoulders relax. “Well, that was refreshing.”

“What?” the Second said, perplexed.

“No gunfire, for a change.”

“Oh.”

Another jolt shoved the ship to one side. Bill was on the floor again, and Captain Jorgensen watched his main antenna sail by, blown off by a missile. So much for calling home any time soon.

## Chapter 16

### Lose/Lose

There was a nice little porthole at the hab junction on the west end where you could sit and look out on the shoreline of Kraken Mare and watch the distant waves, if the day had enough wind to kick them high enough to see. In Titan's 1/7g, it took only a slight breeze. The dunes were right out of one of those Edward Hopper seascapes of an Atlantic-coast lighthouse, sans the grasses and weathered fences. Sometimes Abby fantasized sneaking out to put up a wooden fence just to make the place look a bit more like home. Even without one, the view was hard to beat. The dramatically sullen sky above bloodied the swells in reflections of ruby and ochre, and on clear days Saturn cast a shimmering golden column down the ripples to the beach below. Those ripples surged in slow motion under Titan's low gravity. On days when the fog cleared, Mayda Insula rose from the surf like Ahab's great whale. It was like that today, beautiful and lonely. Today was one of those days when she felt every mile of the millions between her and home. What she wouldn't do for some home-made spaghetti.

Tanya's voice came from behind, breaking Titan's moody spell. "Why are you not out there digging for old artifacts?"

"Hard to find any ancient civilizations on this ice ball."

"I suppose," she said, sitting down on the floor across from her. "So why did you not follow in your parents' footsteps? Archaeology is in Marco genes, yes? I would think it's hard not to be, with all the fame they got."

"Fame?"

"They were famous?"

"I suppose they were," she said quietly, still watching the tide come in.

"Was difficult for you?"

"What? Having famous parents?"

"Yeah."

"They weren't that famous. I suppose they were more famous when they died."

"Sorry. I didn't know."

"That's okay. Ancient history. Which is just what you were talking about. But no, I was never that interested in dead cultures. I was more interested in the weather."

“People say it is safe subject. For conversation. Like parties.”

“That it is,” Abby smiled.

“Well, you got plenty here. Maybe you could go visit that new planet they are seeing at Proxima Centauri. Earth weather there, yes?”

“Last I checked, nobody was volunteering to go on a 60-year one-way trip. Sounds like something for my granddaughter, unless she turns out to be a lawyer or engineer or something.”

Tanya looked like she was executing some kind of higher math equation. “To have granddaughter, you need daughter. Or son. To have those, you probably need boyfriend. Or husband. Or sperm bank. Or some kind of plans. You have plans?”

Abby looked at her hands in her lap. She thought about how many times she had dodged the bullet. There had been men who would have loved to share in a relationship, make babies with her, and even to settle down. But it was never the right time. She had her thesis, or travel, or a crisis at home. She had to bail her sister out of that abusive relationship on Prometheus, of all places. The little ring shepherd probably had thirty people at a time on it, and there was Janice, doing her art thing, studying Saturn’s rings, along with the personal habits of one of the staff at the outpost there. Abby had to go help her little sister, didn’t she? Or maybe she was never in the right place, physically or emotionally. “No plans. Not like that. Just plans to get famous and smart and give the world some knowledge it can use. How about you?”

“Wait, wait, not done with you yet. See? Your plans again, with all work and no people.” Tanya reached across the floor and patted Abby’s foot. Abby looked back out the window as Tanya told her, “But you are fun girl, Anya. You are loveable girl. Special person. Many men would love to be your boyfriend. They all like you, too. Troy is funny boy. And Piers? Have you seen him look? I have. He is nice boy. And clever.”

Abby turned to look at Tanya. “Are you trying to get me hitched, a billion miles from home?”

“They say Russians are best matchmakers.”

“You know what Agatha Christie’s advice to women was about marriage?”

“British mystery writer? What?”

“She said to marry an archaeologist. That way, the older you get, the more interested he’ll be.”

Tanya laughed. It was a natural laugh, not forced or artificial. Tanya reminded Abby of a carefree schoolgirl, ready to discover the world before her. She put Abby at ease.

“Funny thing is, it worked for my parents. They were madly in love until the last.” Abby fell into her own thoughts.

Tanya said, “Not many people can say those thing. True love. Nice idea, but...”

“You don’t think it’s possible?”

“I guess I just haven’t seen that. Or when I did see, I didn’t recognize.”

Abby heard sadness in her voice. Or was it regret? “You lost someone?”

“I lost opportunity. He wants me, I think. I want my career. It does not have to be either/or, I suppose, but that is how it panned in. Looking back, maybe I could have played things other way.” She offered a weak laugh. “There, did you hear what I just

said? ‘Play things.’ That was part of problem, right there. He said everything was game to me. Strategy. Planning ahead with my agenda.”

“Was he right? I mean, you do strike me as a planner.”

Tanya shifted, leaning her back against the wall and shoving her legs out straight on the grating of the floor. “I wonder. I wonder how right he was even now. Why I am here? Yeah, I got nice grant—”

“And a nice giant drill,” Abby added.

“And nice drill, yes. And I do believe idea that we get knowledge, and knowledge makes better life for all peoples. And makes richness for life.”

“The wow factor,” Abby said, not unkindly.

“Sure, sure. But is more?”

“Should there be?”

“I don’t know. Maybe so. But I lost something.” She seemed to fight off the sadness in her voice, and then she grinned. “I do love my big drill, though. We will find good secrets, yes?”

“Yes, I’m sure you will.”

They sat for a few moments, comfortable in each other’s contemplation.

“Anya, you do mind if I ask what happens to your parents?”

“They were murdered.” She had said it with her face buried in the plexiglass. Tanya almost didn’t catch what she said, but Abby turned toward her again. “Died in a quantum blast set off by a bunch of terrorists on Mars.”

“I’m so sorry, Anya. Did cops not see any things on CC data?”

“These people were very clever. Always clever. Got all the cameras offline before things went south. They were blowing lots of things up in those days, and Mom and Dad just got in the way, along with about a hundred other people. Wrong place, wrong time. But I’ve always been a good observer, and I saw lots that night. There was plenty of light in...in the fire, and I could see faces. Had to testify in court and everything. I had to face the man who I saw at the disaster. Guy named Demian Sable. Charismatic. Handsome. Ruthless.”

“How old you were?”

“Sixteen.”

“Sweet sixteen.”

“Not that sweet, believe me.” Abby rubbed her eyes and yawned. “See, the reason I have such a soft spot for Jeremy Belton—my ex-TBI friend?—is that he kind of took my sister and me under his wing when Mom and Dad died. He’s a good guy. Guess he had to; he was our godfather. But I always felt like he would have done it anyway.”

Abby was squirming. Tanya tried to calm her down. “Hey, I am sorry I dig.”

“That’s okay. Besides, digging is part of your job.” Abby jabbed a thumb over her shoulder toward the drill rig outside.

“I hit hot switch. You have some bags. I understand.”

“Actually, nobody understands,” she said, acid in her voice. She closed her eyes, calming herself.

“Abby, I’m glad you end up studying the sky instead of the past. Glad you are here.”

Abby thought for a moment. She weighed the historical possibilities. In one universe, she might have been on the Moon preserving early settlements or in a Sino-Iraqi desert mapping ziggurats, while in another she would be, well, here and now. And in its own way, here with the pumpkin skies and molasses seas and cinnamon-roll hills and Tanya Yampolskaya across the alcove from her, with Piers Wellington down the hall and even crazy Troy Fels still in the mix, this was good.

“Me, too, Tanya. Me, too.”

It was a lovely moment, briefly. Then, Tanya added, “I just wondering how much of past you are still studying. It might get in way at some times, you know?” Tanya left her to her little porthole.

## Chapter 17

### Cover-Up

Marv placed his pad on Commodore Clark's desk, trying to steady his hands in the process. He was shaking and sweating and generally feeling miserable. "I think it's a brilliant plan," Marv enthused.

Clark looked up from the screen, drilling Marv with his eyes. "Brilliant, no. But it might work, at least until we can figure out something more permanent. We can get one of our contacts on Ganymede to make the call; that guy in traffic control. We'll try it. You can start praying it will work, for all of our sakes."

"Yessir. I'll call Ganymede."

"Report back as soon as they transmit to Mayda Station. And tell them to make it look good and official. Government trimmings and all that."

As Marv turned, the door opened. Sommers from flight control stepped in.

"Yeah?" the Commodore rumbled in his typically unwelcoming voice.

"We've just received a report that Montenegro's ship completed Jovian gravity assist. Arrival now scheduled for the twenty-second. They'll come around Saturn once and be set for the radar blackouts at Mayda and Warawoona. All other tracking stations will be on the far side, blind to their approach."

The Commodore smiled at the perfect placement of their base, distant enough from civilization to dodge most radar with their comings and goings. "Right on time."

"And sir? They seem to be pulling another ship with them, an entire captured transport. Quite a feat considering the energy they needed to get here."

"Quite a feat indeed. Brash, even for our own Montenegro." The Commodore sat back in his chair and glared at the man. "Well?"

"Thank you, sir." The minion scampered away just as another entered.

This entrant barely fit through the hatch. The huge mahogany-tinted hulk stood evenly on his two boat-like feet, planted as firmly in the light gravity as anyone could be, standing at attention.

"Commodore Clarke, sir." The basso voice boomed with enthusiasm.

"My files name you as Kinto. Kinto what?"

"Just Kinto, sir."

“Boy soldier in the northern wars. Sierra Leone?”

“Uganda.”

Clarke grimaced. “Bad business, that.”

“Over now. Makes you strong.”

“I suppose.” Clarke stood and slowly circled the towering man. Time to cut him down to size. “Well, look at you, all tattooed and muscly in that skimpy shirt. Don’t you get cold here?”

“No sir.” He clenched a fist and slammed it against his sternum with a grin. “Too much heat in here. Too much *spice*.” He drew the last word out like a hissing snake, the word escaping through a gap in his dazzling front teeth.

Clarke was about to take command of the situation when Kinto, eyes still forward, spoke.

“I understand you have a problem, sir.”

“A problem?”

“Loose end, shall we say? At Mayda Station? Somebody knows about our little operation? I specialize in those kinds of problems.” He held up two fingers in the sign of a “V,” turned them horizontally, and jabbed the air. “If we have an asset on site, I assume we can get the identities of the witnesses?”

Clarke stiffened. “Assassination is not called for at this time, but thank you. I prefer a more subtle approach. We are not a band of thugs. Is that clear?”

“Perfectly, sir.” The tall man leaned over conspiratorially. “But keep it in mind.”

“Dismissed.”

As the door closed, Clarke added to himself, “I will.”

(\*)

The call came in from Dardanus Base, Ganymede, during Piers’ shift. Because of the light-time distance of just under an hour, the message was prerecorded.

“Mayda Station, this is Dardanus. This message is coded as Security Level One. You have one minute to clear the Comm. Please station a person with appropriate clearance. When the area is clear, punch in your code to decrypt the received transmission.”

Piers had appropriate clearance, although Mayda seldom received secret messages from anyone. There was an international incident at Novum Baikonur a year or so back, but it hadn’t amounted to much. This sounded like it would be the same: a lot of excitement that would blow over in a day or two. He keyed in his decryption code, sat back, took a sip of coffee, and waited for the call. After an exceptionally long and annoying beep, the voice returned, this time with visual. The man sat behind a desk backed by a non-descript blank wall.

“Mayda Station, this is Dardanus Base with a Security Level One communication.”

A banner scrolled across the base of the screen, repeating *Security Level One*.

“Please be advised that the North American Space Agency recently began conducting proprietary flight tests of a new transport vehicle at high northern latitudes of Titan. Some of these tests may be visible to your radar. Please note that these are to be treated as covert. They are not to be publicly discussed by any Mayda personnel, nor are their trajectories to be published in any form. The agency thanks you for your cooperation. Dardanus out.”



Piers frowned. "Just like that? Highly irregular." He chewed on a swizzle stick. "Highly irregular."

One thing was certain: Abby and Troy would be blabbing about the test all over the lab. He needed to put the kibosh on that as soon as possible.

Abby didn't answer her remote. Troy picked up immediately. Maybe he didn't have much of a life, but then, who did on Titan?

"Glad I found you," Piers told him. "Can you get right down to Comms? And do you know where Abby is?"

"She's right here," Troy said, a hint of embarrassment in his tone. Piers thought they had been spending an awful lot of time together lately.

"Bring her, too. It's important."

Abby and Troy arrived a few minutes later, with Abby in the lead. She pulled the hatch aside. Piers opened his arms expansively, nearly touching the opposing walls of the cramped quarters. "Welcome back to my sanctuary."

Abby glanced around at the boxes stacked on crates, at the papers draped over tablets and monitors askew atop various bits of hardware. In the corner, bottled water filled boxes stacked nearly to the ceiling, while empty bottles filled another box under the desk. "It's beautiful."

"Well, now," Piers said, "a person can find beauty in the strangest places." He pulled out a tiny origami sculpture and handed it to Abby. "Swan?"

"I would have guessed a duck," Troy said.

"I'm better at giraffes," Piers admitted. "And I excel at paper balls. I've got something to tell you two. Remember your mystery launch?"

"Yeah," Troy said hesitantly.

"I just got some confidential information on it. All I can tell you is, it was on the level and they prefer that we not discuss it with anybody."

That smacked of conspiracy or cover-up. Abby blustered. "What are you talking about? You can't expect us to just go away without knowing something!"

Piers looked to Troy for support, but Troy was grinning at Abby. Abby grinned back, and then glared at Piers. "Well?"

Piers let out a breath of surrender. "Look, all I can tell you is that someone was doing secret tests there. Nothing to worry about. Okay?"

Abby's hands were on her hips. "As in government tests? Bona fide flights by somebody who was actually supposed to be there."

Piers nodded.

"Then why didn't they tell you in the first place?"

"That's what I'm trying to say. They did. Just now."

"Don't you find that a little weird?" she put in. "Where were they before the test? Did they forget that Titan has 20,000 people on it who just might witness this big secret test?"

"Sounds like damage control to me," Troy said, but he lacked enthusiasm.

Piers looked as if he agreed, but he said, "That's what they told me, and that's all I can tell you. Now, I have incoming from Iapetus in five, so scoot."

In the corridor outside, Abby turned to Troy urgently. "There's something definitely not right with all that."

“Yeah, I agree. But we’ll have help soon, from your TBI guy.”

“He’s retired from the TBI. But that’s not the point.” Abby crossed the corridor to look out a small port. The eight-day-long Titan night was well along. External lights illuminated a subtle black flurry.

“Troy, somebody made Kevin into a human ice cube, and whoever it was probably had something to do with that secret launch facility just beyond Mayda’s radar eyes. Test or no test. I just can’t wait for the cavalry.”

“Oh, yes you can. If you go off half-cocked and find something you can’t handle—”

“Like what?” she said defensively.

Troy lowered his voice a notch. “You are one of the most capable people I know. But if you barge into a top security government facility, they can lock you up until Titan’s sky clears, or if you run into some random launch crew who doesn’t want you there, nobody would be around to help.”

“Not even you?” She knew her tone would be hard for him to fight. Abby wasn’t a particularly manipulative person, but sometimes a person had to pull out all the stops.

“You know I’d be there, but it’s dangerous, Apps. Get that TBI agent. Get a pro.”

“And by that time, a crew of small chimpanzees could disassemble an entire launch facility. We can’t wait. If these people and their ‘tests’ had anything to do with Kevin’s death, I want to know.”

Troy frowned. “No, you would want revenge. Again, I say *too dangerous*.”

“Not revenge. We can leave that part to the authorities. But I’d sure want to find out what’s going on there so we can help the process of justice along some.”

Troy couldn’t argue that point. She could tell he wanted justice for Kevin as much as she did.

“Of course,” Abby added, “we’d have to wait for sunrise, and that’s not for another seventy hours or so.”

Troy looked toward the heavens. “You are impossible.”

Abby smiled. She had him. “Does that mean you’ll help?”

“I must be as insane as you are.”

“We need to find out what’s going on.”

“Why?” he said. She shot him a withering frown. He shrugged. “I just mean, if they didn’t have anything to do with Kevin, if they’re just playing rocket, why not let them do whatever they’re doing? As long as it’s not hurting anybody.”

“Not hurting anybody? There’s been a whole lot of hijacking going on lately right out here in the Saturn system, and even out at Uranus, and nobody seems to have a clue where it’s coming from.”

“Your point?”

“What if we do? What if we’ve stumbled onto what’s going on, right here at Kraken Mare?”

“Even if you don’t buy the military bit, pirates? On Titan?” He scoffed. “Bank robbers, maybe. Some con hiding out. But pirates? Sounds like a cheap holovid.”

“Well, I think we should go check it out,” she said defiantly.

“And by ‘checking it out’ I assume you mean go tooling across the lake for all to see, armed with our deadly scientific instruments? No thanks, sister.”

“Whatever happened to bravery and justice and—”

“Look, Apps, let’s be practical about this. We can’t take a Zodiac across the lake; they’d see us putt-putting a mile away.”

“Well, gee,” Abby said, looking up at the ceiling dramatically. “If only we had a way to sneak up on them.”

He was shaking his head before she’d finished the sentence. “Oh no. No you don’t. That submersible belongs to the Interplanetary Science Conglomerate. It’s expensive. It’s—” Panic strained his voice. “It’s delicate!”

“And it’s perfect,” she shot back. “We just skim under the surface. Go in from the southeast. Right below their little felonious noses.”

“You’re jumping to conclusions about what—about *who*—is up there. Besides, it’s—”

“Delicate, I know.” She wore a jack-o-lantern grin. “And it’s perfect.”

“I haven’t even taken it out yet. Who knows if the thing even works?” He looked at her, knowing the lame response would get him nowhere. “Look, I’ll make you a deal, gas girl. You help me do my engineering test cruise and the southwest coast survey and then I’ll go with you on your wild goose chase.”

Abby stuck out her hand. “Deal. What do I do?”

“You know, laser topo, sonar soundings, maybe some mass spec readings.”

“All that?”

“Yeah, but my outings are far less treacherous than yours. Besides, the first is just a shakedown cruise—get all the kinks out. It’s chancy to go too far on a maiden voyage.”

“How about shakedown, then reconnaissance of the launch complex—”

“If that’s even what it is.”

“Okay, and *then* I’ll go help you on your southwest coast survey.”

“Sounds reasonable,” Troy agreed. “And we get some science on the shakedown cruise. Waste not.”

“But soon?”

“Far as I’m concerned, we can go at first light.”

## Chapter 18

# Breakthrough!

Piers pinged Abby's room late. "Hello, Abby. Got a message incoming from Mars, marked *Belton*. It's full data, voice and image. Would you prefer it in your quarters or down here?"

"I'll take it right here. Thanks, Piers."

She pulled her legs up and sat yoga-style on the couch, waiting for the monitor to engage. It must have been an important message, to send all that data across all that emptiness. Then again, Jeremy was never good at plain texts. As soon as she saw the expression on Jeremy's face, she knew the news was bad. She was glad she was alone.

"Hey kiddo. So, well, things have degraded rapidly here. Don't know if you've heard the news, but I hope not, because I wanted to be the one to tell you. Demian Sable has escaped. I know this will bring up a lot of baggage, and I'm sorry." As Tanya had said, bags.

The screen blurred. So did the rest of the room. Abby struggled to focus, but her lungs had frozen. Her head felt like someone had inserted an anvil into it while she wasn't paying attention. She paused the feed, backed it up, and resumed it.

"...and I'm sorry. We've got the very best people on Mars hot on his trail, and everybody's watching all the old haunts—"

Abby thought of the Villa. The charred remnants of her home. The graveyard. She wondered if something was wrong with the thermostat in her room. It was so cold.

"The other bad news, of course, is that they want me here to help. In a way that's good news, because I want to get him back into custody as badly as I'm sure you do. Don't worry, kid. I'm going to do my very best, and Sanjay Rao says I'm the best for the job. I've always thought of him as an excellent judge of character."

Despite her trembling shoulders and shallow breathing, she chuckled.

"So bottom line, I'm not coming to Titan. Not in the foreseeable future, anyway. So sorry. But I know I'm probably right where you want me in the grand scheme of things, right? Send me a message and let me know how you are and what you're thinking about all this, okay girl? Signing off."

Abby didn't know how long her screen had been blank when she finally realized the message was over. The replay icon was blinking away, asking her whether she wanted to see her message again, but she ignored it. Her cheeks were wet. Demian Sable was free. The monster was on the loose. She tried to calm her breathing. Which was worse: the news that Jeremy couldn't help with Kevin's murder, or the news that her parents' murderer had liberated himself from Morrow to curse the worlds again?

Worse yet, did Demian Sable harbor hatred toward her, after all these years? What if he had found out where she was? What if he was on his way to Titan to exact revenge? That sounded too Victorian, she told herself. Abigail Marco was undoubtedly the least of Sable's worries now. He probably remembered her as a gangly, naïve teenaged girl. That's just the way she wanted to be remembered by him. Forgotten would be even better.

Her door chimed. She checked the ID on her screen; it was Piers Wellington. At this hour? She stood, ground the heels of her hands into her eyes, wiped her cheeks, and kept the lights low as she opened the door.

"Hello, Abigail. I hope I'm not too late. I was just hoping you had good news from your friend at—oh, dear."

Abby waved off his concern. "No, no, I'm fine. Come in, Piers. Sweet of you to ask. Would you like some tea? I know you like Earl Grey." She said the last in a mock cockney.

"You remembered. Sure, I'll break my water habit just this once, just to be polite, of course. I like it as you do: piping. Now, tell me your problems and let me share your burdens."

"He's not coming," she sniffled as she padded barefoot into the kitchen, her pajamas swirling loosely around her athletic figure. She called over the island, "My former cop friend—former cop, not former friend—has been put on a case to track down somebody. But it's a good news/bad news thing. I hope he gets his man."

"You have an investment in his new mission?"

"You could say." She returned with the cup of tea and sat beside Piers on her couch, crossing her legs beneath her.

"Abigail, you know how us Brits worry. I know you and Kevin were close. I know it hit you hard. How are you doing with all that?"

"You 'Brits' don't worry any more than anybody else, silly."

"This one does." He gave her a hug.

"They say time heals. I just wish it would hurry up."

"Yes, I know what you mean. It took me a very long time to get over the loss of my father. People kept asking me if I wanted counseling, as if I wasn't hitting an unspoken timetable or making psychological milestones when I should. But it's different for everyone, Abby. Take your time. Let it run its course. Grief is like that. A very personal thing."

She looked at this man sitting on her couch with his mop of blonde hair and his glacial blue eyes. What a kindness he had shared at just this moment. And before she could control herself, her eyes brimmed.

"Oh, now I've done it," Piers said.

Abby wiped the tears from her cheeks. “You didn’t do anything but what was needed.”

“Well, about your friend’s mission ...”

“Right,” she sniffled and smiled. “Do you remember a guy named Demian Sable?”

Piers scrunched up his face. “Sable? No, sorry. Geologist?”

“Murderer. Among other things. Big-time corporate business tycoon into lots of interplanetary investments. I guess the authorities suspected him of being into more profitable things, like smuggling and piracy and such, but they couldn’t prove it. And Sable was the spiritual leader of a movement on Mars called Ishtar, who eventually turned to terrorist tactics.”

“I do remember them.”

“Me, too. They killed my parents.”

“Oh. I’m sorry.” Piers didn’t say it automatically, as Troy had. This was no reflex social action. There was compassion in his voice and on his face. It was a nice face, actually. A scattering of pleasant stubble provided a textured frame for the carefully pruned soul patch crowning his chin. That chin was firm, too. It didn’t need any soul patch to obscure a firm cleft. She realized how tired she was, how distractible. And it was at just these times, when she was drained and her energy was low, that she returned to the dark time. She seldom talked of it anymore, but sometimes it just felt like the right time. And Piers felt like the right person. So she said, “Sable was there, in the aftermath of the quantum explosion.”

“They used quantum? That’s low.”

“The injuries were grotesque. It’s probably a blessing my parents didn’t make it. They were minding their own business at home. The thing went off at a nearby shopping hub. Killed lots of people. And I felt it, Piers. I felt it. The whole fire-and-ice thing. It was like I was standing in a vat of molasses and this wave of ice moved through, but when it hit the side of my face it burned. And the tingling down my back and arms and legs, you just can’t describe how it feels. And I could hear the neighbors. Screaming.”

“How—how did you and your sister make it out?”

“Janice wasn’t home. We had a garden-level basement, and I was in a far corner room that happened to be dug into a lot of quartz rock in the side of the hill. I got out with minor burns. But I suppose I had more lasting wounds. It was dark, of course, with all the power drained. The only light was left over from the blast, this eerie blue. When I went outside it was like walking through one of those infrared photos of houses. I could see the plumbing glowing through the walls of the neighbor’s house, and I remember the roots inside the hill behind our house, how they looked like somebody’s nervous system. And I could see tunnels in the hill with dead animals inside them. It was gruesome. And I saw our neighbors. I tried to get to them, but the emergency crews were there fast. This big guy grabbed me. I tried.” She choked on the words, shook her head, her voice quavering. “I tried to go back in. To help. They wouldn’t let me.”

Piers sat very still, completely silent.

“They—the ones who did it—they shut down all the cameras and electronic feeds. But I saw him. I saw Sable. There in that terrible cobalt blue firelight. Smiling. Grinning, actually. Looking down the hill at the melted shopping hub, at the fruits of his labor.”

“What was he doing up on your hill?”

“Keeping himself at a safe distance, I suppose. He was probably as surprised as I was at how far the effects of the blast reached. They say he usually keeps himself well isolated from his dark works of art.”

“And you never quite got over it,” Piers softly offered.

“Well, I may still have some things to work through.” She felt his hand on hers, gently prying it from his leg.

“I’ve got the bruise to prove it.”

“Piers, I’m so sorry!”

He grinned, and began to laugh. So did she. It felt good.

“I promise not to hit that little hot button again, my dear,” Piers said. “Something like that is not easily worked through. Besides, I bruise easily.”

“It’s the second time somebody’s hit that particular button in as many days. There must be something to it.”

“Sorry to have opened an old wound. Of course, some old wounds need opening. Perhaps it’s festering.”

“Maybe so, but with good reason. This slime got a slap on the wrist and a fifteen-year reservation at a five star maximum-security resort where he’s still doing all his interplanetary trading and buying and selling from the comfort of his own suite. Is that justice?”

“Doesn’t sound like it,” Piers said, looking down at the floor.

In that moment, seven hundred million miles from her Martian home, Abby wanted more than anything for Piers to comfort her. It had nothing to do with gender roles or the isolation and loneliness of a remote living situation. Maybe all those things played into it, but mostly it had to do with simple companionship, with human kindness. Piers was a kind man. She had seen his kindness in how he treated others, in how he reacted to the stresses of his job. Could he not send some of that her way?

A pounding startled them. Somebody was apparently trying to remodel Abby’s front door. The heaviness of memories weighed her movements, but she keyed her monitor again. The ID came up Tanya Yampolskaya. Abby jumped up and grabbed the door. Tanya stood just outside the threshold, bouncing on the balls of her feet. She vibrated her hands at her sides, trying desperately to control them. The tendons in her neck showed.

“Abby, they did it, they did it!”

“Shhh! It’s late. Why don’t you come in?”

Tanya rushed past her. “Da, da. Oh, hello Piers.” A barrage of Russian flowed from her as Abby sat down on the couch next to her.

“Wait, Tanya.” Abby smiled and gently put a finger to Tanya’s lips. “English, please.”

Tanya grinned, closed her eyes, and let out a long breath. “Okay. Okay.” She locked eyes with Abby. “It’s our rig. The drill. They broke through. To the ocean. Just forty-two kilometers. They are through to water!”

Both women let out a whoop, and gave each other a high five. “Congrats, my little Russian genius. What did they find?”

“Oh, too early to tell. It will take hours just to get first samples back up, but the change in drill speed confirmed. Also, we can tell the water is deep, not just lake. Big. Really big!” “This is exciting. Really good.” Abby hugged Tanya. Tanya leaned away and looked into her eyes, suddenly serious.

“Are you okay, my little Anya?”

Was she okay? Could she ignore the aching emptiness in her gut, the weight of a decade of history? Could she look around the room and see anything but the headstones of her father and mother on a little green hill in a little Martian valley? Piers came into view, looking at her expectantly. She looked back at Tanya.

“I’m fine. Hey, I’m happy for your news.”

Tanya sprang to her feet. “Me also. Tomorrow, we do water tests for first time. That’s me! Good night.”

“Good night, Tanya. Sleep well and dream of Evian.”

“And I will say goodnight as well,” Piers said in his best clipped British accent.

“Thanks for coming by, Piers.”

“Abby, you know,” he began. He looked at the floor. He looked at her. He looked at her bare feet. “Well, I’m always sticking my nose in. Good night.”

He left before he could say anything, but she could guess what was on his mind. Something about revenge, about old wounds, about letting go. She didn’t need to hear any of it again. Not until someone had caught up to Sable. Not until the cosmic balance had been restored. Not until he had paid. Finally paid.



## Chapter 19

### New Lead

Sanjay Rao ran his fingers through corkscrews of salt-and-pepper hair. “We aren’t getting anywhere,” he grouched.

Jeremy Belton snorted. “By now, Sable could be anywhere from the air outposts of Venus to the Titan settlements.”

“Could be, but I don’t think so. I think he’s still right here on Ares firma. One thing we’re good at is watching traffic on and off world. If he launched, even without traffic control registry, we would know it. No, he’s got to be here somewhere.” Rao looked toward the horizon. A breeze feathered his hair. In the distance, the suburbs of New Tucson gave way to vermilion hills. Farther north spread Solis Planum, the plains of the Sun. Rao had always considered the name appropriate. Clear skies usually graced those golden flatlands, along with the occasional dust storm, reminders of Mars’ pre-terraformed days. Now, forests grew along the northern edge of Solis Planum, along the rainy corridor set up by Valles Marineris and the Nereidum Mountains to the east.

“Mars is a big enough place to get lost,” Belton said. “We have to look for patterns. I figure Sable has his best contacts right here in New Tucson—which is why you’re here, I’m assuming—”

“You got it,” Rao interjected.

“—but he’d never show up at his Villa. Sable is a smart cookie. My money’s on him being somewhere as far from New Tucson as he can get, just because of all his friends here.”

“What does that leave?”

Belton shrugged. “Lowell, maybe. There’s still an SEN retreat center there. Or maybe Acheron.”

“Where his former girlfriend was from.”

“Right. Circe something. Circe Mbiraru. How well do you know Acheron?”

Jeremy Belton rubbed the back of his neck. “I spent many long, dark nights of boredom there on various stakeouts. And a few weeks now and then exploring a couple vineyards around there.”

Rao let out a long breath. “Oh yeah, I forgot about your wine thing.”

“Wine thing?” Belton laughed. “There’s an art to winemaking and wine tasting, you Visigoth.”

“Yeah, yeah, you told me. Okay, maybe while I’ve got all these guys here, you can surveil Circe Mbiraru’s home in Acheron.”

Belton smacked his gum. “Just what I love,” he grinned.

“Just what you’re good at,” Rao said. “Is that gum chardonnay-flavored?”

“Tooty Fruity. Rich, yet full bodied.”

(\*)

Jeremy Belton sat in his car, lurking in the shadows of a tall hedge of desert mahogany. From his perch, he could see into the front and side windows of the Mbiraru household. Using an infrared device, he could even make out how many bodies were rummaging around inside. In his days with the bureau, if he had caught someone doing what he was doing now, he would have locked them up.

Years ago, he had stopped feeling like a voyeur. When he observed homes, he didn’t get any kind of thrill at all. In fact, without coffee the activity always put him to sleep. He could probably sleep in his rental car more soundly than on the lumpy mattress at the King’s Bridge Hotel on Wells Street. It wasn’t Acheron’s finest, but the price was good, and this wasn’t a luxury trip.

In infrared, the structure of the home glowed as a gridwork of pipes and beams. Only two people were in the house, and after a grueling hour they both came out the front door. Circe was first out. She was as beautiful as Belton had remembered her. From this distance, at least, it looked as though the years had been good to her. He was struck, once again, by the grace of her tall, dark frame. Beneath that caramel skin flowed the blood of Masai warriors. Even in the dim evening light, her skin had an ethereal glow to it.

Circe led an eager-looking man—obviously the wrong build to be Demian Sable—to her aircar, and they lifted off into the evening twilight. Belton could follow, but he really wanted to know if Sable had been in the place. Still, even if he had, he was not there now. If Belton did a search, he’d lose Circe.

He lifted off the pavement, spun the aircar around and took off after them. Enough space lay between him and their car so as not to arouse suspicion. Belton crested the guide poles and turned slightly to parallel them. Several other cars were cruising the night skies at about the same level, providing plenty of protection from prying eyes.

Circe banked toward the south, and Belton followed at a discreet distance. She was heading for the edge of town. Following the vehicle through the countryside would prove to be far more difficult than a city drive. Thankfully, the aircar settled on the roof pad of a dilapidated home on the outskirts of town. Belton overflowed it, passing far beyond. He made a wide circle. By the time he was back, driver and passenger were inside the building.

Belton parked on an open pad across the street, behind a hydrodumpster. His infrared scanner showed four figures. One was clearly a child. In moments, Circe’s passenger and the smallest figure came through the front door, accompanied by

what must have been the child's mother. Circe gave them both hugs, stepped into her aircar, and headed back in the direction of her home. Demian Sable was not here. The trip had been a dead end.

(\*)

Belton was just climbing into his lumpy bed when the phone rang. It was Sanjay Rao.

"No joy here, Sanjay," Belton said, anticipating his question.

"There may be some here. Actually, not here specifically but in Syrtis. We got a tip."

"An anonymous tip?" Belton asked skeptically. Belton thought about all the wild goose chases he had embarked upon, triggered by those invaluable anonymous tips.

"Yeah, but sometimes these things pan out. We're scrambling a team there now."

"Good luck on that, Sanjay. I'm not that crazy about anonymous tips. I think we should forget it."

"Just let it drop? Like that?" Rao sounded flustered.

"Don't you remember how many tips we got that ended up being plants from Ishtar? I think they're up to their old tricks again. I think Demian Sable's long gone from this planet."

"He's still got to be here, somewhere. We've just got to track him down."

Belton sighed heavily. "Okay, have it your way. But I'm going to get some sleep."

"Good idea. Maybe you won't be so grumpy when you wake up."

"Unlikely," Belton said, disconnecting. "Anonymous tips," he grumbled to himself. "If I jumped every time I got an anonymous tip I'd start talking to myself."

## Chapter 20

# Taking Her Out

Feeble morning light cast a rusted pall across the mountains of Titan. The methane drizzle had stopped, but Titan's weather conjured another form of precipitation.

"Soot fog," Abby said as Troy helped her hitch a boat trailer to a rover.

"You say it like it's something refreshing, like it's not a greasy microscopic hail of black cinders."

"You're a hopeless romantic," Abby said. "It's weird, but it's natural, for here. You should be used to it by now."

"I still think it's disgusting. I remember a C. S. Lewis book about Hell, and he described this greasy rain falling all over everything."

"Lovely. Can you stop being literary long enough to help me get your charming yacht onto our trailer?"

The two picked up the inflatable raft easily in the low gravity. Climbing into the rover, they switched off their helmet lights. Abby flipped on the rover's headlights, and they bounced across the alien landscape toward the dunes and the lakes beyond.

"Ten minutes in the Zodiac ought to do it for today," Troy said. "I'll just calibrate my spectrometers and we're good to go."

"Then switch to the sub?"

"Yep. I'd like to really put her through her paces. Maybe an hour's worth?"

"You drive a hard bargain."

Troy smirked. "Don't worry; you'll get your search-and-destroy expedition."

Abby brought the rover to a stop in the damp sand at the edge of Kraken Mare, largest sea on Titan. A specular film undulated along the strand, rainbows rippling at the liquid's edge. A powder of black flakes rode the wavelets ashore like a charred flotilla coming home from a conflagration. Thirty yards down the shore stood the submersible, glistening blue against the ruddy fog.

Troy hopped into the driver's seat and eased the trailer back toward the lake. With Abby's thumbs-up he brought the rover to a stop. She tipped the raft into the liquid and grabbed an oar from the trailer bed. She waded into knee-deep liquid methane. The cryogenic bath made her boots crackle. As she rolled into the boat, Troy said, "I hope nobody's out there watching us."

“Welcoming committee?” Abby offered cheerfully.

“I don’t think that’s a welcome we want.”

Despite the whoosh of air in their environment suits, they could easily hear the whirr of the electric engine. Abby took the rudder and guided them out to sea. The alien “waters” faded into the murky fog long before any far shore could appear. But it was out there, and someone was undoubtedly on it, waiting. That someone was responsible, in some way, for Kevin’s death. Abby could hardly wait to get her hands on them.

“This is far enough for the calibration,” Troy said. Abby gently slid the instrument sled into the lake. Troy revved the engine slightly. The readouts on a small monitor flashed and changed as Troy’s various experiments bobbed in the wake of the Zodiac.

In a few minutes, the instruments and swabbies were back ashore, loading the damp equipment into the bay of the submersible.

“Pretty slick,” Abby said as Troy shoved the sled into a cage beneath the craft.

“Thank you. Guess that’s it. All aboard.”

The two climbed footholds indented flush into the side of the ship. The hatch opened at the top, just behind the plex dome, into a cramped airlock. Inside, the ship smelled of new car and polish. A small observation post under the dome could serve as an above-surface station while underway. Below, on the main deck, two padded chairs reclined at the forecabin facing the wide windows of the prow. Midnight blue marine carpeting provided a safe surface for any wet feet that might hit the deck. The walls and ceiling brimmed with instruments and readouts, their small glowing lights casting multicolored shadows across polished steel beams and curved bulkheads.

“The thing looks like modern sculpture,” Abby said.

“It’s safer when you don’t have any sharp corners to bump into.”

“I feel like I’m in *Fantastic Voyage*,” Abby grinned.

“Ever see the original?”

“With Devlin Clapman? 2035 or so? One of my favorite classics.”

“Oh, no, there was one before. Seventy years or something before. Color flatscreen.”

“Had no idea. Jules Verne?”

“Asimov, I think. Great stuff,” he said cheerfully. “Have a seat.”

They buckled in. After what seemed an interminable chain of checks and rechecks, and two trips aft, Troy seemed satisfied, and he prodded the little ship through the dark methane brew.

“Sorry,” Troy said as the craft lurched to port. “Getting the hang of these controls. Guess it’s gonna take me some time.”

“That’s why they call it a ‘shakedown’ I guess.” Abby shot one hand out to the side, bracing herself with a handle on the wall.

“Shall we check out the drill site?”

She nodded. “Sounds entertaining.”

“Are we getting data?”

Abby checked her monitors. “Three full streams.”

Troy smiled contentedly.

The sea bottom undulated in sandy dunes, snaking from side to side where currents had sculpted it over the years. In the hollows, darker material banked in long lines, much as it did in the dunes on the surface. The liquid was remarkably clear. The sub's lights cut blueish beams a hundred feet in front of them. Up ahead, horizontal waves seemed to undulate beneath the surface, as if another lake lay beneath them. The lines of interference moved ahead of them, warping the grainy floor and the lake floor's hills, breaking the view up in a wavering mirage as if hot air was settling below them.

Troy pointed to the shifting liquid. "I wonder what that's all about. Looks like pavement on a hot day."

"I'm pretty sure it's the delineation between the ethane layer, that's beneath us, and the methane that's less dense. As methane evaporates, the ethane stays behind, settles to the bottom, and gets deeper and deeper. Some of the short-lived lakes, the smaller ones, are essentially pure methane, but if the liquid hangs around long enough you get this dichotomy. The older lakes are enriched in ethane."

They traveled in silence, watching scenes that no human had witnessed firsthand. Watching an alien sea through the eyes of a robot was nothing like this. This was immediate. It was real.

"What are those?" Abby pointed ahead to starboard. Forces had heaved the sea-floor up in icy plates. Sand rested uncomfortably on top of them, dribbling off into pyramids and rounded piles.

"The floor ice is breaking up. We must be near the drill."

Abby felt the speed of the sub bleed down. The ice plates became more pronounced, larger. Some reared up into the space above them tens of meters, looking like a forest of razors.

Troy gently nudged the joystick. "I'm taking us up a little closer to the surface. Don't want to have a Titanic rerun."

They could hear the core drill now, a voluminous low pulsing like a giant's heart. A dark vertical smudge ahead slowly gelled into a set of columns rising from the seafloor.

"Ah, it's so big," Abby said. "What a project."

"It is impressive," Troy agreed.

Abby marveled at the technological triumph. She thought of others: the great Pyramids of Giza, the Palace of Knossos, the Wright Flyer, the Saturn V booster, the Caliph II skyscraper. She thought that this drill, with all it took to get it to this distant place, might number among them when the history of this century was written. Building a facility like Mayda Research Station had been remarkable enough. Despite the infrastructure already in place at Titan, building something in the remote northern lake district had presented logistical nightmares. Travel from the Bacab Colony, Port Antillia, and Kosivo/Taishan was difficult through the icy plains, mountain passes and dunes of Titan's wilderness. Once roads were established, it was a bit easier, as larger payloads could be transported by ground rather than by air, but it was no walk in the park. Then, years later, came that crazy idea to build a drill to dig deeper than anyone in history. The drill amounted to a skyscraper resting on the bottom of a

methane sea, linked to the skein, and to a host of electronic, digital, and power sources over great distances. But its interface with that ocean floor was even more problematical. Like the habs on all Titan settlements, the base of the drill had to be cooled. Otherwise, it would melt its way through the ice surface. And like Mayda itself, the construction had been a truly international—in fact, interplanetary—effort. What a project it had been!

A chime sounded. Abby leaned forward. “What is it?”

“Appears that one of our engines has a little problem with heat. In all this cryogenic methane, you wouldn’t think it possible.”

Troy let the submersible coast to a stop. He made his way aft while Abby continued to monitor the spectrometers and other science instruments. She stood to get a better look outside. It was dark, mysterious, primordial. It looked like she imagined the oceans of Earth to have been in those days when giant reptiles swam through frothy baths, swirling seaweed in their wake, scattering prehistoric turtles before them and pterosaurs above them. There was something visceral here, something primeval and elemental.

Troy returned. “This is an issue I had earlier. I think it’ll be fine, but we’ll need to head back soon.”

She was gazing out the window at the bizarre jagged icescape. “You know how to show a girl a good time.” Abby settled back into her seat. “I must admit, I was hoping for something a bit more like the Loch Ness Monster.”

“It would certainly give us a funding boost,” Troy agreed, eyes glued to the monitor. Troy brought the sub up to break the surface. The methane waves gurgled along the base of the windows. “My Aunt Bets claims to have seen Nessie on a trip to Earth. Got a pretty good look. Long swan-like neck, head like a turtle, flippers like a seal. She said it kind of rolled around near their sailboat, like a whale on one of those whale-watching tours, just lazily showing off.”

Abby shook her head. “Anybody get a picture?”

“Does anybody ever? Keep in mind that my aunt has also seen gnomes in her backyard. And I’m not talking lawn decorations.” Troy looked over at her and grinned. “You want to drive for a while?”

“You bet, captain!”

Abby found the craft to be surprisingly responsive, especially for a watercraft.

“It’s designed more like a high performance aircraft,” Troy explained. “Very advanced. Look at you; you don’t even need me here, first mate.”

Abby leaned toward the monitor on her side. “Did you see that?”

“What?”

“There it is again. Light source. Just along the shore to the left of the little island.”

Troy squinted through the front glass. “I don’t see anything.”

“Can you drive?” Abby lunged to the center console behind her seat. “How do you work this telescope thingy?” Troy flipped a switch and a monitor came to life. Abby scanned the shore. There it was again, and this time, Troy couldn’t miss it. It was a light all right, and the light was attached to the front of a small rover.

“There,” she said triumphantly. “I knew somebody had to be there. I knew it. Let’s go.”

“What do you mean, go?”

Abby’s jaw dropped. She shoved her hands on to her hips. “Look, we agreed we would look into this. There are people right in front of us, right there, where nobody should be. Aren’t you just a bit suspicious?”

He shrugged. “Of course, yes. I just meant—”

“Besides, you promised. Don’t be a chicken.”

“I’m not chicken. I’m not reckless, either.”

Abby’s lips tightened. Her eyes narrowed. He had always been that way: conservative to a fault when a little risk was called for, and wild when caution would have been prudent. He even ran his relationships that way. How she wished he would have asked her to do something risky, with him, just once. Everything had to be the same, sedate, predictable. But his disarming sense of humor diffused the situation every time. That was his strength. That was the Troy that people saw. The clown. The peacemaker. If she kept reminding herself of Troy’s shortcomings, she would be seething.

Troy sensed danger. He held up his hands. “Okay. Tell you what. We’ll zoom in close under the surface and see what’s what, then report back to the authorities.”

“Authorities?”

“We’ll get help. From down in Senkyo or Kosovo/Taishan or somewhere.”

“All right. But we gotta get close.”

“Strap in, stormy.”

Abby hated that nickname, and Troy knew it.

They took their seats and Troy jammed a joystick forward. The small craft skittered and then smoothed out, pushing forward in the dark sea. In moments, Troy muttered something inaudible.

“What?” Abby snapped.

“Dammit. Heat alarm. Gotta check it. Sorry.” The sub slowed to a stall as Troy made his way aft again. Abby had not heard the alarm this time. She scanned the horizon through the telescope’s eyes, but she couldn’t see the rover.

He returned with a concerned look, but Abby could see relief there, too. “It’s the same problem we’ve had all afternoon. Overheating engine on the port. Gotta take her in.”

Abby controlled her tone. “Can’t this thing make it a few miles on one engine? We’re on the brink of figuring out what’s really going on at the north shore.”

Troy took on an exaggerated pose and flipped his hand, palm up, for emphasis. “Well, let’s see. We’re on a boat that’s never been tried in these conditions, a good ten clicks from civilization and help, in a deadly sub-zero bath on our maiden voyage with the potential of a major propulsion failure *and you want to go sightseeing?* Sounds like a dream cruise to me.”

He stormed past her toward the front of the cockpit.

“It’s your boat,” she said.

“Yes it is.”

In the silence that followed, Abby stayed back at the monitor, watching the coastline for activity. The rover was gone. There was no sign of anyone. It was a very long, very quiet voyage home.



## Chapter 21

### Crazy

“Don’t you think you’re being just a little hard on the guy?” Piers took a swig of bottled water. “I wouldn’t want to go out there either. Care for some water?” He held a bottle toward her.

“I only drink the hot stuff,” she said.

“And I only drink the filtered stuff.”

“They filter the stuff here.”

“Not the same,” he said, smacking his lips enthusiastically. “When you think about it, it’s not that surprising that somebody would be up there. It’s a three-ring circus around here. You’ve got the drilling operation with multi bazillion bucks in the mix, and all these scientists competing for limited resources and funding and time, and you’ve got Troy’s new boat and international intrigue and all the rest. Somebody’s undoubtedly spying on someone.”

Abby was just taking in a breath, preparing a defensive fusillade, when Piers’ headset pinged. “Comm,” he said. After a pause, he barked, “Roger that.” He tapped another screen, glanced at Abby, and said, “Interesting,” as a side monitor awakened.

Doc Mason’s face blizzarded onto the screen. “Medlab.”

“Good afternoon, Doctor.”

“Hello, Piers. What can I do for you on this fine orange day?”

“Well, not so fine, as it turns out. Some sort of incident at the drill. They’re bringing you a patient. Seems that a paleontologist on site had some sort of psychotic breakdown. Seeing all kinds of crazy things.”

“Thanks for the heads up. I’ll alert security, too.” The monitor blanked.

Abby was grinning at him. He looked at her, blank-faced. “What is it?”

“Piers, a man of few words. I was just wondering if you ever talk in complete sentences.”

“Rarely.”

Abby looked puzzled. “Did you say paleontologist?”

“That’s what they told me.”

“Guess Troy was right,” Abby said.

“How’s that?”

“North pole of Titan. Just gets weirder and weirder.”

(\*)

Abby had a hunch. It was one of those aggravating hunches that tingled at the top of her spine every time it came up for air. It was doing that a lot lately. She finally gave in to it.

Sitting at her personal workstation, she logged on to the skein. It didn’t take long to find what she was looking for; the CoAz Paleontology Department was proud of its donors. Though this particular one was listed as funding an “undisclosed” amount, it was clearly a big player, perched near the top of the list. Its letters were no bolder than the others. Their color did not differ from the rest of the listed items. And yet, the single word they spelled seemed to vibrate with its own energy: MECTRODEX.

What was a pharmaceutical behemoth doing funding interplanetary paleontologists? She thought back to Kevin’s sketches, to all those vague shapes that resembled microbes. “*Organelles, possible flagella? ... double nuclei?*” his sketchbook had asked. Were these, in fact, not microbes but *fossils* of microbes? That would explain the paleontology part, but not the MECTRODEX part. And where were they from? She had seen electron micrographs of the microfossils from Earth’s Columbian basin and the Martian canyonlands. These seemed to be different. She wished she knew more about old fossils, but she was just a gas girl. If these things had been floating around in clouds, she might have known more.

That left the drug tech guy on Ganymede, and whatever role he might be playing. Troy would undoubtedly be happy to point that out. Kevin as drug kingpin. Kevin as microfossil rock hound. Neither choice made sense.

(\*)

It wasn’t like Gwen to be late. Piers’ communications comrade was prompt as periwinkle. This was ridiculous. She wasn’t picking up on any of her devices or channels.

“Over an hour tardy,” Piers mumbled. “Well, old boy, time to break my water-only rule.” Piers put the comm assembly on auto and nicked up the wickershams to the coffee console.

As he made his way back toward his office, his steaming beverage sloshing dangerously, the airlock hatch at the far end of the hab corridor unsealed. As soon as the door swung open, he could hear a cacophony of crashing equipment and yelling voices.

“Get a biologist.”

“Get the doc!”

“Did anybody see it?”

Half a dozen people blundered through the hatchway, two or three at a time. Two supported a collapsed figure, his arms draped across their shoulders. The wilted man looked up in Piers’ direction. He was a good 60 feet down the corridor, and Piers couldn’t quite tell who it was, but he could tell the man’s hair was plastered across

his forehead in sweat, and his eyes were wide with excitement. Or terror. He was breathing hard as he spoke.

"It was so graceful. But can you imagine? Can you? Did you see it?"

One of the people holding the man up looked at a woman next to him. "Can you *please* call Doc Mason?"

"Yeah, yeah, got it."

The woman punched a tab on the wall, called into it, and said they were on their way with a medical emergency. It looked more like a psychiatric one to Piers.

He let the group pass. The last one on parade was a short woman whom Piers had seen before.

"What happened to him?"

"He saw something that freaked him out."

"What did he see?"

She hesitated.

"What did he think he saw?" Piers encouraged.

"He claims he saw something swimming in the methane out there."

"Swimming," Piers said flatly.

She nodded.

"You mean someone?"

She shook her head.

"Something. Alive."

She nodded in the affirmative. "Long neck. Bulbous head. Ridges along the back."

"Is he, ah, on medication or something?"

"What he *is* is a damned good observer. Renowned scientist. Not like him at all. His description was...clinical. I gotta go."

"Good luck," Piers said, stepping aside. The parade of rescuers disappeared down the corridor, leaving the telltale aroma of mineral spirits in their wake.

When Piers opened the door to Comms, Gwen was inside waiting for him. She cradled her head in her hands, covering her eyes as if playing hide and seek. "Hey, you have books. I never noticed."

"I put most of them out just recently. Got a few of my favorites on the last auto-drop from Earth."

"I admire your literary tenacity. Not easy to get such bulky things out this far."

"I have friends in low places, like shipping companies."

"Piers, I'm sorry about the time. I've got a five-alarm monster headache. Slept in."

"No worries. Want some coffee?"

She grabbed for it gratefully. "I'm just not used to these. My sis used to get migraines, but I never did." She took a long pull of the dark elixir. "I'm good now."

"You sure? I might be able to get Dave or Beth to fill in."

"Nope. You go. I hereby grant you your freedom."

"Thanks, Gwen. You may have some interesting calls to field. Somebody reported a sea monster swimming in Kraken."

"Pretty weird. I had a dream about something like that just before I woke up."

For some reason, Piers found that piece of news unsettling.

## Chapter 22

### Florence

Tanya looked in the mirror. She didn't like who was looking back. Her eyes were red and darkened. Her skin was pale, even for this unflattering light. Her hair looked like a Demoiselle Crane's nest, and the base of her skull hurt.

"What's wrong with you, silly girl?" She splashed water on her face, took a swig, and ran wet fingers through her hair. She just couldn't be bothered with fashion today.

She trudged down the main corridor toward the galley. Maybe some nice fresh orange juice would help. Of course, it wasn't fresh, and it probably wasn't even orange juice when you got right down to it. Just something they put in the water to make it taste like home.

The halls were filled with lyrical music. She had never heard anything like it. It sounded tribal, breathy. It echoed hauntingly down the walkways, seemingly from all directions. Flutes?

As she approached the hatch to the main hub, she could see that someone had been careless. Dirty handprints covered the wall next to the hatch, as well as the doorway itself. Silly people. In a place like this, cleanliness was a matter of safety. She would need to do something about that, eventually. But first, breakfast.

(\*)

Abby sat at her desk, haunted by one thought: Why would a paleontologist be on Titan? She thought about Kevin's journal, about what she had told Troy.

*These aren't drugs. These are...microbes or something.*

Did somebody know something about fossils that they weren't telling? *Titan* fossils? In this day and age, how could anybody keep something like that a secret? It seemed implausible. Perhaps it was time to play Florence Nightingale.

The Medlab seemed busier than usual. A harried nurse sent Abby toward the back room, where Doc Mason was tending to a patient who cradled his head in his hands. "It's weird, Doc. I just don't get headaches."

"Neither do I," Doc Mason said, popping a pill.

Abby noticed Doc Mason and her medication. “Hey Doc, never seen our good doctor self—medicating.”

“You know what they say: physician, heal thyself. It’s been one of those really special days.” The doctor grimaced.

“Sorry about that. I hope it calms down.” Abby glanced around. “Wondered if I could visit with your patient from the drill rig?”

“Be my guest. Jasmine Major, Bed Four.”

“Thanks.” The doctor’s eyes were as bloodshot as a drunk’s on Monday. “You okay?”

“Just a bit of a headache. If I didn’t know better, I’d say I caught it from my patients. We’ve had three doozies just this morning. But migraines aren’t contagious, so I’ve been told.” Doc Mason waved her on.

Abby found the patient in bed number four. She was lying on her side, eating ice chips, apparently perfectly calm.

“Hi,” Abby said cheerfully. “I understand you are new here.”

“You mean to Titan, or to the health center? I suppose I’m new to both.”

“Either way, welcome. I’m Abigail Marco.” She offered her hand.

“Pleasure. I’m Jasmine M—well, you see they have me labeled.” the patient said, pointing to her bedside chart.

“So what’s a paleontologist doing in a place like this?”

Jasmine wagged a finger at her. “Oh, now, that would be telling, wouldn’t it? My bosses wouldn’t like that one little bit.” She grinned. She was slurring her words. Her eyes didn’t seem to be tracking. “I still haven’t had time to go browsing in the west. That’s where they found the nice stuff.”

Abby locked eyes with the woman. “What nice stuff?”

“Some of our so-called advisors, they didn’t believe it. But I had better data than they did. Higher res. You could make out the details in the little things. Oops!” Major held her hand up to her mouth and giggled. Abruptly, she became morose. “We really shouldn’t be here, you know. Doing all this.”

Abby decided to humor the patient. She pulled up a chair and sat. “All what?”

The woman propped herself up on her elbow, dropping her voice to a whisper. “All this digging. All this drilling. We’ve stirred something up.” She leaned back in her bed and stared at the ceiling. She blinked slowly, her eyes dreamy. “And now they’ll come for us.”

Jasmine Major said the last with such clarity that it alarmed Abby. The only danger Abby could possibly imagine was the mystery facility to the north. “Who will come for us? The people on the north shore?”

Major looked at her with confusion, then pity. She seemed to be studying her. “And when they do come crawling out of that pond out there, they will destroy this outpost and everything in it, and then they will devour us down to our bones.”

The doctor stepped over to the bed as Major yelled, “To the bones!”

Doc Mason tapped a bedside console. Her new patient quieted. The doc shrugged and looked at Abby sheepishly. “Saw this once, or something a bit like it. Same symptoms, anyway. Back on Earth. East African continent. Patient was

hallucinating from a fungal infection. The stuff got into the community grain. Caused widespread hallucinations. Bad stuff. That's not what this is, of course. I did a check, and there is no fungal infection, there are no microbes present, no fever, none of that. Puzzling."

"Very," Abby agreed.

"Abby, my dear, can you do me a favor? When you go by Piers', can you ask him about the music?" Doc Mason was massaging her temples, closing her eyes.

"Music?"

"I can't seem to get it to shut off in here."

"I'll check into it," she said, although she didn't hear any at the moment. Abby waved goodbye.

On her way out the door, she spotted the patient's environment suit. The nametag read *Major, J.*

## Chapter 23

# Power Play

Sommers shifted from one foot to the other uncomfortably. “Sir, Marv has a suggestion.”

“A suggestion?” the Commodore blustered. “Is Marv in any position to make suggestions?”

“Well, a proposal. Shall I—”

“All right, all right. Send him in.”

Sommers tried to slink out the hatch as Marv made his way through it.

“Sommers, I need you to remain.” The Commodore thought he could hear a sigh of disappointment.

“Yes, sir.” Sommers closed the hatch.

Marv stood silently at attention. The Commodore stared at him broodingly. “Well?”

“Well, sir, the thing is, I’ve been thinking a lot about Mayda Research Station.”

“As have we all. You have an idea to make up for all the pain and suffering that your little security breach is causing us, I take it?”

Marv fought the cringe within and squared his shoulders. “I do indeed. I propose that our asset at Mayda pull the plug on the power.”

“Are you suggesting we kill a hundred researchers? That’s going to be really subtle. And popular in the long run. That’ll go over real big with the bosses.”

“Not at all. We would simply interrupt their power to isolate them, to take down their communications. Just long enough for Montenegro to come and go, and then we can make more permanent arrangements for stealth here.”

“What about backup systems?”

“They have them, of course. They can communicate through satellite links, so we need to physically disable those. But their entire satellite comlink assembly is about the size of a single person rover. We could carry it off without damaging it, so we could use it for ourselves if we need it in the future.”

The Commodore turned. “And Sommers, what do you think?”

“Can’t we just have our asset get the witnesses out of there? We would be dealing with two instead of a hundred.”

“No good,” Marv said. “By now the news of our last launch may be all over the outpost, despite our precautions. No, I think we’ve got to cut them off, and the only way to do it completely is to cripple the outpost from the ground up.”

“And that means its power plant,” Commodore Clark said. He seemed to be warming to the idea. “But we will be needing that facility. We can’t just go blowing up their reactor.”

Marv nodded almost imperceptibly. “There are better ways.”

“Been doing our homework, have we?” asked Sommers.

“Yeah. Yeah, I have. We can have what’s-his-name remove this one assembly from the reactor. This thingie takes the power from the nuclear fuel and turns it into electricity somehow. It has gears or something. Anyway, supposedly it’s easy. It’s a specific enough part that they’ll never get a replacement in a million years.”

“A million years is a long time,” Clark said.

“Remember, sir, they have that one-of-a-kind new reactor. Hard to get parts.” Marv shot a sideways glance at Sommers. “As I understand it.”

“Not bad. Not bad.” The Commodore sat at his desk quietly. He looked up. “Let’s put some energy into this, shall we?”

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Towing a cargo vessel was not for the faint of heart. Stresses could tear apart the ship under power or send it careening off into space on any of a dozen crazy trajectories. But Titan was the easiest world around which to settle into orbit. Its dense, extended atmosphere provided a wide, soft blanket for aerocapture, and its slight gravity and distance from its parent planet enabled ships to approach at relatively low velocities.

Montenegro’s ship was not a monster. It was small enough to maneuver, sleek enough to evade, fast enough to strike and escape. His crew needed only to attach thruster packs to the ship under tow and remotely slave it to them as they skimmed the tenuous outer atmosphere. Their polar trajectory was carefully crafted for covertness, avoiding the radar and communication corridors of the main Titan centers. The ship retained radio silence until the time was right.



## Chapter 24

# A Present Absence

Circe Mbiraru knew things, and Jeremy Belton knew about a few of the things she knew. The question was, did she know he knew she knew? Before it all got too twisted, he decided to have a chat with her. He had almost missed her, had just caught a glimpse as she left. She wore an uncharacteristically unfashionable floppy hat and sunglasses; she was nearly unrecognizable. She had moved fast, leaving Acheron on a bullet train, headed straight for New Tucson and the Villa. Belton took an airvan. He would make it to New Tucson half an hour before the train would, since—unlike commercial transport—he had no stops along the way.

Crossing the great deserts of Solis Planum, Belton put his vehicle on auto, downed an insti-lunch and some coffee, and drifted off for an hour. When he awoke, New Tucson sprawled below him. It was an extensive city, with an industrial section and manicured parks near a central hub.

As the van descended, Belton could make out more detail. The final approach gave him a glimpse of the TBI, his old stomping grounds. The Tri-Planet Bureau of Investigation took the penthouse level of the tallest building in the city, a glass monolith reflecting the Martian sky in tints of purple.

“Here it comes,” Belton mumbled, gazing out the other side. In some ways, New Tucson had been Demian Sable’s town. His Villa was here because his nightclub was. Fifty meters below the van spread a large building with a flashing holographic image of the Hindu multi-armed god Shiva juggling letters that read *The Revelations Café*. As the van passed overhead, Shiva winked at him. He pulled into a bar he knew just down the street, had a quick drink, and took his time heading over to the Villa.

The ever-present guard was absent, and the robo-sentry had been deactivated. The wrought-iron gates stood open across the sweeping drive, afternoon Sun casting their shadows like bars of a prison. Belton walked along a pathway between two reflecting pools. The water in the pools was in need of tending; leaves floated on their surfaces, and green scum grew along the margins. At the far end, two lions stared down at him from their pedestals, looking forlorn and lonely. Beyond, the

great double doors were closed, the windows darkened. Whoever the floppy-hatted woman had been, she hadn't been Circe.

"I must be losing my edge."

Belton's comm pinged with the ID *R-A-O*. He touched his ear. "Belton."

"Jeremy, it's Sanjay. I have some news."

"Want to trade?"

"Sure, go ahead."

"I'm at the Villa, and it looks like nobody's been here for a while, like they've closed up shop for the season."

Rao grumbled. "That confirms my bit of news. It seems that Ms. Mbiraru may have left aboard an interplanetary yacht, one of those Q'in nuclear drive deals."

"Fast and hot."

"Yep."

"And here I thought you guys were so good at telling who was coming and going from this place."

"I just told you she went."

"Would have been nice to know beforehand."

"Yeah, it would've," Rao admitted sheepishly.

"By now, she could be anywhere," Jeremy complained. "The Galileans, Iapetus, Vesta, on her way to Sedna or Pluto."

"On her way, at least. Not there, though. We're pretty sure she left within the last two days if she went on the one we think she did."

"Can't you pull them over or something?"

"No reason to. It's a private little barge owned by a very influential politician from the Elysium quadrant."

And wasn't that just like Demian Sable and his gang, Jeremy thought. Not only were they well-connected with transport and corporate finance, they had their claws into the mainstream political arena. Not just politicians, but *influential* politicians. "Great," he said flatly.

"Yeah, one of those touchy political situations we don't want to stir up."

"So what do we do?"

"I've got someone following her. Them. Whoever they are. Problem is, she could actually be on one or two others. We need to narrow it all down."

"Just how fast can those idiots at TBI do that, Sanjay?"

"Keep your shirt on. They're working on it. Remember that you used to be one of those idiots. You just go do whatever it is you were doing. Find Sable. Fight crime. Do some knitting."

"Right." Belton severed the connection. He had given up knitting years ago. His fingers were too large. Fighting crime? That sounded too comic book. But finding Sable? That was the ticket.

## Chapter 25

# Disappearances and Appearances

Troy couldn't believe the audacity of that little bitch. Telling him where to take his ship. Sticking her nose in other people's business. If he didn't feel so lousy, he'd take a side trip to Abby's quarters and tell her what he thought of her. But for now, he needed to get back to the submersible and figure out that stinking engine so he could get going. Of course, the engine hadn't been as much of a problem as he had made out, but it served as a great excuse. It got him out of an embarrassing and uncomfortable trip to the north shore.

Racing past Kevin Nordsmitt's quarters, he noticed a smudge on the wall. It looked, for all the world, like the outline of a hand. He continued on to the warehouse hatch. It opened hard. He slammed it shut. Why was everything fighting him?

Troy threw the light switches. Frost glistened across the surface of his slick new submersible. It was cool. It was hot, in the best way. He felt like a teenager with his first car. He blew his breath out in little smoke rings as he placed a bundle on the workbench, put on gloves and flicked the switch on the little heater next to his toolbox. Grabbing a diagnostic unit, he sat next to the unruly starboard engine and plugged the instrument into a small aperture in the skin of the craft. As he watched numbers scroll down the screen, he heard a shuffling sound behind him.

"It won't do, you know."

He recognized the voice of Kevin Nordsmitt. He couldn't make himself turn around. Instead, he replied unemotionally, "What do you mean?"

"I mean all this drug stuff. It just won't do. You know it's not like me. You know she's right about that part, at least."

A chill had come over the room that wasn't there before. It had a different quality to it. It wasn't the chill of cryogenic methane or orange mist. Rather, it was the kind of cold one feels at the sight of a plane crash or a dead animal or a wound one finds that wasn't there before.

"Well, yes, I really didn't think so. But you were obviously covering something up."

"As if you aren't?" There was accusation in the dead man's voice.

“That’s just business.” Troy continued to stare at the diagnostic unit in his hand. Its lights blinked away, keeping time with the throbbing of his headache.

“Everybody has some kind of business, don’t they?” Kevin seemed to be toying with him, and Troy didn’t like it one bit.

“What kind of business did you have, anyway?” Troy said with as much force as he could muster.

“Don’t change the subject. You aren’t being a very good friend to her. She should be able to trust you.”

“She doesn’t trust anybody.”

“Would you, if you had been through what she has?”

“You’re dead. What do you know? Why don’t you get out of here?” He turned around. He was alone. And very, very cold.

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“Sir,” Sommers called through the partially open hatch. “The cargo ship is in Titan orbit and Montenegro is on final approach.”

“We gave them one ping?”

“Standard procedure.”

“That’s all?”

“Yessir. One ping.”

“These days I feel like I need to check. All right. When you detect final descent radar, give them a narrow beam and bring them in.”

Few members of the “Family” saw the actual landing. The landing area was beyond a distant rise in a secluded natural hollow. The Commodore dispatched two of the big industrial rovers to pick up the crew. The cargo ship was not equipped for landfall, so it would need to be offloaded on orbit. That would take more care and timing, but soon even this type of operation could be done without secrecy. When the chains of the solar establishment had been broken, the Commodore supposed, the Family would rule Titan independently, with the freedom to come and go as they liked. Piracy would give way to accepted political power, and Titan’s new, wealthy rulers might even dispatch diplomats to Ganymede, Mars and Earth to negotiate sweet trade deals. And undoubtedly, his name, Commodore Clark, would become synonymous with founding fathers, early statesmen of the new empire. It was a bright future.

Montenegro’s crew arrived amidst pomp and festivity. The Admiral was, after all, a celebrity and a hero. The leader made a beeline for the Commodore’s den, trailing an entourage behind him like the train of a bridal gown. The Commodore was already standing when Sommers ushered Montenegro and several of his adjutants in.

“Clark, I have been looking forward to this.”

“As have I, Admiral,” the Commodore said. As he spoke the words, Montenegro raised a sort of wand, pointing it toward a desk in the corner.

“Stiles, you can station yourself over there. Commodore, may I?”

Clark stood with his mouth open as Montenegro’s second in command began clearing the Commodore’s desk. Another of Montenegro’s minions stepped through

the door with a computer console and placed it at the center of what used to be the Commodore's province.

"We'll only need to be here until I move into Mayda Station, of course."

Clark stared at the pile of his belongings on the floor. He looked up at Montenegro, who was looking back at him expectantly. Locking into focus, he finally responded, "Oh, of course."

"I'll want to speak to everyone here at Northern Quadrant very soon. Can we set something up for the morning? Say, during breakfast?"

"Certainly, Admiral." He jerked slightly as he said the word. "I'll have Sommers take care of it right away."

"Fine, fine. Now, I want a tour. I want to see command and control. I want to see your security center—I assume you have a security center? And I want to see your storage areas. We may need to do some modifying of things to accommodate the supplies we've brought."

"Supplies?" The Commodore was suddenly intrigued.

Montenegro smiled at Stiles, then turned back to Clark. "Oh, yes. Lots and lots of them."

"Enough for a nice little war," Stiles put in quietly, peering over his monitor. Montenegro shot him a vicious glance. The man shrugged awkwardly.

"Clark, we're burning daylight, what little of it there is here. Let's get on with it."

"Sure. Welcome to my little dominion." The Commodore said it with enthusiasm, but he wondered just how long he could make it stick.

## Chapter 26

### Reunion

Smooth, desolate mounds stood against the stark black of the sky. Piles of debris, shattered rock and fractured boulder rested uncomfortably on crater rims, leftovers from a more violent past. Stones baked in the blazing sunlight and shimmered with a patina of frozen gases in the shadows. The only sign of life was a metallic framework protruding from a heap of discarded talus. It was good to be home.

Horf had not yet visited the inhabited interior of asteroid Vesta. There was no time; he was on a mission. He went straight from the staging sector to the Topside Bar on the comm center level where his friends awaited. It was a party, wasn't it? Welcome home for the wayward son? Celebration for the traveling friend? He hated to take advantage, but this was important business.

Horf was well into his third tube of margarita, and his tenth glance at his watch, when she appeared. He hadn't prepared for this kind of reunion. He had the equipment he needed, and he had the contacts and the strategies and all his ducks in a row. But he was unprepared psychologically for the tsunami that was Charlene Swenson. And her tidal wave broke upon the scene at the most inopportune time.

"Hey, baby. You're late," she cooed.

"I've been here for an hour," Horf said defensively, letting her scoot in beside him on the low-g couch. Lord, she had long legs. Although he told her he was coming, he hadn't planned on seeing her this soon. Not before he finished the business at hand. But Vesta was too close a community to keep secrets for long.

"I mean you're a coupla years late. I missed you." She draped an arm over his shoulder and planted her formidable lips on his.

"Charlene, you really know how to make a guy feel welcomed."

"There's more 'welcome' where that came from, kiddo."

Reluctantly, he reached up and gently removed her arm from his shoulder. "I'm quite interested in looking into that, but right now, I need to get rid of these three Margaritas I've had. Excuse me, sweets?"

"You get right back here soon, babe."

He winked at her and headed for the men's room. It was just out of sight around a corner. Once there, he continued on past, toward the maintenance section.

Fire control was to the left. He pulled a pair of good old fashioned micropliers from his pocket—why not use brute force?—and found the correct subassembly. Once it was disabled, he made his way back to the bar, carefully working around the back of the room out of Charlene’s field of view. He made it to his target, his old buddy Denise.

“Yo,” he called over the blaring music. “How about that tour. I wanna see the new comm system.”

“Now?”

“Carpe tour-um.”

“Follow me,” she said, her hair swimming around her head like a mermaid’s. Horf had missed the gentle move and sway and slow pace of the low g environment. Mars had been harsh, with its brutal ¼ standard gravity. He was feeling better each day. And after today, if all went well, he would feel great.

Denise was sharp; she thought about things, why they were the way they were and how they should be different. She was deep. He had to tread carefully with her. Denise was attractive in her own way, though less so than Charlene, but Horf had no time for such distractions. He watched and listened as she introduced him to the crew. “Horf used to do your job, Kenny. And he was a lot better at it.”

Laughs all around.

She guided him through several secure areas, although she really shouldn’t, but he was Horf, good ol’ boy, after all. In one corner, under the coolant system for the bank of high gain antenna mains, he placed the little smoke generator. He flipped the switch. It was armed and ready to do his bidding.

When they got back to the bar, he hit several buttons on his watch in succession. Then he bought Denise a drink, which did not please Charlene, who apparently had decided to become omnipresent. They were just beginning to discuss this terrible social infraction when the fire alarm went off. Bedlam ensued within the nightclub. The entire crew streamed from the communications center. If his colleagues had done their job, the secondary comm center should be fully disabled by now.

As the mass of humanity made its way toward the emergency exits, Horf moved in the opposite direction, picking up several heavily armed men and women at the door. Two of them had recently played the part of newlywed tourists. He escorted his team to the comm center. Vesta, and navigation command access to the entire outer Solar System, was theirs.

## Chapter 27

### The Lair

Tanya stood on the shore, cradling a new set of samples, her Zodiac staked to the beach. She could hardly wait to get back to her gas chromatograph/mass spectrometer and microprobes. What wonders awaited her from those depths? She took a last glance back.

Somewhere out beyond the orange smog, the sky above was fading from gray-green to purple as twilight arrived. The dull rust of the landscape would bleed into a ruby red before it faded to black. The drill, nearly a silhouette now, rose above a layer of sickly yellow fog, still pounding away, plunging deep into the viscera of Saturn's largest moon. The ocean it explored had never seen the light of the feeble Sun, never tasted the bitter methane rains or felt the acrid hydrocarbon dust of a million years' flurries. What could be down there?

For decades, her colleagues in astrobiology doubted that the alien ocean held anything but sterile chemistries, intriguing but inert. Tanya ruminated on those dark waters of Titan, cut off above by a hundred miles of ice, and barred below by another hundred from any life-encouraging minerals in that stony core. But she knew the ice was not stable. It billowed and migrated and carried with it impurities from beneath, a slow motion dance akin to the atmosphere's currents above. Perhaps volcanoes from the core pushed minerals upward, toward that primordial sea. Perhaps, just perhaps, the right combination of things came together there as it had on Earth, Saturn's Enceladus and, briefly, Mars long ago. The spark of life...was it only for Earth, Enceladus and Mars? Perhaps Tanya would be the one to find out.

She was just turning from the languorous waves when she saw a shape break the surface. She couldn't quite make it out in the fading light. It seemed the wrong profile for an errant wave. It sank back quickly, but it left a wake. *Waves do not leave a wake*, she thought. It was moving. What could it have been? Troy's submersible? But there was no top tower. The color seemed too dark, even in this light.

She began to shiver. For some reason, Tanya felt as though it was no longer safe to be out on the shores of Kraken Mare.

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The rumor mill was in full swing. Admiral Montenegro planned to blow up Mayda Station. Montenegro was staging a coup soon on Mars, with Iapetus as his base. The Admiral had escaped an insane asylum and was on his way to the Pluto/Charon space elevator with sabotage on the agenda. Montenegro's captured cargo ship had the Chancellor of Venus aboard. The conjecture went downhill from there.

The warrens and catacombs of Northern Quadrant Base emptied into the largest central area, a set of three chambers that included the mess hall and a storage warehouse that somebody cleared out just for the occasion. Sixty men and women assembled to hear what the legendary Admiral had to say. Montenegro cut an imposing figure. He wore a robe of ultrafiber that glistened in the floodlights of the warehouse ceiling. In the low gravity, it swung around him like a whirlpool. In his left hand, he carried a baton. It was black and green, with a long black tassel at the top.

Commodore Clark started waving his hands ineffectively for quiet. Montenegro held one arm aloft. Silence settled upon the room almost immediately. The Commodore stood to the side. He noticed that the Admiral was looking at him expectantly. He obviously wanted an introduction, and Clark knew it had better be good.

"Ladies and gentlemen, members of the Family, we have the great honor of hosting a man who has helped to build an empire of supply routes and economic trade unmatched in the Solar System today. While the so-called legitimate vessels carry goods from the asteroids and smaller moons to the inner and outer system, our own ships navigate essentially at will, outside of any borders, offering profits far outshining those skimmed off the top by the corporate types on those more *civilized* worlds." Here, Clark emphasized the word *civilized*. He knew it was a hot button. The crowd grumbled in agreement, thumping their feet, nodding assenting heads and clapping enthusiastic hands. "It is my pleasure to introduce one of the best, a man who began as navigator on a small freighter and worked his way up to become a myth among entrepreneurs and law enforcement alike." The last triggered laughter and applause. "Fellow sailors of the void, I give you our own Admiral Montenegro."

Clark turned and held out his hand to Montenegro, but the man didn't see it—or ignored it; he had already passed in front to enjoy the accolades. *This was going to get old fast*, Clark thought.

Montenegro made a show of speaking before the ovation died down, cutting off the audience before they had time to stop themselves. "I've heard some interesting rumors. Have you?"

To the sound of scattered laughter, a few voices added, "Yeah." "Oh, yes."

"I'm sure you've all seen the weapons we're bringing down, and the armored vehicles and the tactical high-altitude fighters. Believe me, there is more to come. And you know, I heard someone say that Montenegro was taking over Iapetus. Anybody hear that?"

The crowd was with him now, hooting and agreeing.

"I also heard someone say, 'Montenegro is going to create an empire right here on Titan, take Novum Baikonur and Port Antillia. Maybe throw in the Bacab colony for good measure?'"

The three interlocked rooms erupted with applause, but Montenegro held them at bay. “Why not take the entire Saturn system while we’re at it?”

Jessie Flannigan leaned toward Marv Holliman and Kinto. “Doesn’t sound like he really wants to stop there, does it?” Kinto shook his head in disbelief.

As if a favorite team had scored a goal, the crowd exploded into controlled bedlam until the Admiral held up his hands for silence once again. He took a long, cool drink of water and handed the glass back to Stiles, who always seemed to be nearby. Montenegro swung his baton expansively. “The Saturn system, with all its wonders, is far too small a goal for us. Our march begins here, but it is a march. It will move from Titan across the entire Saturn system, from Iapetus to the outposts on Pan and Helene and Phoebe and Enceladus. No stone—not even an icy one—can remain unturned. There can be no infrastructure from which the enemy can take a foothold.

“Once established here, we will be in a good bargaining position. Where governments are not willing to negotiate, we will be equipped to use force, but this will not be our first option. It’s just too expensive. We go from here to the Jovian system, solidify the asteroids, and finally worry about the outer ice giants, Uranus and Neptune. Kuiper Belt objects like Pluto and Sedna can wait for a while, as they are not as strategically important. What we want is to control the entire outer Solar System. This will present us with riches beyond what the old players of the inner system have been wallowing in for the past century. Our plan offers a new order, a new economy to the Solar System, and it offers the brave ones in this room, the ones willing to come along, not only monetary wealth but power and influence. Isn’t that better than owning a few science outposts and frontier towns on an orange ball of ice?”

Montenegro’s soliloquy was met with stunned silence. Kinto turned to Jessie and whispered, “Is the man batty?”

“Delusional, I think,” Jessie said.

A few people began to clap in the back of the room, uncertain of whether Montenegro was completely serious or not. He certainly looked that way. As soon as they did, Clark took up the lead, clapping energetically. The room filled with affirmation of its leader’s new vision for the outer Solar System.

“You guys have something against wealth and influence and power?” Marv Holliman scolded over the noise. “What’s wrong with you?” He joined in the applause.

## Chapter 28

# Slithering Things

Tanya couldn't count the times she had rubbed her eyes. Her neck hurt. Her shoulders felt like they had fossilized. Several of the electron microscope's delicate instruments were on the fritz. She had imaged all kinds of mysterious micro-structures in the benthic seawater of Titan, but nothing definitively left over from life processes. And she was tired. She looked at her chronometer.

"How can it only be two?" she moaned to her silent monitor. "Time for a break."

She stood, arched her back, wiggled her hips from side to side, and closed her eyes as she rubbed her shoulder. Tanya made her way from the lab down the corridor and into the main galley. She took a yogurt and a hot tea and made her way to a remote table out of the way.

She closed her eyes again. Her lids felt like sandpaper. She let the sounds of the kitchen lull her—the gentle clanking of utensils, the bubbling water, the sizzle of something frying.

"We obviously can't serve them this," said one of the cooks. "Just look at those."

"Keep your voice down," said another. Tanya sat forward and strained to hear. The first voice belonged to a man who didn't seem interested in keeping his volume down in the least.

"But what are those? How did they get in there? They're so...slimy!"

The voice of a woman, the voice that had encouraged him to be more discreet, spoke in a calming tone, "I don't see anything in there. You need to sit down."

"Ew!" came yet a third voice, another woman's. "I think he's right. Hey, there is something in there. It's long. It's like—"

"An eel?" the man's voice said. "A red eel?"

"Grab the lid—it's going to get out!"

"You two are crazy. It's just vegetable soup."

"Yeah, with a side of serpents."

"Maybe we just need to cook it some more. Never saw a pink eel before. Disgusting."

"Oh, God! It's big! It's slithering around! I'm leaving!"

"Joan—your shift's not over!"

Tanya saw the woman burst through the kitchen door and out into the hallway. She stopped out by the porthole. Tanya went out to her. She was breathing hard.

“Are you okay?” she asked. “Can I help?”

The woman reeled. She leaned over, hands on her knees, and shook her head. “We are so careful. Keep everything sterile, clean, you know? But that was disgusting.” She shivered.

“Something in your soup?” Tanya encouraged. The scientist in her wanted to hear firsthand.

“Vegetable soup a la sea snake or something.”

The woman was sweating, her eyes wild with horror. Her expression was not commensurate with what she thought she had seen. She was on the verge of losing control. “How about if we go to the Medlab?” Tanya said in a soothing tone.

The woman let Tanya guide her down the hall. “They really were pretty, though. Pink and sort of fluffy. They had these little sparkles. Almost like sequins.”

Tanya stopped walking. She looked at the woman. What was so familiar about that description? The cold had returned to her.

They set out toward the Medlab again. As the women turned the last corridor, Troy nearly collided with them.

“Watch it!” he yelled, careening around them. He paused and looked back. “Sorry, Tanya. Gotta set sail. I’ll be back.”

He carried a bundled object about the size of a microwave food synthesizer. Whatever it was, it was weighing him down hard as he rammed through the hatch toward the storage areas. It seemed that nobody was on their game today.

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“My friends, we first need to take Mayda Station.” The Admiral carried himself like a matador in a bullring, self-assured and equipped to be completely deadly at a moment’s notice. He spread his hands before him. “What you have done here is wonderful, if one likes caves, but Mayda will become our base of operations. It will be abandoned soon enough, either voluntarily or by force. We have a plan to disable the station’s nuclear power plant without any explosives or violence.”

Marv scowled across the room at Clark in disbelief. “We?,” he grumbled under his breath.

“Did the good Commodore steal something of yours? Like an idea?” Kinto asked in a whisper. “That’s just the beginning if Montenegro has his way.”

“This project is already in progress at Mayda, as are other parts of our strategy,” Montenegro continued. “I have dispatched a team to confiscate the satellite communications assembly from the mesa to the east of the outpost, which will effectively cut their backup communication to the outside world. Mayda Research Station will suffer a rather quick demise unless the scientists and support staff there seek help, and we, of course, will be here to lend it, as their communications equipment will be sadly too underpowered to seek outside aid. By the time they learn of our existence here, they will not see us as a threat, but rather as their saviors. Additionally, the main center of command and control for outer planets operations

on Vesta is now ours.” Excitement rolled through the room on a tsunami of amazement.

“He’s done his homework,” Jessie said over the cacophony of the audience.

“Still have doubts?” Marv asked Kinto.

“More than ever.” He didn’t stay for the end of the speech.

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Tanya spotted Abby outside of “Pepe’s Watering Hole” bar, the most northern south-of-the-border drinking establishment on Titan. “Abby, come join me for cold ones.”

Abby seemed to be rushing off somewhere, but she hesitated and examined Tanya’s eyes. “Hey, you look exhausted.”

“Got a headache.”

“Your eyes look like the Martian canyon system. Looks like you’re empty. I’m buying. What’ll you have?”

Abby sat down next to Tanya on a cherry-red bar stool, its chrome rim shining like it had been polished moments before.

“Smith and Kearns. Where were you headed?” Tanya asked, massaging the back of her neck.

Abby ordered the drinks. “Piers wanted to see me at four, but I’ve still got some time.”

“I miss him, Anya. I miss Kevin.”

“Me, too.”

Tanya was tired of fighting the tears. She let them flow. “Kevin was special. Do you know what I mean?”

“Yes, he was.”

“No, I mean, special to me. For me.”

Abby’s mouth opened into a little circle as her eyebrows rose. “You and Kevin—”

Tanya swallowed hard. “I don’t think peoples knew.”

“I don’t think peoples knew either,” Abby said absently. “It was him you were talking about, wasn’t it? How close were you?”

“I was going to have baby.”

*That’s pretty close*, Abby thought. But she said nothing. She leaned over and gave Tanya a hug. “I’m so sorry.”

Tanya sniffled. “Da. Me, too. But we move off.”

“Move on.”

“Thank you. We move on. See, I am learning. You are only one to help me. Other people are afraid or something.”

“I’m happy to, sweetie. We female scientists gotta stick together, right?”

“Affirmatif.”

“But a loss like that...you don’t just move on. You work to keep going, day by day, but you don’t just go to the next thing. You let yourself be sad, have lonely times, hurt. Otherwise you don’t heal.”

Abby wondered how much of that she had done over the years. Jeremy told her she hadn't done enough, that she had substituted work for grief, making up for what her parents could not accomplish in their lives cut short. But where did one draw the line? She was an independent woman, a top researcher in her field. She'd gone on lecture circuits, written professional articles and popular books. Didn't all that help? Or did she do it to keep the shadows of her past at bay?

Tanya broke in. "Oh, I am doing sad and lonely and hurt. No problem there."

"Tanya, I loved Kevin as a friend. Not in the way you did, certainly. But we will do this together." She squeezed Tanya around her shoulders.

"Yes, you and me, gluing together."

"Speaking of sticking together, have you seen Troy?"

"Last time I saw him he was headed for little cruise, so he said."

Abby looked alarmed. "In the sub?"

Tanya buried her face in her hands and leaned against the counter. "I'm not knowing."

Abby let it go. The drinks came. She nursed her margarita for a few moments. Where could Troy be going in the sub? Surely not off to do research. He wanted her with him to help out. Maybe he was recalibrating some equipment. But that didn't make sense either. No, something was up, and she was going to find out just what that was. Whatever he was up to, it had certainly been a revelatory happy hour.

## Chapter 29

# A Ping of a Different Frequency

Troy had chosen this particular model of submersible because it was designed specifically for deployment by one person. It wasn't that difficult. He was in the sub, under the surface of Kraken Mare, and under way in no time at all. He left the boat trailer conspicuously by the shore, but he wasn't worried. Soon everyone at Mayda would be far too preoccupied with other things to notice his little trailer.

Troy gave the drill a wide berth. He felt its pounding in his ears, felt its deep throb in his chest, even tasted its acid in his mouth and smelled its pungent metals and lubricants in his nostrils. It was a beast, towering into the sky. He decided to take a look from a distance.

The top of the boat was a good 2 m beneath the waves, but within periscope depth. He sent the little mast upward until it broke into clear air. There it was, atop the rugged promontory of ice, rocking back and forth like a lumbering troll. And something was up on its tubing, above the cab. Not something. *Someone*. It looked like that burly engineer guy who Tanya worked with. What was he doing out there? He seemed to be crawling upward, and he was looking down at the water. His body language communicated one thing: fear.

The sub continued to move away. The drill and its tiny mountaineer slid from view, dissolving into the auburn miasma. Troy walked back to the prow of the little ship and strapped in for the duration of the voyage. The base on the north coast would be a short trip. He knew; he had done it several times before. The sea was rough today, so he dropped the sub to a greater depth. The craft had a nice feel to it, like a kayak on a calm lake. He could sense the currents in the joystick, play with them as an eagle plays with the updrafts of a canyon wall.

The smooth, quiet ride was interrupted by a ping. It came from the sonar. One ping. Troy squinted into his monitor. A second echo rang ominously, and then a third more rapidly after. Something was there. What was it?

The pings came more often now, but they took on a random nature, an irregularity. Out the window, in the distant twilight of the beam, he could see it coming. Serpent-like, undulating, it came slowly, gracefully. The long neck moving in an almost perfect sine wave, the bulbous head scarcely bobbing, steadily lancing

through the methane bath. Then came the whale-like body, the pinniped flippers, the humps along the back. The creature turned away from the ship and the light, but the echoes continued. Another was somewhere ahead, and another. An entire school of them awaited him out there in the murky sea. School? Or would they be called a pod? He wondered.

The sonar had taken on a strange frequency, no longer random, but not the metronomic heartbeat of a mechanical device, either. Rather, the sounds had morphed into chime-like rhythms, and then whispers, like gentle woodwinds or panpipes.

And then they arrived. Two. Three. Half a dozen of the leviathans. Several must have been 20 m long, Troy guessed. As they passed, the ship shuddered. They seemed an awful lot like his aunt's description of Nessie, except for their color. In the white beam of the sub's floodlights, the creatures took on the appearance of a nice Cabernet Blush. Wine sounded good about now, come to think of it. Soft, rippling curtains of lavender flesh—perhaps gills?—trailed from the backs of their necks and sparkled in the light. There was a grace about them. If they hadn't been so large, so terrifyingly powerful, the primordial monsters would have reminded him more of children's toys.

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"Let me show you something," Piers told Abby as he pulled a chair away from his work station. She sat and looked over his shoulder at his monitor. Green sheets of light undulated across the screen, overlapping like the aurorae in a Montana sky. "These lovely waves come from all kinds of sources. The tall ones, here and here, are from Saturn's magnetosphere. These little spikes are from several of the outposts to the south. And these nice big roller coasters are from us, from Mayda Station itself. It's like an electromagnetic symphony, and on this screen, a visual symphony, always going on around us. It's beautiful in its own way. Do you see the balance, the overlapping textures and patterns?"

Abby nodded quickly. "You've just proven what you said earlier: a person can find beauty in the strangest places."

"Not so strange when you think about it. Water bottle?" He waved one at her.

"No thanks."

"Now, I scroll down the timeline a little, and...there. See that little peak?"

Abby squinted. "Looks like something punched through your beautiful little symphony."

"Something did. A ping. Just a single one. All your talk about things going on around the north shore got me interested. This little ping is subtle, but it's there. It's distinctive. Someone settled into Titan orbit two days ago. Someone who didn't want to be seen or heard. Whoever these people are, they're employing a frequency that used to be employed as a carrier signal on old robotic cargo ships. Pretty clever. Really hard to find."

"Ah, but you found it," Abby nudged him with admiration.

"Yes, I suppose I did."

There was worry on his face. She said, "There's something you're not telling me."



“The reason I found it was because I was looking for it. Specifically. I read that this communications trick was one used back in the days of asteroid mining by the pirates.”

“The Martian emirates? Guys like that?”

“Exactly.”

“You think that’s the kind of thing we’re dealing with? I knew it. I tried to tell Troy.”

“Yeah, well Troy’s another thing. I’m wondering if—that’s odd.” He frowned, leaning toward the screen.

“What?”

“I have a low power reading on my—oh, there’s another one.”

The lights flickered.

Abby leaned over to Piers with an urgent look. “What kind of reading?”

The screen blanked. Suddenly, the only light in the room was the orange glow from the tiny porthole in Piers’ wall.

“That can’t be good,” Abby whispered.

“And where’s our backup juice?”

Red lights faded on. One small screen popped to life on Piers’ console.

“There,” Abby said. “Your screens seem to be coming back.”

“No, just this one, and it’s bad news. This is an emergency monitor, very low energy. It only comes on when the others will be down for a while.”

“Looks like we have a big problem somewhere,” Abby said.

“And will for some time. I don’t know why we aren’t on our main backup power. I’m going to try to get a message out on what we’ve got left, but this station is about to be officially off line and in the dark.”

## Chapter 30

# Conspiracy Theory

“Let me tell you what’s wrong,” Kinto said through clenched teeth. He grabbed Jessie and Marv by the elbows and ushered them into the hallway, away from the crowded room. He glanced up and down the corridor. No one was around. Apparently, everybody’s attention was riveted on Admiral Montenegro and his wild new universe.

“Can I give you guys a quick history lesson?” Kinto hissed.

Marv bristled. “I don’t need no stinkin’—”

“Let the man speak,” Jessie cut in.

“Look,” Kinto said urgently, quietly. “Adolf Hitler had things well in hand a few years into World War Two. He held most of Europe. He had not yet pissed off the Russians, and he had planned on leaving America out of things as well. If Japan hadn’t bombed Pearl Harbor, he probably would have made it to world domination.”

Marv was looking at Kinto with something like admiration. “Where do you get all this stuff?”

“I have some military experience,” Kinto whispered darkly. “If he had stopped there, regrouped maybe, the Third Reich might have been alive and well for a thousand years. But he just kept adding to his shopping list. He wanted North Africa. He wanted the southern states of Asia Minor. He got greedy. He just didn’t know when to stop. Same with the Romans, and the Ottoman Empire. Every one of them over-extended themselves.”

Jessie held up her hand. They saw a shadow. A man with wild red hair and eyes to match came bounding down the corridor and turned toward the maintenance area. He was struggling to carry a large piece of equipment with some wires sticking out.

“What’s that guy bringing in?” Marv asked.

“No idea,” Kinto snapped.

“And you think Montenegro is making the same mistake?” Jessie asked, urging him back to the subject at hand.

“Where’s he going to stop? Is it on to the Balkans? Then Russia? Once we control the Jovian system do we move into the Martian realm? Earth would be

impossible. But what's going to stop him from trying? He's going to self-destruct. It's the same old story. He'll be on to Mars with his visions of grandeur before you know it, and it will be full-fledged war. I say there's a better option. If we don't go too far, if we set our sights in a limited and doable way—control Titan from Northern Quad and, from it, the entire Saturn system—we can end up on top and live like kings, have the kind of wealth and power the Admiral is talking about. The Saturn system is vast in the right kind of resources, but remote and limited enough to defend. Later, step-by-step, maybe we move on to Uranus or Jupiter. I say Uranus would be easier.”

“Jupiter is the bigger jewel,” Jessie objected.

“Sure, and that's exactly what makes it harder to take. It's well defended. It's also a lot closer to Mars, and Mars has lots of military.”

“Listen to you two!” Marv whined. “You guys are talking mutiny!”

Kinto held Marv by the shoulders. This was no time for the man to be panicking. “Marv, my fine man, we are not talking anything in specific. We are just...talking. Thinking out loud. Okay?”

“Okay.”

“Options to be discussed. Amongst the Family.”

“Right.”

“Hey!” The redhead was back. He seemed agitated. “I brought something for the Admiral.”

Marv said, “He's a little busy right now.”

“I'll wait. You guys want to see something amazing? Really Earth-shattering? Or should I say, *Titan* shattering? Actually, universe shattering. There's something out there.” The man nodded down the hall toward the dock.

“Out there? Out there where?” Jessie prodded.

“Outside. I recorded it on my sub. Want to see?” The man had a strange light in his eyes.

“You have a sub.” Kinto said flatly.

“I do. Come, come. You guys will not believe this.”

“I don't already,” Kinto said.

Marv shook his head. “You guys go ahead. Really.” He headed back into the room to hear Montenegro talk some more.

Kinto leaned over to Jessie as they struggled to keep pace with the crazed visitor. “We gotta keep an eye on this one. Where's security, anyway?”

She hooked a thumb back toward the sounds of the speech. “Probably in there.”

The man continued at a furious pace, but reached behind himself unstably to shake their hands. “Troy Fels.” He grabbed Jessie's hand. “Troy Fels.” He grabbed Kinto's. He swiveled forward again before they had the chance to say anything. “It's just down here.”

A look of recognition crossed Jessie's face. “You're the guy from Mayda Station, right?”

He didn't seem to hear. “They're all over the place. We had no idea, of course.”

Jessie looked at Kinto, concerned. He returned her look of apprehension as they entered the pressurized docking bay. Kinto kept his hand low at his waistband, near

a concealed knife, something that had come in handy more than once in his colorful career.

“Climb aboard. It’s just here.” Troy ushered them down the ladder, into the cockpit and to the forward monitor. He tapped a couple pads. “And one of them was big, too. A regular monster.”

“Just what are you talking about?” Jessie said impatiently.

Troy grinned. “Sea monsters, of course. Titan sea monsters. Now, watch closely. At first they’re hard to see.”

The monitor was dark. Jessie could just make out some amorphous shapes, but nothing definitive. “There,” Troy said quietly. “Come, my babies. Come to papa.”

Jessie began to wonder just what looney bin this guy had escaped from. Kinto leaned toward the screen. He frowned. It was dark.

Troy touched Jessie’s shoulder. “Here they come. There. And there. Do you see?”

Suddenly, Jessie took in a quick breath. “Oh. Oh!”

“What? Where?” Kinto snarled. “I don’t—”

But he did, didn’t he? See something? There, in the murky methane depths? “Pink,” he mumbled.

The trio stood slack-jawed, marveling, twitching, staring at a blank screen.

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Tanya liked what they’d done with the place. Someone had been decorating. The corridors had always seemed so sterile and claustrophobic. But now, with these delightful moving pictures, things were different. Little painted deer and rabbits and handprints graced the walls. Spirals and square-shouldered silhouettes danced along the hatch seal at its junction with the floor. They really did seem to dance. The effect was subtle, but the hands seemed to intertwine, and the feet shifted nearly imperceptibly from one pose to another. A figure playing a flute spread across the main doorway. Nearly 5 feet tall, it didn’t look painted; it looked like it had simply been there for a long time, faded into the metal itself. It was all so beautiful.

## Chapter 31

# Lost in a Lost World

Sanjay Rao appeared on Jeremy Belton's screen once again. "Sanjay, this is getting to be a bad habit. Maybe you should just move in."

"I hear Kasei is nice this time of year, but I'm having way too much fun right here at HQ. We got a message that I thought might interest you."

"Something finally turn up?"

"Nothing to do with Sable. But didn't you say your god-daughter was up at Mayda Station?"

Jeremy leaned forward. "Something like that. What do you hear?"

"I'll let you have the full experience. Here it is—forwarding now."

The screen shifted for a moment. The face of a man in low-level light swam before the imager. The transmission was rasterized, smeared, as if low resolution was even difficult for it to manage.

"...is Mayda Station, Ti...da Station, Titan. We have an emergency situ—"

The screen froze. So did Jeremy. There was silence on the other end.

"You gotta be kidding me, Sanjay. Is that it?"

"Sorry, Jer. That's all that came in, and that was to Ganymede. They think it's a power failure with Mayda's new reactor. Another station on Titan picked it up, and they're going to see what they can do about it, but it's all a little weird. My Ganymede contact tells me the engineers said a failure like this has been precluded by the hardware or some such thing. Anyway, he doesn't think it can be a simple breakdown. If the reactor had to be shut down, there are plenty of backup systems in place. Normally."

Jeremy slapped his hands together. "Sanjay. I think I know where Demian Sable is."

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Montenegro grinned at the submersible. "Fine little ship. Research vessel, you say?"

"Yes sir," Troy said, slouching against the curved wall of the cabin. "Marine research, mostly."

Montenegro didn't impress Troy. As far as the scientist was concerned, the Admiral—if that's what he really was—was just another vacuum-surfing thug out for his piece of the pie. But it was a pie Troy would gladly share in, even if he had to bite his tongue and show a little respect to get his.

Montenegro looked up at the low ceiling and turned slowly, taking in all the gadgets and blinking monitors. He pivoted smartly back to Troy. "Good, because I need you to do some more *research* for me. Get back there, back to Mayda, as quickly as you can. Keep an eye on things. With that little piece of engineering you brought us, we'll have them where we need them in a few short days."

"Hours, maybe."

"Better, better. These scientists are clever, though. They'll probably kluge something together and hold on longer. Here." Montenegro slapped a radio into Troy's hand. "I'm sure theirs won't be working by now. At least not this far. Wait for me to call. We may need you there. Eyes and ears, Fels. Eyes and ears."

"Sure, sure," Troy said, fumbling with the buttons. He looked up. Montenegro was scowling. Troy cleared his throat and added cheerfully, "Yes, sir!"

## Chapter 32

# Serpents' Swim

As soon as the lights had gone down, and the feeble glow of Titan's murk was the only illumination in the station, it had become obvious—there was something out in the lake. Not just one something. Dozens. Heads bobbed atop long necks that stretched from the rolling waves, looking like a swaying crop of long grass in an orange field.

Tanya strained to peer over the heads of the crowd gathered at the port on the north side with the best view of Kraken Mare. It reminded her of an American celebration of the Fourth of July—crowds staring in one direction, oo-ing and ah-ing as they marveled at wondrous sights.

“There! Look at that tall one.”

“Near the drill?”

“No, far right. See it?”

“Sort of...I think so.”

“Oh, now I see it.”

“Yes, I think I see it, too.”

It went on like that, over and over again, as one person would see something and point it out to the others, as if the crowd needed a suggestion before it could witness the scene. Tanya's captivation was matched by her exhaustion. She hadn't slept. Her head and neck hurt, and she had noticed other people rubbing their shoulders or the backs of their heads. Everyone must be under stress, she decided. She pulled herself from the window and turned into the cold hab. With no light and no heat, with the air hanging stale and sullen, the place seemed incredibly harsh. She knew how serious the situation was. When all the engineering, when all those subsystems and all that complex machinery was humming away as it should, Mayda Research Station seemed deceptively safe. But the walls that formed a barricade against the super-chilled, poisoned air, the warmly lit interior, the printed dividers and ambient music and aromas of food and electricity, all lay on the frozen world like a fragile egg. The toxic air just outside cocooned and ate away at the outpost. The pressure and dark and cold clawed at it relentlessly. Titan stood ready and waiting to reassert itself and reclaim the lonely bastion of delicate Earth life.

Maybe Brian and his techies could fix the problem, whatever it was. They would know soon. Maybe she should try to help. She rubbed her eyes and went in search of coffee or tea or anything to give her the edge she had lost.

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Abby crept down the corridor. The sounds became clearer as the darkness faded. She could see the light coming from the window down at the junction of habitats, and a crowd of five people crammed around it, pointing and shuffling. Just before them, in a small recess in an access port, she peaked through another tiny opening. This port was only a few inches across, just enough to look through. No one had thought to use it, so she had it to herself. Outside, looming out of the lake's mist, the great drill stood abandoned. Its lumbering assemblage had ground to a halt. Now, it rose like an ancient tower from a lost civilization. Perhaps that's what it was, what it would be, if they didn't get help soon. A remnant from a past civilization's dreams and engineering accomplishments, a modern Tower of Babel left to disintegrate in the relentless elements of nature.

"Look at those, over there. A whole bunch of small ones, like a flock of geese!" said a voice.

"Titan's Loch Ness," offered another voice.

"Yes, beautiful!"

Abby knew she was looking directly at the portion of the lake they could see, at the same shore, the same waves, the same drill and landscape and seascape. And she knew, without a doubt, that she could see nothing in the lake but empty waves.

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The coffee center in the main hab junction was dead. Maybe there was something in the galley. Even cold coffee would be okay at this point. As Tanya passed another window, she resisted the urge to look out again on the surreal lake scene that she knew would greet her. Night was falling, and soon she would no longer be haunted by the maniacally psychotic scene that was playing out in the Titan wilderness. Or was the psychosis on this side of the window?

There were so many reasons that those things, those rosy Nessie curiosities, shouldn't be there, and she knew it. Titan was a lousy place for life. She tried to talk herself out of what her own eyes had seen, ticking off the list, item by item. Although the atmosphere of early Earth was similar in composition to the current atmosphere on Titan, the important exception was the lack of liquid or vapor water. Liquid water was a critical solvent for the kinds of materials that living systems used to carry out operations. Water was a chemical unifier, a bridge, the oil of many biochemical mechanisms. Methane did not break down nearly as many complex chemicals. But on the other hand...

Those hydrocarbons that sifted from Titan's sky tended to assemble into delightfully complex structures akin to amino acids, and even constructs resembling DNA. Her colleagues who did laboratory research back on Earth and Mars had carried out experiments mimicking Titan's chemistry—a brew without liquid water—and found



within their products the five nucleotide bases involved in DNA and RNA replication, along with amino acids. But Tanya shook her head. Because on the other hand...

The amount of energy available to carry out those fabrications was so limited in the low light levels and low temperatures of Titan. Cryogenic biology, at least any kind that biologists could recognize as life, didn't make much sense chemically. All living things on Earth, and apparently the fossilized life on Mars, used liquid water as a solvent. Liquid water was a stronger solvent than anything in Titan's lakes. And that ice world seemed to be cut off from its own core, where useful things such as iron, molybdenum, and magnesium were sequestered away from the living systems that could use them. But...

Was it conceivable that life on Titan might use a liquid hydrocarbon, something like methane or ethane, in place of water? Perhaps such creatures would take in hydrogen rather than oxygen, react it with acetylene instead of glucose, and produce methane instead of carbon dioxide. How many other choices could nature come up with that biochemists had not yet envisioned?

And there was, of course, yet another possibility: the drill. The beasts had not shown up until after the drill had broken through to the ocean below. The ocean was distant, 50 km straight down even here. That ocean might have its own power source, its own radiogenically or tidally triggered heat to birth benthic life. But how would that life survive in the relative low pressures up at the surface? How could it have made it up? The drill had many systems to keep it secure. Had there been some catastrophic failure to let the creatures up? And what were they doing down there anyway? What was their source of power and nourishment? It was all too much to think about, especially without coffee.

The throbbing in her head worsened as she approached the darkened galley. Before she turned the last corner, she sensed something—or someone—in the hallway in front of her. She heard a note, soft and lilting. Then another. A flute, breathy and clear.

Amorphous light from somewhere in the galley seemed to flare slowly, and she could make out the silhouette of a figure leaning against the wall, a young man. There was something about the jawline, and the lay of the hair across the forehead, and the relaxed posture. It looked like someone she knew, someone who couldn't be there. He was playing one of those hand-carved wooden flutes. She stopped in her tracks. The man turned toward her and slowly pulled the instrument from his mouth. It was Kevin. He wore cotton pants and no shirt.

"Hey Tanya," he said easily.

"Hi Kev," she replied. "I thought that was you." Suddenly, it felt perfectly natural, standing in the dimly lit corridor, talking to Kevin Nordsmitt.

"You look a little tired," the man said. "But it's all going to be fine. You know that, right?"

"I suppose so." She glanced around. They were alone. She could have asked him where he had been, or what he had been doing just before he died, or what he was doing here, now, when everything seemed to be falling apart, but she was afraid he would disappear. Instead, she said, "I have been missing you."

"I know." He smiled kindly at her.

"What you were playing?"

"It's a flute, silly."

"I know that. I mean, the music."

"Did you like it?"

"Da, very much."

"I'm so glad. It's the ancient music of Kokopelli. Flute player of the Native Americans." For one disorienting moment, his voice sounded like Troy Fel's. That was odd. Kevin smiled and placed the wooden instrument to his lips. He winked at her and began to play again. Tanya wanted to say something, but her throat was dry and her lips didn't seem to want to move.

As Kevin turned to walk down the hall, down into the darkness, she could see wine-colored splotches and blisters across his back, burns from Titan's frigid wilderness. And the burns on his back seemed to impart their chill down Tanya's own spine.

## Chapter 33

### A Little Trip

There was a clarity to things when one was at the precipice, about to embark on something that seemed adventurous...or dangerous...or deadly. To Jeremy Belton, such times imbued life with a surreal atmosphere. Colors dazzled, sounds rang more sharply, smells held a richer aroma. Everything had a diamond-hard edge to it. That was how this day felt to Belton. It had a succinct quality to it. It felt lethal.

His fellow passenger told him the trip would be easy—she'd read all about it—and undoubtedly it would be easier than the trips of the past. "You know, they say the earliest Titan explorers suffered terribly. Coming all the way from Earth, and despite the constant flow of nuclear thrust, their transit times stretched to years. They arrived exhausted and bored. Can you imagine all those countless protein bars and hours on stationary bicycles and treadmills?"

*How did she know all this stuff?* he wondered. But he was too nervous to make good conversation. He let her go on about how from Mars, at the right planetary alignment, flight times to Titan could be cut down by over a third using Jupiter's gravity as a slingshot. It was still a grueling trip. But with China's Q'in nuclear propulsion, coupled with the new disposable ultra-high thrust trans-stages and various chemical additions to the bloodstream, Belton faced a trip of less than five weeks. To him, even this seemed daunting.

He tried to relax into the couch, but his body kept bobbing around. He tightened his belts. His phone rang. The woman stopped her monolog. Saved by the bell.

He tapped his ear. "Belton."

"How goes the adventure?"

"Sanjay Rao, what timing you have. I was just thinking about you here as my nausea was increasing."

"It's all going to be just a fond memory soon. No traffic to report, but Jeremy, keep an eye out. This whole business makes me nervous."

Jeremy lowered his voice. The woman was chatting up an attendant. "I'm telling you, this is the best way to do it. A nice, low profile civilian liner. Nobody will notice. Any word from our friends?"

“We’ve dispatched a SWAT team from Ganymede. They will either be waiting for you or they’ll have things under control by the time you arrive. Does that make you feel better?”

“Marginally. What would really make me feel better is a little more gravity. Looks like we’re on approach, so I’ll sign off.”

“Good luck, space cowboy.”

Belton gazed out the window of the little shuttlepod, but his mind was a few gazillion miles away at Saturn. Godspeed to the SWAT team, he thought.

The massive transport loomed above him like a colossal mountain. It was nothing like the luxury liners that ferried passengers between Earth and Mars. The shuttlepod carried only one other passenger, the loquacious woman whose name was Jennifer.

“It’s all brawn and no beauty,” Jennifer observed. Belton noticed the bolts, hatches and rails scattered across the metallic hull of the transport as it filled the windows.

“No golden trim or ebony checkerboards here,” he said. “Those Mars cruisers wouldn’t dare show a bolt or maintenance hatch.”

“May not be much to look at on the outside, but she’s pretty sleek on the inside,” the pilot chimed in. “Jupiter and Saturn passengers aren’t about tourist experiences; most are more interested in speed.”

“Fair enough,” Belton said.

The pod docked flawlessly to the side of the ship.

“You’ve obviously done this before,” Belton told the pilot, trying to sound relaxed.

The pilot gestured toward the opening hatch. “A few times. Right this way.”

The entry was a little cramped, with low ceiling and a lip on the base of the door, but it opened out into a relatively spacious corridor. Railings along the walls accommodated the short orbital periods of near-weightlessness endured by the ship. The signs mounted on the walls, floor and ceiling could be read upside down as well as right-side up.

The pilot led the two to the check-in station and said goodbye.

“Welcome to the Starlight Queen,” an attendant said, placing electronic stamps on their wrist passport chips. “Please go to Medlab in preparation for flight. Have a nice trip.”

“Thanks,” Belton said, already looking down the hallway with trepidation. “Time to get prodded and stuck, I guess.”

“Yep!” Jennifer grinned as she pushed off and drifted down the corridor.

It had been years since Belton had been weightless. He had done a trip to Phobos, just for fun, and another to Earth’s Moon. Both voyages involved fairly long periods of zero-G. He had forgotten how uneasy his stomach became.

As he entered the Medlab, he glanced around. Jennifer didn’t seem to be there. He heard her voice near the ceiling. “Exhilarating, isn’t it?”

“Oh yeah,” he said, forcing a smile.

A skinny med tech with wayward black hair approached him. He spoke in a gravelly baritone. “Would you like a patch? Feeling any nausea?”

“I’d love one,” Belton said with enthusiasm. As he slapped the little adhesive oval behind his ear, he felt immediately better.

“Now,” the tech continued, “I need you both to strap into these couches. We’ll set you up with a transferrable I.V.”

“Transferrable?” Jennifer looked at the bizarre contraption at each bedside. Multi-colored lines carrying translucent liquids snaked around and into a host of vials and tanks. It did not look portable by any stretch of the imagination.

“All this mess is just to get you started. When you’re stable and happy, you’ll transfer to the passenger area, where you’ll plug in your packs.” The tech held up a small container the size of a daypack. Several nozzles protruded from its soft shell. “We’ll begin with mostly saline, introduce the drugs gradually. Now, Mr. Belton, if you’ll loan me one of your veins...”

Initially, Belton felt no change. But as the tech was prepping Jennifer, Belton began to feel a flush drift over his skin. His ears became hot, his mouth dry. He began to experience something like an adrenaline rush. He took in a deep breath. It came out in ragged spurts. “Wow!”

The tech frowned at him. “First time in high G interplanetary?”

The passengers nodded in unison.

“Did you watch your holovideos?”

“Holovideos?” Belton said, his voice a little higher than normal.

“Came with your tickets.”

“I watched mine,” Jennifer said.

Belton squirmed. “Teacher’s pet. I just thought it was...” Belton coughed. “... like a travel brochure.”

The tech waved a finger at him. “It’s a primer. It tells passengers what to expect. You were very naughty. Don’t worry: the initial rush goes away quickly. I suppose you’ll want to know what’s in it, since you didn’t watch your holo?”

Belton nodded.

“The stress of our primary break from orbit is our main concern right now. The Q’in drive, coupled with our trans-stage, is strong enough to kill a human crew. So, we mix up this tidy high-gravity cocktail for all of us. It keeps us conscious and able to move, and it keeps our internal organs from freaking out. There’s also an anti-nausea regimen included, no extra charge. Make sense?”

“It does,” Belton said, feeling more himself.

“Questions?”

The two shook their heads. The tech looked at Jennifer’s bedside monitor, then at Belton’s.

“You guys are squared away. Let’s get you to the passenger arena.”

Belton was disappointed in the so-called arena. It was small and rectangular rather than the spacious amphitheater he envisioned. The outer planet transport Starlight Queen—where did they get these names?—had a capacity of eight crew members and twenty four passengers. All couches were full. The berths were arranged in six rows of four each, with some type of console three rows in. Belton and Jennifer settled into their places. The tech slid their packs into a compartment on the side of each couch, just under the left armrest.

And there they lay. The long minutes passed like molasses.

A soft gong sounded.

*Ladies and gentlemen, welcome once again to the Starlight Queen. Our flight is about to begin. Dinner will be served after our initial acceleration, which should last for the next fifty minutes.*

Belton heard a faint noise from Jennifer. He glanced over. Her eyes were wide open and tears streaked her cheeks. So much for bravery. He reached over and patted her hand. Suddenly, a terrifying jolt shoved him into his couch. He began to see red, but the drugs kept him awake and aware. A full three seconds later, he heard the muffled crackle of the trans-stage, mingled with the soft whirr of the nuclear propulsion. They were on their way.

## Chapter 34

# Somebody Told Me

Even when darkness came to Mayda Station, Saturn still cast a meager golden glow outside. At sunset, Saturn floated in the mist, nearly kissing the horizon, as a full globe. As night progressed, the great planet did not move from its perch low in the sky, but it marched through phases, from gibbous to crescent. When it had all but disappeared, it would be sunrise again.

The golden giant's glow scarcely penetrated into the galley. What had been a bustling, cheery eatery with aromas of brewing teas and hot dishes had fallen into a cavernous funk. It had brought on the silence—and ambience—of the grave. It was a great place, Tanya thought, for a conversation.

Brian sat down next to her. He was a tall, gangly man with a cap of jet-black hair that seemed to disappear in the dim light, as if the top of his head had gone missing. A dim glow illuminated just the edge of his jaw from one of the few emergency lights still functioning. His circumspect expression matched the dismal surroundings. Though he always looked moody, his appearance belied a cheerful spirit. He raised a coffee cup to his lips, sipped, and let out a satisfied huff.

“Where did you get that?” Tanya asked, eyeing the cup.

“The console on corridor B still works. It just doesn't heat anything.”

“Cold coffee?”

“Very. But it's got cream and sugar and I'm just pretending about the temperature.” The tech shivered. “I borrowed this nifty little flashlight from Abby. Have you seen her?”

“No. She is mystery woman.”

“That she is. I like her. She's got fierce eyes.”

“Maybe because of her past, because her parents die? I think you can see people's history in the eyes.”

Brian raised his eyebrows. The whites of his eyes glowed in the darkness. “My parents died. Do I have fierce eyes?” He leaned toward her with a scary look and then they both laughed. “You get over things.”

“I don’t think she ever got over hers. Something still there. When she talks about them she seems like she has unfinished things. I don’t know.” Tanya noticed that she was staring at Brian’s coffee. He noticed, too.

“Want a sip?”

“Sure.”

In a lonely place, with the Grim Reaper scratching at the door, a sip of coffee could be a remarkably intimate gesture.

“Spaciba,” she said absently. He simply nodded. “So how does thing look downstairs?”

“You’re tired.”

“How can you tell?”

“When you get tired, your English goes to hell. So, how do things look? Not so hot.” He smiled at his little joke before his brows furrowed. “The reactor’s fine. But it’s missing a critical part.”

“What missing?”

“It’s a rather simple mechanical unit that transfers power from the nuclear source to the transformers and then on to the rest of the outpost.”

Tanya could tell he was about to launch into something technical. “My degree not in nuclear engineering, and English is fourth language for me. Take it easy on a girl.”

“Sorry. All that’s really happening is—well, most normal reactors put out heat, and that heat turns an assembly called a turbine, which translates that movement into electricity...eventually. Got it so far?”

“Got it.”

“So our new reactor is a little more direct than that, but suffice to say that we have plenty of power. It just can’t get out anywhere.”

“So this important turbine thing just disappear? Just like that? Somebody must has, yes?”

“Makes sense, of course. Somebody stole it, but to what end?”

“How big this thing is?”

“About as big as that microwave,” he pointed toward the nearby counter.

Tanya remembered Troy running down the corridor with his bundle. “Can we borrow from Port Antillia? Even Kosovo/Taishan has a reactor, yes?”

“Don’t forget our wonderful Ingermanson system. It’s been a joy to work on, and it’s incredibly efficient, but it’s...special. It won’t interface with that type of hardware. That’s what we get for being progressive.”

“Where else do they have?”

“Ingermanson reactors? There’s a brand new one on Ganymede that’s been on line without a glitch, and a bunch in the south of Mars are just about to get up and running. I’m afraid that’s as good as it gets. This time of year, there’s not enough wind for turbines. I have the guys working on a wave machine down on the beach. That might give us a little juice, but just enough to heat maybe one or two habs in the short term. It’s not much.”

“Not enough?” Tanya asked quietly.

“We’re working on it.”



“Why can’t we call on backup? Satellites don’t take that much and we have emergency stuff in the—”

“I know, I know. There’s something else just as disturbing. We’re also missing our entire equipment bay from the east mesa. All our satcom equipment. There are heavy rover tracks all over up there, and footprints. A whole lot of footprints.”

“Who is doing this?” Tanya thundered in frustration.

“No idea.”

She looked down, and said, “How much time you think we have before—”

Brian turned squarely toward her. She looked up into his eyes. In the dim light, they seemed like deep caves. “Tanya, I hate to rain on your little Russian parade, but unless we get help soon, Mayda Station is going to die a fairly rapid death. Without power to the pumps, Titan’s nice, chilly toxins are going to come seeping in. With the heaters down, the infrastructure will freeze solid, and it will take us with it.”

“They say it is like falling to sleep,” Tanya offered hopefully.

“If we’re lucky enough to freeze out. But if the seals fail first, we’ll be poisoned by the air, or we’ll get a nice mix of methane and propane with our oxygen and burn the place down, or we’ll just run out of oxygen. Either way, I’m not too crazy about it.”

The last emergency light flickered, and Brian’s chin faded away. “This is what I call dark.” Tanya let out a long sigh. “Only one thing to do. Go to bed.”

“Together? Are you proposing to change the moral landscape because the lights went out?”

“In the dark, I cannot tell if that makes you happy or sad, but that is actually not what I was suggesting.”

“Would you hate it?”

Brian was sweet, but timing is everything. She was in no mood. “Do you not need to be working at beach, trying to save Mayda Station?”

“But would you? Hate it?”

“What I would hate is freezing to death after dying in methane/oxygen fire. You painted a posey picture.”

“I think you mean ‘rosy,’ and I hope you’re being sarcastic.”

“Rosy. Thank you. Now, get to working, and keep away from the sea beasts of Kraken.”

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Mayda Station loomed out of the darkness, draped across the frozen landscape like a herd of gray, sleeping elephants. All the external floodlamps stared blindly into the darkness, their light quenched by the dwindling power inside. It was perfect. Troy backed the rover toward the warehouse hab at the west end, easing the trailer—with its precious cargo of his blue submersible—up to the door. Without power, he had to open the massive hatch manually. It was heavy, but he managed. His helmet lights filled the chamber with a blue glow. The walls and floor glistened with ice crystals. He dropped the trailer off inside, left the rover out in the fog, and ducked back through. He slammed the door, cycled the air, and watched the ambient temperature on his wristpad; the wall monitor was dead. He hoped it was warmer farther in than it was here, barely above freezing. But it didn’t matter, really. He would bide his

time until they called him back or until things got really uncomfortable, and then he would leave for the warmth of the north shore.

(\*)

Piers wracked his brain. Where could he get more power—enough to get a message out to other Titan installations or Iapetus, or maybe even Ganymede? He'd been over it and over it. He hoped, desperately, that someone had heard at least part of his last transmission, but the power had failed during the operation, and he had no idea how much, if any, had processed and made it out. They might have picked up at Kosovo/Taishan, and if so, that was their best bet. Kosovo had enough infrastructure that they likely had hardware that could help out. But they would have had to receive through satellite, and he had no way of knowing if the relay could have been completed at the right time. The data that could have told him that was lurking somewhere behind his darkened screens.

He heard a knock on the door. He stood and moved around the table, brushing against the walls as he crossed the tiny room. He opened the hatch a crack. A cloud of vapor billowed into the room, casting transient rainbows before him. The mist had apparently come from Tanya, the light from her wristpad.

"Piers?"

"Hey Tanya. Come on in."

"Thank you. You look like polar bear, all bundled up."

"My warmest coat. It's pretty good. You keeping warm?"

"Not really," her voice wavered. She rubbed her hands together. "I'm...I'm not so sure we will make it out of this."

Piers put his arms around her. "Hey, if you look out my little window, you can see Brian's team hard at work on the shore. They're clever people. Harriet is setting up some weird wave contraption, and if that doesn't work they'll come up with something else. I have faith in our people. They've never let us down."

Tanya nodded, wiping her eyes. "Da, da. Good people. And you are a good man." She patted him on the shoulder and turned to step back through the hatch. "Oh, Piers, you must see what they've done with the halls. Very nice decorating. And the pictures *dance*. How do they do that? Especially that Kokopelli."

Her dreamy tone alarmed him; it was not the slur of a drunk. Rather, she had the air of a heavily sedated person—but he kept a calm tone. "Coca-what?"

"Kokopelli. Native American flute player."

"Where'd you learn about all that?"

"Kevin told me. And you know what? I forgot how hot he is with his shirt off."

## Chapter 35

# Sticks and Stones

“There are aches and pains after those ‘first fifty minutes of hell,’ as we call it,” the tech told Belton, “but your body will settle down. Give it time.”

Devon scowled suspiciously. “I’ve had broken bones before, and this is reminding me of those happy times,” he grumbled.

Jennifer noticed a paleness to Belton’s pallor. A sheen of sweat glistened on his forehead. She turned in her couch to face the tech, a young woman she had not yet met. “If he thinks he’s broken something, can you at least check?”

“If you were in your fetal launch position, you should have been just fine.”

“Fetal launch position?” Belton sat forward in alarm.

It was the tech’s turn to scowl. “You did view the holovid we sent with your confirmation, no?”

Jennifer tried not to look sheepish; Belton was doing well enough on his own.

The tech leaned toward Belton’s couch. “With your good arm, show me the position it was in when we entered the launch sequence.”

“I had it a bit like this, but it slid off and kinda bent back toward the floor.”

The tech immediately tapped her ear. “Johnny? Think we got an injury during the burn. Can you come to the arena with a scope?”

In minutes, another tech arrived with a small wand and a monitor. Belton couldn’t help but notice the similarity between the new male tech and the female one: same aquiline nose, same jawline, even the same haircut. Only the hint of beard on one gave any clue to his gender.

“I’ve seen that look,” the tech named Johnny told him. “We *are* related.”

“Yep,” the other tech offered. “Same clone batch.” Her eyebrows tried to meet on her forehead as she looked at her screen. She tapped a spot on it and nodded toward her brother.

“Mr...” the tech looked at his chart, “Belton, you should have watched the tutorial.” Johnny affected the tone of a scolding grammar school principal.

“Yup,” said the other. “Broken ulna. If your arm had been in the right position for departure, you would be fine.”

Johnny, whose glower matched his sister's, added, "That's why we send the holovids."

"I was in a hurry," he said defensively.

Johnny ignored the comment. "As it is, you'll be wearing a cast and taking bone growth meds for the next week."

"Maybe two," the other said with more glee than Belton could muster. "Never know how things are going to heal. Might be okay in—"

"A week," the brother finished. "I'll get the cast."

"A week? You're an optimist. I'll get the meds. Don't move that arm, Mr. Dalton." She followed Johnny out with the same gait, like a mime shadowing a hiker.

"Wonderful," Belton said to Jennifer.

She shrugged. "These high-velocity burns are wicked." Her face felt flushed from the drugs. "Aren't they, Mr. Dalton?" she added with a sly grin.

Belton shivered and glanced out the window. "Wow. Look at that."

Jennifer sat up and peered over his recliner toward a port. Outside, Mars stared at them like an immense red eye. But what she found remarkable was how quickly it was shrinking. The world they lived on, worked upon, raised families upon, explored and shopped and traveled with friends and family, the entire little universe that they knew as home was dwindling at breakneck speed.

"It's...dizzying," Jennifer said. "Unless that's the high-g cocktail."

"I don't think so. The thing is just...just...disappearing!"

The orb that had filled their window moments ago seemed more like a basketball now, and it was rapidly taking on ping-pong ball dimensions. The mesas and canyons grayed out and paled into soft lines across the red deserts. The reborn oceans to the north in Elysium and Vastitas faded into metallic blue patches, then dark smudges. Mars was melting away, fast.

Belton seemed paralyzed by the scene. "Pretty scary how everything you know can disappear so quickly."

"Mr. Dalton? We have your kit." It was the sister. The brother was close behind. The two med techs went to work, efficiently prepping and prodding until Belton's arm was cocooned by a soft, skin-tight metallic sheet.

"That should do it," the woman said cheerfully. "And I promised Johnny to not subject you to any more lectures."

A commanding voice came across the intercom. "Good evening from the flight deck. On behalf of our crew, this is Captain Reynaldo. The cruiser is now in trans-Saturnian trajectory. Gravity will remain steady for the foreseeable future, at a constant 1/3 g, so you are free to move through the cabins and sample our two restaurants, entertainment centers and observation dome. Please let our crew know if there is anything we can do to make your transit more enjoyable."

"One third g," Jen said to Belton. "Feels almost like home."

"Woohoo!" A distinguished woman bolted from her couch and promptly fell over.

"Careful, dear," the elderly man next to her said. "You're not on Earth anymore."

Belton hooked a thumb toward the retired couple and whispered, "Not so easy for them, but they'll get the hang of it."

The void outside pulled his eyes back to the window. Mars was on the other side of the ship now, and the stars moved gracefully past the portal as the ship did a gentle pirouette. He tapped on the window and looked back at Jennifer.

“We’re spinning.”

“Keeps the ship stable, oriented.” A suntanned woman with each platinum hair in perfect place stood beside Belton’s couch. “I’ve been on this flight before. Out to Titan.” She jabbed her hand toward Belton before she noticed his cast. “Oh, sorry.” She brought her hand back with the kind of reflex one gets from touching a hot stove. “Delphine Jackson. Perhaps you’re familiar with my holojournalism?” She smacked a wad of gum cheerfully.

“I’m Jennifer,” Jennifer put in, her hand outstretched. “This poor invalid is Jeremy Belton.”

“Pleased to meet you both,” said the coiffed reporter. She glanced at Jennifer with apparent disappointment, then back at Belton.

“So, you’re a journalist?” Belton asked, flashing a smile. “Is there a big story on Titan?”

She flashed back with more enthusiasm. “Titan’s one of those places where there’s always a big story. Fog all the time, mysterious landscapes, weird social combinations. All those international outposts vying for research dollars. I’m surprised there aren’t more murders or assassinations or hit squads.” She was chewing with more concentration now, like a cow with its cud.

“You say that with such elation,” Jennifer said.

“It’s what makes the world of journalism go around. Murder and mayhem always win out over bouquets and butterflies. Maybe you know my work. I did that report last year for TriPlanet News on the slave trade in the Asteroid Belt?” She looked from Jennifer to Belton. Jennifer’s blank face echoed what Belton was feeling.

“No?” said the reporter. “How about the on-location piece about the failure of the buoyant Japanese Research Station on Venus? That was a real dramatic piece. We were all in actual danger; nothing virtual about it. Got an award and everything.”

Belton shook his head. “Sorry. I don’t watch much news. Sounds exciting, though.”

The living mannequin turned. As she walked away, she called over her shoulder, “You have no idea. No idea at all.” Belton could just hear her mumble the word *hicks*.

“Congrats on your award, though,” Jennifer called after her.

“Journalist,” Belton said, rubbing his arm. “That explains a lot.”

“How so?”

“She looked just a little too perfect.”

“Even after that wild ride,” Jennifer marveled. “But I’ll tell you one thing: all this rocketing around has given me an appetite. Let’s check out the dining room.”

“Oh, let’s.” Despite his complete lack of appetite, Belton found himself actually looking forward to spending some time in space. He never would have imagined it.

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Only at night, when the dark seeped in and tore sanity from consciousness, did Jeremy Belton become a true worrier. What was wrong at Mayda Station? A

sophisticated science outpost doesn't just drop off the grid. Had there been a fire? Titan was one of the worst places for a fire to break out, with all that methane and butane and propane constantly being trudded in by astronauts' boots. Perhaps it was a power problem. Nuclear-power plants in the outer planets were stable systems these days, but things did go south now and then, and Mayda's experimental one undoubtedly had a few kinks to work out. What if they had some sort of meltdown or serious radiation leak that kept everyone from the comm centers? What about a plague? What about aliens? He had seen too many movies. He was glad he would have help waiting for him when he got to the foggy moon of Saturn. He suspected he would need it.

Poor Abigail; what had she gotten herself into? Ever since the death of her parents, Jeremy had felt responsible for her and Janice—perhaps too much so. Abby was the academic of the two, her sister the creative one: a Da Vinci, Callas and Dickens rolled into one. A renaissance girl, as Abby often put it.

Abby took after her parents in the sciences, with a pile of papers published in her name, or with her at the front of the colleagues list. When her parents died, in the ensuing dark weeks and months, he could see the fires glow in her eyes. She became driven to pursue her career. And at every professional turn, he watched her dig deeper and deeper into research, always burning, always carried along on a river of lava. While Janice engaged with the creative ones around her, eventually marrying a painter, Abby kept looking over her shoulder, back toward a past that held her parents. At times, Jeremy felt that she was a haunted soul.

How he wished he could do something about it, something to ease her pain of loss, something to free her from the driving forces of her past. But now was the time for sleep. Maybe if he counted sheep...or the number of barf bags he had used today...

## Chapter 36

# The Morning After

During the long Titan night, the only thing for Abby to do was stay in her room with a few galley items and hide away. She tried to raise Piers on the intercom, but with no luck. He was probably down in the Comm Center doing who-knows-what. Troy had not been in his quarters. In fact, he had not been in his right mind. He'd been lurking near his sub ever since his mystery absence, which he refused to talk to anyone about, according to Tanya. Maybe he would talk to her.

She threaded her way through the maze of corridors toward the bay, where the submersible hung from its special crane. Any smells had faded from the labs and rooms, replaced by the sterile absence of smell, like the crisp air of a Colorado winter day. The only scents evident were occasional and ominous. Near the seals at several habitat junctions, Abby could smell the bitter aroma of hydrocarbons, like a bad day in Los Angeles, or a disaster at a paint factory. The air was beginning to hemorrhage in from outside. With the oxygen in here, that could prove a deadly mix.

The smells didn't bother her as much as the sounds. Down one hallway, in complete darkness, came the echoes of deranged laughter. As she turned into another causeway familiar to her, she expected the sounds of machinery and air pumps. She was met with spooky silence.

At the final junction before the work habs, a scream tore through the darkness. Then, as the voice's breathing slowed, it said, "Oh, it's you. Mom, what are you doing here? How did you get all the way out here?" The voice began to fade down the corridor, along with one set of footsteps. "Don't get me wrong. It will be a nice reunion, but it must have taken you forever. And cost a fortune!"

Abby reached the hatch. The monitor gave her no clue as to whether it was pressurized and cleared, but the handle was in the 'safe' position. She yanked it. It was jammed. She pounded on the metallic door. "Troy! You in there?"

She heard a muffled sound. In a moment, the handle turned. Troy looked out, then up and down the hallway. "You alone?"

"Yeah. You?"

He grabbed her by the elbow and pulled her inside. "What's that supposed to mean? Of course I'm alone, girl." He was trembling.

Her first reaction was anger, but she knew that would get her nowhere. Love was the more powerful force. Compassion took more energy than argument, but it was worth it in the end. She took charge of herself, and carefully put her arms around his shoulders. "It's okay," she said. "We're all totally stressed out." She hugged him tightly, pulled back and looked into his bloodshot eyes. "Right?"

His tensed shoulders relaxed. He let out a long breath and nodded at the floor, his eyes downcast. "Yeah, I guess so."

"It's really dark out there. I almost ran into the door."

"Yup." His eyes darted from side to side.

"So how are you doing now that you're safe and sound back home?"

"Fine," he said, but his voice betrayed wariness. "How are you doing? You seem to be quite chipper."

"I'm cold and hungry and jonesing for a good hot chocolate. But feeling good."

"Hot chocolate sounds nice. Just what do you have to be so cheery about?"

"Hey, we're all alive. Brian's team is figuring out what's wrong with the power. I'm on Titan, a gas girl's paradise. Livin' the dream."

Troy would have none of her optimism. "We'll see how long you feel that way."

"Troy, what's going on with you?" She said it gently, but firmly. "This place is in real trouble, here. Where did you go?"

"They needed help with the drill," he said tentatively.

She remembered its frozen, lifeless hulk towering in the fog. "Guess you weren't very successful."

Troy jammed his pinky in his ear and wiggled it as if extricating a moth. "You know, Apps, this is your problem. Right here. You know what your problem is, but in these last days of Mayda Station, I'm going to tell you again in hopes that you will finally hear it."

"What do you mean, 'last days of Mayda Station'?"

"And there you go changing the subject. Just like that counselor of ours—Ortner?—told you: *Don't change the stinkin' subject.*"

"That's ancient history, and we agreed not to go there. Right now we've got real-time problems. You always"—she slammed her fist on the shelf—"bring up the past at the most inappropriate time."

Some part of the structure in the wall popped as the cold of Titan continued its inexorable assault on the habs. The station was constantly pinging and popping like a wet grille. Troy jerked at the sound. He began to smile.

"I always do, huh? Whether you like hearing it or not, Apps, you are still trying to make up for lost time. And it's not even your time. It's your parents' time. All your accomplishments and accolades—tell me again how that's going to balance out the ones they never had the chance to do on their own?" He wasn't smiling any more. He didn't need to say it. That was ground they had covered before. It seemed as though he was simply being mean-spirited, trying to push her buttons.

She felt the sting of tears in the corners of her eyes, and the heat moving up the sides of her neck. Where did this attack come from? Troy seemed to be teetering on the brink of some precipice.

He motioned toward the open door. "You're hopeless. Just go."



She did, happily. But as soon as she was out in the hallway, she felt exposed in the shadowy corridor, vulnerable. She thundered back to her room in record time and slammed the door. The habitats and laboratories and research pods should have been silent this time of night, but unhealthy Halloween laughter filled them. Voices yelled and cackled and screeched. What was happening out there? It was going to be a very long night.

Was there any truth in what Troy had said? What did he mean by Abby being on the ‘wrong track’? Clearly, he was not himself. Still, people under stress often said true things that they might not otherwise. Had she learned nothing since the death of her parents? Since her travels to Earth and Titan? Was she really hopeless?

Abby could just make out rivulets of methane slithering down the window in oily streams. The darkness clawed away at her spirit. It numbed her mind. It drained her strength until there was nothing left but a restless, chilled sleep.

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By now, the cruise ship was too distant for direct communication. Sanjay Rao’s message to Jeremy Belton arrived in no-nonsense text form, scrambled for security:

*ship approaching saturn with swat team.  
will make landfall on titan in two days’ time  
and deploy immediately to Mayda with supplies and arms.*

Good, Jeremy thought. If somebody had, in fact, taken Mayda Research Station by force, the crack team would have it surrounded at the very least by the time he arrived. In the best-case scenario, they would have everything back up and running, and Demian Sable, if he was behind things, would be in custody once again. Belton could finally relax, just a little.

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Abby had finished the last of her nutro-bars hours before the first hints of twilight bled across the horizon. The faint indigo always came first, a purple haze that began as an ill-defined, amorphous horizontal line. Eventually, as the light turned to a dull burgundy, the lower portion firmed up into darker shapes: hills, bumps, the rise of Mayda Insula itself. In a few hours, the sky would take on its moldering orange glow as Titan morning arrived. But even now, there was enough light to see the wave machine still in pieces on the shore, as if it had been abandoned in a panic.

It was very, very quiet. Abby crept down the hall to Piers’ quarters. He wasn’t there. She turned and headed back toward the Communications Center. Several of the doors to the personal apartments stood ajar, gaping darkness threatening to spill into the dim hallway.

Out of habit, she had been looking for the rows of tiny indicator lights on the entry hatch when she nearly ran into the wall beside it. The Comm door was secured. She tapped on it and whispered, “Piers?”

She said it louder. “Piers?”

She thought she heard something behind her in the darkness. “Piers!”

The door cracked open. “Hey, Abby. Are you, ah, okay?” He spoke the words tentatively.

“I’m fine, Piers,” she said with just a hint of impatience.

Piers lowered his voice. “Seen any weird things in the halls lately?”

She glanced back into the hallway. It was empty. Her nerves must be frazzled. “Only my colleagues.”

He opened the door and let her in quickly.

Piers sealed the hatch. “You sure you’re okay?”

“Sounds like I should be asking you.”

“I, ah, yeah. Sort of. *I* am, but I’m pretty sure Tanya’s batty as a vampire’s balcony. She was going on about wall paintings and flute music and dancing co-koalas—”

Abby broke in. “Wait. Kokopelli? Is that what she said?”

Piers thought for a moment. “Sounds about right.”

“It’s a Native American mythological flute player. Troy and I saw paintings of Kokopelli in Kevin Nordsmitt’s room.”

“Yeah, flute player. That’s what Tanya told me. But get this—when I asked her how she knew about it, she said Kevin told her. In the hall. Just a while ago.”

Abby opened her mouth, but nothing came out.

Piers said, “That was my reaction.”

Abby felt a wave of apprehension building slowly within herself. Had Troy placed the idea of Kokopelli in Tanya’s mind? Did she know anything about those Native American sketches in Kevin’s room, know about Kokopelli before she had her hallucination with Kevin? That was the most likely scenario, but it didn’t quite fit. Troy himself hadn’t known about the little flute player until Abby told him, so he hadn’t planted the idea, had he? And Tanya’s perception clearly was that Kevin told her, in the hallway, long after he was dead and gone. Then there was Doc Mason, complaining about flute music that Abby couldn’t hear. Auditory hallucinations, to add to everything else? It seemed to be the same sort of shared hallucination that people held as they watched whatever they were watching out the windows. What was going on?

“Where is she?” Abby asked urgently.

“Not a clue. But Abigail, it does beg the question.” He looked down at his hands and fidgeted in silence.

“What question?” she prodded.

He turned to her and put his hands firmly on her shoulders for a moment. The pressure of his palms on her skin, his warm fingertips on her back, his thumbs gently resting on her collarbones gave her a sense of security, encouragement. “Abby, everybody seems to be crazy. *Why aren’t we?*” He sat down on the little chair behind his desk, as if the question had exhausted him. “Is there something different about us? Where’s all this coming from?”

Abby tried to walk back and forth, but there was no room. She leaned against the wall and kept bouncing her back against it. “Seems like it all began when we saw that launch, right?”

Piers looked up at the ceiling. “No, later. I’ve been thinking a lot about it, trying to remember, and I don’t think anybody did anything really out of the ordinary—at least by the standards of this weird place—until sometime after the drill broke through.”

“To the water ocean.”

“Yes.”

“A hundred clicks below.” Doubt could be heard in her voice.

“Right. Like they say, it’s something in the water.”

Abby shook her head. “No good. First of all, that drill is sealed. Nothing can come up unless it comes through the closed system, and it’s closed in several layers of security, so the thing’s not going to leak. Not ice, not water under pressure, nothing. Tanya said they were very careful about back contamination. And we aren’t drinking it, we’re analyzing it.”

“Maybe something is in the ice matrix, locally. If the ice down there is spongy enough, there might be chambers linked to the passage cleared by the drill. Perhaps we’ve got contamination indirectly.”

“I think that’s a stretch—something in the solid ice that we melt for our water?”

“Happens in Earth’s aquifers, doesn’t it? Water filtering through seemingly solid rock over time?”

“Maybe so. But everybody’s been drinking Titan water for decades. We walk on it, for the love of Mike.”

Piers wilted in resignation. “I suppose so.”

Abby straightened. “But wait a minute. You don’t drink it.” She surveyed the piles of water bottles around the room.

Piers jabbed a finger at her. “But you do. It’s in your tea and coffee and hot cocoa!”

She frowned at the floor. “It’s got to be something.”

Piers patted one of the dead consoles. “Whatever it is, it’s getting worse and we’re flying blind here. There’s not enough power for comms, let alone life support. I don’t know if anybody is on the way, if anybody heard my last transmission.”

“Somebody must know by now, because you haven’t been chatting anybody up. I hear you in here blabbering away all the time. The cosmos is probably rejoicing at the silence.”

Piers grinned. “Hey, communication is my life. Sit. Have a bottle of non-Titan water, guaranteed to be uncontaminated.”

Abby took the bottle from Piers and shoved a pile of detritus off the chair.

“I keep thinking there’s a way to get a message out. I asked Troy about the sub, but it’s strictly short range communication, except for nav.”

“Speaking of crazy, Troy’s another one.”

“He’s got whatever it is? Unfortunate. I was hoping we could count on him to help out.”

Someone tapped gently at the door. “Piers?” came the tentative voice of Tanya.

Piers grinned at Abby and whispered, “This could be entertaining.”

Before Abby could object, he had opened the hatch. “Come in, my dear. Welcome to the completely offline Comm Center.”

“Spaciba, sir. Hello, my little Anya.”

Tanya gave Abby a hug.

Piers said, "May I offer you some freshly chilled water?"

"Still liquid?"

"Just."

"Love some." She took a bottle and tried to open it. "My fingers are too cold." She shoved the bottle to Piers. He cracked it open and handed it back. Tanya drew a long draft before sitting on a box, apparently planning to stay for a while.

"How are you...feeling?" Abby asked.

Tanya held her bottle aloft in a sort of toast. "Fine. A little headache, but otherwise. Please, continue what you were doing. I will just enjoy company."

Piers took her at her word and turned to Abby. "Why do you suggest he is crazy?"

"Who is crazy now?" Tanya broke in.

"Troy," Piers blurted. Abby winced, not wanting to get Tanya involved in this. Who knew what her mental condition was at this point?

"He sure is!" Tanya barked. "That poor guy. Fruitpie. Crazy man."

"Can you elaborate?" Piers asked Abby.

"First, he lied about going out in the sub. Said they needed him at the drill."

"Nope," Tanya offered. "Nobody has been out there since the monsters came."

They both stared at her. In a very controlled voice, Piers said, "Tell us a little about the monsters."

"You know, they are almost cute. If they weren't so big, I mean. That chemist lady, Dr. Delpine or Daphnine or whatever it is, she calls them Loch Ness Monsters of Titan. I think that is perfect, don't you? So when that one chased Stanley up main tower of drill, everybody abandon it."

"I don't blame them," Abby said, indulging her.

Piers shook his head, as if trying to get rid of an annoying distraction, and turned back to Abby. "You think Troy lied about the sub. And what else?"

"He went off on some tirade about something." Her voice trailed off. She dropped her gaze to the floor. "I guess maybe I'm overreacting."

"Tell me. I'm interested."

"Me, too!" Tanya said with too much enthusiasm.

"I don't know; he just seemed to have lost all his self-control. He said it was the last days of Mayda Station, and he was really exhibiting paranoid behavior. Peering around corners and flinching at sounds. He brought up things from our past, things about our relationship."

"Oh," Piers said flatly.

"What's that supposed to mean?" she said, accusation tinging her voice.

"I didn't mean anything by it, Abigail. You know me. I'm not on anyone's side. But you must admit that you two have some baggage, and sometimes baggage gets in the way of rationality. Just a bit. Agreed?"

Abby looked away. She remembered Troy's comment. *You're hopeless*. "Right." After a moment, she looked back at him. "You're right, of course. Lots of history."

"I think you are one of the most brave and brilliant people I know," he said. "I admire the veracity of your work and your relationships. That's not what I'm saying at all."

It had been a long time since anyone had spoken to her like that. She felt like kissing him. She might have, if her teeth hadn't been clattering so much and Tanya hadn't been there. But she could tell by his tone that he was winding up to one of those 'but' clauses.

Abby pushed. "Go ahead and say it. 'But' what?"

"It's just that even though he's not very smooth about it, there might be truth in some of the things Troy says. Just take his ideas into account. It might be helpful, sometimes. That's all I'm saying."

Abby couldn't hold back a Cheshire cat grin. "I guess you've got just about enough caveats in there to cover yourself!"

"Why they have bags?" Tanya interjected.

Abby said, "We go back farther than you probably think."

Tanya looked at Piers. "Why Troy knows her best?"

"Well, it was—let's see—how long were you dating?"

Tanya jerked as if she had been hit by a cattle prod. "You and Troy? Boyfriends and girlfriends?"

"Everybody makes mistakes," Abby said sheepishly. Both she and Tanya were blushing.

"It was before either of them came to Titan," Piers tried to explain. "Not common knowledge."

Abby added, "And it was only a couple of dates. That's all it took for either of us to see the oil-and-water effect the two of us were playing out."

"Not a good mix?" Tanya offered.

"That's putting it mildly. Believe me, we were more surprised than you are. Neither of us planned on ending up on the same ice ball at the same remote science station. Not the ideal situation. But here we are."

"Yes," Piers said. "Here we all are, in those last days of Mayda Station."

"Maybe Brian and the gang can fix our reactor," Abby said quietly.

Tanya stood, a look of realization playing over her face. "No need to fix it. Just missing a part. Somebody stole it."

"Stolen part?" Piers said. "Did Brian say that? Hey!" But Tanya was already out the door and gone. He looked at Abby. Her mouth was hanging open. He said, "Why would somebody steal critical hardware from our nuclear plant and put themselves—and us—through all this?"

"It would make more sense if they weren't from here at all."

In unison, they said, "The north shore."

"Well, that makes it simple," Abby said. "We've got to get it back."

## Chapter 37

# Serpents in the Morning

Tanya made it back to her room in time to see the Sun rising above the hills. It looked like a tangerine ember in the clearing fog, spilling itself across the molten bronze of Kraken Mare. The morning should have been a welcome sight, but as soon as Tanya's eyes adjusted to the light, she saw them. They were what she had feared, and there were hordes of them. The monsters were out at Mayda. Long necks rose and fell in the undulating waves, but the beasts no longer stayed out to sea. Now, a few of the most determined had lumbered their way onto the shore, and they were coming this way.

Monsters in the methane. Amazing.

Troy and Abigail. Astonishing.

A dead man playing flute music to her in the hallway. Astounding.

There was something she needed to talk to Brian about, something important. What was it? Her temples throbbed. Her eyes wouldn't focus. She needed a good night's sleep. She just couldn't remember what it was she needed to tell him.

(\*)

Abby's trusty flashlight—the one that had seen her through grad school, fieldwork at the volcanoes of Elysium and in the canyons of Ganymede, and tours inside Hawaii's hot and humid lava tubes—was on its last legs. Its dim light played unevenly against the hatch to Troy's sub room. She cranked hard on the handle. The door opened easily. She didn't think the air could be any colder than it was in the hallway, but a flash of arctic wind hit her face from inside the darkened vault. The sub loomed like a dark blue whale, hanging from the ceiling, lifeless. Troy was not here.

What was Troy up to? He was slinking around like a juvenile delinquent worried about getting caught for some minor infraction. He was acting sophomoric, immature, and decidedly paranoid. She felt sorry for him. Somehow, even after all this time, he triggered in her that same feeling she had for abandoned puppies at the

pound. On one level, he made her angry with his suspicions and his tirades, but on another, she wanted to help him, to “make it all better.”

Maybe that was the flaw in their relationship from the beginning. She found human interactions far more baffling than planetary weather systems, but both could be tempestuous. She smiled at the word. Tempestuous. From tempest. She thought of the greatest tempest of them all, Jupiter’s Great Red Spot, with its hurricane-force winds and its vast size, two full Earths across. Then there were the blue storms on Neptune, like cobalt jewels floating in an azure fog. There was nothing like those on her home world. The worst storms Mars ever got were the great walls of dust that rolled off the deserts, draping powder across entire cities and battering roofs and walls with stinging winds. Her mind wandered sunward, to those terrestrial hurricanes that had come with more frequency and severity with Earth’s changing climate. Storms. Tempests. That’s what Troy was: a tempest.

She headed back to her quarters, past bands of people huddled together for warmth or grouped around windows gazing at scenes she could not begin to imagine. The morning sunlight, such as it was, had begun to bring a kind of psychological warmth to the day. It cast a yellowish pall inside her room. As she entered, she saw Troy at her kitchen table, hunched over something.

“Hey Apps,” he said without looking up. “Sorry if I was a jerk back there.”

The tempest had calmed. But Abby was distracted by something that should not have been there. Was it finally happening to her? Did she have the sickness—the infection or hallucinogen or whatever had descended upon the entire facility? Perhaps it had just been a matter of time. But there, sitting on the table in a small glass next to Troy, a perfect red rose stood in a few inches of water. A live rose. How ridiculous. Perhaps there wasn’t much time before they would all be gyrating blobs of insane gelatin.

Troy looked up. She didn’t dare say anything. Although it was obvious that people were having shared hallucinations, maybe he hadn’t seen this. Troy nodded at the glass.

“Looks like somebody’s attempt at an apology. Or peace offering, maybe?”

Where would Troy get something like a live flower? Maybe it was just an illusion, but his apology was real, wasn’t it?

She smiled and put a hand on his shoulder. “Apology accepted,” she said, somewhat triumphantly.

But Troy didn’t seem to have heard her. He was staring at his wristpad, looking confused. “Where are they?” he murmured.

(\*)

Like so many things in nature, the rings of Saturn were beautiful and deadly. Four hundred thousand miles from inner to outer edge, the vast disk of ice and dust fanned out around the planet in a plain less than a hundred feet thick. To drop into any orbit around the golden giant, a ship must cross the plane of the rings, whether its ultimate destination was Enceladus or Titan or Phoebe or Saturn itself.

The spectral colors of the ring particles changed as the ship moved over the surface and as the debris shifted in the weightlessness. The floating pebbles and ice grains glimmered and sparkled in the sunlight. Thousand-mile-long tendrils of microscopic particles moved along lines of static electricity just above the ring plane, giving the appearance of the spokes of a wheel radiating away from the planet. To starboard, the tawny dome of Saturn covered half of the sky, its faint storms and bands painting the intimidating globe in subtle autumnal hues. Lieutenant Joshua Lyon had done this before, and he loved it. His copilot was not so enthused.

Jennings began to agitate as he looked out his porthole. The ship closed the distance, and the initial wonder brought by the rings shifted to something more akin to terror. Icebergs and stony boulders bobbed in fields of hail. If the ship went through the rings here it would be pulverized instantly.

“There, up ahead,” Lyon pointed through the cockpit window. In the tumbling rocks and sparkling sarsens ahead, a dark stripe was opening up. “Keeler Gap,” Lyons said confidently. “We just wing our way through there and loop on around to our appointment with Titan.”

“Doesn’t look like much room,” Jennings said nervously.

“Forty-two clicks across. Plenty of room.”

“And one little moon keeps it clear?”

The Lieutenant nodded. “Daphnis.” He keyed his microphone. “Okay team, stand by for final capture.” The 30-member crew tightened their shoulder straps and sealed their helmets—each marked with the bold letters SWAT—as the ship decelerated. The vast ring system spread before them like an infinite racetrack, concentric circles of glistening ice shimmering and undulating as gravity waves moved across them. Below them, the ship’s shadow grew larger as the rings flattened out. Subtle tans, yellows and grays inscribed what now looked like parallel lines vanishing at the horizon. In the distance, the battered moon Mimas peered above the rings, cut off exactly at midsection by the glowing plane. As their shadow came up to meet them, the black pathway of the Keeler Gap seemed to part the rings for them.

“A modern-day Red Sea,” Lyon said, tapping a joystick. He dived into the gap and headed for the other side. Jennings felt like he was riding a glass elevator, watching a thin floor pass. But as the rings swooped by and became a ceiling of grainy material above them, they came face to face with a large and well-armed ship.

“What the he—” The copilot’s voice cut off as the rear of the ship exploded.

“They don’t seem to like us,” Lyon said. “Team, we are under attack. I repeat, we are—”

A second jolt hit the port side. Jennings’s head slammed against the side of the cockpit. He seemed to be out cold. Lyon hit the ship’s automatic defense systems, but one side of the craft was badly damaged. “Burkette, up here now.”

Burkette pulled himself into the copilot’s seat, unceremoniously throwing Jennings into the back. Jennings ended up floating against the ceiling just above him. “Somebody knew we were coming.”

“Do ya think? We’re shot up pretty bad, but I’ve got lots of fuel and two good engines, so I’m changing trajectory.”

“To go where?”



He pointed up.

“Into the gap again?”

“Not a chance. We’re sitting ducks. I’m going to hide us in the rings.”

“In, sir?” Burkette looked at Lyon as if he had dachshunds crawling out of his ears.

Lyon held up a hand. “I know it’s a hail of bullets, but if we match speed with the ring debris, it may not be too bad. Otherwise, we’re done.”

Burkette looked at the screen. The ship was gaining on them. A small, nasty-looking missile sailed by, narrowly missing the end of the nose. “Sounds like a plan. I like this plan.”

They were still a couple kilometers away when they heard the barrage on the outer skin of the ship. It grew louder and stronger with each passing second.

Lyon squinted out the viewport. “If we can just make it a little further, and just a bit slower...”

A loud crash echoed somewhere below. An alarm sounded.

“We’ve been hit,” Burkette called out.

“Of course we’ve been hit,” Lyon growled over the din. “We’ve been hit millions of times. That’s why it’s so loud out there. It’s all just a matter of degree.” The ship bobbed, then steadied itself.

The wall of shining debris approached them in waves and shelves. Lyon hit the thrusters, slowing the ship, matching speed with the particles. He banked into the icy cloud-wall. Suddenly, there was silence. Beautiful silence. “Welcome to Saturn’s magnificent A Ring,” Lyon whispered. “Now we match the course of the ring particles and orbit Saturn here for a while. Just like following a race track, except that nobody can see us in here.”

Out the window, a tan fog enshrouded the ship. Ice crystals and small bits of rock drifted slowly by. Beams of sunlight filtered through the particles like sunbeams in a misty rain forest. Now and then a loud ping sounded somewhere in the ship, but with the engines off and the sense of weightlessness, the experience was almost soothing.

The crew had almost repaired their third engine when the other ship found them again. This time, they weren’t so lucky.

## Chapter 38

### Shifting Allies

Jaime was a tough cookie. This much Kinto knew. So when she burst through his door, he knew that some attention was in order. He remained reclining on his bed, his head against the wall, fingers laced behind his neck, eyes at half-mast. “What’s got you riled, woman?”

She slammed the door to his personal ‘quarters,’ which were nothing more than a bunk and washbasin. “There is news from Saturn. Did you hear?”

“Did they find ring number two bazillion?”

“Montenegro’s hotheads destroyed a SWAT ship from the Jovian system. Obliterated it. Probably no survivors.”

Kinto sat up. His expression clouded. “That seems unnecessary.”

“And unwise? How about reckless? Or even suicidal? We’ll have the entire system on our backs, just when we’re getting things set up.”

“The timing is not good. Why would a SWAT team be here, anyway?”

She raised her shoulders dramatically. “Montenegro knew they were coming. Vesta gave us the heads-up. But this? The guy has come unhinged. Said something about how we’re ‘building an empire’ and how ‘not all considerations are economic. Some are security-related.’ He asked for questions, and that guy from Europa, the guy with the respirator, questioned the necessity of killing the crew. You know what Montenegro said? ‘In the beginning, sacrifices must be made. Your high morals can come later.’”

Kinto was frowning in thought. “Perhaps now is a good time to be thinking about allegiances.”

“Alternate allegiances?”

“Exactly.”

“I think I’ll try to find Marv.”

“Be careful, Miss Jaime. He is a very loyal man.”

“Maybe it’s time he reevaluated.”

(\*)

Abby walked the length of her little table and stopped across from Troy. “Tanya says there’s a part missing from the reactor, a part that got stolen. I think it’s with whoever is running the show on the north shore. Unless it’s right here somewhere.”

“It’s not here,” he said too quickly. Troy looked embarrassed. “I can tell. By the radiation signature.”

“Radiation signature. I didn’t know you were so well versed in those things.”

“That’s right.” Was his tone defensive? “I tracked it.”

“Did you take an online course while I wasn’t looking?” He didn’t say anything. “We’ve got to get it back.”

“She’s right,” came a voice from the door. Piers looked through. “Mind if I come in?”

Abby motioned for him to join them, as Troy spoke. His tone was casual, to the point of being apathetic.

“Look, guys, it’s a lost cause. It’s way up there somewhere.” He gestured in a northerly direction with a limp wrist. “We’ll never find it in time. The only thing left for us to do is evacuate.”

Abby turned on him. “*Evacuate?* How would we? We have one crippled rover and one that’s complete toast—parts still haven’t arrived from Titania base—and both rover busses are down thanks to that fire from the leak in the east section. Things can only get worse over there.”

Piers added, “Whoever did this timed it perfectly. Our next ship is an unpiloted supply, and the next people transport won’t be here for over a week.”

Abby took up where Piers left off. “And we do have one four-person rover that might make it as far as Kosovo/Taishan on a good week. But we haven’t been having good weeks lately, have we, Troy? So how would you propose to ‘evacuate’ everyone to safety? It’s a very long walk to civilization.”

Troy continued staring at his wristpad, its light illuminating his face in a ghostly blue glow.

Piers sat down next to him. “Troy, I think the only prudent thing to do is for Abby and myself to take a Zodiac out to the north coast and try to get the thing back.”

“I’m afraid we’re missing one of the inflatables; Brian’s crew took it to the far side of Mayda Insula, where the currents are stronger. They’re working on another wave machine. And the outboard on the second big one is damaged, perhaps irreparably. No one seems to know where our small boat even is.”

“That is too bad,” Piers said, “because that leaves us only one choice. We take your submersible.”

Troy’s head jerked away from his wristpad. “You’re insane. You can’t pilot that complex vehicle.”

“But I can,” Abby said. “You said so yourself. I’ve had plenty of on-the-job training. Remember?”

Troy let out a long breath and stretched dramatically. “Under normal circumstances, your plan would seem reasonable. But I’m afraid I’ve got that port engine all apart. It’s still overheating now and then. Under repair and all that.” He was frustratingly cavalier.

Abby leaned across the table and nearly touched her nose to his. Through clenched teeth, she said, "Then put it back together. Get it done. We need it. Now."

Troy was silent. He buried his face in his hands, rubbed his eyes, and then massaged the back of his neck. Finally, he said, "I have a better idea. I have several good short-range handhelds on board ship. Piers, I'll leave one with you so we can stay in radio contact. Apps, you and I will go find our missing part from whoever these scoundrels are. You can sail this thing in a pinch, but—"

"I know. It's delicate."

For the first time in the conversation, Troy smiled.

Abby noticed, with some relief, that Piers was looking at the flower on the table. "Nice rose, huh?" she said. "I have no idea how it got to an ice ball like this."

Piers seemed to be studying the corner of the room with an odd tightness to his mouth. "Well, you know, a person can find beauty in the strangest of places."

(\*)

Piers had no idea how much time it took to prep a submersible, so he rushed. It was a long shot, but at least it represented some sort of backup plan. He had thought things out carefully. Mayda had a host of transportation choices, thanks to Titan's benign environment for travel. Its dense atmosphere and low gravity left travelers a variety of options for long-distance mobility. Flying was the mode of choice, preferably with big wings. Mayda had no aircraft in the conventional sense, but they did have a nifty little two-person helicopter. Unfortunately, Mayda's chopper was on loan to the high-altitude research station in the mountains of Xanadu. The place was a bitch to drive into, and the Chinese needed the aerial perspective for some of their research on drainage patterns. The Dutch staff down the mountain at Tortola Center often complained that the Chinese mountain scholars were overflying their airspace, which was odd since Tortola was surrounded by dunes and plains rather than mountains, but all that was none of Piers' business.

Mayda also had access to the Brazilian Aerospace Conglomerate's blimp, as large as the old Hindenburg, and more maneuverable. Its hydrogen-filled envelope posed no danger of burning, as the Hindenburg had, simply because there was no oxygen around to combine with the hydrogen. The dense atmosphere made it easy for the craft's expansive, lazy propellers to push, providing the great airship with a slow-motion appearance as it plied the orange skies. No doubt about it: that would have been an excellent choice. But the International Southern Polar Survey was leasing it. The thing was probably floating somewhere over Ontario Lacus right now.

The jumper, with its rover-like treads, deployable pontoons, hover-turbines and stubby wings, was hopelessly mangled from the most recent crash. It was a great engineering concept, but the darn thing was just too unstable a design. So that left...

Rovers. The two vans had been badly scorched in the fire, and Piers doubted they had the range he needed anyway. Only one of the three standard rovers on site was functional. If they had any power, they could have charged a second one up; otherwise that one was just peachy. But there was just one that had a full charge, healthy fuel cells, and a good transmission. That was the one he was banking on.

Brian was at a table in the galley with two of his techies, trying to warm up before returning to work outside. Piers said, “How would you guys like to do something for crown and country?” They stared at the Brit with blank expressions. He tried speaking American, slowly. “Brian, there may be a way to save this place if a couple of your techs are willing to get moving right now, and if they’re up to a very long drive.”

Brian said, “I’m game if they are. Truthfully, we’re just not getting very far out there with what we have to work with. But it’s up to my trusty techs here.” He nodded at them quizzically.

One of Brian’s assistants—an attractive Hispanic woman on tour from the Callisto settlement—shrugged and looked at the other tech, a wrinkled, spindly man with graying hair. “Suits me,” the woman said. “Willy?”

“All I’m doing out at the wave generator is getting frustrated. Sure, I’ll go.”

Piers clapped his hands together. “Excellent. Grab food, enough for a week or so, and grab full supplies for four suits as well. Meet me at the south garage.”

Brian frowned. “Four suits? Two people?”

“Just trust me.”

## Chapter 39

# The Hunchback of Mayda Insula

Troy Fels hunched over the dashboard of the submersible like Quasimodo. His bloodshot eyes squinted into the distance, studying something Abby couldn't see. His labored breathing whistled through gritted teeth. Haloes of dark moisture ringed his sleeves and painted a stripe down his back. His hair did a fair impression of Einstein.

"You look like Captain Nemo," Abby said. "Why don't you relax? At least until we get there." Troy kept his eyes ahead. His breathing quickened. Abby suspected something was up. "What are you so nervous about? What are you not telling me?"

He turned his head to her, smiling. The smile gave her the kind of chill that her cat did when it was about to pounce. "You don't know everything. You think you're so smart. But you don't know who's up there, do you?" He turned back to the controls and to the empty methane abyss ahead.

"What are you talking about? You're just not making much sense."

"So demanding, aren't we?" He shook his head.

"Troy, who's up there?"

His grin faded away. "How would I know something like that? You are so distrustful."

The pitch of the engines dropped down the scale to silence.

Troy unstrapped. "Oops. There's our little alarm again." He made his way aft.

"I didn't hear anything."

He paused and held up his hand, as if training a dog. "You stay."

Abby watched the darkness outside. Flotsam drifted by the windows, bobbing in the beams of the sub's headlights. The cockpit leaned slightly left, then back to the right in a soothing rocking motion. A set of lights darkened on the console before her.

"Too bad," Troy called, returning to his seat. "Looks like we lost a fuse or something."

"A fuse? That's ridiculous." Abby jumped from her seat. "I'm pretty good at electrical stuff. Let me have a look."

She stepped past the center console and the ladder leading up, and proceeded to the aft logistics compartment, the small closet from which Troy had just returned. There, lying on the deck, was a cable, unplugged from its place in the wall.

She felt a wasp-sting in her neck, and swiveled to see Troy with a glistening hypo. “What do you think you’re doing?” The words lay heavy in her mouth. Troy had done something to the cabin lights. They were so soft, so dim and romantic...

“Preserving my investments.” His voice reverberated strangely.

Everything leaned sideways, including Troy. She wondered, for just a moment, how he could stay on his feet at such an odd angle.

## Chapter 40

# Silence of the Grave

It had been far too long, and Piers knew it.

“Mayda to sub. Piers to sub. Do you read?”

He heard only the waves of energetic fields radiating from Saturn as background static. Where were they? He felt a tendril of sweat weave its way down his back, and another threaten to drop into his eye from his forehead. He wiped his face, sat up straight and began again.

“Mayda Station to sub. Do you read, Troy?”

Silence.

By now, they should have been two-thirds of the way to the other side, and he wanted to make sure he could remain in contact. Perhaps he had just proven the negative. But the channel was open. The light was green. The radio was able to send as well as receive. At least it thought it was.

Piers flipped to a different channel and listened. More static. He tried a third. Nothing. He returned to the first.

“Piers to Troy. Do you read? Troy, where are you?”

If the radios worked, and the channel was open between them, there were only two possibilities: they chose not to respond—unlikely at best—or they were unable to respond. That would be bad.

(\*)

Clark and Montenegro sat at the small desk in what used to be Clark’s office. Marv burst through the door without knocking. Montenegro smiled mildly. Clark glared at Marv as he had so many times before.

Marv stood at attention. “Sir.” His eyes swiveled from Montenegro to Clark. “Sirs. Radar has just spotted an incoming ship.”

“Incoming?” both men said at once. It was Montenegro’s turn to glare, and he cast his baleful eye at Clark. Clark fell silent.

Montenegro said, “Incoming from where?”



“Our best radar guy has narrowed it down to a couple possibilities. He says the thing is either coming from Port Antillia on a polar run to Cusco, in which case it’s just a little off course and will be headed east soon, or it’s coming from the Sino-European complex at Kosovo/Taishan, headed for Mayda.”

“And how soon will they know?”

“Minutes, sir.”

Montenegro looked at Clark and gestured toward the door. “Shall we?”

Three techs hunched over two screens, trying to balance in the cramped quarters. The addition of Montenegro, Clark and Marv didn’t help.

“Report,” Montenegro snapped.

Two of the techs stood, while the third, eyes glued to the screen, reported. “It’s definitely coming this way. I had hoped it was just a transport on its way to Cusco, but no such luck.” He looked up and realized who was in the room. He launched to his feet and said, “Sorry sir.”

Montenegro waved the air with his cudgel. “Continue.”

“It’s a fairly substantial ship, cargo of some kind. Definitely coming for us, not for anywhere else.”

“No possibility it’s going to the east or west?”

“No sir. I tracked it from the Sino-European complex at Kosovo/Taishan. Right down the pike.”

“Crew?”

“On a ship of this type, undoubtedly.”

Montenegro swiveled to Marv. He raised his famous baton and waved it at him. “It must be headed for Mayda. Get rid of it.”

“Sir?”

“Get rid of it. Now. If you don’t have missiles with the range or speed, we brought plenty. Surely you have a few minutes to get a bead on the thing.” He turned to the radar tech. “Yes?”

“Yessir. It’s still half an hour or so out.”

Montenegro turned back to Marv and raised his eyebrows at him. Clark put in, “Well, Marv? Get to it, man!”

“Yes sir.”

Marv slammed the hatch behind him. Clark turned to Montenegro, eyeing the truncheon. “What is that thing, anyway?”

“This ol’ thing? Just an artifact I picked up. A baton of the Black Watch.” Clark looked at him vacantly. “Senior regiment of the Royal Highlanders. Part of the [Scottish Division](#). Highly trained. Dated back to the eighteenth century. When people heard their bagpipes coming, it struck such fear that they usually chose to flee rather than fight. That is the kind of discipline we need here, wouldn’t you say?”

“Yes, yes sir. I would.”

## Chapter 41

# The Long and Winding Road

Piers had not been kidding. The drive to Kosovo/Taishan was a long one, and none too easy. There were no roads in the north, and when the duo finally found the “equatorial highway” that made its way from Novum Baikonur through Kosovo and eventually to Antillia, the road turned out to be a wash-boarded, potholed mess. Brian’s second in command, Laurita Hernandez, found it easier to offroad on the rover’s inflated donut-like tires. Deployable treads handled the few scattered dunes easily.

Willy Braun, riding shotgun, cocked a thumb out the window toward what was left of the road. “Don’t they ever grade that thing?”

“Once a year, whether it needs it or not.”

“Once an Earth year, or once a Saturn year?”

She just smiled.

“We ought to be getting close enough to the place, don’t you think?” Willy held up a portable radio.

Laurita stuck out her bottom lip. “You can try. I think we’re still out of range. These little things are local only. I just don’t understand why the satlink doesn’t work. It always works.”

“Murphy’s law.” The tech held up the small radio. “This is Willy Braun of Mayda Station, Willy Braun of Mayda Station. Do you read, K/T Station?”

Silence. The rover bounced in and out of a deep rut. Willy grunted. Laurita sounded concerned. “How’s the car sickness?”

“Not so hot.”

“I’m telling you, these patches work great, and you’re not being a wimp to use one.” She held up a flat packet the size of her thumb with one hand as her other hand cranked on the steering wheel.

Willy took it reluctantly, reached through his open visor, and slapped the patch against the side of his neck.

“Wimp,” Laurita taunted.

“Willy Braun to K/T Station. Do you read?”

“Give it a rest, Wilhelm. We’ll be there soon enough.”

The man let out a long sigh. “Guess you’re right. I just keep thinking of all our friends freezing back there, and we don’t even know if these guys can help.”

“Oh, they’ll help, all right. Come hell or high methane, they’ll help. Hey—” Laurita was leaning toward the windshield.

“Looks like...yeah, it’s a ship. And it looks like it’s headed toward—”

“The north!” Laurita yelled.

“Toward Mayda. Piers must have gotten his mayday through after all, bless his little limey heart.”

A milky white trail weaved in and out of the mist above. As it approached a point overhead, Laurita and Willy could make out its details.

“That’s a substantial-looking ship,” Laurita said.

“Big enough to carry a decent load,” Willie agreed. “That’s good. Mayda needs all the supplies they can get.”

Laurita shimmied the rover to a stop. They watched the ship glide above them, its engines singing a low thrum. Suddenly, a piercing scream came from behind, to the northwest.

Willie swiveled in his chair, craning his neck and looking through the roof windows. “What the heck is that?”

“Now that, *that* looks like a missile.”

“Not good.”

“What’s going on?”

The two watched, mouths hanging open, as the glowing point of light tore a crack through the sky, meeting the transport ship in a blossom of fire. They cringed reflexively. Willy groaned.

The glow faded from the clouds. Radiant pieces of wreckage appeared out of the fog directly above them, trailing smoke.

“Somebody did that,” Laurita said, numbed by the surreal scene. “On purpose. Killed them.”

“Hey, that stuff. It’s coming this way.”

Laurita’s monotone betrayed her shock. “You mean, as in down? It’s pretty straight-forward Newtonian physics. What goes up must—”

“I mean,” Willy cut in, “It’s coming down on us!”

He opened his door. Laurita reached over and grabbed his arm. “We have a better chance if we stay in here. Duck!”

The tinkle of metallic hail rang out on the roof of the rover. Ten yards ahead, a large cone of steaming metal slammed into the ground, digging out a crater and tossing a slurry of dust and icy gravel over the windshield.

“That was close,” Willy said. The grating crunch of metal jarred the rear of the rover. The cockpit nosed up into the air a few feet, then hit the ground at an angle. The vehicle bucked, bounced to the left, and then rolled right, farther and farther, and finally onto its right side, spilling coffee cups, papers, and Laurita all over Willy.

“That was closer,” she said, prying herself off of him.

They pulled themselves from the crippled rover. The airlock had busted open, and cracks spidered several of the windows. The left quarter of the windshield was

gone, leaving the cockpit open to the elements. Laurita put her hands on her hips. “Can we make it to KT if we walk?”

Willy called up the map on his heads-up display. “Just under twenty clicks. We can make it if we take the other set of suits with the extra oxygen. But it’s going to take us a couple days. By then, I don’t know what shape Mayda will be in.”

“I doubt Kosovo’s got another ship like that one to spare, anyway. Not that they’d be willing to risk, with somebody shooting things down. We may end up being the only survivors of Mayda Research Station.”

## Chapter 42

# Remembering Old Times

It was a dreamlike feeling, stepping with your feet while not really touching the ground, moving while still waking up. Abby remembered having oral surgery on an impacted wisdom tooth as a teenager. The normal laser procedures wouldn't work in her case, and she had to be put under light anesthesia, but she had one of those sensitive systems. The dentist had never seen anyone react to the medication as she had. Her first post-operation memory was one of walking along a passageway, propped up by her mother. But in this case, her mother was nowhere to be seen. Troy was ten steps ahead of her, and the people propping her up were not very maternal.

Troy glanced over his shoulder. He grinned. "Hello, sleepyhead."

Abby grunted. The corridor in which she found herself had clearly been constructed of hollowed-out ice with some kind of coating over it. The air was chilly, but certainly heated beyond the outside temperatures.

Troy. Now she remembered. He used to be her companion, her Sputnik, as Tanya would put it, her attendant traveler. But now he served a more Biblical role. That Judas! Betrayed by a hypo. His actions went far beyond any illness he might have had from whatever was going around the habs. No, this went deeper. He said something about his investment. What kind of investment? How could he betray her like this?

They passed through a succession of chambers, and she began to focus for the first time. All were filled with weapons. The first housed an assortment of small arms, handguns and large automatic pulse weapons, shoulder-held rocket launchers and the like. The second room upped the game, with person-sized rockets that looked to Abby like small surface to air missiles. The next room was far larger and housed all-terrain vehicles outfitted with various pulse-guns. There were even small single-seat hovercraft and suborbitals.

"Next right," one of Abby's keepers called to Troy. The group turned into a cavernous room with tables and the smells of food.

Abby sniffed in the aromas, realizing how famished she was. "Mmm."

"Hungry?" the guard on her left asked. "I will be sure to call room service, first thing."

The other cackled. "You crack me up, Kinto."

At the far end of the cafeteria, they passed through an open hatch into an office of sorts. Two men sat at a central desk. Another stationed himself in the back corner, and several others seemed to be spending a lot of time attempting to appear menacing. They were doing a pretty good job. These, she supposed, were the pirates everyone had been talking about, the thieves of the outer system. These weren't the kind of pirates who wore eye patches and went around singing happy songs to their parrots. These were the kind who hijacked expensive freighters and slaughtered innocent crewmembers.

The two oafs seated her unceremoniously in a chair in the center of the cramped room. She scanned the floor. Most of the foot traffic had gone from the door she had just passed through to the desk and back, but some had led off to a door at the right wall. It was open a crack, and beyond it she could see a battery of monitors. Perhaps some kind of control booth? A security center? Abby was wide-awake now. Her entry into the room hit her like a blast of cold air, but it wasn't the ambient temperature that had brought her to full awareness. It was the man at the desk.

"Admiral Montenegro," Troy announced, "Here is our little troublemaker."

Abby smiled at the man incongruously. "Hello, Demian. Last time I saw you, you were just being locked up."

Momentarily flummoxed, Montenegro quickly recovered himself. "Hello, my dear. I had heard you were here on Titan."

"I see you have new hobbies." Montenegro frowned. Abby jutted her chin toward the armory behind. "Not your typical hunting club?"

"Oh, that. You have no idea. You've turned into a lovely young woman."

"We've both aged," she said impassively.

"*Demian?*" Kinto asked. He glanced around in puzzlement.

Abby grinned. "They don't know, do they?"

Kinto looked back at the prisoner. "We don't know what?"

"Your leader has a colorful past that goes way beyond piracy."

Montenegro stood. "Take her away. To the dock, for now. Kinto, you stay."

(\*)

As soon as Abby had been removed from the room, Montenegro pounced on the man. "Get rid of her, Kinto."

"Yessir."

"I mean permanently."

"I thought we needed her as leverage," Clark put in.

"That time has passed. She has lost her usefulness." He leered at Kinto. "I hope you won't lose yours. Go get her and do what you have to do. Chop chop. Dismissed."

Montenegro turned to Clark. "Things seem to be moving along, and we need to control them more carefully than we have been. I think it's time we paid a visit to Mayda Station to offer our help. Once we're the knights in shining armor, they'll welcome us into their deepest, most secret corners. Get a team ready. Take a rover along the western shoreline. We need to be in control of Mayda outpost before anybody else gets the bright idea of rescuing them.

"Yessir." Rather than hitting his intercom, Clark rushed from the room like a hunted squirrel.

In the hallway outside, Clark leaned with his back against the wall, breathing hard. Grudgingly, he admitted to himself that this was the turning point. No longer was he the man in charge, the emperor of Titan's Northern Quadrant. No longer did he command a great fleet of clandestine ships, plying the dark waters of the outer planets. Those days were gone. A new world had taken their place, a world hijacked into existence by the man in Clark's own former office of operations. He should have been incensed. Instead, he was exhausted.

He sensed Montenegro's urgency. He knew that if he wanted to be a part of the Admiral's "new order" he would need to please him. The situation called for perfect timing and superb performance. But before he put into motion a rescue party—an action that would lead, inexorably, to the demise of Mayda Research Station—he took a moment, simply glad to be out of Montenegro's presence.

## Chapter 43

# Unwelcoming Committee

The shuttle had flown from Port Antillia up over the north pole and across the lake district. It came in low over the hills to the east, across Moray Sinus, past Bimini Insula, dipping down toward the shore between the beach and Mayda Station. If anybody was running radar, they wouldn't see it coming. It was a simple commercial shuttle. The SWAT team should be giving them a welcome as soon as they touched down.

But there was no SWAT. There was no military. There was nobody. The place seemed abandoned.

"Where is everybody?" Jeremy Belton whispered to the pilot.

"Beats me. Looks like a ghost town. I'm still not getting even a ping on my transponders. And all the lights are off. Everything's off. Dark."

"But is somebody home? I wonder."

"There's supposed to be a hundred somebodies," the pilot said. "Set down anyway?"

Jeremy looked at the blank monitor and listened to the empty static. He threw a suspicious glance out the window. "You bet."

He cinched his helmet, unholstered his pulse gun, and stepped to the door, along with the three European marines that Port Antillia had sent along. The shuttle hovered just over the methane surf, casting up a spray that scattered a rainbow across the orange sky before them. Then the craft slid past the shoreline and bumped to the ground. The door popped open and the ramp clanged to the sand.

"Shall we?" Jeremy said, stomping down the metal ramp. He led his small team to the airlock where a ship full of SWAT members was conspicuously absent.

He studied a panel on the door and shook his head. "No juice. Not even enough to tell us what's going on inside."

A bearlike Marine in front, wearing Master Sergeant stripes, spoke with a Norwegian accent. "What dew ve dew, knock?"

Jeremy held up his hand. "We may have a hostage situation, or a critical failure of life support—"

"Or a bunch of human ice cubes," said a corporal. "I say we get in and see what's up."



The Norwegian officer spoke up. “Marine, until dere are other Marines to answer tew, Mr. Belton is technically head of dis operation. It is up tew him.” He turned to Jeremy. “Sir?”

Jeremy shrugged under his environment suit. He had no idea what to do. That ship full of military experts, SWAT from Ganymede, was supposed to be crawling all over the place by now. Someone had apparently forgotten to invite them. He was no hero. What should he do?

Jeremy turned toward the head Marine, but the wall-like man towered above him. Jeremy’s eyes settled on the nametag on the officer’s chest: Dønnes. Looking up through his visor, he said, “The most prudent thing is to wait for the SWAT team, don’t you think?”

“Unless time is of the essence for survivors inside. It does look like the station is in bad shape. No power. No lights. It might be an ambush, or it might be a systems failure. Yer call.”

Jeremy turned away from the door. He paced toward the ship, then turned back and walked past the airlock, turning again to end up at the side of the Marines. “Let’s give it an hour. No, half an hour. Where the hell are they?”

Jeremy was quiet for a moment. If it was an ambush, they were hiding quite well. There were no tire tracks or footprints surrounding the habs, no signs of forced entry. If anyone was in there, it wasn’t a bunch of militia. It was somebody who was in trouble. And Abigail might be among them. She was his goddaughter. *Blood trumps orders*, he thought. Finally, he said, “I suppose we just go in.”

“Carefully,” the Nordic Marine added, bringing his weapon online. Jeremy was relieved to hear the hum of the man’s weapon. He didn’t like wielding his. He had only used it once in his entire career, in self-defense, and in that event only into the air above the head of a threatening young woman who didn’t really need to be shot anyway. He wasn’t about to go into a situation with guns blazing now.

Jeremy leaned into the airlock doorway and studied the controls. “Here goes nothin’.”

He tapped several keys. “It’s cycling.”

“Dat’s a gewd sign,” said the big Marine.

Airlocks on Titan were different from those Jeremy was familiar with. Rather than equalizing pressure for ingress and egress, the relatively Earth-like surface pressure of Titan allowed for simple entry without pumping pressures up or down. Rather, airlocks here simply exchanged the exterior methane-rich gases for the oxygen-rich interior ones.

The chambers also supplied a biological barrier, infusing the air with an antibacterial that killed any human-generated microbes on the suits. But airlocks served one other important function: they vacuumed off the volatiles from boots, space suits and any equipment that a researcher might track in. Even some of the sand was saturated with materials that, when exposed to the oxygen atmosphere inside the station, could become flammable. If there was no power in the airlock, Jeremy worried that they might trail in disaster with them. He could only hope that the majority of outside material would fall through the airlock floor’s grating.

In a few moments, the door popped. The *all-clear* lights that normally indicated that the airlock was safe to enter remained dark, but Jeremy opened the door anyway. A soft swoosh of air issued from the chamber. The four stepped in, secured the

hatch, and cycled the air again. Despite the lack of power to the lights, it seemed to be working.

Once the atmosphere was equalized, with only their suit lights to illuminate the lock, the three Marines held their weapons at the ready. Jeremy cracked his visor and sniffed. The place smelled like a cross between a cold-storage meat freezer and a boy's locker room. What he did not smell, thankfully, was the aroma of deadly liquids from the outside. He stepped back from the inside door slightly. "Please, after you."

Master Sergeant Dønnes stepped smartly through the open hatch, covering the corridor to the left. A second Marine pivoted to the right, while the third cat-walked straight ahead, with Jeremy following. The group made their way down the hallway in this fashion, into the darkness, until Jeremy had them pause. He checked his wrist monitor. "The temp's like a Siberian winter in here, but the air is marginally breathable." He unsealed his helmet and opened his visor. The others followed suit. As they did, they could hear a quiet voice coming from down the hall.

The lead Marine gestured them forward. The voice became clearer. It was a woman's, and she was clearly not trying to be clandestine.

"So then he says, 'Hey, you're the guys with all the Vodka.'" A chorus of laughter echoed down the corridor. "True story. I swear!"

The four rescuers cautiously entered the hab. A dim lamp sat on a table in the center of the room. A dozen people huddled around it, covered in blankets, coats and even a rug. They peered, unblinking, at the intruders.

"Well," said one of them. "If it isn't the Marines!"

"Help at last!" said another. Applause broke out. Jeremy held up his hand for silence.

"What's the status here? Is everybody okay?"

A man stood. "I'm Brian Finnegan, Chief Engineer here. We're in reasonably poor shape. No heat, no active pressure or oxygen. Reactor's non-functional. Air's getting stale, to say the least. Did you bring heaters?"

"Or coffee?" someone else chimed in to the sound of groans all around. The woman shoved her hand at Jeremy. "I'm Susan Mason, physician for this lovely tropical paradise. We seem to be having a spate of symptoms that are tempered by hot coffee or tea."

"I'll check on our hot drink situation, but I doubt we can handle a hundred people. We're a small shuttle. More help is on the way soon." He said the last with blind hope in Sanjay Rao.

"Did the monsters give you any trouble?" one of them asked. Jeremy looked at him curiously.

"You must have seen them on your way in," the doctor said. "We've got a real infestation. It's scientifically incredible, but in our state, it's just adding to our woes."

The Norwegian Marine was slowly shaking his head.

"You can't have missed them," Brian said, crossing to the porthole. "There, look. Down at the beach. There are two of them, almost completely out of the lake." He jabbed his finger against the plexiglass.

Jeremy leaned over. Several people had huddled around the window a few feet to the right. "Oh, yeah, that's a huge one. He's new, isn't he?" crowed someone.

Another jockeyed for position. "He is big. Longest neck I've seen on one of these buggers. Man, they're weird. Who would have imagined?"

"Right here on Titan."

"Amazing!"

"Wait 'till the people back home hear about this, right?" Doc Mason said to Jeremy.

Jeremy looked at the Marines. They wore expressions of complete bafflement. He turned back to the doc. "Interesting. When did they first start showing up?"

"About the time the drill broke through."

"Drill?" Master Sergeant Dønnes asked.

Jeremy said, "Big core drilling project here, according to the files. They're trying to sample the ocean down there beneath the ice crust, but it's a long way. They broke through shortly before we lost contact."

"They did it," Mason said. "Broke through to the water. Started bringing up samples. And that's when the trouble began. Weird stuff. These creatures all over the place, but they're too big to have come up any borehole. Nobody can quite figure out what's going on."

"I see," he drew the words out. "And everyone has seen these creatures?"

The doctor looked at him as though he had lost his mind. "Whatever do you mean?" She glanced toward the window and back at him, as if he was a fool.

Jeremy rubbed his hands together as if enjoying a warm campfire. "Let's leave the creatures to the biologists. We need to get everybody as close together as we can, and we'll get our portable heaters in here. I was wondering if anybody knows the whereabouts of Abigail Marco?"

Brian chimed in, "If anybody would know, it's Piers Wellington. You'll find him in Comms, down that corridor on the left. But what about that coffee?"

"Dat sounds like a job for da Marines." The Master Sergeant sent one of his troops back to the ship while he and the other Marine continued to evaluate other sections of the outpost. Jeremy headed for Comms.

Titan's orange pall tinted the corridors with the faintest of blood-red glows. Jeremy's suit light reinforced the miserable chill: ice crystals sparkled back at him from the walls and surfaces of equipment. The floor felt oily. When he finally reached Comms, he found the door ajar.

"Anybody home?" he called.

Piers twisted around in his seat, grasping a metal rod. "Who are you?"

"My name's Jeremy Belton. I'm—"

"Belton! Boy, am I glad to see you!" He erupted from his seat toward Jeremy. "Abby's told me all sorts of things about, well, anyway, I'm glad you made it. Did you bring supplies?"

Piers held his hand out. Jeremy shook it. "Our ship is a small scout shuttle. I'm hoping help is on the way soon."

Piers looked around. "Yeah, well, soon would be my vote. We're in a degrading downhill slide here. We've got no operational power and mass hallucinations."

Mass hallucinations sounded dangerous, if true. Then again, they sounded like the ravings of a paranoiac. Was Wellington sane? "One thing at a time," Jeremy said. "I'm looking for Abby."

“She’s gone. So is Troy. I think they may have been kidnapped by some people who are holed up on the north shore. Know anything about that lot?”

“Not substantially, but we have some intelligence on them. They seem well equipped in terms of weapons and transportation.”

“We got nothing here. Any chance we can help our two wayward buddies?”

“Maybe. We need to talk to our Marines.”

“You brought the Marines? Why didn’t you say so?”

“I brought three Marines.”

“Oh.”

Jeremy wanted to mount a rescue for Abby, but he obviously could not assemble a full assault—or even a clandestine operation—with himself and three Marines against what amounted to an ice fortress. He had to focus on the problems at hand first. “What about the power here?”

“You’ll have to ask Brian about that. He’s our resident expert.”

“I met him.”

“Good. He says our reactor is fine, but there’s some other problem and it’s not fixable by us.” Piers met Jeremy’s eyes. “How did Brian seem? Is he okay?”

The corners of Jeremy’s mouth twitched. “Just what’s going on here?”

“I’m not sure,” Piers said cautiously. “Let me ask you something. Did you see anything in the lake as you came in?”

“There’s the rub, isn’t it? Yes, I did see things.”

Piers looked deflated.

Jeremy added, “A wrecked pile of equipment on the shore and a huge drill that was not doing much drilling.”

“Is that it?”

“That’s it.”

Piers snapped his fingers. “Excellent! There seems to be some kind of mass hysteria going on here, some universal mirage or something. Everyone seems to be seeing brontosaurus out there and really weird things in here.”

Apparently, Piers had a good handle on the situation. He seemed to be thinking more lucidly than anybody in the other room, and there was something else: his eyes were clear.

“Weird like what?” Jeremy prodded.

“Everybody’s complaining about the music.”

“What music?”

“Exactly. Doesn’t matter. There’s no time. Look, whatever it is, everybody seems to have it except me. And Abigail.”

Jeremy’s eyebrows crawled toward each other. “Really? Everybody?”

Piers nodded. “Yep. Something in the air? The water? I don’t know. Doc Mason’s too out of it to ask.”

“And you and Abby escaped somehow. Hmm. What are the two of you doing differently?”

“We’ve tried going over it. I’m too cold to think and I’m too worried about Abby.”

“Yes, I can understand that,” Jeremy said, putting his hand on Piers’ shoulder. “Me, too. Let’s see what we can do about our Abby.”

## Chapter 44

# A Bridge Too Far

Kinto dragged Abby roughly through the door and into the corridor, away from Montenegro's 'headquarters' and down the hall from the guards who had held her. Once alone, he paused. "Stand up straight," he commanded.

"That's a little hard with you throwing me around like a rag doll."

He put his hand against her back in an almost reassuring manner. "It's the effects of the tranq. You'll be on your feet in no time." He leaned over and spoke rapidly. "Look, Montenegro, or Sable, or whoever he is, has lost it. Certifiable. Marbles fully absent. Come this way. I'm depositing you in a storage closet for now, until we can figure this whole mess out. You can thank me later."

"For stuffing me in a storage locker?"

"For not killing you." He flashed a grin at her.

At the end of the hall, in a room full of lockers and stowage areas, Kinto nudged Abby into a large, metal cabinet and slammed the door. As she sat in the darkness, Abby mumbled, "Gee, thanks."

(\*)

Piers waved toward his darkened monitor. "Just before our power grid went down, I figured out what frequency these numbskulls were using."

Jeremy shifted in his chair, trying to get comfortable around the small boxes, empty water bottles and papers nested around his butt. "So using our ship's equipment, I could probably contact them, right?"

Piers cast a disdainful glance at Jeremy's seating arrangement. "Sorry about the mess. Abby calls it 'Wellington modern.' So, yes, maybe you could contact them. If they'd pick up. To what end?"

"To negotiate release of hostages."

"Or hostage."

"You really think Troy was in on it somehow?"

"I don't know; there was just something not right about everything the guy was doing lately."

Jeremy sat silently for a moment, ruminating. "Well, I say we try it. Want to come?"

“Absolutely.”

Even by Mayda’s standards, the ship’s interior was cramped. Jeremy stationed himself on one side of the cockpit, while Piers stood behind the other seat, occupied by the Marine communications officer. The officer handed a headset to Jeremy, and keyed his touchscreen so that the transmissions could be heard on the cockpit speaker.

Jeremy looked at the comms officer, and then at Piers. His eyebrows twitched upwards. His eyes narrowed. “Here goes nothing.”

He keyed the microphone. “This is Jeremy Belton, calling on behalf of Mayda Research Station. Do you read?”

Static. White noise.

Jeremy keyed his microphone again. “This is Jeremy Belton, calling on behalf of Mayda Research Station. Is anyone reading us?”

The speaker registered a click, and then a voice.

“This is Commodore Clark of the Northern Quadrant. We have been trying to contact you. Can we be of service?”

Piers looked surprised. Jeremy fought down the skepticism in his own voice. “Good to hear from you, Commodore. Mayda is, indeed, in need of some assistance, but we want to first inquire about the status of two of our scientists, Abigail Marco and Troy Fels.”

A long silence met Jeremy’s statement.

“What could be going on?” Piers said.

“Equipment’s fine,” the comms officer said. “We are receiving. They are just not saying anything.”

“They seem to be sorting something out,” Jeremy guessed.

A new voice came across the speaker. “This is Admiral Montenegro. We are happy to be of any help we can be. What is your status?”

“Evasive, at best,” Jeremy observed before keying the mic. “We are currently missing two scientists who were headed your way. Do you have any information about either Abigail Marco or Troy Fels?” He said the last more emphatically.

After a pause, the Admiral’s tone came back more boldly. “We’d be happy to help you in your search, but it sounds like we should be trying to help you with your crippled station first.”

Piers whispered, “We never said anything about a crippled station.”

“Yeah, I noticed.” He stared at the floor, then looked out the window toward the north. Somewhere beyond the rusted mist, somewhere on the far side of the methane swells and shimmering surreal light of an alien sea, Abby was stuck with this group, and the Admiral was playing games. There was something else that bothered Jeremy: the Admiral’s voice sounded awfully familiar.

The Admiral was back on the air with a surprising announcement. “Your friends are safe.”

“What?” Piers roared. “Just like that?”

“He’s toying with us,” Jeremy said.

“Not us. With Abby, if one were to ask me.”

Jeremy keyed the mic. "That's good news, Admiral. May we speak to them immediately? We have need of their...expertise on something."

"They are unavailable at this time," came the retort.

The comms officer grumbled, "This thing smacks of a hostage situation."

"Admiral Montenegro," Jeremy said into his headpiece, "I think we've met before. Perhaps on Earth? Perhaps at Morrow Rehab Campus?"

There was no reply.

"Admiral?" Jeremy repeated.

"I think you got his attention," Piers said. "What's that all about?"

Jeremy held up his hand for silence. There was plenty of it. He waited another full minute. Could it be true? He was good with voices, and he would never forget this one. He keyed his microphone again. "Demian Sable, shall we stop playing games? What is it you want?"

This time the pause was a short one. The return voice was clear and concise. "Simple, Mr. Belton. We are going to take Mayda Station."

## Chapter 45

# The Evening News

“Look,” Jeremy said, squaring his shoulders and gazing across the table at Piers and Brian. “We have three Marines and a hundred plus nearly frozen scientists here armed with a handful of spectrometers and microscopes. It’s likely that they have an army over there with something more formidable. None of us is trained to go sneaking in on a rescue mission, not even these Marines, able as they are. So let’s just wait for help. The team should have been here by now, so I’m sure they’ll show up any moment. I have calls in to both Mars and Ganymede to see what’s up. Our friends on the north shore are undoubtedly monitoring communications, so my messaging is encrypted.”

Piers’ lips tightened. “Right,” he said, his body stiff.

Jeremy put a hand on Piers’ shoulder. “And relax. There’s not much we can do at this moment. What we do need is to fix that reactor. Brian, now that we can communicate through our ship, can’t we call Antillia or Kosovo for, you know, something that would help? A replacement part?”

Brian’s voice took on a professorial tone. “You won’t get a replacement part for quite some time. Our Ingermanson reactor is unique. The problem is in the transfer of power from the reactor itself to the grid, the rest of the station.”

“There’s no jury-rig? Nothing you can kluge together in the interim?”

“Not with the parts we have here. The Ingermanson is a delicately balanced system. You can’t just plop something on the end of it to make it work. I did figure out a way to get some power out of it for a little while at low levels, enough to save the place, with some technology that they probably have at the larger settlements on Titan. What I’m hoping is that our rover team will be able to get a ship here from Kosovo/Taishan with the proper equipment. But even that won’t last long. We need the real thing if we are to save this outpost.”

“When is the rover due to arrive there?”

Brian looked toward the window, shivering. “They should have arrived two days ago. I told them to transmit in the blind when they got there, in case we got the radio up. I have great faith in Piers.”

“Too much, I fear,” Piers said.



“But the ship will pick up anything that comes our way,” Jeremy said. “It would have been good to know your plan,” he scolded. “I’ll have them contact K/T right away. See if there’s been anything.”

(\*)

Jeremy figured the Mayda residents had had enough bad news lately, so he climbed aboard the ship to talk to the comms officer directly.

“Well, that’s a fine how-do-you-do,” the officer said. “Why the heck didn’t they tell us they had a rover on its way out there?”

“Nobody’s on their game. They’re all cold and starving. Let’s just focus on contacting Kosovo/Taishan.”

“Yes sir. Part of our problem has been that Titan’s still got that one comsat down. They need to replace it, and who knows when that will be? But I think the constellation has another one in range at this point. I’ll give it a try, see if we have a relay available.”

In moments, the comms officer had the communications center at Kosovo/Taishan on the line, and a few minutes later, Jeremy was speaking directly to Laurita Hernandez.

“It was bad. After the explosion, after we could tell that the rover was toast, we tried transmitting in the blind once or twice, but we just didn’t have the range. K/T has tried three times. Don’t know why we didn’t get through, but I’m glad you did.”

“Me, too.”

“I wish the news was better. It’s like Brian suspected. These energy people here are pretty sharp. They had a whole contraption bolted together to try to adapt onto our Ingermanson system. They weren’t sure it would work, but it was worth a try. Looked like something out of a cartoon show.”

“And it all went down with the ship?” Jeremy asked.

“All of it. Some of it was specialized. No backups here. They said they might be able to get something similar from Ariel, of all places, but they say it’s on the wrong side of the system right now. We’re talking months.”

“And you’re sure it was a missile?”

“Oh, yeah. I’ve seen surface-to-air before. This one had the ship in its sites. No accident. Who would shoot down a rescue ship?”

“Very nasty people,” Jeremy said. “But you two are okay, right?”

“Right.”

After some of what Jeremy hoped was encouraging small talk, he signed off and looked at the comms officer.

“These guys are out of control. They seriously need to be shut down. Where’s our help?”

Jeremy was in what was left of the galley when the answer came. He sat at a small table in the corner with the Master Sergeant, nursing a cold coffee, when his earbud pinged. It was the comms officer in the lander.

“Prime One to Belton, do you read?”

Jeremy spoke. “Roger, go ahead.”

“Feeding a message through from Director Sanjay Rao.”

*Finally, some news*, Jeremy thought. His helmet accepted the prerecorded message.

“Jeremy, Sanjay here. I have some really bad news that’s going to change things up considerably. We’ve gotten a snippet of a distress call from the SWAT team. They disappeared somewhere in the rings of Saturn. It appears that several lifeboats managed to deploy, but your ground support is simply not coming. And it takes a lot to take out a SWAT team, so I want you all to stand down until we can get some backup there. I’m looking into that now, but sit tight until you hear from me. No heroics, Jeremy. Rao out.”

Jeremy looked at the big Marine next to him. “Did you hear that?”

“No sir. Dat vas on your personal channel.”

Jeremy Belton was not one for short words, but on this occasion, he said several. Even Master Sergeant Dønnes was surprised.

## Chapter 46

### Visitations

In addition to one of the rover bays, the eastern section of Mayda housed the boats and general storage units, meeting rooms, and the smallest of the three galleys, now abandoned but for one lone inhabitant. And although everyone seemed to be clustering together for warmth or encouragement as the science outpost slowly surrendered to Titan's relentless elements, Tanya Yampolskaya wanted to be alone.

She sat at a corner table, imagining the feel of hot chocolate and steaming borscht, a favorite childhood combination. The nearest windows faced away from the sea, which was just as well. She didn't want to know what was going on out there. She was tired of thinking about it.

Her eyes felt heavy. If only she could sleep. It was so cold.

"Tanya."

Had she really heard a voice, or was it the sound of her coat against the table?

"Hello, Tanya. Would you like me to play for you?"

She turned in her chair. He looked so good. How she missed him! "Hello Kevin, my love. No, not just now. Where have you been?"

"Around. I've been watching."

"The place is falling apart." Her eyes teared and her nose began to run more furiously than it had from the cold air.

"There, there, my sweet. You are a strong girl. You will get through this. You all will."

"I'm so tired of dark and cold and dry food. And of just being tired. So tired."

"Why do you think you are so tired?"

"I have not sleep—*slept*—well," she said in a weak voice.

"Does it smell funny in here to you?"

Tanya rested her forehead against the table and sniffed the air. She looked up. "Yes, it does smell."

"What does it smell like?"

"Glue. Paint."

"Maybe you should leave this area."

"Oh, Kev, I'm just going to rest a little bits."

"It smells very funny in here. You know what that means."

“Yes,” she slurred.

“Maybe you should get up right now, Tanya. Maybe you should leave.”

She sat up straight and blinked. “Yes, maybe so.”

“And close the door behind you.”

“Yes, yes,” she said quietly, stumbling as she stood. “What if someone is in here?” But Kevin seemed to have left.

Tanya stepped to the galley doorway and called down the hall. “Hello? Is anyone there?” She coughed and turned in the opposite direction. “Is anyone there?”

She stumbled to the hatch leading back to the main outpost and called over her shoulder, “Is anyone there?” She stepped through and slammed the hatch shut. The floor dipped to the right as she stepped down the corridor. It swung back to the left, but as she got some distance between herself and the east section, she felt clearer, more stable. Somewhere behind her, from the direction she had just come, a flash brightened the gloomy hall. Then she heard the fire alarms.

(\*)

Piers wished he had Abby to talk to. He hadn’t realized how he relied upon her to help him think through life’s difficult decisions. She had often been there for him, and always when it counted. But not this time. This time he had to figure things out, like a big boy.

Those thugs on the north shore weren’t here for the mining or the study of nature’s wonders. They were here to rape and pillage, in the old vernacular. They were criminals, pure and simple. They had shot down a rescue and supply ship with innocent passengers aboard. They had cut down a SWAT team, which took cunning and skills and superior equipment. Even if Jeremy Belton could get another ship full of top-rate GI Joes, what was to stop these pirates—and that’s what they were—from doing the same to them? They seemed to be plenty good at it. No matter how he looked at it, Piers could only come to the conclusion that they were on their own. He had to take matters into his own hands. Belton had his own plan. Fine. Piers would take a different tack. He smiled at his mental simile as he headed for the boat room. He wore a fully outfitted environment suit prepared for a long stay in the Titan wilderness. He hadn’t sealed the visor yet. It was hard to see in the dim light.

His first order of business in the boat room would be to find a toolbox and make whatever repairs were necessary to whichever Zodiac was in the best shape. But the first inflatable he came to seemed to be perfectly intact. The engine gleamed on a stand next to it, tagged with a handwritten note—in Troy’s handwriting—as “serviced and ready to go.” *Odd*, he thought. *So much for Troy’s damaged-beyond-repair boats.*

He slid the engine into place, wheeled the inflatable to the door, set the inner and outer seals, and closed the visor on his helmet. Just before the door unsealed to the murky outside world, Piers could have sworn he caught a whiff of benzene, and something a little more acrid.

## Chapter 47

# Delayed Gratification

It was time to call in a favor. Clarisse Sanbourne had been stationed on Iapetus for over a year. She loved it. She'd gotten the military transfer, in part, due to a glowing reference from Jeremy Belton, formerly of the Tri-Planet Bureau of Investigation. Not bad.

"I need you with me when I make the call," Jeremy had told Brian, "in case something technical comes up." So Jeremy and Brian crowded their way into the confined cockpit with the long-suffering comms officer.

The time it took Jeremy's voice to reach Clarisse was roughly nine seconds at this point in the orbit, enough to be annoying. Jeremy reflected that it wasn't as bad as it could have been. The orbit of Iapetus took it on a leisurely loop around Saturn once every seventy-nine days in a great ellipse 7 million km across. Its path was inclined to the equator, giving it the best view of Saturn's rings of any major moon. Titan, not as far out, coasted by Iapetus as closely as 2,300,000 km away, but at its farthest, the dance of the two moons brought it nearly as far from Iapetus as 5 million km, with a light time transit of sixteen seconds. Texting might have been easier.

"Clarisse, I figure if they're shooting down ships and taking over facilities, they may have what amounts to a military base here. The Marine analysts share that view. It seems like you guys should send everything you can. Over."

Her reply began half a minute later. "That won't be much. Not for a while. But—and this could be good—there's a detachment of Marines en route to Iapetus for some sort of training exercises. I'll see if we can get them out there post haste. It could be less than forty-eight hours, if all goes well. That should do something, one would think. Over."

"One would hope," Brian said under his breath.

"Roger that, Clarisse. Now would be good. We can't wait any more. People are going to start dying." He prayed they had not already, but he wouldn't put anything past Demian Sable. "Thanks for whatever you can do. Keep it on this channel, scrambled, and hopefully those visitors on the north shore won't be able to decipher our communiqués. Out."

Jeremy turned to Brian. "I guess the bottom line is, once we secure our hostages, we need to get that equipment back. It's the only thing that can save Mayda now, right?"

"Those guys out there are besting SWAT teams and knocking supply ships out of the sky. And you have—what—three well-armed Marines? Let me compute those odds. Wait, where's my calculator..."

"Granted, they're armed to the teeth. We'll just have to do it clandestinely."

"Out," came Clarisse's delayed reply on the speaker.

"Clandestinely?"

"Using that cool little sub of Troy's you've all been slobbering about. Where is it?"

"It should be in the warehouse dome hab."

"It should, but it's not. I checked."

"Okay, Piers knows where it is."

"Where is Piers?"

But Brian's eyes were tracking something out the window: two people in pressure suits were dashing toward the ship. The comms officer popped the airlock just as the Master Sergeant came on the radio.

"We've got a fire in the east habitats. I say again: fire in the east habs."

The suited duo burst through the airlock and unsealed their helmets. They were breathing hard. The closest one said, "Fire! We've got a breach of some kind and fire all over the place in the east end. It's burning hot, like there's methane streaming in. There's no power in the fire suppression system, obviously. We've got the whole section sealed off."

"That's bad," Brian said. "Hope none of those beasts get in."

"Oh, I hadn't thought of that," the other one said.

Jeremy gave Brian a withering scowl. "Let's grab some fire extinguishers and worry about your creatures of the deep later."

(\*)

She didn't want to sleep. She wanted to stay sharp, in case an opportunity presented itself for escape. But Troy had filled that hypo with strong stuff, stuff that was lingering, and the closet was getting warm. And so dark.

Her sister's laughter filled the air. Even Janice's laughter could be musical. The sky was that crystalline gray-blue that only Martian skies could be.

"Abbeeeee, come on!" Janice's voice called. Across the little vale, beyond some rocks beside a little stream, lay the hulk of a great spaceship. Her father had told her that some of the old Soviet-era spacecraft were still unaccounted for. She had always wanted to find one. This one was much larger than she imagined an ancient robot would be. But she had never seen a Soviet spaceship anyway, so who could tell?

The long, green-gray disk lay on its side at an angle. Its edge rose high into the sky. From a little port or opening on the rim, Janice looked down and waved. Abigail knew they were in trouble. She knew they would be found out.

"What are you girls doing?" came the booming voice of Father. But there was no anger in it. There was amusement.

Mom was there, too. “You girls come down, now. There is icky radioactive stuff in there, and germs.” She was laying a picnic on the sand by the stream.

Abby realized that this quality, this air of entertained observer that her parents often adopted, was what she really missed. They were smart about grown-up things like Russian Mars landers and early settlements on the Red Planet, and they were always patient to take time out to explain new wonders. They always corrected gently, always shared a bit of wisdom, always turned fear away with kindness. That’s what she missed. Even now. Even in a darkened closet. Her eyes were open now. Her cheeks were wet.

## Chapter 48

# The Creeps

The tech stood before Montenegro, apparently fighting the urge to wring his hands. “Sir, we found it just south of the docking bay, moored to the cliff base.”

“Show us,” Montenegro said, rubbing the back of his neck. The tech stepped to the screen timidly, punching up several exterior views. Finally, the correct camera angle materialized. An inflatable bobbed by the rugged shoreline.

Montenegro bellowed at Troy. “I thought you came alone.”

“I thought so, too, but that’s my Zodiac, all right.” Troy’s tone lacked even a hint of intimidation.

“Wonderful. Guess it’s a little late for us to be the rescue party of Mayda Station.” Montenegro turned to Clark. “Get the vehicles outside and prepare for a ground and air assault. How soon can we be ready?”

“Possibly tomorrow morning, I suppose,” Clark said.

Montenegro pivoted menacingly toward Troy. “As for you, I’d like you to lead everybody to the most susceptible point on that outpost and make yourself useful. And try to not shoot the place up too much. Remember that it will be an extension of this base when we get it squared away.”

“Of course, sir.” Troy left to get his environment suit, but he realized that Montenegro’s forces had much more to worry about than orange fog leaking through a few holes in the wall. Those Titan versions of Nessie might well have their own plans for any land assault. The serpents were out of the lake now, roaming free. They had even spread to the north shore, appearing as soon as Troy had arrived. And everyone at Mayda and at the Northern Quadrant Base had seen them.

(\*)

Demian Sable keyed the microphone while he could enjoy a moment of solitude. All of his incompetent minions were off bumbling his orders. It was time to check in.

“Hello, Circe, my dear. Are you there?” He waited for the dozen seconds of light travel time between Titan and his voice’s destination, and another dozen for hers to return.

“There you are, my sweet. Right on time.”



Circe's image was snowy, her voice like tin. The connection was lousy. How annoying. Before he would respond, she said something else.

"When can I come out? I miss you."

"Of course you do. Not just yet, my queen. There are several other things to accomplish here before it's safe for you to come. I want all to be in readiness for you. No loose ends. How does that sound?"

The moments passed. Sable felt a pang of yearning, more than lust or even romance. He found himself surrounded by people ready to do his bidding, and yet he was lonely. Finally, her voice called to him. In the moment, it was the voice of Parthenope, a voice for which he would gladly do any bidding. The voice spoke. "What could you possibly need to get done? You have a veritable army there already. Have they taken care of things?"

So much for his Siren. Sable slammed his palm on the table. "Woman!" he rasped to himself before hitting the mic button. "Now my dear, remember how we talked about open radio links? Let's be discreet, shall we? There are some complications here, still much to be done. I will call just as soon as you can come, and then we will have a celebration on an interplanetary scale. There's a good girl. I must sign off. Good bye, my sweet."

He didn't wait for her reply. He shut off his side of the comm. Now, the only sound was the hum of electronics and the dripping of a melting wall somewhere. Dripping. Eroding away. Like his business empire. His status as tycoon had crumbled a bit when he went to prison. The courts and the TBI had systematically attempted to dismantle his corporate empire, although he still retained most of his personal wealth in off-world investments. Faux corporations and secret allies continued to build his interests. But *they* were skeptical. *They* had always been there, in the background. The naysayers. The cynics. The disbelievers. He had shown them once, building his—what had that Martian editorial called it?—"spiritual/financial kingdom." That was it. The second-rate editorialist undoubtedly thought his clever label was a disparaging insult to Sable, but it really summed things up nicely, Sable thought.

But now, he had to prove himself all over again. How painful. He couldn't count the sacrifices he had made over the years, in front of and behind locked doors. And the sacrifices of those around him had been great, too. Poor Circe had been the epitome of patience and kindness and grace. She had outsmarted them on more than one occasion during his incarceration. It was time for payback, for retribution. He would pay her back with kindness and the wealth of the entire Solar System. He would pay the cynics back with his iron fist.

(\*)

In the dark, alone, in a storage closet on a distant moon of Saturn, an odd memory rolled through Abby's mind. As part of her graduate lessons in meteorology, she had studied the global flow of the Tharsis influenza epidemic. She remembered watching a global Mars map, watching the unrelenting march of the microbial onslaught as it made its way across the Red Planet. For some reason, it gave her the creeps. She had not slept for days afterwards.

Knowing that Demian Sable was just down the hall, so close, sharing with her the same oxygen in this little underground fortress, gave her that same cloying, creepy feeling. In her adult years, when she knew enough to pay attention, she had watched as his empire continued to grow, spreading across Mars like that earlier plague, then on to the interplanetary arena. She couldn't shake the thought that now, finally, she could do something. All her life, Sable had been an amorphous figure locked away in a maximum security facility. True, her eyewitness testimony had helped to put him there. And at times, she had hoped for his redemption, some kind of miraculous about-face, a salvation of some kind. She had seen that happen with people, and she believed it could happen even to someone as heinous as Demian Sable.

It seemed that Demian had gone through some kind of transformation. Just what had happened to him? He had been a charismatic, focused leader, a man of vision, no matter how dark that vision had been. He had been the tip of the spear for thousands of followers, both spiritual and political. He was a pied piper in the business world. But something happened to him in prison. Something must have snapped. He was not the Demian Sable she had known. The evil inside had turned rancid, if that was possible. Could evil come in degrees?

And thinking of Demian's descent into deeper malevolence, Abby had those other, darker times. Perhaps it was a damning reflection upon her that more often, she wished for his demise. She imagined that a judge would see clear to resurrect the death penalty for those who killed with design and without compunction. But sadly, people like Demian Sable seldom got what they deserved. They killed and destroyed and then got locked away to continue their business from a distance.

And suddenly, Abigail Marco had the opportunity to do something about that. Now. After years of yearning for her parents, two very good and kind and brilliant people who had so much to offer the world, after agonizing over how they must have suffered in the terrible quantum waves from a weapon whose use was seen—even by most terrorist groups—as a crime against humanity. Sable sat there, in a cold little office scraped out of the ice cliffs of Titan, just ripe for the taking. For justice.

And of course there was the other thing. Sable had associated himself—perhaps even been the force behind—this circus on the north shore of Kraken Mare, and these clowns were responsible for the death of her friend. Poor Kevin. What had he done? What did they do to him?

Why did her palms ache? She realized that she had balled her hands into fists, and she was gritting her teeth. She took in a deep breath and let it out slowly. She let the tension drain from her hands, from her neck, from her jaw. The coolness of her cheeks betrayed tears, but they would dry soon.

She tapped on the closet door. It felt like sheet metal. It was reinforced, but the lock and hinges were probably light. She shoved her shoulder against it. Light seeped in along one edge of the door, the hinged edge. There was the weakness. She leaned away as far as she could and tried again. This time, her shoulder dented the door and left a fist-sized crack of light along the frame. In the cramped quarters, she pulled her shirt off, wrapped it around her hand, and grabbed the edge of the metal. She shook it furiously. The top hinge popped off, then the center. If she shoved hard enough on the top of the door, she could just climb out.

She put her shirt back on—funny how those social mores kick in under any circumstance—bent the door away, and stepped gingerly through the ragged opening. The hallway was clear. Her first stop would be the armory. She reviewed the personal tour the guards had so generously given her upon her arrival. Although she had feigned drowsiness, she had paid close attention. At the first junction, she made a right and slammed into Marv Holliman's chest. He grabbed her arms with gorilla strength. She wouldn't be going any farther without his permission.

## Chapter 49

# Chivalry Is Not Dead

It was over. She had been so close to Sable she could taste it, like the foul hydrocarbons that stuck to the insides of the airlocks. And now this bear of a thug held her in his paws.

“I don’t think you want to be going that way just now.” Abby shook her arms. Surprisingly, Marv let go. He said, “Would you come with me, please?”

She glanced down the hall, heard voices, thought better of fleeing, and took her chances with Marv. He led her to a rough-hewn room with a couple of crates for chairs, some computer cables draped across the wall, a bevy of screens, and the guy who had locked her up.

“Gee, you don’t seem to have any locker jails in here. I feel so naked.”

The huge man laughed. “You are funny, girl. I am Kinto, by the way. I’m sorry about that. It’s all gone south, I’m afraid.”

“What has?”

“That man in there.” Kinto jabbed the screen. Demian Sable, a.k.a. Montenegro, addressed the crowd.

“What he means,” Marv said, “is that our fearless leader has gone bonkers.”

“He was there already,” Abby said.

Kinto shook his head, staring at the screen. “No, not like this. And I can’t say much for his musical taste.”

“Yeah,” Marv enthused. “Who says we need mood muzak in a place like this? Besides, I never did go in for that Indian crap or whatever it is.”

Abby listened to the silence. She looked at Kinto, and then at Marv. They both had the bloodshot eyes common to those at Mayda Station.

Marv rubbed his temples as he said, “Anyway, it appears you may have some company, and whoever it is, they’re walking into a hornet’s nest.”

“What do you mean, company?” Abby asked.

“Have a look,” Kinto said, punching up another view. “That’s the south cliff face. Look familiar?”

Abby nodded, but kept quiet.

“One of your inflatables, I believe,” Marv said.

Abby realized that there was no use denying it. “Who came in on it?”

“We could probably find out,” Kinto said. He clocked through a few external views, then began to survey various closed-circuit shots of halls and rooms.

“There,” Marv pointed. “There he is. Recognize him? Brave little bugger.”

He is indeed, Abby thought. How chivalrous, Piers Wellington coming to rescue the damsel in distress! What was it that Troy had said about that rose in her room? *Looks like someone’s peace offering.* But he hadn’t meant he had put it there himself. Someone else had. Where would Piers—or anyone out here—get a live rose?

He was a sweet guy. She only hoped he had brought help. And she wondered what these two were going to do about it all. About him.

“Where is this?” Kinto asked.

Marv checked his screen. “Outside the armory. Pull up the interior view.”

Kinto called it up. Piers entered the room, shuffled down one aisle as if he was doing his last-minute shopping at a grocery store, and turned almost directly toward the camera. He had chosen a wicked-looking hand weapon, and something else.

“Good choice,” Marv said admiringly. “MV-24s handle nicely.”

“Not much kick,” Kinto added.

“Lightweight, too,” Abby said. They both gaped at her. “What, I don’t look like I know my way around a firing range?”

Marv squinted at the screen. “What’s he got in his other hand? Looks like a...”

“Hammer,” Kinto and Abby said in unison.

“Where’s he headed?” Kinto asked.

Marv studied the monitor, and switched cameras to follow. “Maybe going to Montenegro?”

“Sable,” Abby corrected.

“Weird,” Kinto and Marv said in unison. Marv added, “I can’t get used to it.”

Kinto keyed the screen. “Let’s just see what those two are up to.”

Both Kinto and Marv were observing intently. Neither seemed interested in letting Montenegro know that Piers might be on his way, or even that he was within the confines of the base. It puzzled her.

On Kinto’s screen, Sable and Clark were looking directly into the camera. It was disconcerting. “Get us a different view of their ugly mugs,” Marv complained. “We got any audio on that thing?”

From a camera over their shoulders, the trio could watch what Sable and Clark observed. They had spotted Piers, too.

“He’s armed,” Clark was saying.

“He obviously came for the nuke thingy. Bring it here.”

Clark hesitated.

“Now!” Sable stormed around the room until Clark arrived with the mechanical assembly, the unique piece of machinery that could save Mayda Research Station.

“I know what they’re up to. We can’t let them have Mayda at any cost.”

“True,” Clark said, holding up his hand in warning. “I’m just thinking, Admiral, that for our future plans, we—”

Sable pulled a pulse weapon from behind the little desk. “Fire in the hole!” he called out. He fired once. The shot went wide. The piece of equipment spun around

next to a blackened hollow on the desktop. He fired a second time, directly into the center of the delicate technological marvel. It morphed into a pile of slag and fused tubing.

“No!” Abby said, her hands over her mouth. It was the same thing all over again, a rerun of twelve years’ past: the killing of innocents. First her parents. Now this. Over a hundred men and women at Mayda. Engineers, scientists, friends, lovers. They would all be dead in days, perhaps hours. She buried her face in her hands.

“Where’s our rescuer now?” Marv asked, apparently oblivious to what Sable had just done.

Abby looked up, trying to compose herself. The monitor displayed a fuzzy view of a darkened hallway. At the edge of view, Piers hunched over an access port and played with some buttons or controls of some kind. A display lit his face from inside the wall. “He appears to be tying into the security system, looking for our friend here.”

“The man’s pretty handy,” Marv said.

“And it looks like he found us. Wave to the camera.” Kinto and Marv waved. Abby stood motionless, her skin clammy. Piers ran out of the camera’s field of view. Moments later, they heard his pounding footsteps in the hall outside. He lunged into the room, gun pointed, hammer held aloft.

“Abigail, get over here!”

She slinked sideways along the wall, keeping out of the line of fire. “Piers, you’re amazing.”

“I really, *really* don’t know what I’m doing,” he wheezed. “I’m very nervous, so nobody make a move.”

Abby kept a forced smile pasted on her face. Through clenched teeth, she told Piers, very quietly, without taking her eyes off of Marv, “The safety’s on.”

“Pardon?” He waved the pulse weapon around as he spoke, shifting his eyes quickly from Marv to Kinto and back again. He hadn’t blinked since he had entered the room.

“She’s telling you you’ve still got the safety on, bub,” Kinto called from across the room.

“Look,” Marv said. “At this point, we’re on the same side. Far as I’m concerned, the two of you can just go on your way. We’ve got all sorts of problems of our own here.” He wagged his chin toward a monitor that displayed a horde assembling in the large chamber, their leader at the front.

“Here, here,” Kinto agreed.

“All right. Thanks, guys,” Abby said, heading for the door. She paused and turned around. “Can I ask you guys a question?”

“Shoot,” Marv said.

“Probably a bad choice of words,” Abby said, gently pushing the barrel of Piers’ weapon aside. “Have you two seen the...creatures out in Kraken Mare?”

Kinto shook his head. Perhaps they did not have whatever was ailing the team at Mayda. He fixed her with his eyes, continuing to shake his head. “I’ve done a lot of travel. Been to the Amazon and the rain forests of Madagascar, and I come from the big continent, after all. I have never, in all my travels, seen anything like them.”

Marv added, “They are amazing.” He massaged his forehead.

## Chapter 50

# Lost Ticket Home

Piers and Abby had made it 20 meters down the hallway before Piers shot a hole in the roof. “Good grief!” he cried. “How do we turn this thing off?”

Abby reached carefully for the gun. “Why don’t I just take care of this,” she said, jamming it into the back of her waistband.

“Good idea.” Piers let out a relaxed sigh.

“What’s the geology hammer for?”

He wagged it at her. “I know how to use one of these.”

“Ah, I see,” she grinned.

“You’ll need an environment suit. The boat’s this way.”

Piers led her down a corridor to a cramped, dimly lit room next to an airlock. The walls were made of some kind of cast metal, yellow paint peeling from their sides. Large bolts protruded from the seals, more H. G. Wells than modern interplanetary. Abby tapped the side. It gave a hollow ping. “Old school.”

“Yeah, they must have brought it in from something else, an old cargo transport or derelict orbital; just plopped it here for their exit. This place has been thrown together in a real hodgepodge, but it works. Why don’t you grab one of those?” Piers gestured to a row of ghostly figures standing at attention along the wall. The environment suits were all of one piece, with the helmets attached at the shoulders as if they were a row of bodies staring straight ahead. Abby slid into one as Piers picked up a helmet from the floor. “Just where I left it,” he marveled. “Channel five, right?”

Abby switched her suit’s communication channel to Piers’ and sealed the suit. In moments, Piers had secured the door and pumped the airlock up. They stepped out into Titan’s midday twilight.

Abby could almost feel the fresh breeze on her face (although it would not have felt nearly as refreshing as she imagined). She could hear the gurgling slosh of the methane swells as they washed against the rugged shoreline ahead. Sometimes she almost expected the cry of seagulls overhead. It was good to be outside again.

“This way,” Piers said. He led them along a ledge just 2 meters above the lapping waves. The cliff face was steep here, with no sign of a beach or ridge at surf’s edge.

“So Abigail, may I ask you a question?”

“Course,” she huffed, stepping carefully along the frozen shelf.

“Those guys were calling the head honcho ‘Montenegro,’ who we have all obviously heard of before, and then there was that discussion about ‘Sable.’ You weren’t talking about Demian Sable, were you? Ishtar terrorist Sable? *That* Sable?”

“They appear to be one and the same.”

Piers stopped and did an about-face. “Well that brings up a host of questions. How did he get out here? How did he escape? What’s he got to do with Kevin and who was—”

Abby held up her hand. “I don’t know even a small percentage of the answers. I have a few questions of my own, as you can imagine. But this is probably not the time for distractions. I’m sure somebody knows we’re gone by now.”

“Yes, quite. Sorry. This way.”

As they rounded a corner, Piers stopped in his tracks.

“What?” Abby asked.

“It’s gone. The Zodiac. This is where I left it. I know it is. There’s a mark on the cliff face here. But it’s gone.”

“Crrrap.”

“Just what I was thinking.”

Abby shoved her hands on her hips. “We’ve got to go back.”

“Back where? You can’t want to go back into Ali Baba’s den of thieves, surely?”

Abby turned around to take the lead. “We can’t swim. Besides, I know a shortcut to the dock. They’ve got an entire airlock bay, a real nice set-up. There must be something we can use in there.”

“Yeah, sure. Sounds just like the strategic sort of place where I’d post a few guards.”

“Good thing there’s two of us.”

Abby passed the airlock Piers had led them through earlier and took them on a circuitous route farther along the shore. The cliff face became a gentle slope and finally crumbled into a stony beach. The walk took them nearly ten minutes of precious time, but it was worth it. The airlock adjacent to the bay was unlocked. They passed through it into a large pool ringed with a catwalk. No guards were in sight. In the methane bath, two small inflatables bobbed on tethers near Troy’s submersible.

“There it is,” Piers said happily, pointing to his small boat.

“We don’t need no stinkin’ inflatable.” Abby pointed across the pool. “Let’s get in that beauty.”

Piers knew how to sail an inflatable. He had no clue as to the workings of a complex vessel like the one Abby headed for. The thing looked like the latest interplanetary yacht.

“I hope you know what you’re doing,” he muttered.

Piers climbed aboard the top of the shining blue vehicle, spun the wheel and pulled the hatch open. Abby made her way to the huge bay doors. The panel’s red letters spelled out the word SECURED. She punched a sequence to open the doors.

SECURED AT TERMINAL

She tried another set of commands. This time, the words flashed.



## SECURED AT TERMINAL

“Nice,” she mumbled.

“What?” Piers said in her headset.

“The doors are secured remotely. Somewhere else. And we know where that somewhere is.”

Piers popped his head out of the blue hatch. “What can I do?”

“You wait up front in the cockpit, in the left seat. Turn on every switch you can find on the far left console—not the center left one, the far left one. Got it?”

“Got it.” He fixed her with his eyes. “What are you going to do, Abigail?”

“Find Sable so we can disable this security stuff and open this bay.”

“But Abby, just what are you going to do, if you know what I mean. To Sable?”

“You just get the sub warmed up and wait for me.”

## Chapter 51

# Unsettling Revelations

Doc Mason held out a patch to Brian. She looked from him to Jeremy. “Either of you need any pain meds?”

Brian took one, but Jeremy shook his head. The doc frowned and stuck out her lower lip momentarily. “Hmm. I’ve been passing these things out like candy around here. It’s been a regular epidemic. Why don’t you have a headache?”

“He’s lacking some other symptoms, too,” Brian said.

Jeremy put in, “Like none of us have seen any of those sea monsters. Not the Marines, and not me. More importantly, both Abigail and Piers seem free of these symptoms that seem to be the latest rage around here.”

Mason looked alarmed. She turned to Jeremy, wide-eyed. “What are you talking about?”

Jeremy stepped to Mason’s side and took her hand. “Doc, can I talk to you for a minute?”

Their eyes met as Jeremy sat her down in a chair next to him.

“Look, Doc. I think we’ve got some serious hallucinations going on here. Group hallucinations. Is that possible?”

Doc leaned over and held her chin in her hands. “*Folie a plusieurs*, yes.”

“I love it when you speak German,” Jeremy quipped.

“French. *Folie a plusieurs*, the madness of many.” She was thinking now, the panic melting into an intellectual distraction as she stared out the window. “I suppose it is possible. It’s happened before, historically.”

Brian leaned in. “What was that thing you said? The French thing?”

Mason seemed to awaken from a coma. “Yes, yes. *Folie a plusieurs* refers to mass hallucination. It really has more to do with a shared psychosis. A delusion is transferred from some individual who is typically charismatic, a leader type, to someone who is in a subservient role, someone with a weaker personality, a follower. It’s most common in situations where the subjects are physically isolated, or socially isolated, with limited outside contact.”

Jeremy warmed to the idea. “Like an outpost on Titan cut off from outside communication? Like that?”

“Exactly. There was this case—a more limited one that they call *folie à deux*—”

“Madness of two,” Jeremy offered.

“See? You do speak some French. This event involved a woman and her husband. The couple’s *folie à deux* presented as shared delusions of harassment. As I remember it, the couple believed that people were sneaking into their house, spreading dust around and doing something to their shoes, of all things.”

“Great excuse for not doing the house cleaning, I guess,” Brian said.

Doc Mason sighed like a martyr. “The point is, the idea was shared between them.”

“So, to be clear,” Jeremy said, “you think something like that might be going on here? Someone has a vision or hallucination or something, and it gets caught by others?”

“What we’ve got here is on a scale that nobody’s seen before, to my knowledge. I’m no psychiatrist, but I could do some digging...”

Jeremy pushed the point. “And when you think about it, rationally, isn’t it more likely that those sea monsters everyone is seeing are merely visions, shared mirages of some kind, rather than extant life coming up from the ocean a hundred clicks below our feet?”

“I guess that makes sense.”

She was staring at the floor now, but Jeremy called her back into focus. “But I haven’t seen them, nor has Abby, nor has Piers. Why do you suppose that is, Doc Mason? Can you be thinking about that little problem for us?”

“Yes, I suppose I could.”

“Good, because I think it might be very, very important.”

## Chapter 52

# Retribution

Abby peered down the long, rough-hewn corridor, feeling like Dorothy in the wizard's palace. It was a very long way to Demian Sable's lair, but she had a plan, and all it required was a simple architectural feature: an extra door. Reaching behind her, she reassured herself that the pulse weapon was still in her waistband. A man and woman rounded the corner. She kept walking, and so did they. *Act natural. Just act natural.*

She passed the rooms filled with countless arms shipments. These people weren't interested in the next hijacking; they were preparing for an invasion on a global scale.

She approached the galley, but passed it in hopes of finding another way into that little room next to Sable's. She passed two hatches, both locked and both apparently giving access to storage or equipment. Further down, another door looked far more promising. She placed her hand on the door, gently grasping the handle, but paused.

What was best, the element of surprise? Stealth? Overpowering shock and awe? After a moment's deliberation, she knocked lightly. There was only silence. She tried the handle. The door opened easily. She peeked in through the narrow crack. Only one person stood in the room, and he was looking through the side doorway into Sable's compartment. She could hear Sable ranting about something.

"Get in here. Now. And close that door."

The man disappeared, closing the door behind him. Abby had the room to herself. She stepped in, closing the hall door softly behind her. Gun drawn, she dashed to the central monitor. It had touch keys, but another set on the arm of the chair looked more likely. She studied the pad, found what she wanted, and keyed in a command to unlock the bay. Sable was changing direction in the next room. She lurched around the chair and hid in a small space between the console and the wall. It was a lousy place to hide. She could hear Sable hollering.

"I'm surrounded by incompetents! Clark, I thought you were supposed to be organizing our invasion of Mayda. Stiles, go help him. You, Darrow is it? What kind of security guru are you? Get out. And find that girl!"

After a few moments of shuffling feet and murmuring voices, the room fell silent. Sable muttered something about doing everything himself. He slammed the hatch that led to the galley, but she could hear him in there still, busily moving around. Abby got up and stepped over to the hall door. She opened it, checked to make sure it was clear outside, and waited in the corridor, listening. Inside, the inner door opened and she heard the chair in front of the console squeak. Now Sable was in the room with all the screens, undoubtedly searching the system for her.

She opened the door slowly, gently let it latch shut, and stood behind Sable at a discreet distance, her gun steady and aimed at his back. The back of Demian Sable. She thought about that. There he sat, the source of pain, loss and hardship for a host of people across the entire planetary system. The inspiration behind Ishtar, a group that had destroyed so much beauty and life and culture on a number of worlds. How many families had he obliterated? Hers was a microcosm of so many. And what justice had he seen? There he sat, punching keys, calling orders, executing his plans. Someone should put an end to it. Someone could. One person could. Once and for all. The justice system had had its chance, and it had failed. She took in a deep breath to steady herself.

Sable's left hand rested on the tabletop, balled into a red fist. His right hand tapped a key. On the screens before him, a series of scenes marched through like a deck of playing cards. Armory One, Armory Two, Galley, Docking Bay, Airlock One, Two, Three, Electrical Room...

On the left monitor, the bay appeared again, and this time, Piers stood atop the sub, clearly looking around. "Ahh, got you," Sable said.

Abby said, "I don't think he's who you're really looking for, though, is he?"

Sable the terrorist, Montenegro the ersatz pirate, spun in his chair to face her. She aimed her weapon at the left screen. "You might want to lean to your right just a bit." She fired. The monitor splintered against the wall.

"Put that thing down!"

"Still giving orders, are we?" she said in a coy voice. "Was it you that gave the order to kill Kevin Nordsmitt?"

"Who?"

"Pitiful. You don't even know his name. Turn around. Face the screens. Sit up straight."

He did. She fired at the right screen. It disintegrated into powder.

"Just how do you propose to leave this place without someone stopping you?" Sable said, keeping his eyes on the center screen, the only one left.

"Well, have a look at that monitor in front of you, Demian. See all those people swarming? They aren't swarming this way. They're doing just what you asked: preparing for an invasion. That's what it is, isn't it? I'd say they're a bit distracted, wouldn't you? They look as organized as bees after someone's hit their hive with a baseball bat."

"You don't have a chance of escape, and I am your only chance of survival here. I think you should just—"

"Demian Sable, you gave up the right to ask anything of me twelve years ago. You took my parents and stole the lives of a hundred families."

“Don’t be so dramatic. It was simply a strategic operation as means to an end.” He wasn’t even denying his involvement. This scum needed to be eradicated. But something within her, something deep inside, objected. Still...

“And now you sit here, with all those people out there waiting to do your bidding. I guess Morrow did a lot to ‘reform’ you, didn’t it?”

“It did help me accomplish a few things.”

“You don’t get to accomplish anything else. Scoot over.” She fired at the central screen. It vanished in a cloud of powder and shards.

“I had other goals in mind.” Sable spoke faster now. “I was certainly not responsible for—”

“Look, you cannot possibly pull the ‘just following orders’ card at this late date. You were the one *giving* the orders.”

There were no monitors left to shoot. She fired one last time.

## Chapter 53

### Bon Voyage

Troy's fancy little sub seemed to be getting smaller and smaller. Where could she be? Piers wiped his palms on his knees, swiveling his chair from side to side as he waited. He stood and paced as far as the cramped quarters would allow. Outside, he heard the door to the bay open. That was good. Then he heard voices. That was bad.

Piers stood in the upper platform and cracked the hatch. He peered out. Two people had come into the bay. One he had never seen, a large, burly man who looked like a bouncer from a pub he knew in Cornwall. The other was all too familiar to him: Troy Fels. It was Troy who seemed to be doing the talking.

"So I say to this pencil-pusher, 'Got any electrons in there?'" and he looks at me like I've got monkeys crawling out of my nose, so I left and that was that. Amazing, or what?"

"Yah, amazing," the other said with little enthusiasm.

There were only two of them. When Abby got back, the odds would be even, and they would have the element of surprise on their side. How could he be ready? Where had he left that geology hammer? Sweat dribbled into his eye. He blinked it away.

He stepped down onto the main deck again and looked around. It was all so clean, so pristine. So...useless. He scurried back to the storage closet and found a heavy wrench-like thing. Carrying it back up, he peered out again. He could see the bouncer, but where was Troy? Sounds echoed from somewhere across the room. The two had split up. That would make things more difficult. He had to be ready to spring into action. He stepped backward to get a better view. His foot met empty air. The rest of his body quickly followed suit.

He nearly landed on his back, but caught himself with his right foot. He felt something crunch as it twisted under him. Sharp pain sizzled up his entire leg. He felt instant nausea. He collapsed onto the floor. What had he done?

He heard the bay door open. It had to be Abby. The blood pounded in his ears. This was it. Pulling himself up the steps, dragging his useless leg behind, he got to

the hatch just as the bouncer spotted Abby. He was starting to say something when she hit him in the head. Her weapon was a heavy fire extinguisher, and it was quite effective.

“You little bitch!” came a call from somewhere behind. Piers opened the hatch wide. Abby saw him and began to move toward the sub. Piers tried to put weight on his foot, but it was no good. Blinding pain and white light flooded his world. He took a deep breath and tried to simply remain conscious.

Troy had come around to Abby’s side of the pool. He was moving fast. He’d be to her before she was to the hatch. Piers threw his wrench-thing at Troy, carefully. He made the shot count. The heavy tool clipped him on the left knee, sending him sprawling to the ground. Abby ran for it, but Troy was faster. He was on his feet and nearly to her.

In a flash of inspiration, Abby turned the fire extinguisher on him. Its spray hit him in the face at a range of several meters, stopping him in his tracks. The stuff apparently made a better fire retardant than eyewash. He clawed at his face. Abby climbed aboard, dove through the hatch and tumbled down the steps. Piers secured the door and clambered down, limping forward to his seat. Abby scrambled into hers and pulled a large lever. The entire submersible dropped a foot and rocked free in the pool.

“Let’s hit the road!” she cried.

(\*)

After the wild exit from Demian Sable’s North Quadrant base, the susurrations of the methane sea was soothing. Piers and Abby were quiet for a few minutes as the little submersible gained distance from the pirate lair. Finally, Abby broke the tranquility.

“Your ankle. How did you—”

Piers shook his head. “Just twisted, I think. I’ll wrap it in a minute. I’ll take some pain meds. It will be fine. You okay?”

“Good,” she smiled.

The soft sloshing of the methane filled the cabin. Bubbles sang along the vessel’s sides, a quiet marimba serenade. But Piers found no comfort in the sounds outside the hull. He was afraid. He was afraid for Abby. What if she had killed Montenegro? Perhaps it was in self-defense. That would help. But when a person takes another person’s life, they are never the same. What if she had killed him under other conditions? Was it murder? An act of war? The lesser of several evils? The mind rationalizes in these times. What was her mind telling her? Would she leave this place mentally intact? Piers was trembling, aching for Abby and for what might lie ahead in her life. He averted his vision, trying to look forward and not toward her.

Abby broke in on his dark thoughts. “I didn’t do it, you know. Back there.”

Piers stiffened. “I don’t need to know anything you did or didn’t do while I was waiting for you, Abby.”

“Piers, what I’m saying is that I didn’t kill him. Even after everything he has done and all the pain he has subjected zillions of people to, I couldn’t kill Demian



Sable. Not like that. It wouldn't make things even, despite the years that I told myself it would. It wouldn't be justice. It would be the kind of death my parents suffered, with no warning and no chance to do anything about it." The last word caught in her throat. She took a breath. "And there is no justice in that."

After a moment, Piers nodded in understanding. He didn't need to say anything.

"I did shoot the arm of his chair out from under him so he didn't have any more controls. Scared him half to death. That was worth something."

They both laughed.

Without preamble, and without taking her eyes off the window, Abby said, "Troy thinks I'm driven to excel in my career because I'm trying to make up for all the things my parents never could do because of *him*." She glanced back toward the pirate base, toward Demian Sable and Troy and all the rest of them. "Do you think there could be any truth to it?"

Piers was silent for a moment. He took a deep breath, choosing his next words carefully. He wasn't shaking any more. "Tell me what you remember most about your parents."

"There's a nice, random non sequitur."

"Humor me, Abigail."

She looked at her monitor, then out the front windows. "I guess we have some time. What's there to tell? My Mom was always there for us. Loved us. Loved her friends, too. She was one of those people who everybody else counted on. Dad was like that in his own way, especially in a crisis. People always looked to him to get things organized, herd the crowd. And he did it in a way that left everyone laughing."

"That's where you get your sense of humor? Or maybe your creative use of fire-fighting equipment in a crisis?"

She smiled wanly. "I suppose, but it went beyond that. He just made people feel happy, somehow. Even when he got mad, he could turn a tense situation into something funny. With us at home, with people at his work. I think that was one thing Mom loved about him. They both worked a lot, and neither had time to cook for the other, really, so it was always a real treat when one of them would stop to fix a big meal. Mom would do these Italian feasts for her 'funny man.' Kind of old fashioned. Sweet."

"Yes, very," Piers said. They sat in the stillness, listening to the thrum of the engines.

"Funny thing," Piers said.

"What's a funny thing?"

"You never once mentioned their archaeological careers. I am sure they were impressive."

"Oh, they were. They both were awarded the—"

"I've actually read their bios," he broke in. "Very notable. But Abby, that is not what the people around them remembered them for. That's not what you remember them for. They inspired things in you and in others, but those things were not academic. They were deeper. And when the end of your life comes, the record will

show what was important to you, and what you inspired in others. Either you will have a few electronic files that some graduate students will dust off now and then for some reference project, or you'll have a train of people who will remember the things you did and the things you said and that beautiful smile and that imposing and creative mind of yours and that laugh—”

He stopped himself. Red flushed his ears.

“At least you didn't mention my figure.”

“I'm sure it's nice, too. Don't change the subject.”

Abby eyed her British friend. He was cute when he was like this. And he was something else—dashing.

“Abby, I'm proud of you. I've watched you ever since you came here nearly two years ago. I've watched as you kept returning to the old Abigail, the bitter, vengeful one out for retribution. No ‘Vengeance is mine sayeth the Lord’ for you. But you had a decision to make back there, and I think you left the old Abigail Marco behind. Now, she wasn't bad at all, but I'm looking forward to getting to know the new one. The free one.”

“You should be a poet.”

“No good. I nearly flunked out of English Lit for my Advanced Communications Tech degree. Can you believe it?”

“After the last few weeks, I can believe just about anything.”

## Chapter 54

# Return to Sender

High noon on Titan was a gloomy affair. The Sun stayed low to the horizon for viewers near the pole, and Mayda Research Station's inhabitants got used to the eternal twilight. Still, the outpost looked exceptionally melancholy as the submarine surfaced offshore.

"It looks spooky with no lights anywhere," Abby said quietly, as if a loud voice would disturb ghosts lurking in the darkened habitats.

"It's bad, Abby. Look at the eastern habs."

"The whole section's been cordoned off. They're blackened. Charred or something."

"Fire. Methane must have gotten in. Look, we've even got breached windows over there at the far end. Maybe you were too easy on Sable after all."

"Maybe I was. We've got to find Jeremy."

"I'm sure he's with his Marine buddies at the other end."

(\*)

Jeremy gave Abby a huge bear-hug. "Sight for sore eyes, sweetie."

"You're not sounding very professional," she said into his coat.

"I leave the professionalism to the Marines. I'm wearing my godfather hat right now. Piers," he said, turning to the man and shaking his hand while not letting go of Abby. "Excellent job, although I do wish you'd told us. I would have happily gone along to help out."

"Didn't think of it at the time. I was distracted. Besides, I figured a full invasion wasn't what we needed at the time."

Abby scrunched up her nose. "Smells like someone's been grilling plastic."

"It's a lot worse closer to the eastern section," Jeremy said.

Piers glanced in that direction. "Yeah, we saw."

"And speaking of invasions, the good news is that a large contingent of Marines is on its way from Iapetus as we speak. Due early in the morning."

Brian had joined the little crowd of celebrants to welcome Abby back. He inched his way up to her.

“Hey Brian.”

“Abby, glad to see you in one piece.” He fidgeted. “Ah, did you, by any chance, get that little item?”

“No good, old boy,” Piers called out in mock regimental. “Sable shot the hell out of it.”

“Why would he do an insane thing like that?” Brian’s jaw clenched.

“So this is the reactor they took?” Jeremy asked.

Brian gave Jeremy a disdainful glower. “People don’t just run off with nuclear power plants. They are heavy and bulky, not to mention dangerous. But,” he held up his index finger, “the heat energy from the reactor goes to a little thing that turns around and around—”

“Like a turbine?” Jeremy put in.

“Show off,” Abby said.

“That’s it, yes. But to get to the turbine, there’s a very special unit unique to the Ingermanson power plant that connects the two, and that’s what they took.”

“There’s no *they* about it,” Abby said. “Troy took it.”

Jeremy eyed the Master Sergeant. “Yes, well, Troy will get his, I’m sure. So we just need to jury-rig a way to get power from the reactor to the turbine, and Bob’s your uncle. Right?”

“If only your Uncle Bob were here. It’s a very specialized device unique to the Ingermanson reactor stack.”

Abby leaned in toward Brian. “That’s what I’ve been trying to say: there is another Ingermanson reactor on Titan. The sub has one. Troy was very proud of the fact.”

Instead of pure joy, Brian met her news with casual nonchalance. “A comparatively dinky one, probably.”

“Wouldn’t it still work?”

“With the power difference, it would be fried in short order.”

“But it would work for a while?” Jeremy pushed.

“Maybe in a limited way,” Brian admitted, with just the hint of a smile.

“Limited is better than nothing. Brian, you’re a genius at this kind of stuff.” Abby shot to her feet. “Let’s just check, shall we?”

## Chapter 55

# Sequins and Saline

Someone had strewn floodlights across the floor of the engineering hab. The lamps illuminated the room from below, casting surreal shadows as if from a cheap horror holovid. Half a dozen onlookers crowded the equipment-crammed room, a bevy of fuzzy bears wrapped in winter couture.

Brian hovered over the small, whining assembly from the submarine like a worried hen over her chicks. “I don’t know how long this thing will hold out.” He rubbed his hands together and peered skeptically at a monitor. “We’re running heat for twenty minutes an hour, and life support for another twenty, and if we keep the lights on low-level night mode, maybe...”

Abby blew a puff of vapor his way. “Nice to have some heat, though.”

“And comms. And light,” Jeremy said. “I was getting tired of flashlights. Now, if they can just get that hardware out here from Ganymede before Brian’s little masterpiece gives up the ghost, all will be right with the world.”

“Well, almost all,” Abby said. She turned to Jeremy urgently. “Please tell me you won’t let him get away. Tell me, at the end of the day, that Demian Sable will be back where he deserves to be, that some TBI bigwig has a big plan.”

Jeremy’s silence was an answer.

“Or the Marines?” she begged.

“I’m sure they’ve got their plans.”

“That does bring up the issue, doesn’t it?” Piers said. “Shock and awe may not be the best solution over there. How to get the upper hand?”

Doc Mason and Tanya stepped into the room, grinning. Everyone’s spirits had lifted dramatically since Brian’s reinstatement of the power, even at low levels.

“I’ve been thinking about that,” Abby said. “I wonder if we need to be looking in another direction.” She was staring at the doctor, who looked around the room, realizing that all eyes were on her. “Hey, guys. How’s it looking down here?” Everyone nodded courteously. She looked back at Abby expectantly.

“Doc, I was just wondering, how’s your patient?”

“Which one?”

“Jasmine Major.”

“All better,” she said cheerfully. A look of suspicion shadowed her face. “Why do you ask?”

“What did you do to her? If that’s not a breach of patient confidentiality.” Abby smiled. Doc Mason relaxed.

“I didn’t do much. I tried a wide spectrum of antibiotics and psychotropics. No effect. She was dehydrated so I flushed her system with saline. She just got over it. Often, medical conditions resolve without us knowing exactly why.”

Excitement tinged Abby’s voice. “That sterile saline you use. It’s not distilled from Titan water, right?”

“Right. Comes prepackaged. I think I see your point.”

“Point?” Jeremy asked.

“It’s not infused from Titan ice.” Abby’s voice was contemplative.

“Which may have been contaminated from Titan sea water as of late,” Piers said.

Abby thought back to her conversation with Piers in her room the night the drill broke through. *I only drink the hot stuff*, she had told him. And he had responded, *I only drink the filtered stuff*.

“I’m not sure I see the tie-in to our imminent Marine invasion,” Jeremy said.

“Let’s not get ahead of ourselves,” Doc Mason cautioned. “We first have to see if there’s a connection to the water, and more importantly, if it has something to do with mass hallucination.”

“Yes,” Jeremy warmed to the subject. “It’s as I was saying earlier. Is that a possibility? Could people be ‘catching’ these sea monster sightings and auditory mirages, as they did in your *foie gras* whatever?”

“*Folie à deux*. It is possible,” the doctor said, steepling her fingers. “But what if it’s something different?”

“Different, like what?” Jeremy asked.

“I worked in an orphanage in sub-saharan Africa where we had some mass hysteria. Pretty ugly scene. We traced it to a fungus in the grain. *Claviceps purpurea*. They call it ergot poisoning. And various toxic chemicals or microbes have been blamed for things like the events leading up to the Salem witch trials.”

“I wonder what my father-in-law has been eating,” Brian said, still gazing at his monitor worriedly.

“In this case, I doubt we’re dealing with microbes or some kind of Titan life,” Abby said.

“But you said, yourself,” Piers told Abby, “I drink the bottled stuff and you heat your water. If heating water makes it safe, doesn’t that imply that you’re killing off some little germies?”

“More likely some chemical toxin,” Tanya said. “Some chemical reactions are subject to temperature changes, also.”

Abby said, “Doc, humor me and describe the monsters out there.”

The doctor shrugged, as if another description really wasn’t necessary. After all, just about everyone had seen them. “Long-necked, like the Loch Ness Monster, with flippers. Pink, with a fuzzy purple fringe along the neck, perhaps feather gills or something.”

“Something, yes,” Abby encouraged.

“And a shimmery skin. Sort of ...” The doctor wiggled her fingers. “...glittery.”

Abby looked at Tanya. Tanya seemed in the midst of realization. “Well, Tanya, ring any bells?”

“Da. Dmitri Dragon.” She explained to all. “Pink toy dragon we had as kids, long neck, sequins on purple hair. What did you call it, Abby?”

“Mane.”

“Mane, yes.”

The doctor pursed her lips. “Sounds familiar. To everyone, I’m sure.” Her tone became firm, in control. “I can start a saline infusion for the most severe patients right away.”

“I’ll go,” Tanya said in a resolved, clear tone.

“What?” Doc Mason said.

“I’ll be your first hamster pig,” Tanya said. “For your test. Give me the stuff. I...” She looked at Abby, tears in her eyes. “I don’t want to see Kevin anymore.”

Abby didn’t have the heart to correct her guinea pig reference. She just gave her a hug.

## Chapter 56

# What the Doctor Ordered

Doc Mason was never crazy about close spaces. But what she was after didn't sit out in the open. She crawled through the dry food storage compartment. It wasn't fun, but it was necessary.

What if she was reliving a nightmare from her past, that near-disaster that she experienced in that African orphanage so long ago? She had tried to convince herself that Mayda Research Station's inhabitants were suffering from conversion disorder, like some cases she had seen during her post-doc. Patients presented neurological symptoms like numbness or even mild seizures. The disorder interfered with their senses, affecting touch, visual perception, even hearing, but with no clear external cause. The symptoms seemed to always be associated with stressful situations affecting a patient's mental health, something akin to PTSD. It made sense: the disorder typically arose at a time of trauma or stress. Physical symptoms affected the senses—with occasional blindness or deafness—and movement, with partial paralysis. And another thing fit: the symptoms she saw spread rapidly, throughout an isolated group of people kicked off by a sort of “patient zero,” a common source person in contact with the group.

She ticked off the list for convergence disorder: rapid onset and recovery of symptoms, check. At least “check” for the onset part. Recovery was still an open question.

Manifestation in an isolated group, check. Mayda was about as isolated as you could get.

The presence of extreme anxiety, check. The life support systems were crumbling around their ankles. If that wasn't cause for some anxiety, she didn't know what was.

Symptoms spread through sight, sound or verbal communication. Maybe. But maybe not. That part of it fell short. Some people who had no foreknowledge of the tie-in with Kevin's petroglyphs heard the music. Some saw the beasts out in the surf before anyone told them about them, didn't they? She had to think. And she kept coming back to that orphanage in Africa.



And ergot poisoning. She could smell the grain as she peered behind the last row of shelves. A dugout section in the wall extended back farther than her flashlight could reach. The place reminded her of a root cellar she had seen in an Earth museum. And she had to go back there, back where the wheat and rye and rice was bagged in rows, kept cool by proximity to Titan's cold ground. She pulled a stepstool over, leaned in on her belly, and began to shimmy in.

By now, the entire station was dark, save for a few pools of isolated light sources. But this cramped crawlspace had a darkness all its own. It was the perfect place to be thinking about those creepy, fungally induced events in Africa and, before them, in Puritan New England.

She had just looked it all up on the skein, and the parallels were spooky. The small enclave of Danvers, Massachusetts, consisted of a community of Puritans living under stressful conditions, as stressful as any that Mayda was now enduring. The Salem witch trials cranked up just as the town was recovering from the traumas of a British/French war fought in their own backyard. They had just survived a smallpox epidemic, and they were constantly under attack by the local Native Americans. Psychologically, it was the perfect storm. If the populace was sickened by fungal infestations of the main food source, it was no wonder they suffered mass hallucinations.

She beamed her waning light over the foodstuffs. She knew what to watch for: discoloration, breaches in the containers, a sickly sweet smell. But all the grain seemed intact, safe. That was probably a good thing, she reflected. After all, 20 of Salem's finest had been executed, most by hanging.

This had to be something different, something completely alien. Sure, there were parallels. But something was getting into people's brains, something that enabled them to...what?...telepathically connect? Influence each other subconsciously? Communicate over long distances? The scientist in her was skeptical, but she knew she would feel a lot more rational once she was out of this storage room. She determined to take samples back to her lab, but she felt certain, just by the conditions and safeguards here, that she would find nothing.

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Commodore Clark gazed along the cliff face. Beyond it, beyond the rise where his precious North Quadrant base lay excavated within the ice, stood dozens of vehicles in ramshackle rows: single-seat flyers, bombers, troop carriers, all-terrain vehicles. It was silly, really. Overkill. All they had to do was go in and take possession of a science station inhabited by a hundred weakened, chilled, starving scientists. Even so, he wasn't sure of the attack's outcome. After all, his own people had intercepted that pesky SWAT team in the rings. Who knew what other wicked plans the authorities might have to put a cloud upon his sunny disposition. But so far, no sign of them. Just a lot of empty space out there between Titan and real civilization. He gazed at a handful of his 'warriors' loping around the icy plain.

"Disorganized doesn't begin to describe them," he told Kinto. Reflexively, he reached up to rub his eyes, but the visor on his environment suit got in the way.

"I'm telling you," Kinto said, "It's a lost cause. Give it up. Half of these people have blinding migraines, and the other half are terrified to distraction of those sea monsters out there. And have you seen Montenegro lately? His eyes look like a pepperoni pizza."

"You don't look so good yourself," Clark said. "But Montenegro's definitely not on his game. I don't know what happened in the security center, but distraction is definitely the order of his day. He's been twitching and sweating like a stuck pig and mumbling about some 'remarkable woman.' I think he's lost it."

"He'd lost it back when he announced his grand plan, Clark. Face it."

The Commodore didn't note Kinto's insubordination. "All we need is a base of operations to get started," Clark said with a touch of the old eagerness. "A base like Mayda Station."

Kinto turned to go back in. "Still clinging to the hope? Be my guest."

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"How are you feeling?" Abby asked Tanya, looming over her cot in the Medlab. Jeremy stood beside her.

"Headache's all gone. And so is the constant music. You should never be a nurse, my Anya. No bedtime manners."

"Guess you were right," Doc Mason called from across the room. She abandoned her microscope and walked over to them, wheeling a portable IV along with her. "Flushing the system seems to do it. But I don't understand something you said earlier. You told Mr. Belton here that we needed to be thinking in some different direction, and I got the distinct impression that direction involved me."

"Well, yes," Jeremy interjected. "You see, Abby has long suspected that these hallucinations were somehow 'contagious.' And then you, yourself, said that something akin to that has happened before. I'm beginning to think she's right, and if that's the case, why not make use of those hallucinations?"

Doc Mason put her hands on her hips. She didn't bother to tell them of her failed search for the epidemic's culprit. Why spoil it for them? "Just how do you propose to do that?"

Abby smiled. "Tanya had her Dmitri Dragon, and now everyone sees pink sea monsters with purple fringe. Kevin's room was covered in images of Native American flute players, and now everyone sees petroglyphs and hears music. Why not push the equation a little? Make a mental prompting of our own?"

A sly smile spread across the doctor's face. "Ah, like hypnotic suggestion?"

"On steroids," Jeremy confirmed.

Abby walked over to the porthole and looked out into the somber glow of Titan's wilderness. "The Marines get here soon, and they'll have all the same problems that Piers and I saw: a well-fortified base, whole bunches of well-armed and probably well-trained hoodlums on the defensive. It's a tough nut to crack. But they've been drinking the same water we have. What if they think their impenetrable fortress is not so impenetrable? What if they think that they have no electricity, no power?"

“They’d be fenced in. And none of their security would work,” Jeremy said.

“At least that’s what they would think, until they pushed a button or something,” Mason said, frowning.

“But those minutes of uncertainty, that pregnant pause, might be all our boys and girls in blue would need to penetrate the real defenses and get a handle on things. They do wear blue, don’t they?”

“Induced hallucination,” Mason mumbled.

“There is one problem,” Abby said.

“Down to just one?” Doc Mason scoffed.

“For now. I wonder if there’s a range to this. We might have to get within a certain distance to make it work. Whatever those people are going through over there hasn’t seemed to have affected us at Mayda.”

The doctor surveyed the Medlab. “How soon do they get here? The cavalry?”

Jeremy glanced at a nearby screen. “Two hours, give or take.”

“And how long does it take to get to the north shore by boat?”

“Less than half an hour if we take Troy’s supersub,” Abby said.

Doc Mason pulled the IV out of her arm. “Just when my headache was beginning to resolve. Somebody get me a glass of nice, cool, unfiltered Titan water and let’s go for a ride.”

“You’re sure about this?” Abby asked.

“You bet. I’m the best candidate. Tanya’s almost recovered, and I’ve just started. I’ll make the sacrifice for a bit longer. But I could ask you the same thing. Are you sure you want to go back there, anywhere near that place? If I’d just escaped from an ice cave, I don’t think I’d be in any mood to rush right back.”

Abby took in a long, liberating breath. She closed her eyes and smiled. Though the pain would always be there, the oppressive weight of her parents’ loss had evaporated. She and Demian Sable had come full circle, and she was the one who had ultimately gained the upper hand. Abigail Marco had shown mercy. She had stayed her hand, in the hopes that the system’s justice would come to bear. She hoped she had acted wisely. The sense of freedom coursing through her veins told her she had. It was emancipation day. It was the year of jubilee.

“Yep,” Abby said. “Time to see this thing through.”

Jeremy headed out the door toward the Comms Station. “I’ll check in with Iapetus and let them know what’s up. The Sargent Major’s giving us all a ride to a ringside seat, so I gotta get going. Keep in contact out there. I want to know what’s happening, okay?”

“Yes, dad,” Abby whined. He grinned as he left.

## Chapter 57

# The Dancer

Abby and Mason took the front two seats in the cockpit. Tanya sat directly behind, watching out the windshield between them. Piers drove the rover, backing the boat trailer into the lake. As the submersible floated off the trailer, he waved them off.

“Bon voyage, ladies,” his voice crackled in their headsets. “I’ll be listening in on comms when I’m not dealing with incoming military and various other things.”

“We’ll try not to be too entertaining,” Abby radioed back. She pirouetted the vessel in the shallows and thrust forward. “Okay guys, we’ve got no access to our reactor anymore, so the batteries will last us about two hours under power. That’s all the time we’ve got.”

“What about those extra ones Brian put in?” Doc Mason asked, rubbing her temples.

“That’s counting those. Headache back?”

Doc Mason nodded and winced.

“I’ll get us out there as quickly as I can and then you can go back for a good IV drip and a margarita.”

“Both of those sound great right about now.”

The paltry light outside faded quickly to darkness as Abby submerged the little craft. Gentle currents rocked them back and forth, whispering along the walls.

Mason was staring out the window, mesmerized. Abby knew what she was looking at, although she could see nothing.

“They really are beautiful, even if they aren’t real,” the doctor said, her tone soothed with wonder.

Tanya gazed out the window longingly. “I cannot see them anymore.”

The doctor continued to study whatever she saw out there. “When I was in Africa, I learned an ancient proverb. It said, ‘Those who do not hear the music think the dancer is mad.’”

“The music has gone quiet for me,” Tanya said, forlorn.

They were half way across the lake now, and Abby could see distress on Doc Mason’s face.

“What is it?”

“Do you hear...voices? Sounds?”

Both Abby and Tanya shook their heads. Tanya said, “Maybe you are hearing things already from the other side, from the pirates?”

“Yes, I think that’s it. We must be close.”

“Okay, if you can hear their thoughts, my bet is they can hear yours,” Abby said, her voice jittery. The joystick was slick with her sweat. “Let’s get in just a bit closer.”

“Ah, there’s a big one,” Mason said. She looked down, embarrassed.

“Don’t concentrate on the sea monsters, Doc,” Abby said. “Concentrate on the pirates.”

“Yes, yes. I suppose it’s time.”

Abby keyed her microphone. “Jeremy, we’re in position.”

Doc Mason sat in her seat with her eyes squinted shut, lips clamped, jaw tight, deep in meditation. Tanya and Abby watched the monitor carefully, its feed set to the periscope view. The sky was blank, save for the undulating orange fog. The horizon rocked back and forth gently.

Suddenly, they were there. The Marines had finally arrived. They swept from the sky like giant locusts, black barbed things bristling with weapons, ion engines casting blue beams through the rusty mist.

“I’m glad they’re on our side,” Abby cringed.

The doctor opened her eyes.

“Relax, Doc. I think you’ve done all you can. Thanks.” She reached over and patted her hand. “A lot.”

“Small sacrifice for peace-and-freedom, if it works.”

Abby handed her a bottle of water. “I’ve been saving this for a special occasion. Straight from the artesian springs of Syrtis. I’ve been there. Beautiful little place right on the Martian equator. Drink up.”

“They’re landing,” Tanya said.

Abby remembered the World War Three movies she had seen: armed men falling from the sky, pulse beams blasting away, people scampering from force domes to trenches. But this scene seemed completely one-sided and eerily serene. She counted five behemoths. In the dense air and low gravity, they seemed to float like giant leaves as they descended toward landfall. The first two set down beyond the ridgeline on the coast, but the third landed where they could see it. A ramp dropped. Light spilled onto the icy ground. A quartet of armed giants loped down the ramp, then half a dozen, then two score. They made their way toward the hatch that Abby and Piers had used in their search for the Zodiac. As they approached the entrance, a second group of Marines wheeled around from the other side. It was a dramatic force. Now was the moment of truth. Would Doc Mason’s mental suggestion have any effect? Would the men and women from Iapetus be met by gunfire? Explosions? Surrender?

Then she remembered something else, something that sent a slow, controlled wave of terror down her back and into her gut. Jeremy was out there with them.

The view abruptly flashed to a sickly yellow-green. Something was in the way of the periscope. Abby punched in a command for a wider field of view. Above them, just a hundred meters away, a large chartreuse speedboat was motoring their way.

“It has guns,” Abby said.

“Lots of guns,” Tanya agreed. “And big guys with more guns. And they are not Marines.”

A chill slithered down Abby’s spine.

Doc Mason stood up. “What do we do? Lock the door?”

Suddenly, the screen went dead. The lights flickered and darkened. The whir of the engines died to an alarming silence.

“Well, guys, we just ran out of battery power,” Abby said. They could hear the sound of the approaching boat.

Mason sat back down. “I believe the expression is, ‘Dead in the water.’”

## Chapter 58

# Boarding Parties

Jeremy had been part of SWAT actions before, but nothing near to this scale. It inspired awe and fear, and he wasn't even on the receiving end. The Sergeant Major's shuttle had met up with "Bird Number Four" at 20,000 feet, well within the haze layer. Jeremy and the three Marines had boarded there and stowed their vehicle. He was astounded by the scale of the ship, a third the size of a luxury liner.

His comment about a ringside seat had been a facetious one, but he and his three colleagues were given seats in the front observation pod. They could see everything. They could see the giant ship below and ahead of them as it touched down, scattering ice and mist in its wake. Dozens of men and women fanned out in its floodlights, perfectly choreographed, setting up stations at the two known access points. Small weapons vehicles rolled into place as their own ship bumped to the ground. The Marine in charge at the gate motioned for Jeremy to come on over.

"Belton, you're on," said a voice in his ear.

Belton climbed into the lock with eight others. The air cycled and they stepped out. The base had few external lights, and the ones it did have were off. The vehicles focused their headlights onto the main hatch. Jeremy stood by. The Marine at the door, First Sergeant Orin, asked Jeremy, "Ready, sir?"

"Go for it," he said with more gusto than he felt.

Orin's men aimed their guns, ready to blast, but Orin held his hand up. He reached over. The hatch was unlocked. It opened easily.

Getting a massive army through a small airlock would not be easy, so they stood by with grenades to blow the wall out if they needed to. Thanks to Titan's air pressure, there would not be an explosive decompression if they needed to enter by force. As a precautionary measure, the first group burst through the door without cycling the air, using an emergency decompression procedure. No one was directly on the other side. The corridor was dark. They resealed the lock for the next group and secured the area. As soon as the second group was through, Jeremy found the nearest access monitor and keyed through views of the interiors of North Quadrant. Most of the hallways were dark. Why were all the lights off? Where was everybody?

He clocked through several more screens. Empty halls. Darkened corridors. Abandoned rooms. Finally, the screen flared with light. The monitor read “galley.” People crammed the chamber cheek to jowl, all stationed at the ends of each other’s guns. They appeared to be holding a massive standoff.

The Marines had reached a critical mass of several dozen on this side, and another fifty on the far side would converge on the galley area in moments. “Time to move,” Orin said.

As they made their way quickly down the hall, he noticed a brightly lit hallway to the left, and heard voices. The Sargent Major held the group up, took five with him, and accompanied Jeremy down the corridor. At the end, in a cramped, brightly lit anteroom, Demian Sable slumped on a small metal chair, looking dejected and holding a black and green stick. Surrounding him, and heavily armed, stood Kinto, Marv and Jessie, who introduced themselves as friends of Abigail Marco. By the handdog expression on Sable’s face, it certainly appeared so.

“Abby called us as soon as she blew off the control panel on the Admiral’s chair,” Jessie explained, putting her hands up.

“We were already having some problems with his management style,” Kinto added, setting his weapon on the floor.

“To put it mildly,” Marv said. “Who are you guys, anyway?”

Jeremy said, “These are Tri-Planet Marines, recently arrived from Iapetus. Did you not notice the uniforms?”

“It’s a bit hard to tell in this dim light,” Kinto squinted.

The Marines looked at each other, mystified.

“We’ve had a massive power failure,” Kinto explained. “Nothing works.”

“Yeah,” Marv added. “You guys have built-in night vision goggles or something? I can’t see anything in this light.”

The puzzled Marines escorted the trio back down the bright corridor. Jeremy followed a few paces behind. As Orin entered the shadowy hallway, a blast of light filled the corridor. Jeremy grabbed his sidearm and rushed toward the hatch, but Orin gestured him to wait. Orin swiveled out, set, and fired twice. A pulse hit him in the shoulder and he went down. Two pirates dashed by the doorway, trailing the smell of ozone. Jeremy heard more firing. He jumped to the door, peered around the corner, and saw one of the two turning back toward Orin. The pirate leveled his weapon. Orin was a sitting duck. Jeremy fired, hitting the marauder in the chest. Jeremy turned to see half a dozen more armed men bearing down on him from behind. He ducked back into the hallway and aimed his weapon, but he never had to fire. A flood of Marines washed into the hallway from behind the pirates. Now surrounded, the attackers lay down their weapons. Jeremy squatted next to Orin and helped him to sit up.

“I’d love to say something dashing like, ‘It’s just a flesh wound,’ but it hurts like hell.” Orin began to slide over again.

“Medic!” Jeremy called.

Jeremy glanced at the motley crew, now surrounded by the Marines. He leaned in urgently. “Sargent Orin, where is Sable?”

The airlock at the end of the corridor was cycling. Someone was headed out.



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Abby, Tanya and Doc Mason watched in horror as the armed yacht turned to, bringing to bear a large cannon extending from its prow. Spotlights scattered diamonds across the lake surface, crossing the submersible from side to side. Whoever they were, they didn't bother using a radio transmission. A voice boomed from an external loudspeaker.

"Surface immediately and prepare to be boarded."

"A bit dramatic, don't you think?" Doc Mason said in the near-darkness.

"They even *sound* like pirates. Not much choice," Abby said. She punched a lever for a manual surfacing. The sounds of fizzing bubbles filled the cabin. Feeble light filtered through the windows. Then the floodlights from the green boat poured in, creating ghoulish caricatures of their faces.

Suddenly, another voice boomed from above, this one from somewhere higher.

"Surface craft, stand down or we will sink you. I repeat, stand down or we will sink you."

Now, the spotlights were beaming from above, converging on the ugly green ship. Overhead, beyond the green pirate boat, floated one of the whale-like Marine cruisers.

"There's a nice sight," Doc said.

"Da, da. Good guys," Tanya said.

The bobbing avocado remained where it was, pointing its prow cannon in the submersible's direction, but didn't make a move. The immense Marine ship drifted slowly over it. An inflatable raft dropped into the water, then another and a third. Each had some type of pulse weapon mounted on its prow, and the small craft were surprisingly maneuverable. The flotilla surrounded the boat, and its crews boarded it efficiently. A fourth craft, larger than the others, lowered from the belly of the floating Marine ship on cables and came alongside the sub. Abby's radio crackled.

"Mayda submersible, this is Marine Three. You all okay in there?"

"Yessir," Abby radioed back. "We have just enough backup power for emergency radio and life support, though."

"Need a tow back?"

"We'd appreciate it."

As Marines scampered across the deck of the submersible attaching lines, Jeremy's voice came across the comm. "Abby, do you read?"

"Hey, Jeremy, you okay?"

"Great, actually. The girls and boys in blue are now embarking on what they refer to as 'mopping up operations,' which in this case is fairly literal, as some of this place seems to be melting. I don't know how to tell you this, but your former boyfriend is in custody."

Abby winced. "Wish he wouldn't call him that." Into the radio, she said, "Where he belongs."

"Yeah, I thought you might feel that way. Tell Dr. Mason she did a great job. They took the entire place pretty much without firing a shot. These guys in here were so disorganized that the good guys just marched right in and took away their toys. And they had enough heavy armaments for a planetary invasion. Literally. Are you guys all set?"

“We had some adventures. Tell you when we’re all back at the ranch.”

“Roger that. See you soon, kiddo.”

“Jeremy, what about Demian Sable? Jeremy?” But Jeremy had already signed off.

The sub lurched as the Marines began to tow it home. The corners of the doctor’s mouth turned up slightly.

Abby raised an eyebrow. “Out with it.”

“Da, What are you not telling us?”

Doc Mason smirked. “From what Abby said, I just had the sense that they were suffering a bit of, shall we say, disunity? So I encouraged it. I figured a little civil war would come in handy for us.”

“You got that right. Looks like you made things a lot easier for the forces of light.” Abby’s eyes met the doctor’s. “Doc, what was the deal with MECTRODEX, anyway? I just can’t figure out how much they knew.”

“Jasmine Major was pretty appalled at what was going on here. Said she wanted nothing to do with something that could turn people into zombies. Her word. She spilled her guts about it, once she was feeling better. Apparently, MECTRODEX knew of an alleged fossil find by a CoAz grad student here nearly a decade ago, and covered it up. They concluded there might be something in that ocean down there worth using for their research. At that point, it was pure guesswork, but those kind of microbial studies often lead to profits in pharmaceuticals, so they bided their time until someone would have the wherewithal to gain access to the subsurface sea.”

“So, Kevin?” Tanya looked as though she was afraid to ask.

Mason didn’t answer right away. Abby let out a long breath. “Troy was right about that part, sadly. Kevin must have been working for MECTRODEX on the side. Not hydrology, but Titan microbes. New beasties, like the sketches we found in his sketchbook.”

“Bugs that could mean a fortune on the pharmaceutical market if they had the right laboratory spin,” Mason said. “Although I’m still not sure all this has a biological source. Those microscopic blobs may be just that. Flotsam. Bubbles of hydrocarbon sludge. But something is interacting with human metabolisms. And the dark side, of course, was how powerful a tool this mass hallucinogen could be in the wrong hands.”

The beach appeared through the fog. Along the shoreline, a team of Marines waded through the methane, taking samples. “Undoubtedly, elements of the worlds’ defense departments will be interested in its applications. Certainly there’s no way around that, unfortunately.”

“Why?” Abby asked, her head reeling.

“You mean, why unfortunately?”

“Why defense departments?”

Doc Mason reached over and squeezed Abby’s hand. “I love that about you—your innocent optimism. You’re still thinking drug corporations, and we’ve already used it as a tactical weapon against the thugs on the north shore. I gave them power failures and civil war with a mere long-distance suggestion. Who knows what’s ahead? But maybe we scientists can reign in that onslaught, control that process, don’t you think? After all, you’re the optimist.”

As the submersible beached firmly, the lights of the habs in Mayda flared to full power. Apparently, the Marines had brought the science outpost a present.

## Chapter 59

# Imminent Departures

Over the ages, methane erosion had peppered the northern shore with potholes and basins. Hydrocarbon powders had sifted down, mixing with the ground methane emerging at shoreline, to form a sort of deadly pudding, filling the hollows and sinkholes in so that they looked like simple flat spots on the rugged icy landscape. Jeremy Belton knew this. He knew to be cautious. But not everyone did.

Jeremy walked along the cliff line, watching the huge Marine hovercraft as they dissolved into the orange haze. Here and there, uniform straps, backpacks or pieces of equipment lay strewn across the hills. A short distance away, toward the shoreline to the south, something caught his eye. It was black and green, and lay next to a smooth spot. He approached carefully. Footprints led to the oblong area, a perfectly level, textureless pond. They were desperate footprints, made by someone running, darting, not sure where they were going. At the pond's edge, the prints disappeared. Next to its border lay a strange object, something artificial. Jeremy looked more closely. It was a war scepter, a baton of the Black Watch.

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Abby and Tanya sat on a tabletop at the coffee station near the western airlock, their legs swinging into empty air above the chairs. It was a fairly secluded place to chat, a nice place now that there weren't any dancing petroglyphs to distract or music to interrupt their conversation. Abby handed Tanya a tissue as her friend sniffed.

"Good to have hot chocolate for change," Tanya said. She blew her nose.

"I talked to that hunk of a marine engineer. He called it a power band aid, but he said it should last until the replacement reactor arrives next month." Abby knew that Mayda's power output wasn't the primary thing on Tanya's mind. She set her cup on the table and put her arm around Tanya's shoulders. "I miss him, too. A lot. It seems like this is the kind of place where you say goodbye too often. We just had to say it to Kevin before we should have."

Tanya nodded, burying her nose in another tissue.

Abby glanced in the direction of the Comm Center, several habs away. "Guess I'll be missing Jeremy soon, too. He's headed back to Mars in the morning."

"You should go be with your friend."

"I will soon. He's doing something official with that big Nordic Marine guy. Said he'd be this way when he's done."

"And Jasmine Major, she is leaving also. She is nice lady. We talked last night at dinner."

"Yeah, she is."

"And now Demian Sable is gone."

"Demian Sable is gone." Abby said it with finality. There was a freedom in the statement, a period at the end of a twelve-year-long sentence she had been serving. It was melancholy, but it felt good.

"And we say goodbye to Troy."

"I said goodbye to him a long time ago. There's one I won't be missing. He was so baffling in the end. He even gave me a rose, right before he essentially kidnapped me."

"Real rose? Where he get that?"

"No idea."

"So we miss Kevin and Jasmine, don't miss Troy, and do miss Jeremy?"

And I'll miss Piers, Abby thought.

"You leave soon, too, my Anya. I have another two-year grant here. I will be missing you."

"You, too, girl. You are a good egg."

"You are the one who taught me that, what that means."

They hugged again and sat peacefully, comfortable in each other's company.

Behind them, someone stepped through the hatch at the end of the compartment.

"Oh, there you two are. Hey, Tanya." Doc Mason came to a stop before her long hair did. It swirled around her face as she came to stand beside the table.

"Look at you," Abby said. "With those fine tresses waving around your face, how can you see out?"

"I let it down in celebration of the station's new lease on life. It does tend to get in the way, though. Takes it a while to settle down. I'll probably have it pulled back up by tonight. Abby, I wanted to thank you again for getting this sketchbook to me. Really helpful. It's perplexing, this whole alleged Titan microbe thing. Kevin's sketches show these amorphous shapes, and I've seen the real thing now, under the microscope. If they're cells, they have no nuclei, but rather a network of organization within the outer membrane. A bit like prokaryotic cells, I suppose." She jabbed her finger on the page and held it up. "Those structures, both fossil and in the water, don't have any defined villi or specific organelles or familiar items like flagella or even lysosomes. It will take some study to see just what those globules are."

Abby was trying to reel herself back from the quietude of the moment, the list of farewells she would soon have to endure.

"But they are organic, yes?" Tanya said.

The doctor waved her hands around. "That doesn't mean they are life. Maybe they are. I don't know. Maybe they metabolize some water/methane/ammonia mix.

But why would they remain active at body temperature and not at the boiling point? Abby's tea and coffee prove that. That little tidbit implies a non-biological cause to me, chemical rather than microbial."

"I'm sure the biochemists are going to have a field day with our shared deliriums for years to come," Abby said.

"The communal hallucinogenic aspect is one of the things that most intrigues me. Who knows? I may even take on Titan's grand enigma as my life's work!"

Mason turned and made her way through the hatch at the far end of the hab. Abby told Tanya, "She's another character I'll miss. Crazy lady."

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"Piers, you're not making any sense. Out with it."

Abby stood in front of Piers' desk, in the only square meter of clear floor. She wasn't used to being summoned to somebody's office, but that's what Piers' call had felt like. Piers sat uncomfortably behind his desk, the cramped Comm Center cocooning around him.

"It's just that, you see, Abigail, when you—that is, when Troy, well, not really Troy, but—"

"You know, for a communications officer, you're just not very communicative"

"I'm sorry." Piers took in a deep breath. "As a picture is worth a thousand words, would you mind coming this way?" He gestured toward the closet door in the corner of the room.

"The last storage closet I was in didn't show me a very good time."

"This one is different. It's custom made. Did it myself."

"You did, did you?" she said skeptically, ducking through the low door. The back wall was missing. Beyond was a darkened room with hooded lights hanging from the ceiling. A wave of warm moisture bathed her face. It carried scents of summer meadows and mountain streams. She could smell the rich aroma of mulch, feel the humidity, taste a faint hint of loam.

"This way," Piers said.

"What happened to the wall?"

"I removed it. This used to be an outer storage shed. I asked if I could reinforce it to pressurize it. Nobody seemed to mind, so here we are. My greenhouse. Complete with a whole lot of insulation and some backup batteries for the grow lights."

He led her along a cramped walkway, metal plates lain across a bed of earth. On either side, low retaining walls buttressed the rich soil into mounds. He swept his hand as they walked.

"Some oregano, mint—I love mint in my Darjeeling tea—parsley, onions, and—"

A pungent, familiar fragrance hit her, a dense surge of perfume. "Roses! I smell them!"

"My Rio Sambas all died in the cold—those are a nice rich yellow—but I still have some Belle Rouges left, and they even have buds coming back. One opened up just this morning." He reached over and picked a red bloom. "Just in time for your tour."

The petals of the flower looked as if they had been crafted of velvet. The blossom was such a deep, luxuriant red, it seemed nearly black.

“It’s stunning. So delicate. It’s, it’s...”

“Beautiful?”

She nodded enthusiastically. “Beautiful.”

“So you see, it is just as I asserted earlier. A person can find beauty in the strangest of places.”

Abby put the rose to her nose, sniffed, and closed her eyes. “Even in a storage closet on Titan.”

Suddenly, looking back, it all became so clear. *Looks like someone’s peace offering*, Troy had said about the rose sitting on the table in her room. But he hadn’t meant he had put it there. It had been Piers. In fact, Piers had been there for her all along.

“So it wasn’t Troy; it was you.”

“Troy kind of got in the way. Inadvertently.”

“He tends to do that a lot.”

She leaned over and gave him a playful kiss, right on the lips. She realized it was something she’d been thinking about doing for some time.

Piers leaned back in surprise, eyes wide. Then, a look of concentration and amusement on his face, he put his arms around her waist, pulled her to him and kissed her. Abby decided that this kiss was even better. It was a surprisingly good kiss.

“Tanya and I were just discussing who we were going to miss when we leave this place. You’re on my list.”

“And you, my dear, are on mine. You’re on several of my lists, in fact, from most brilliant meteorologist to favorite submarine skipper. Perhaps we should make sure this is not a final goodbye.”

“Perhaps we should,” she agreed.

(\*)

As Jeremy had business at the Bacab Colony, he would not be leaving with the last big Marine transport. That was fine with him; the commercial shuttles were far more comfortable. But he did need to make a decent farewell to the man who had seen him through this terrible, wonderful, frightening, exhilarating experience. At the hands of Master Sargent Dønnes, the assault of Northern Quadrant had been efficient and as close to peaceful as anyone could have hoped.

He motored out by himself in the little inflatable, listening to the slosh of the methane, watching the scattered reflection of Saturn’s fuzzy orb, the distant cliffs, and the towering, abandoned drill. Upon his approach to the floating Marine ship, a ramp lowered to water line. Two Marines clambered down the ramp and helped Jeremy hoist the boat up, securing it to the slanted deck. At the top of the ramp, in the wide, neon-lit bay, stood a hulking silhouette that could be only one person, Master Sargent Dønnes.

The men shook hands and wished each other well. Jeremy declined the offer of entrance for a cup of coffee. He had already sampled the Marine version.

“I can’t blame you,” Dønnes said cheerfully. They said their goodbyes.

Motoring back to the beach, Jeremy was relieved to be done with his brief stint in military action. He cast a last glance over his shoulder as the gigantic craft lumbered into the air, leaving a drizzle of cryogenic liquid raining down into the sea. The blue ion engines flared and the craft turned, blimp-like, to begin its ascent back to Iapetus.

He thought about the wonders he had seen. He had seen the vids, read about the ice mesas and the undulating methane lakes, but to be here was another thing entirely. Titan was a moody, beautiful place. He slowed the engine and let it drift for a few moments. The sound of the waves against the hull of the little boat soothed him. The place did remind him a little of Loch Ness, a place he had seen as a child. Even without long-necked sea serpents, Kraken Mare was a magical place.

He beached the inflatable a dozen yards down shore from the closest habitat, just next to a mooring post. As he stepped out, he looked down. The wet sand had a strange pattern in it, a regular set of indentations. Most had softened into disks the size of a rover wheel, but several still held the imprint of something familiar, something webbed, reptilian. Did he see three claw marks spread out in a double v shape, and between them, a subtle webbing of scale pattern? An errant wave sloshed around the boat, around his feet, and over the sand. As it retreated, it took any beach imprint with it, away into the abyss of Kraken Mare.

## Chapter 60

### The Note

The package arrived in a hermetically sealed standard issue with a return post from somewhere on Mars. Piers popped it open. Inside was a real printed book, on wood-pulp paper, no less. The cover read, “*A TRAVELER’S GUIDE TO TITAN* by Abigail Marco.”

Carefully, gently, Piers drew open the front cover. Scrawled across the inside page was a handwritten message:

Dear Piers:

My return to the warm canyonlands of Mars was a happy one, to say the least. I’ve settled into that small cottage I told you about on the rim of Kasei Valley. It was cheaper than I feared, and it’s just a ten-minute flight from Jeremy’s house. I had my first iced tea in two years, so I must be warming up.

As you can see, I’ve followed your suggestion and pursued my dream of writing travel guides. My first, of course, is a compendium about Titan. It was an easy sell to the publisher because, as they said, it’s a book that has no competition yet.

I’m serious about you coming to visit. It’s a long trip, but I do wish you’d come. I can show you the sites of Mars properly. Besides, if you really do miss me, that’s another thing we have in common.

Love, Abby

Piers flipped to the first chapter, past the front matter. The opening paragraph began:

*My advice to the tourist on Titan is the same as my advice to  
the European traveler in Central America:  
do not drink the water.*



He laughed, closed the book, and gazed out the window. The drill was immobile, but worker bees crawled over it from top to bottom, retrofitting all kinds of devices onto it to seal the waters of Titan's deep ocean where they belonged, once things got started again. It was a relatively clear day. Saturn sliced a thin, blurry crescent through the wine-red sky. He glanced around at his office. He had kept it much cleaner since Abby had left. He missed her. Things just weren't the same.

As he opened the book again, he thought about the price of a ticket to Mars. His eyes settled on the book's dedication. It read:

"To Piers Wellington, who finds beauty in the strangest of places."

-end-

**Part II**  
**The Science Behind the Fiction**

# Chapter 61

## The Science Behind the Fiction

### Vesta and Asteroid Mining

The character of Horf comes from the asteroid 4 Vesta. Vesta is the second most massive asteroid in the Solar System. Although Pallas is larger, Vesta is more dense, making up some 9 % of the entire mass of the main Asteroid Belt. It is second only to the largest of the asteroids, Ceres (Fig. 61.1).

Much of what we know about this huge asteroid comes from the Dawn spacecraft, which orbited the cosmic rock for 14 months, surveying its minerals and mapping its gravity in detail.<sup>1</sup> Combined with analysis of meteorites that have come from Vesta, scientists have assembled a picture of an asteroid rich in resources, a world with a past somewhere between a dead moon and a geologically active planet. Vesta is a world of basalts (rocks of volcanic origin). Minerals confirmed or strongly implicated so far include olivine, pyroxene, pigeonite, plagioclase and orthopyroxene. Like a planet, Vesta appears to be differentiated, meaning that the heavier elements settled to form a core when the asteroid was still molten. A differentiated asteroid should have far more complex geology and mineralogy than a simple one, like the smallest moons of Saturn, which seem to be fairly homogeneous in composition. Vesta's rocky composition and volcanic history may well make it a target for future mining operations (Fig. 61.2).

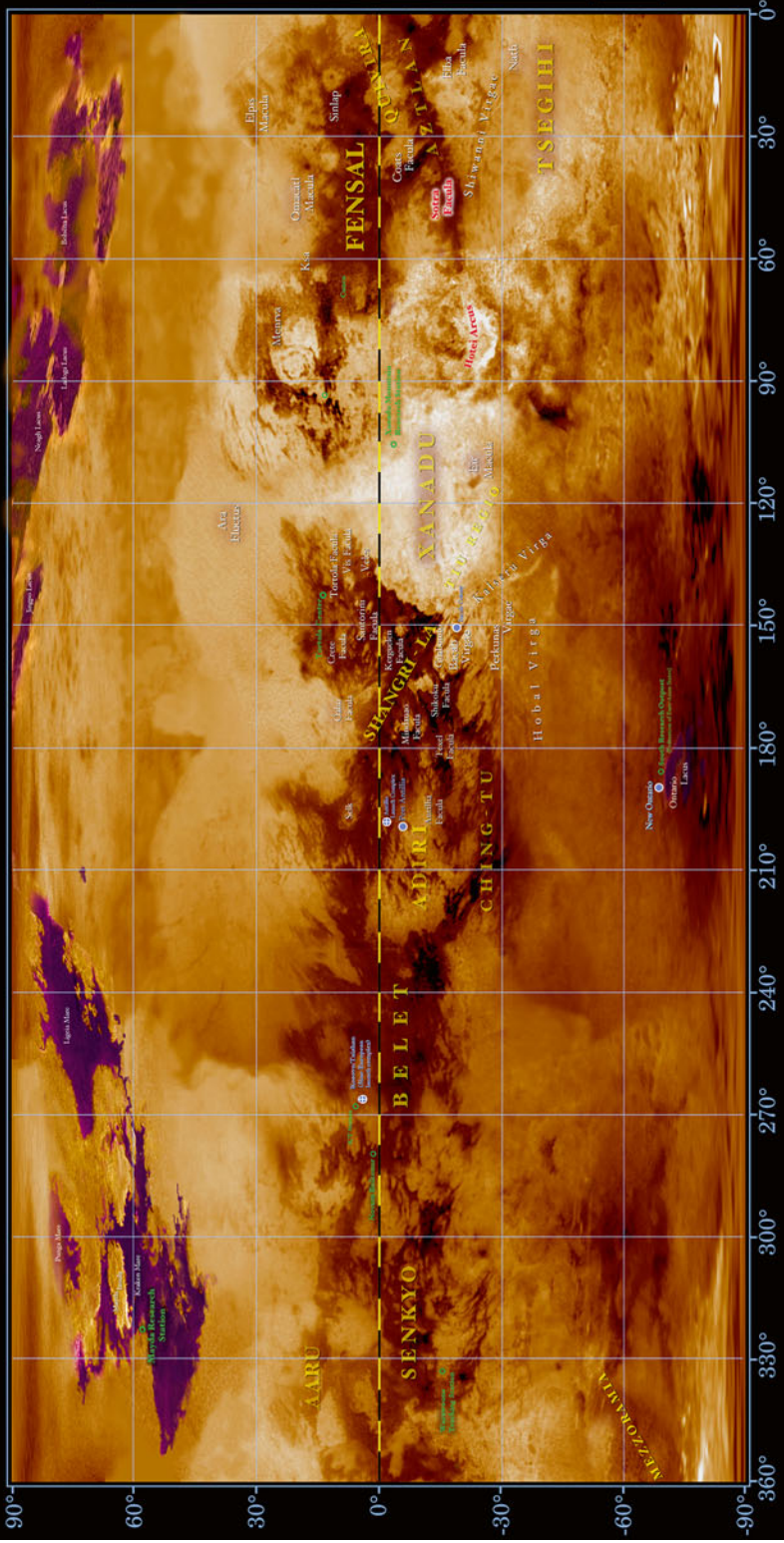
Vesta's surface is surprisingly clean, as asteroids and moons go. On Earth's Moon and many other natural satellites and small bodies such as asteroids and comets, the space environment "weathers" surfaces, causing them to accumulate metallic particles of iron. This dulls and subdues the naturally fluffy surface texture. But very few of these particles blanket Vesta's landscape, leaving it unusually reflective. Fresh impacts and landslides on steep slopes continually mix the surface layer.

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<sup>1</sup>From there, Dawn departed for its next destination, Ceres, where it arrived in February of 2015. For updates, see the mission home page at [dawn.jpl.nasa.gov](http://dawn.jpl.nasa.gov).

# TITAN

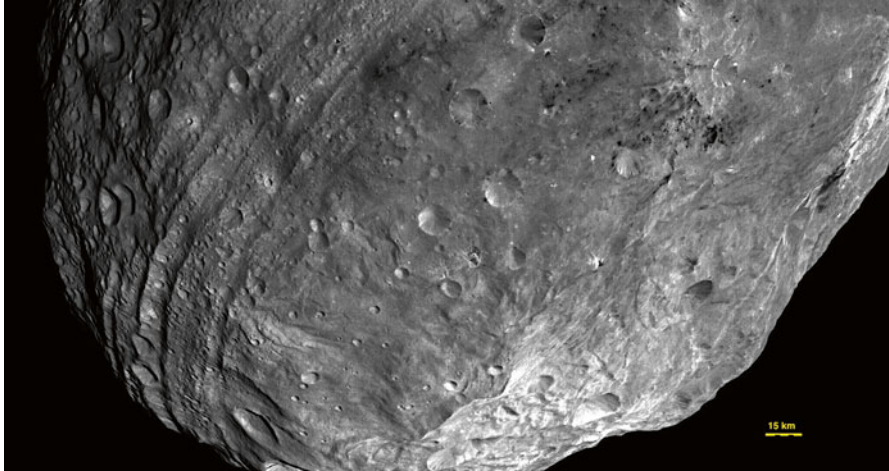
ca. AD 2260



## KEY

-  New Omara Settlements
-  Oumara & common services
-  FENSAL Regions
-  Fensal facilities
-  Sotran Branches  
Cryogenic stores
-  Liquid methane  
Minimum extent of seasonal liquid methane

Horizontal scale  
1° = 141 km



**Fig. 61.2** NASA/JPL's Dawn spacecraft revealed an asteroid rich in geology. Dawn took this image of asteroid 4 Vesta on July 24, 2011, showing its towering mountain at the south pole, seen here at lower right. Grooves encircle the asteroid along the equatorial region. Dawn's framing camera was built by the Max Planck Institute (Courtesy NASA/JPL-Caltech/UCLA/MPS/DLR/IDA)

Vesta's equatorial region is belted by a series of remarkable grooves. These deep channels may be graben, which are faults caused by the expansion of Vesta's surface. They may have been triggered by the massive impact that dug out the crater at the south pole. The Rheasilvia impact crater has a colossal central peak that towers three times as high as Mt. Everest. The grooves may also have been the result of Vesta's differentiation, forming as the cooling crust pulled apart above sinking metals on their way to the molten core. The shape of the valleys indicates forces from within, rather than near-surface movements.

A wide range of different terrains underscore Vesta's planet-like nature. The giant asteroid has a global dichotomy—one hemisphere is different than the other.<sup>2</sup> Craters dominate its more ancient northern hemisphere, while the brighter south is smoother and grooved. Vesta shows a variety of color as well. Southern lands match basaltic formations, while northern craters have stirred up a host of minerals from within. The equator is peppered with hydrated minerals such as hydroxyl, meaning that water is chemically trapped within the rocks. These minerals may have come from the constant rain of carbon-rich meteors in the Asteroid Belt. Several sites show vent-like pits where volatiles such as water may have boiled out from the asteroid's interior.



**Fig. 61.1** Titan, ca. A. D. 2260 (Base map NASA/JPL-Caltech/Space Science Institute)

<sup>2</sup>Other sites in the Solar System that exhibit dichotomy include Saturn's two-tone moon Iapetus and Earth's own Moon, with its maria-covered Earth-facing hemisphere and its rugged far side.

Asteroid mining has been the subject of many futurist writings, and with good reason. Telescopic observation and spacecraft encounters, as well as the study of meteorites, tells researchers that the asteroids may contain a wealth of metal ores, minerals and volatiles such as water and methane that can be used for fuel or human-supported activity. Some estimates<sup>3</sup> suggest that mineral value in the main Asteroid Belt may reach \$100 billion (in today's market) for each person living on Earth. A roughly spherical asteroid with a 1-km diameter has the mass of 2 billion tons. Within this bulk, there may be upwards of 30 million tons of nickel, 1.5 million tons of cobalt and 7,500 tons of platinum. Much of this material may be more accessible to the surface than comparable metals on Earth, where mines are becoming deeper or more extensive, causing more and more damage to our environment.

Most asteroids inhabit the main belt, a torus of debris circling the Sun between the orbits of Mars and Jupiter. The asteroids fall into three general categories. C-type stony asteroids, or carbonaceous objects, make up more than three quarters of the known members. Their composition is similar to that of the early solar nebula, but without the volatiles such as hydrogen or helium.

M-type asteroids are metallic, and are the most rare. They are rich in nickel and iron.

S-type asteroids are a mix of stony and metallic material, and make up roughly 17 %. These are rich in nickel, iron and magnesium. Vesta is similar to an S-type asteroid, although it has been given a class of its own, shared by a small number of other asteroids.

Early asteroid mining will probably resemble conventional terrestrial mining. Solar power will be common, as the Sun is near enough to the main belt to provide plenty of power. Automated operations will be carried out wherever possible, because working in a vacuum is hazardous, and working in mining environments is one of the more deadly careers on the books. Strip mining of surface materials would be combined with tunneling into veins of subsurface minerals. Both techniques will require new technologies, but mining of the surface will be especially challenging, as the mined talus will tend to float or fly off the surface. Tents or canopies may be used to harness the mined products. Some asteroids are likely dead comets, containing volatiles surrounding the precious ores. In these cases, heat can be used to melt and vaporize the matrix to free the materials. Some stony/metallic asteroids may have precious metals mixed with debris on the surface, where magnetic rakes or scoops could be used to gather resources.

Asteroid mines may have refineries on site, or they may send their metal treasures to other locations. Once material is ready to ship, rocket fuel can be distilled from the asteroid's volatiles, such as hydrogen, oxygen and methane.

Our Vesta miners in *Farthest Sea* added another technique to their toolbox: biomining. As the Vesta guide told his pretend honeymooners, "*Acidithiobacillus* and *Leptospirillum* are the miners. They use the sulfur in the acid to break down the rocky material. What's left is the really good stuff."

In today's global economy, what was once considered mining waste is now recoverable resource, thanks to the use of microbes. One area in which microbe

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<sup>3</sup> See *Mining the Sky* by John S. Lewis (Basic Books, 1997).

mining has seen great success is in the copper mines of Chile. Chile is home to Codelco, the largest copper mining company in the world. Codelco mines and other mining facilities use *Acidithiobacillus ferrooxidans* and *Thiobacillus ferrooxidans* bacteria to break down minerals, improving copper recovery rates and reducing operating costs. Microorganisms naturally liberate copper from rocks, but the process tends to be gradual, taking centuries or millennia. To speed up the process, scientists use a technique called bioleaching. Placing ores into acid, they add bacteria that change the solution so that it dismantles the rock and frees the copper in liquid form. The copper is sent through an electrochemical process, where it turns back into solid metal.

Over 30 strains of bacteria are being used for biomining, and this figure is growing steadily. Biomining now accounts for roughly 15 % of all copper mining worldwide, along with 3 % of all gold mining. It also contributes substantially to nickel, cobalt and zinc mining. Biomining plays a key role in the copper mines of Uganda, the gold mines of Ghana, South Africa, central Asia, and Australia, and in various mining operations in Finland.

As for near-future asteroid mining prospects, a class of “easily retrievable objects” (EROs) was identified in 2013 for near-Earth mining. Over 9,000 asteroids were studied, and the list was culled to a dozen rocks ranging in size from 2 to 20 m in diameter. All of these could be brought into a near-Earth orbit using a velocity change of less than  $500 \text{ ms}^{-1}$  (1,100 mph/1,800 kmph). Several private companies are already interested in the possibilities of mineral exploration on these cosmic boulders.

Also under study by NASA is the possible human exploration of a near-Earth asteroid. The Asteroid Redirect Mission would bring an asteroid into a stable lunar orbit, where a crew could venture out to study it. Designers are studying two concepts for capturing the asteroid. One would capture a small boulder using an inflatable bag. A second design envisions a spacecraft using a robotic arm to snag a large boulder from the surface of an even larger asteroid.

## The Lay of the Land on Titan

Titan is unique among moons in our Solar System, as the only moon to have more than just a trace atmosphere. Its opaque nitrogen-methane cocoon is the second thickest among all the solid bodies of the Solar System. At 1.5-bar, Titan has more air pressure than Earth does. Its atmospheric blanket sustains a surface temperature of  $-178 \text{ }^{\circ}\text{C}/-290 \text{ }^{\circ}\text{F}$ , much warmer than nearby Enceladus, whose daytime temperatures hover around  $-201 \text{ }^{\circ}\text{C}/-330 \text{ }^{\circ}\text{F}$ . Titan’s day drags on for 382 h, about equivalent to 16 Earth days. Its year—identical to Saturn’s—lasts a lingering 29.7 Earth years. Titan’s environment is nearly as complex as Earth’s, with dynamic meteorology and an active hydrological cycle unlike anything found throughout the Solar System, with the sole exception of our own world. Titan’s landscapes echo those of our terrestrial vistas. Dendritic channels, the result of liquid erosion, score its face

and carve valleys. Dark hydrocarbons, washed from the highlands, pool in low-lying areas. Aeolian [wind-driven] effects leave trails of scattered dust and sculpted forms, piling up sand into great fields of dunes. We see cloud systems and storm fronts. In short, Titan generates Earthlike processes, but they are occurring in alien materials. The surface of Titan has rocks, but the rocks are thought to be water-ice. You have water available, but it's frozen 'rock solid.' And the rains of Titan are cryogenic methane, similar to the natural gas with which many of us heat our homes. As we learned from poor Kevin Nordsmitt, "If he didn't know better, he could convince himself that the place was made of stone. But the ground and mountains and boulders of Titan were water-ice, frozen to the consistency of granite."

Titan's murky blanket of nitrogen and methane has its own story to tell. On both Earth and Titan, weather is nature's attempt to balance out temperature and pressure. Heat comes in from the Sun, and wind carries the warm air to colder areas. Just 93 million miles from our own world, the Sun pumps prodigious amounts of energy into Earth's system constantly. This makes our atmosphere a vigorous and active place. Our changeable meteorology stands in stark contrast to that of distant, frigid Titan. Titan receives one-hundredth the amount of sunlight that Earth does. Less heat enters the atmosphere, resulting in more gentle mixing of the air, which means that there are fewer individual weather events. An occasional storm may be all that occurs over the course of many years. Scientists liken this atmospheric heating to a pot of water on a stove. When the flame is first lit, an occasional blob of water will rise from the bottom of the pan to the top, making a little turbulence. As time goes on and the water gets hotter, more and more of those blobs will rise through the liquid. The water in the pot can be very turbulent even before the water itself begins to boil. Titan's atmosphere may be similar to the beginning stages of our warming pot, where blobs of warm fluid come up only rarely. Earth's atmosphere is similar to the pot's liquid at the boiling stage.

Titan's rain precipitates out of methane clouds at an altitude of 12.5 miles (20 km). Above that cloud deck, thinning haze underlies a high altitude layer of methane ice crystals. The methane precipitation may increase closer to the poles, where the lakes have been found.

Titan's rains may come in intense, seasonal waves. Many river channels have been charted across Titan's surface, and these typically have morphologies indicating intense floods that produced them. Planetary meteorologists reason that a steady drizzle would not do it. Titan's methane storms may be most like storms over terrestrial deserts that wet the ground and even carve arroyos but don't result in any significant buildup of bodies of liquid. Despite active methane cloud systems and carved floodplains, it appears that methane rain falls far less often on Titan than water-rain falls on Earth. Titan is very much a desert planet, where rainfall is extremely rare compared to Earth. Where there is precipitation, it is torrential. The question is, is that torrential rainfall seasonal, or is it a year-round phenomenon? Although the methane humidity at the equatorial Huygens site was 45 %, which would be enough to trigger rainstorms on Earth, the distant Sun's heat at Titan is just too weak to drive moist air up and generate storms under current conditions. Large cloud systems would require higher humidity. The Cassini spacecraft has spied



storm clouds forming over the equatorial regions, but the events have been rare. Typically, weather systems blossom rapidly to the southeast. As the storm clouds drift away, they sometimes leave in their wake a darkening of the landscape, implying a changed surface from rainfall.

Researchers estimate that the annual rainfall on Titan amounts to about 2 in. (about 5 cm). This is the equivalent to annual precipitation in Death Valley. But another kind of precipitation falls from Titan's skies: hydrocarbons. Titan's upper atmosphere reacts with solar radiation to generate organic soot. This fine powder drifts down to the surface, building up enough to fill valleys and bank into drifts.

Titan's globe is split across its midsection by a belt of dunes. The equatorial regions seem to be desert, nearly devoid of the methane rains that fall in other areas. Here, dunes act as weather vanes, pointing along the direction of the global winds that blow from west to east. These dunes often interact with dry river valleys, canyons and ancient eroded impact craters. To the north and south, methane humidity increases until lakes form. Many lakes and seas have been mapped in the north, but the southern provinces have far fewer. The largest lake in the south is Ontario Lacus, covering an area equivalent to that of North America's Lake Ontario. Near the north pole, Titan's largest methane sea, Kraken Mare, is the size of the Eurasian Caspian Sea.

## Strange Seas on the Surface and Beneath

Since the late 1960s, scientists theorized that Titan's surface conditions might allow for seas or oceans of liquid methane. After the Voyager flybys in the early 1980s, the idea of a global ocean was in vogue. But remote sensing by Earth-based observatories, and data from the Hubble Space Telescope, along with the first Cassini orbiter data, suggested that Titan was a dry desert world. The hoped-for Titan seas were nowhere to be seen until 2004. In that year, the Image Science Subsystem aboard the Cassini spacecraft observed the first dark features with coastline-like shapes, although it was not immediately clear whether the dark regions were filled with liquid or simply damp. Images showed a dark expanse near the south pole, now known as Lacus Ontario. The lake was imaged in greater detail by the RADAR instrument, finally demonstrating that some dark areas were, in fact, covered by liquid. Later, Cassini's radar eyes spotted hundreds of small lakes, mostly contained within hollows, in Titan's northern polar regions. Although dark, flat features had been seen in other regions, these were different. Their morphology (physical shape) was similar to terrestrial lakes, as was their relationship to channels, deltas, and other river-like features. They had very low radar backscatter, implying that their surfaces were very smooth. The polar regions in which they were found had high levels of methane humidity, consistent with computer predictions using atmospheric and climate models. Finally, the radiometric "brightness"—or how the radar reflects energy off the surface—of the supposed lakes was consistent with the high emissivity expected for a smooth surface of liquids such as methane, ethane, butane and

other related substances. This high emissivity showed that the lake areas were warmer than their surroundings.

Titan is now confirmed as the only world besides our own with an active cycle involving rain fed by evaporation from surface lakes and rivers. Its river valleys drain into liquid-filled basins, some as large as the Black Sea. Because of their size, the largest are referred to as “maria,” Latin for “seas.” To date only three have been classified as such. From largest to smallest, they are Kraken Mare, Ligeia Mare, and Punga Mare. Titan’s lakes and seas vary greatly in size, from the limits of Cassini’s resolution up to about 400,000 km<sup>2</sup> for Kraken Mare. For comparison, North America’s Lake Superior is 82,000 km<sup>2</sup> in extent, and Europe/Asia’s Black Sea is 436,400 km<sup>2</sup>.

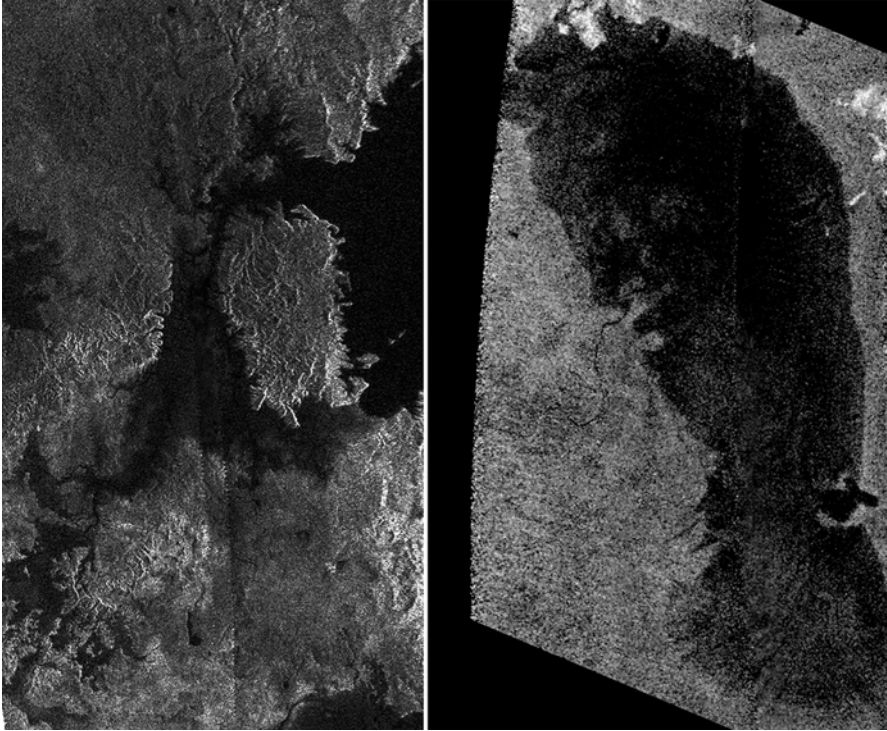
Rugged coastlines resembling the fjords of Scandinavia or the flooded valleys of Lake Powell scar the edges of Titan’s seas. A few of the largest lakes also have some rough features, but the smaller ones are of a very different character. They seem to have mostly circular, oblong or curving shorelines, and their margins are often quite steep. Because of their cliff-like borders, some researchers suggest that the lakes are the result of collapse or melting, much like the rounded lakes caused by melting ice blocks left behind by retreating glaciers on Earth. Terrain dissolved by water is called karstic. On Earth, similar regions are often fractured and porous, with groundwater flowing beneath their surfaces. It may well be that on Titan, these lake regions drain into a web of underground methane aquifers that make their way to the coasts, eventually feeding the seas. If so, this underground river network may be a major contributor to Titan’s atmospheric methane (Fig. 61.3).

The makeup of the methane brew through which Troy navigated his little blue submersible is somewhat mysterious. The exact blend of hydrocarbons in Titan’s lakes is unknown, but it is probably a mixture of ethane and methane. Although the methane rainfall is thought to be at least a 100 times greater than that of ethane—which may make up part of the precipitation—methane is far more volatile than ethane. Any surface methane would evaporate more quickly. Over time, a standing body of liquid would become enriched with the more stable ethane, in which case ethane is probably dominant. Ligeia Mare, which is farther north than Kraken, may be filled with more fresh methane rainfall than Kraken, as higher latitudes appear to receive more rainfall. In this case, a recent paper proposes,<sup>4</sup> Ligeia Mare may be methane-enriched, with up to 80 % of its liquid in this form. But currents within the basins of Kraken Mare mix methane with the more dense ethane, which might leave Kraken dominated by ethane, by as much as 60 %. The variations in the two hydrocarbon seas, says author Ralph Lorenz, are analogous to the salinity gradient between Earth’s Black Sea and the Mediterranean.

Methane and ethane are intrinsically more transparent than is water, so visibility might be excellent along a Titan shoreline. However, there may be material suspended within the liquid. Titan’s descending haze of very fine particles, as small as a third of a micron, is very similar to smog found hovering over Earth’s major cities.

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<sup>4</sup>See Lorenz, R. D., 2014. The Flushing of Ligeia : Composition Variations across Titan’s seas in a simple hydrological model, *Geophysical Research Letters*, 41, doi:[10.1002/2014GL061133](https://doi.org/10.1002/2014GL061133).



**Fig. 61.3** *Left:* Mayda Insula is a rugged island within the great methane sea Kraken Mare. It is roughly the size of the island of Hawaii (north is to the right). *Right:* Ontario Lacus spreads across 235 km in the southern hemisphere (Images courtesy NASA/JPL/Space Science Institute)

But its precipitation is less snowstorm and more constant, invisible settling. Those hydrocarbons drift out of the sky and land in the seas. The density of liquid methane and ethane is such that almost anything sinks in it. Under Titan's low gravity, material would sink very slowly, so Troy's cruise through Kraken Mare might be like a trip through Miso soup. The particles eventually settle out, but even convection currents are enough to lift the particles up. This means there are a lot of opportunities for particles to clump together in Titan's seas before they settle, and those larger particles, once stranded on drying beaches, might become the material that builds into sand dunes.

It is difficult to tell how full some of Titan's lakes are. The lakes and seas of Titan are somewhat transparent to radar. The surface of the liquid is smooth, so it acts like a mirror. Incoming radar hits it at a slight angle and reflects away, leaving a dark image. But the liquid methane also lets some of that radar pass through into its depths, like light passing into clear water. This clearness makes it challenging to tell just where the methane/ethane sea ends and the shoreline begins.

Within the seas of Titan, investigators observed several subsurface channels. The researchers were able to measure depth—or at least general slope—along their

lengths. Because rivers flow downhill, they expected that if these were indeed drowned river valleys, the channels would get progressively darker downstream, since the spacecraft would observe them through progressively deeper liquid. This has, in fact, been confirmed.

In 2009, the visual and infrared mapping spectrometer (VIMS) observed a glint of sunlight reflected off the sea Jingpo Lacus, resolving any remaining doubt that Titan's dark areas are bodies of liquid. Researchers are now searching for wave action using Cassini's VIMS in areas where the sunlight might glint off the surface, and also radar that might uncover telltale signatures of waves.

Another unusual incident may indicate wave-caused foam on the surface: Cassini imaged a bright "island" during a flyby in July of 2013. The irregular region in Ligeia Mare was completely missing in imagery from three previous encounters. The area disappeared as abruptly and mysteriously as it had appeared. It was absent again on the next flyby just 16 days later, leading researchers to brand it the "magic island." Aside from frothy waves, the brightening may be caused by gas bubbling up from the seafloor or icy slush floating on the surface. Methane ice is denser than methane in liquid form, so the slush would need to be a lighter related material, perhaps chains of polyacetylene. Titan experts continue to search images for further sightings.

Adding to the portrait of Titan as a vibrant world, the lakes seem to be changing shape. The coastline of Titan's largest southern lake, Ontario Lacus, receded by at least 10 km over a period of 4 years. Several transient lakes in its vicinity completely vanished during the same period. Radar indicates that Ontario Lacus itself, while as vast as Lake Ontario in North America, may have an average depth of 0.4–3.2 m, with its deepest part diving to just over 7 m. Ontario Lacus may resemble terrestrial mudflats.

The lakes in the north are a different story. Their coasts have been unchanged over a decade of observation. Clearly, they are more stable than those in the southern hemisphere. The more numerous northern lakes have steeper-sided shores, so as surface levels drop, changes may be harder to detect along the shorelines. Or, the northern ponds may simply be deeper and less prone to evaporation. Whatever the cause, most researchers agree that the lakes in the north are more stable and permanent than the weather-related lakes in the south. Depths of the great Ligeia Mare may reach 170 m, plenty of room for a little blue submarine.

Kraken Mare is the largest body of liquid known on the surface of another planet. Named after the legendary sea monster that lives off the coasts of Norway and Greenland, Kraken covers over 400,000 km<sup>2</sup>, an area equivalent to Earth's own Black Sea. One or more channels may link Kraken to the nearby sea Ligeia Mare. Toward the northern end of the sea lies the island called Mayda Insula. Fjord-like valleys cut its rugged coastline. The island is 100 × 170 km, covering just a bit more territory than the main island of New Caledonia.

Not all of Titan's seas are skin-deep. Careful study of features on Titan's surface show that the moon's crust has wandered, shifting positions of mountains or other landmarks by as much as 30 km (19 miles). Cassini orbital measurements also showed some telltale evidence of bulges in the moon's surface. If Titan's interior

were composed of solid ice and rock, Saturn's gravity would just barely shove the surface out of round, causing it to rise and fall about 3 ft. each day. But in fact, Saturn's push and pull trigger bulges some ten times that high, suggesting that Titan's interior has a layer of liquid inside, creating a global ocean.

Additional clues come from Titan's orientation as it circles Saturn. Titan's axis is tilted by about  $0.3^\circ$ . This angle—or obliquity—is too high for a solid body with its weight centered at its core. But if some of that weight were slightly above the core, in the form of liquid water nested in the solid ice crust, the obliquity would make sense. Models indicate that Titan's ice surface is part of a shell that stretches down to a liquid water ocean. This ocean, in turn, lies above a mantle of frozen water. Beneath that mantle is an ice/rock core. The ice shell on top may be anywhere from 90 to 125 miles thick (150–200 km), while the ocean far below may range from 3 to 265 miles (5–525 km).

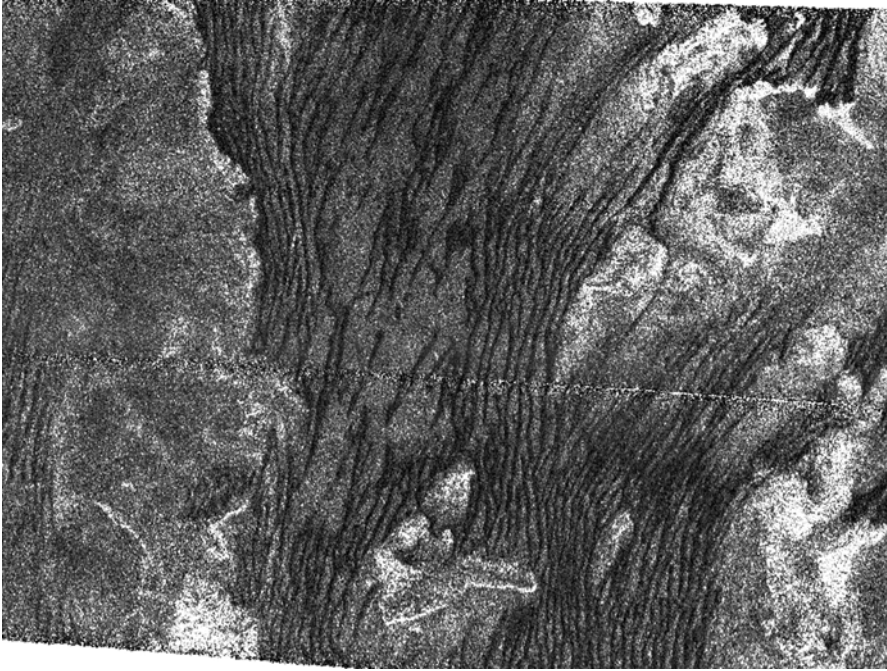
Researchers suspect that the subsurface water ocean on Titan is a witches' brew of briny water and ammonia. To fit the gravity data, the water must be dense. The water is likely high in salt content with dissolved sulfur, sodium and potassium, elements common in the outer Solar System. This density would be at least as salty as water found in the Dead Sea or in the ponds of Badwater, Death Valley. Although this may not be a positive sign for present-day life, conditions may have been very different within these dark waters in Titan's past.

## Dunes

With an area of over 77,000 km<sup>2</sup>, the Dasht-e Kavir is Iran's largest desert. But there is another that rivals even this spectacular natural formation. Titan's Belet sand sea has not seen liquid water for eons. Although dunes in the Dasht-e Kavir rise some 40 m, those in Belet tower 150 m high. Instead of silica, its dunes may be made up of pulverized ice or organic material that rains from the sky. The dunes of Africa's Namib Sand Sea are nearly as tall.

At least 20 % of Titan's surface is covered by dunes, and perhaps much more. By comparison, dunes cover about 5 % of Earth's land, and less than 1 % of the Martian landscape. Titan's atmosphere is  $1\frac{1}{2}$  times as dense as Earth's at sea level. Chilled to 290° below zero F, the sluggish air moves across the face of Titan like a planetary tidal wave. The shape and orientation of the dunes indicates that Titan's winds blow from west to east near the surface. Recent estimates put the number of recorded dunes at well over 20,000.

Titan's dunes may be one of the most alien features of the planet. If they were analogous to the Earth's dunes—silica sand that comes from ground-up rock—Titan's dunes should be ice (since frozen water is Titan's "rock"). But Titan's dunes may not be comprised of water-ice at all. They may, in fact, be composed of organic material that falls from the sky. Cassini's visual and infrared mapping spectrometer sees all the dunes as dark. If they were water-ice, they would appear bright. Cassini's radar offers another clue. In addition to providing a visual image, radar yields



**Fig. 61.4** Dunes drape across many of the landscapes in Titan's frozen wilderness. Here, linear dunes draw a fingerprint on low plains, while raised topography remains clear (Images courtesy NASA/JPL/Space Science Institute)

insights into how the material behaves. Radar waves bounced off the surface indicate fine-grained organic material, undoubtedly related to the soot-like hydrocarbon matter that precipitates out of the sky as a result of the interaction of the Sun's ultraviolet radiation and methane in Titan's atmosphere (Fig. 61.4).

However, the dunes are made of coarser stuff than comes from the sky. How does it get there? What creates it? As Saturn's orbit precesses, the seasons on both Saturn and Titan lengthen in one hemisphere and shorten in the other. This change might lead to a drying out of seas in one Titan hemisphere, and a shift in methane humidity to the other. We find a similar phenomenon recorded in Earth's geological record. Huge layers of salt lie beneath the Arabian and Mediterranean gulfs, because they were once ocean basins that became closed off, eventually drying out. In this process of drying out, fine hydrocarbon particles in a Titan sea may come together as grains to make sand. The sand gets blown out and makes its way to the equator, resulting in the great sand seas that spread across the equatorial regions of Titan today.

The dunes imaged by Cassini are similar to the largest ones seen in Earth's deserts. Although no coastal dunes have been seen near the lakes or across areas scored by river valleys, it is possible that small dunes may form in these regions, as they do on beach areas of Earth's coastlines. *Farthest Sea* makes this assumption.

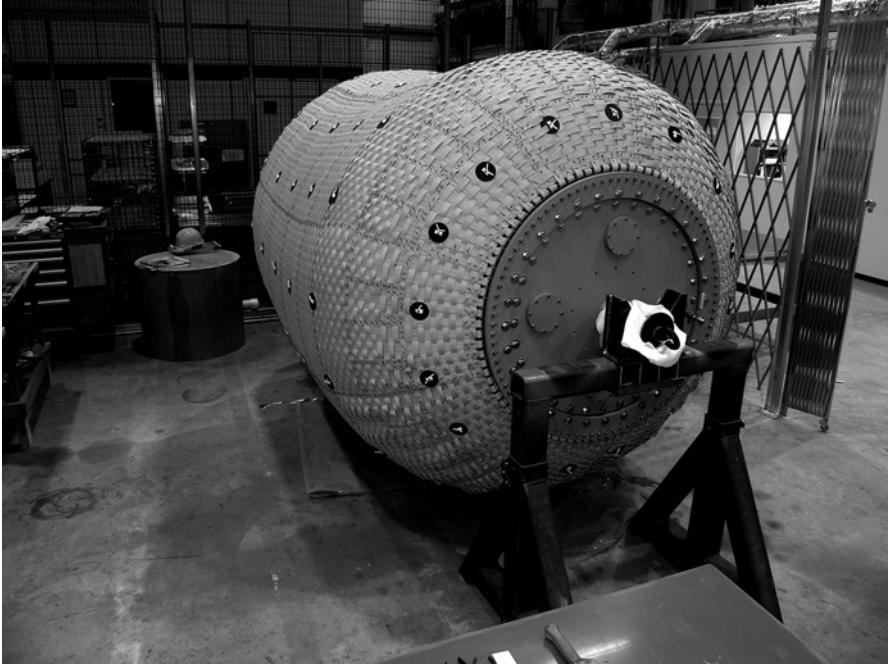
## Living on Ice

As Kevin Nordsmitt observed in our first chapter, on the moons of the giant worlds, water freezes to the consistency of rock. This can be used to the advantage of settlers. Just as Inuit peoples of the arctic use ice to build igloos, so astronauts could use blocks from the icy surface to construct various structures. Under the conditions in the outer Solar System, ice will provide excellent masonry, or even material from which to carve out caverns, as our pirates did at their Northern Quadrant site. The only caveat—it must be insulated from the interior heat. Humans like their rooms warm, and at a temperature of 70 °F, their walls and floors will begin to melt. “You have to isolate things, using insulation,” says Lockheed Martin’s Ben Clark. “But we’ve been doing it on Earth for a long time. They insulate buildings from the cold surface in the arctic and Antarctica.” In an ice cavern, inflatable habitats could be erected without being in direct contact with the frozen surfaces. Insulation could also be sprayed onto ice surfaces that, once stabilized, could provide a permanent barrier for interior heat. Another option for living on an ice world such as Titan would be inflatable habitats. Inflatable domes would require anchoring, as there is enough wind to shift them. Titan’s winds move particles around on the surface, as the sand dunes attest, so a large-scale inflatable would be a big area to drag on. And like the ice caverns on our north shore or the hard-bodied cylinder habitats of Mayda Research Station, they would require insulating from the cold surface. “We don’t know for sure what the surface composition of most of Titan is,” says JHU Applied Physics Laboratory’s Ralph Lorenz. “In some places it may be water-ice. In most places it appears to be organic, so it’s stuff that could soften or even melt at what we call room temperature.” For the now-canceled Constellation program, NASA’s Johnson Space Center conducted formal studies on inflatable habitats for the lunar surface for over a decade. Work with inflatable habs continues in Antarctica as well, with several outposts making use of the equipment as part of their infrastructure. With some added insulation and reinforcement for pressurization, these technologies are directly applicable to the environments of the outer Solar System (Fig. 61.5).

Daily life on Titan would be a dangerous prospect, simply because of the “back-yard grille effect.” In addition to methane, Titan’s atmosphere includes other flammable gases that Troy outlined for Abby: “All that ethane and butane and all that other stuff.” In Titan’s non-oxygen environment, there is no danger of fire. But people require oxygen, and this makes any human habitat a dangerous place to put in the wilderness of Saturn’s largest moon.

The Applied Physics Laboratory’s Ralph Lorenz comments, “Methane is flammable in air at abundances of 4.4 % or above. If the abundance at Mayda is the same as the Huygens landing site (5.6 %), then a leak of Titan air in, mixed with oxygen-bearing air inside, will NOT lead to a combustible mixture (e.g., a 50/50 mix would be about 2.8 % CH<sub>4</sub>, 10 % O<sub>2</sub> and 87 % nitrogen). If it is mostly Titan air, then there might not be enough oxygen to support combustion. [The danger could come from] extra-humid methane-rich air... or better, hydrocarbon ‘dirt’ from outside (which at habitat temperatures, would melt/evaporate) to have a fire hazard.”





**Fig. 61.5** An inflatable habitat is pressure tested at Johnson Space Center (Photo by the author)

With everything saturated by the Titan environment, even the sand and “rain” tracked in by explorers might be a fire risk. But these are the types of hazards that are commonly dealt with in modern coal mines. Habitats would undoubtedly have mudrooms where uniforms and equipment could be hosed down or vacuumed off before entry into the living and working areas of the outpost. Laced with exotic chemistry, the air might smell like a gas refinery or a paint factory. Still, that external atmosphere could support human life for some time. It has enough pressure that a person could survive for quite a while with an oxygen mask and a good parka.

For all its challenges, travel on Titan promises to present many varied possibilities. Because it has low gravity and a thick atmosphere, Titan affords opportunities for mobility on large scales. Whether flying heavier-than-air or lighter-than-air vehicles, the prospect is easy on Titan. Explorers could have a hot air balloon driven by the waste heat from a radioisotope generator, or a light gas balloon, or even an airship. In the dense atmosphere, heavier-than-air airplanes afford a host of possibilities. Helicopters would work well. Hovercraft have even been suggested. On the seas, floating vehicles have been studied in detail, and may be built and flown in the near future. Hovercraft could go from one environment to another. Submarines—robotic or piloted by human villains—are another option.



## Finding Life

Tanya bemoaned the fact that “Titan was a lousy place for life.” But because of what she thought she had seen, she went down a mental checklist of the possibilities anyway. She was not the first to have done so.

Although water cannot exist as a liquid on the cold surface of Titan, it may not be the only liquid that could support biological processes. Methane and ethane appear to be available in abundance, in liquid or vapor form, at various times and at various locations on the giant moon. But liquid water has some advantages over cryogenic liquids. In specific, chemical reactions will take place much more slowly in Titan’s liquid resources, which means that so will metabolism rates. Some biologists are skeptical that such slow biological processes can take place. It is possible that biotic forms may have developed weaker chemical bonding than terrestrial life requires, so the chemical reactions might not be so limited, but this has not—*as yet*—been seen in nature.

Water has another advantage—it can dissolve a host of compounds to enable biological processes, far more than methane and ethane. Water is the enabler of most biological operations we understand, often serving as a bridge between important chemicals needed for life. And some compounds or elements simply may not be available at all. NASA Ames astrobiologist Chris McKay says, “The other problem suggested is the availability of elements other than carbon, hydrogen, and nitrogen, which are present in the organics produced in the atmosphere. Elements such as manganese, iron, and molybdenum are useful.” To determine if these elements are present on the surface of Titan will require advanced robotics not yet on the table.

Nevertheless, as Tanya observed, Titan’s ongoing atmospheric chemistry experiments may offer possibilities for life. The Sun’s ultraviolet radiation reacts with Titan’s upper atmosphere to produce a smorgasbord of organic materials.

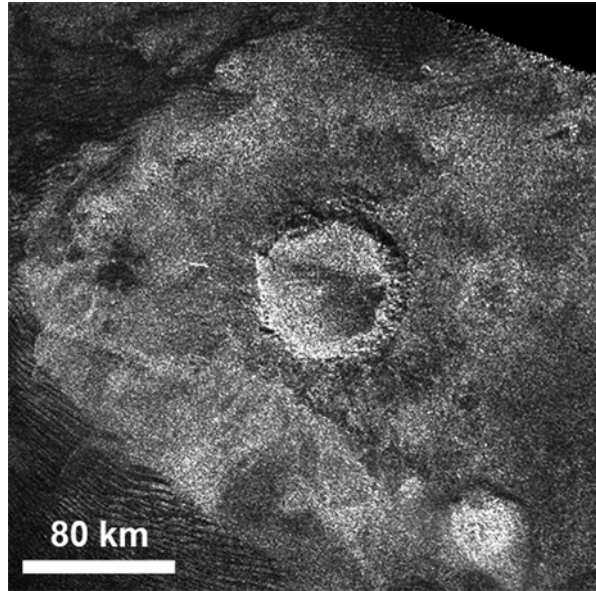
Over the ages, a rain of organics has undoubtedly built up deep layers of sediment blanketing the surface and mixing with the methane seas. One such compound is acetylene, a heavy compound rich in chemical energy.<sup>5</sup> We combine acetylene with oxygen to create superheated welding torches. But when it connects with hydrogen, it also releases energy—though more slowly—with methane as a waste product. This means that acetylene is at least one possible “food source” for Titan microbes (See Dirk Schulze-Makuch and David H. Grinspoon. *Astrobiology*. 2005, 5(4): 560-567. doi:[10.1089/ast.2005.5.560](https://doi.org/10.1089/ast.2005.5.560)).

However, where would that life come from? Even in Titan’s dense atmosphere, an occasional meteor makes it through to the surface, as evidenced by some fairly large impact craters. The dual-ringed impact basin Menrva, for example, is 270 miles across, and the impact crater Sinlap stretches 37 miles wide. At these and other impact sites, temperatures would have been hot enough for liquid water to exist for perhaps centuries or millennia. At other locations, cryovolcanism may have

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<sup>5</sup>ESA’s Huygens probe detected acetylene in Titan’s environment.

**Fig. 61.6** The impact crater Sinlap. Could such sites have played host to the genesis of biological forms? (Image courtesy NASA/JPL/Space Science Institute)



generated long-term heat, enough to liquefy the rock-hard water-ice surface. Perhaps these sources of energy fueled the chemical fires needed for life to take a foothold ages ago (Fig. 61.6).

There is, of course, another, deeper sea on Saturn's planet/moon. Perhaps 100 km down lies the abyssal water ocean, locked in eternal darkness, cut off from any external energy and separated from the mineral-rich rocky core. To remain liquid, models suggest that the water is at high pressures and mixed with ammonia, a sterile concoction seemingly lethal to life. But just how sterile is that ocean? Studies of ice fields show that diapirs, slowly moving masses of solid ice, can move material from the base of a glacier upward within the ice. It may well be that minerals from Titan's core have migrated upward to mix with its isolated water ocean, making it not so isolated at all. Additionally, if there has been cryovolcanic activity, it is likely connected in some way or in some locations to this ocean. This contact with surface hydrocarbons creates another source of biologically related materials that may be channeled into the subsurface ocean. Although there may not be any pink Nessies below, it makes us wonder, as Tanya did, "How many other choices could nature come up with that biochemists had not yet envisioned?"

## Shared Hallucinations

The poor scientists at Mayda Research Station seem to have been afflicted by both delusions (false beliefs) and hallucinations (false perceptions) that have a dangerous effect on their well-being. Doc Mason leads the scramble to find the cause. Where



**Fig. 61.7** The inhabitants of Mayda Research Station see hallucinations spawned by the petroglyphs of the Fremont culture, such as some of these in the Canyonlands region of Utah (Public domain via Wikimedia, commons.wikimedia.org/wiki/File:Newspaper\_Rock\_closeup.jpg)

could these strange visions of sea monsters and dancing petroglyphs be coming from? Why would more than one person experience the same illusion (Fig. 61.7)?

Psychologists draw a subtle distinction between delusions and hallucinations. Delusions are false beliefs, such as the suspicion that “someone is out to get you” or the sense that the voice in your head is not your own thought, but rather something being transmitted to you by someone else. A delusion is a belief or impression that is strongly held despite being contradicted by generally accepted, external evidence or opinion. A hallucination, on the other hand, involves a false perception coming through the senses, such as seeing something that is not there (a visual hallucination) or hearing voices from outside of one’s self telling you what to do (auditory hallucinations). At times, delusions may reinforce hallucinations. For example, a patient may perceive something crawling under her skin when she actually sees nothing there (a tactile hallucination), and at the same time she might believe that what is under her skin are creatures embedded there by aliens from Alpha Centuri (a delusion).

In a landmark study published in 2007,<sup>6</sup> researchers classified hallucinations by four categories: (1) Self-generated from an apparent inner source; (2) Self-generated from an outer source; (3) Externally generated from an inner location, and (4) Externally generated from outside. The self-generated “hallucinations” are ones

<sup>6</sup>See “Hallucinations from a Cognitive Perspective” by Laroi and Woodward; *Harvard Review Psychiatry*, Vol 15, #3, May/June 2007.

that the subject understands are coming from within themselves. So, for example, self-generated thoughts coming from an inner source (the self), are healthy. These would include daydreaming, memories, songs, and various thoughts. It is clear to the subject that these are coming from inside, and their location is internal (the mind or consciousness). The problem comes when the perception shifts, so that it appears that either the thoughts are being generated from somewhere else or that they are occurring somewhere else. At that point, they become an hallucination. Rather than voices as a memory in the mind, the voice shifts to a sound coming from a darkened closet or hallway. Instead of a familiar song as a happy distraction, music becomes a haunting tune from an unknown location.

What can cause hallucinations? Doc Mason talks about a fungal infestation of grain: “*Claviceps purpurea*. They call it ergot poisoning. And various toxic chemicals or microbes have been blamed for things like the events leading up to the Salem witch trials.”

Salem Village, which is present-day Danvers, Massachusetts, was permanently settled as early as 1636. The small enclave consisted of a community of Puritans living under harsh conditions. The Salem witch trials took place 55 years later, as the town was recovering from the stresses of a British war with France in the American colonies in 1689 (the “Second Indian War”), a smallpox epidemic, and attacks from nearby Native American Massachusetts tribes. The stressful environment may well have contributed to the events spanning February 1692 to May of 1693, when dozens were accused of witchcraft, dramatically tried in court, and some 20 executed, most by hanging. Although often cited as a cautionary tale for isolationism, religious extremism, or the danger of a lack of due process, the Salem witch trials are widely accepted as a primary example of mass hysteria (collective obsessional behavior). Mass hysteria involves group delusions of threats to society that spread rapidly through rumors and fear. Its physical side is often characterized by a group of people believing that they are suffering from the same physical symptoms or disease. Mass hysteria typically occurs in stressful and isolated environments, much like Mayda Research Station, a remote science outpost suffering a massive power failure, cut off from any outside help.

Aside from the external stresses suffered by Salem’s inhabitants, several medical theories have been put forward to explain its events. The most popular and well documented is called convulsive ergotism, a debilitating sickness that may have been caused by colonists eating rye bread made with grain contaminated by the fungus *Claviceps purpurea*. A 1976 article<sup>7</sup> in the journal *Science* by psychologist Linnda Caporael blamed the bizarre behavior of Salem’s defendants on the fungus ergot, which can blight commonly used grains such as rye, wheat and other cereal grasses. The fungus flourishes in warm, damp climates similar to the swampy meadows in Salem Village, where rye was the staple grain during the spring and summer months. Ergot poisoning can lead to muscle spasms, vomiting, delusions, coma and hallucinations. Ergot poisoning broke out as recently as 2001 in Ethiopia from contaminated barley.

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<sup>7</sup> See “Ergotism: The Satan Loose in Salem” by Linda R. Caporael, *Science* 192, April 1976.

Among other theories, another posits that an epidemic of encephalitis lethargica—which involves high fever, coma or psychosis—can be carried by migrating birds. But the Salem events may well have been a combination of biologically and socially caused phenomena. Examples of shared physical disorders with apparently psychological sources are well documented. Hysterical contagion occurs when a group of people share physical symptoms of an illness, when in reality the causes are psychological. And like the Salem witch trials, hysterical contagion has its classic example: the 1962 “June bug epidemic.” A mysterious disease broke out among employees of a dressmaking department in a U. S. textile factory. The symptoms included numbness of limbs, vertigo and vomiting. Rumors of an insect in the factory that would bite its victims and cause them to develop the symptoms quickly spread. Sixty-two employees soon developed the peculiar illness, some of whom needed to be hospitalized. After examination by company physicians and experts from the U. S. Public Health Department, researchers concluded that the case was one of mass hysteria. Although some workers did suffer insect bites, not all did. It is now believed that anxiety was the true cause of the symptoms. No evidence was ever found for a bug that could cause the flu-like symptoms.

Factory managers evaluated the working environment, concluding that it was quite stressful. Several factors contributed to the heightened stress: the plant was newly opened, it had a large volume of work, and organization was poor. Most of the victims reported high levels of stress. Of the 62 employees that reported symptoms, 58 worked on the same shift in the same area, and 50 of the 62 cases occurred in the two consecutive days after the media covered the event.

A similar shared hallucination, called conversion disorder, causes patients to suffer from neurological symptoms such as numbness, seizures or partial paralysis, and disturbances of senses like touch and vision, but without a diagnosable cause. Researchers theorize that symptoms arise in response to stressful situations affecting a patient's mental health. Conversion disorder is considered a formal psychiatric disorder (DSM-5). Typically conversion disorder begins with a stressful event or trauma that expresses itself as physical symptoms. Usually the physical symptoms affect the senses and movement. For example, a victim of conversion disorder may experience short-term blindness after the loss of a parent or spouse. Reports cover a wide range in severity and duration, but symptoms are usually short-lived and fairly mild. In the related mass psychogenic illness (MPI), symptoms spread rapidly, affecting members of a cohesive group, originating from a patient's nervous system disturbance involving agitation or loss of coordination. Patients' symptoms seem to have no corresponding physical source. Shared symptoms sometimes progress throughout an isolated group of people following ‘exposure’ to a common source person. Although MPI has been documented in a variety of situations, the common symptoms include rapid onset and recovery, occurrence in a segregated group, the presence of extreme apprehension, and symptoms that are spread via sight, sound or verbal communication.

Psychiatric records document other cases of shared hallucination on smaller scales. *Folie à deux* (the “madness of two”) is a shared psychosis. A delusion is transferred from a dominant individual to a second person that would not, presumably,

have become deluded on his or her own. Also called shared psychotic disorder, it most commonly appears in two or more individuals living closely together who are physically or socially isolated with limited outside interaction.

A well-known case of *folie à deux* concerned a woman named Margaret, along with her husband Michael, both aged 34 years.<sup>8</sup> The couple's *folie à deux* took a unique form of shared delusions of persecution. The two believed that people were entering their house, spreading dust and "wearing down their shoes."

*Folie à deux* sometimes has a broader effect. When the delusions are shared among many, the syndrome is called *folie a plusieurs*, the madness of many. But when a large number of people come to believe obvious falsehoods based purely on rumor, these beliefs are not considered to be clinical delusions like *folie à deux*; instead, these are considered cases of mass hysteria.

Similar symptoms to *folie à deux* have been induced by the military chemical weapon BZ (3-Quinuclidinyl benzilate, also known as "buzz"). In the late 1960s, the nerve agent was weaponized for battlefield use. Although never used in war, research showed that it caused stupor, delusions and hallucinations, disorientation and a loss of coordination. Stocks of weaponized BZ were destroyed under treaty in 1989.

More recently, anthropologists working in the rainforests of the Amazon Basin in South America reported<sup>9</sup> mass shared hallucinations from the ingestion of ayahuasca. Ayahuasca is a tea prepared from the jungle "spirit vine" *Banisteriopsis Caap* mixed with other plants. The tea has rich medicinal and spiritual traditions among the indigenous tribes of the region and plays an important role in many ancient and emerging religions of the area.

Although ayahuasca is indigenous to the Amazon, psychotropic or hallucinogenic substances are found throughout the plant kingdom globally. Who knows what mass hallucinogens might be waiting in the exotic chemistries of other worlds?

## A Note about Terraforming

Abigail Marcos was born and raised on Mars. She didn't grow up in a spacesuit or a metal can. She ran free across farmers' fields and swam in lakes on the Red Planet. How can this be? The future Mars inhabited by our main character is a planet whose environment has been transformed to resemble that of Earth's. This global engineering process is called terraforming. It's a complicated process that makes use of existing resources and brings in others. Some recent estimates project that the planet could be substantially terraformed within several centuries. This optimistic view is the one used in our plot.

In order to make Mars into an Earthlike world, terraformers face several problems. The atmosphere on Mars is thin. In the low valleys, pressures are equivalent to the

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<sup>8</sup>See *Uncommon Psychiatric Syndromes* by David Enoch and Hadrian Ball (Hodder Arnold Publications, 2001, p. 181).

<sup>9</sup>See "Hallucinogenic Drugs and Plants in Psychotherapy and Shamanism" by Ralph Metzner in *Journal of Psychoactive Drugs* (1998).



pressure on Earth at 100,000 ft altitude. The thin atmosphere comes from a host of factors, but two are the most important. First, Mars has low gravity, just 38 % of the amount that Earth does. This means it has a more difficult time holding onto air. Secondly, Mars has no magnetosphere. A planet's magnetic field is generated by a molten core and acts as a shield of protection. This magnetic bubble shelters an atmosphere from solar radiation, which it can strip away. The combination of low gravity and lack of magnetosphere have contributed to Mars' lack of air. Unfortunately, there is nothing we can do about either of these two factors!

What can we do? The loss of an atmosphere is a gradual process, and it is likely that if a Martian atmosphere can be built up enough to sustain life, it will be stable for some time. Mars has many resources from which to draw. Recent estimates suggest that there are huge inventories of carbon dioxide ice in the south polar cap and within the Martian subsurface globally. Studies by Mars Odyssey indicate that this CO<sub>2</sub> may reach as much as 12,000 km<sup>3</sup>, equivalent to the water in North America's Lake Michigan. If this CO<sub>2</sub> was heated and sublimated (turned from ice to gas) by warming the climate, the atmospheric pressure of Mars could reach 30 kilopascals (3/10 what it is at sea level on Earth). This is comparable to the pressure at the summit of Mt. Everest, nearly breathable by humans.

Warming of the Martian climate could be done by several methods. One would be to pepper the polar ices with dark material from meteors. As the polar ices darkened, water and CO<sub>2</sub> ices would melt, increasing the pressure. As the pressure increased, so would temperature. This cycle would continue as more and more gases sublimated and water vaporized, increasing and warming the atmosphere.

Rockets with compressed greenhouse gases such as sulfur hexafluoride or chlorofluorocarbons could seed the atmosphere during this warming process. As the atmosphere built up, these gases would dissipate, hopefully leaving a more pristine environment. One study estimated that a steady rain of rockets could get the job done in several decades.

Orbiting mirrors have also been proposed for melting the polar ices. Built in synchronous equatorial orbits, trains of these giant reflectors would beam sunlight onto the polar caps, freeing CO<sub>2</sub> and water into the atmosphere.

Once a thicker atmosphere is established, terraformers envision genetically engineered plants that could begin the process of transforming the primarily CO<sub>2</sub> atmosphere into a breathable one. The Martian soil seems to have a wide variety of minerals, along with some nitrogen. Water is available. Its day/night cycle is just 37 min longer than an Earth day. Seasons on Mars are similar to terrestrial ones, as the axial tilt of the planet (which causes seasons) is very similar to our own. However, the seasons on Mars are nearly twice as long. These differences in natural cycles will have an unknown effect on plants (Fig. 61.8).

One major problem with the Martian environment is that it is highly acidic. The Phoenix lander confirmed suspicions from earlier Viking experiments in finding perchlorates in the soil. Planting a garden on Mars today would be like planting in soil saturated with hydrogen peroxide (although in subpolar regions, the soil is slightly more alkaline and less hostile to terrestrial plant life). But as the atmospheric conditions change, many of these volatiles will combine with other elements in rock, air and soil to become more stable.



**Fig. 61.8** The face of Mars would be transformed dramatically as the planet is terraformed into an Earthlike world (Paintings by the author, based on Viking spacecraft global mosaic, NASA/JPL)

Mars is half again as far from the Sun as Earth is. Although the thickening of its atmosphere will bring seas and warmth, Mars will never be a tropical paradise. Martian settlers would find themselves at home in places like Alaska or Siberia, but not the Mediterranean or Caribbean. Still, 1 day it just may be possible to sit at the edge of a Martian canyon out under the stars, sipping a cup of coffee and watching a condor riding the updrafts, as two moons rise in a twilight sky.