

Oxygen

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Oxygen

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Part I: Human Factors

“Man is the best computer we can put aboard a spacecraft ... and the only one that can be mass produced with unskilled labor.”

-Wernher von Braun

“For long-duration manned spaceflight, the most important consideration is not the technology of the spacecraft but the composition of the crew.”

-Shannon Lucid, Ph.D., astronaut, holder of the American record for most hours in space, “Six Months on Mir,” *Scientific American*, May 1998.

“To summarize in *Star Trek* terminology, what a piloted Mars mission needs are two ‘Scottys’ and two ‘Spocks.’ No ‘Kirks,’ ‘Sulus,’ or ‘McCoys’ are needed, and more importantly, neither are the berths and rations to accommodate them. We can do the mission with a crew of four.”

-Robert Zubrin, *The Case for Mars*, p. 87.

Chapter 1

Tuesday, August 14, 2012, midnight

Valkerie

Valkerie woke up screaming. A viper bat clung to her face with fishhook claws, smothering her with its thin, leathery body. She tore at her face, but the creature had dug in too deep. She could already feel its venom burning into her lungs, constricting her chest in a long, convulsive cough. Struggling for control, she traced the contours of her face with tingling fingertips. Slowly, the clinging creature melted into her skin, fading back into the world of dreams.

The nightmare gradually faded, giving way to a new, more gripping terror. Valkerie was wide awake now. There was no such thing as a viper bat. But she still couldn't breathe.

Valkerie flung herself from the camping cot and thudded to the floor. She lay on her back, gasping for breath. She was hyperventilating, but the burning in her lungs grew worse. An acrid stench filled the cabin—the smell of sulfur dioxide—SO₂.

“Oh no.” The volcano was venting. “Oh God, please ...” Valkerie rolled over and fought her way up onto her hands and knees. Dim red light filtered in through the cabin window, illuminating a large duffel bag in the middle of the room. She crawled slowly toward the bag, struggling through the coughs that wracked her body.

“Please, God.” Squeezing her eyes shut against the pain in her cramping muscles, Valkerie inched forward until she felt the heavy canvas. She dug underneath a metallic thermal suit and pressed her breather to her face. Her lungs choked shut at the rush of acidic gas. *Idiot!* She flung the mask across the room. Gina-Marie had warned her about the filter, but Valkerie had insisted it would be good for one more trip.

Her mind raced. If Mount Trident was venting, the whole valley could be filled with sulfur dioxide. She had to get out of there. Fast.

Valkerie tried to stand, but the room spun out of control. She crashed onto the floor, hitting her head hard on the edge of the cot. A cloud of ringing light sparkled in her mind. Her muscles relaxed, and she gave herself to the tide of darkness that washed gently across her senses. *Sleep. No more experiments. Sleep.*

An image crept into her mind. A large plastic bag filled with new sample tubes. Was it still sealed? She couldn't remember.

Groping her way forward, Valkerie swept her hands across the floor. A smooth surface crinkled at her touch. She lunged at the bag, poked a trembling finger through the heavy plastic, and pressed her lips to the hole. The air tingled in her lungs with burning sweetness.

She curled around the bag, hugging it to her body, breathing life through the ragged wound. Gradually, the needles that prickled at her consciousness started to recede, but she knew it wouldn't last. The air in the bag was getting stale—fast.

Valkerie took one last breath and staggered to her feet. Her jeep! It was just outside. She lurched to the cabin door and pushed her way out into the night. The air hit her in the face like a blast of hot tear gas. Gagging on the foul gases, she stumbled blindly forward, clinging to consciousness.

Heaving herself into the seat of the jeep, she turned the key. The starter whirred and the engine coughed to life, but then died immediately. *Idiot!* Valkerie smashed her fist against the dash. The jeep couldn't run without oxygen any more than she could.

A wave of nausea wracked Valkerie's body. Her muscles were cramping again. She fell across the seat and reached into the glove box for her knife. *Pliers*. They would have to do.

Valkerie crawled out of the jeep and threw herself on the ground by the jeep's front tire. Taking off the cap of the air valve, she crushed its metal tip with the pliers. After a few seconds of twisting and squeezing, she heard a faint hiss.

Valkerie chomped down on the rubber valve and sucked in a desperate breath. The air was black with the taste of rubber, but anything was better than SO₂. When her lungs were full, she clamped down on the valve with the pliers. Breathe, clamp, breathe, clamp. She held each breath as long as she could before letting it out.

The tire went flat way too soon. Valkerie crawled to the next tire and repeated the process. Then the next tire and the next. After she had sucked the last ounce of air from the spare, she took off running across the clearing. The valley was rugged and wide. She knew she couldn't make it out on foot, but if she could just get above the blanket of heavy gases she might have a chance.

Halfway across the clearing, Valkerie fell reeling to the ground. Red thunderbolts stabbed at her brain. A sparkling haze shrouded her vision as she fought her way to her feet. The heavy gases were thicker close to the ground. She had to stay upright. Walking on tiptoe, she made her way to the edge of the clearing, looking up at the night sky to keep her nostrils elevated.

Valkerie stumbled into a limbless old pine and crashed to the ground. Too dizzy to stand, she crawled on her hands and knees to a younger pine with limbs low enough to climb.

The rough branches cut her face and tore at her nightgown as she climbed. Valkerie lost her grip and fell, crashing into the branches below. She pulled herself up and kept climbing. Higher and higher through the darkness, until slowly, her head began to clear.

"Thank you. Thank you." Valkerie breathed in and out to the cadence of the simple litany that filled her mind. The sparkles in her eyes were fading. Below her feet, tendrils of mist danced in the moonlight, flowing along the envelope of the deadly gas cloud.

The valley reflected an angry red glow. Valkerie looked up at the peak that loomed above her. If the venting continued long enough, the gases might rise higher than she could climb. But that was the least of her worries.

She closed her eyes and wrapped her arms around the tree, hoping Professor Henderson was wrong. His solemn voice echoed in her mind: "*If it starts venting, get out. Fumarolic*

venting almost always presages a major eruption.”

Wednesday, August 15, 2012, 9:30 a.m.

Bob Kaganovski had shampoo in his eyes when the decompression alarm went off.

He grabbed the suction hose and ran it frantically over his face and eyes. Footsteps pounded outside the shower.

“Decompression!” shouted Josh Bennett, mission commander of the Ares 10. “Get to the EVA* suits now! We’ve got about fifteen minutes.”

Bob popped open the Velcroed shower door and grabbed a towel. Fear knotted his gut. Only fifteen minutes! He stepped out of the shower and swiped a towel across the soles of his feet, drying them just enough so he wouldn’t kill himself on the stairs.

He ran through a corridor to the steep circular stairway that led down to Level 1 of the Habitation Module. The decompression alarm beeped once every two seconds. The interval was keyed to cabin pressure. When it got down to vacuum, the beeps would merge into one steady drone. If he wasn’t in his suit by then, he wouldn’t hear it. For one thing, sound wouldn’t travel in a vacuum. For another, he’d be dead.

Bob slipped and slithered down the metal staircase. Josh lay on the floor, with both his legs already stuffed into the lower half of his EVA suit. Bob yanked open the door of his locker and pulled out the heavy upper half of his suit.

It fell on the floor in a heap.

“Easy!” Josh said. “Don’t panic. I’ll give you a hand~”

“I’ve got it.” Bob grabbed it and heaved. *Who designed this beast?* Fifty years of research, and the thing still weighed over eighty pounds. Normally, somebody was supposed to help you into an Extra-Vehicular Activity suit. But in an emergency, you could do it yourself. In theory.

Bob latched the upper half of the suit to a stability rack and laid out the lower half on the floor. He grabbed a MAG, NASA-speak for a diaper, and taped it on.

The beeping of the alarm increased in tempo.

Now for the hard part, the LCG~Liquid-Cooled Garment~a Spandex pair of long johns with feet, encased in a clunky water-cooled nightmare of tubes and gizmos. Bob struggled furiously to pull it over his damp skin. Minutes passed.

Josh was almost all of the way into his suit by the time Bob got his LCG on. “How you doing with that thing?” Josh asked.

“I’m getting there.” Bob wiped the sweat out of his eyes.

“We’re down to eight minutes.” Josh fastened the inner connectors at his waist, then the outer ones. “Need some help before I put on my gloves?”

Bob stuck both feet into the legs of the EVA suit and pushed in. His feet slid home into the boots and he pulled the pant legs up to his waist. “Okay, give me a hand up.”

“Better hurry.” Josh put on his Snoopy cap and adjusted his comm mikes. “The air’s getting thinner.” He pulled Bob to his feet. “Just climb up into your top. Nothing to it.”

Right. Bob clumped over to his top, turned, and tried to squat. Which was almost impossible wearing the pants.

“Drop the pants,” Josh said. “I need to pressurize, okay?” He pulled his helmet and gloves out of his locker.

I’m on my own now. Bob let go of the circular metal ring that ran around the belt of the pants. He squatted and tried to back in underneath the suit. Which was practically impossible for a guy almost six feet tall. Josh had it easy—he was five inches shorter and a lot more limber. Bob pushed up into the suit. The thing was the mother of all turtleneck sweaters, fifteen layers of everything from Teflon to Nomex to who-knows-what. Halfway up, his head got stuck.

His heart was hammering now, three beats for every beep of that blasted alarm. He backed down and tried again.

And got stuck again. *Force it.* He pushed harder. Harder.

The suit popped loose from the stability rack. He staggered forward, but the heavy pack pulled him back. He teetered, lost his balance, and fell on the suit’s backpack with his legs pinned beneath him.

Stuck! Bob tried to roll onto his side, but he couldn’t move. His head and arms were tangled inside the suit. His legs began cramping. He was trapped like a turtle on its back. Except a turtle would at least have its head out of the shell. The alarm beeped fainter, faster. Sweat poured down his face. *So this is what the Apollo 13 boys felt like. Dogmeat.*

Minutes passed. The beeps merged into a single tone. Quieter. Quieter.

Off.

Hysterical laughter echoed in the small room. Bob felt strong hands grab the upper half of his suit and begin tugging.

“Congratulations. You’re dead!” Josh slowly manhandled Bob out of his turtle-shell prison.

Bob opened his eyes and saw Josh with his helmet and gloves off, grinning like a maniac.

The airlock door opened and two med techs walked in. “The exercise is over,” said the first one, a cute redhead with dangly earrings. “That’s six times in a row you’ve killed yourself, Bob. You’ve got the record.” She and Josh helped him to his feet.

The other tech grinned. “Don’t sweat it, bro. You’re supposed to break records, right? That’s what they pay you for~to go where no man has gone before.” He and Josh helped Bob step out of the lower half of his suit.

The redhead shook her head, making her earrings dance like wild men. “Okay, now let’s check you over. Any parts broken?”

“I’m fine,” Bob said.

It took the techs ten minutes to peel off his Spandex underwear and MAG diaper and check him over for damage. Bob stood there, buck naked, barely noticing them. He’d been in this program too long to bat an eye at the indignity of the medigeeks’ inspections. But if he couldn’t pass the EVA drill ...

“You’re fine, Dr. Kaganovski,” said the redhead. “Next time take it slower and dry off a little better.” She turned to Josh. “How’s the splint on your wrist holding up?”

He shrugged. “Hey, it’s just a hairline. No sweat.”

“Yeah, well, take my advice and don’t buy another motorcycle.” She walked out of the room with the other tech.

“Yes, Motherrrr.” Josh flexed his wrists and revved an imaginary bike. “Hey, Kaggo, you want to run another exercise before lunch?”

Bob looked at his watch. “We don’t have time. The psych test is coming up.”

“Psych test?” Josh raised an eyebrow.

“At eleven,” Bob said. “Didn’t you read your e-mail?”

Josh just looked at him.

“Don’t tell me you weaseled out of it.” They walked out of the Hab and into the locker room. Bob went to the sink and began rinsing the last of the shampoo from his hair. “Lex and Kennedy are gonna spit bile if you’re the only one who doesn’t have to take it.”

“Nobody told me anything about a psych test.” Josh stepped into his street pants. “Lex is doing T-38 proficiency training this morning. And Kennedy’s running docking sims over in SES.”

Bob’s heart double-thumped. He went to his street-clothes locker and began dressing. “Let me see if I’ve got this straight. The klutz of the crew has to go have a happy chat with the shrinks, while the rest of you get to play?”

“You’re not a klutz,” Josh said. “You just need a little more time~”

“What do you call a guy who can’t even get dressed without hurting himself?” Bob yanked on his pants and plopped down on the bench. “Seventeen months till lift-off, and they’re getting nervous, that’s what I think. They’ve still got time to unload me, bring in someone else who knows his head from a hole in the ozone.”

“Just can it, will you?” Josh sounded angry. “Listen up. You know who’s the most important guy on the crew? Read the mission architecture document. The flight engineer, that’s who. The ace mechanic. Scotty. That would be you, in case you’ve forgotten.”

“Mechanics are a dime a dozen.”

“Yeah, right, and monkeys can do brain surgery.” Josh finished tying his shoes. “You’re the best mechanic in the Ares program. Anything goes wrong out there, it’s you who’s going to fix it, and everybody knows it. So what are you worried about?”

“Flight surgeons, that’s what. They want a change. I can smell it.”

“Then blow your nose. I don’t care who wants a change. My main priority is getting to Mars and back with my crew alive. As long as I’m commander on this mission, you’re my number-one mechanic. Got it?”

“So what’s the deal with the psych test, then?” Bob jammed his feet into his shoes. “What do I tell these guys?”

“Shrinks are all alike,” Josh said. “They’re afraid of a repeat of the Mir fiasco. Just figure out what they want to hear and tell it to ‘em.”

“Oh, right,” Bob said. *And what do they want to hear?*

“You’ll do fine.” Josh whacked Bob on the shoulder. “Believe me, you haven’t got a thing to worry about.”

*A glossary of NASA terms is on page 367.

Chapter 2

Wednesday, August 15, 2012, 6:00 a.m.

Valkerie

A deep rumble, steady and insistent, droned in Valkerie's mind. The sound meant something. Something important. She covered her ears, but the roar hammered into her skull, setting off echoes of throbbing pain.

The volcano! Valkerie opened her eyes, blinking against a thick film of goo. The valley swayed and tilted around her as she searched the summit of Mount Trident in the gray light of early morning.

A thin column of steam rose above Trident's fourth cone. But the roar didn't seem to be coming from the volcano. She turned and blinked into the rising sun. A large military helicopter approached low over the Valley of Ten Thousand Smokes. A rescue party?

Valkerie tried to wave, but the motion set off a fit of coughing. Her lungs felt like they had been dissolved in acid, and after the coughing, her head felt even worse. She watched helplessly as the helicopter descended into the clearing by the cabin.

"Don't land! SO₂!" Valkerie's tattered voice was washed away in the rush of wind.

The pitch of the helicopter's roar dropped as the blades spun down. *Great!* The idiots either cut power or their engines were choking on the oxygen-depleted atmosphere.

Two men in business suits stepped out of the helicopter and pointed in her direction. Her rescuers? They didn't even have breathers. Half dazed, she watched them approach, waiting for them to start coughing.

Valkerie shook her head to clear her mind. The men seemed to be okay. She leaned back and uncurled her legs from around the branch she had been sitting on. Her body tingled with prickling pain. Her vision blurred with each pulse of her quickening heart.

A branch slipped from her cold-numbed fingers, and she fell, crashing down through the jagged limbs. She slammed into the ground and rolled on the gravelly cinders, struggling for breath in an ocean of dizziness and pain. Running footsteps. Shouted questions. "Are you okay?" "Can you breathe?"

Valkerie struggled to her feet, ignoring the bright lights that flashed in her brain. Her samples. She couldn't go without her bacteria. "Get back to the chopper! I've got to get my samples."

The men stared. Mouths open, eyes wide, they stood watching her—like imbeciles.

Good grief, she didn't have time for this. The volcano could erupt any minute. "Get to the helicopter. Now!" She turned and ran for the cabin.

"Valerie Jansen?"

Valkerie glanced back. The taller one was jogging after her.

“They’re in the cabin. It’ll only take a minute.” Valkerie flung open the sheet of plywood that served as a door and stepped inside. The interior still reeked of SO₂. She fell to her knees in front of the portable sample heater and checked the dial.

“Are you Valerie Jansen?”

Valkerie picked up the oven and turned slowly. “Yeah, I’m the only one here. Gina-Marie left two days ago.” She stepped toward the man, but he made no move to let her pass. “I’m sorry, but I couldn’t leave without my samples. It took me five days to collect them. I ...”

Valkerie bit her lower lip. Something was wrong. The man was in his late forties. Tall. Well-groomed. Good-looking. What was he doing on a rescue helicopter? And why was his face so familiar?

The short man appeared behind his companion, peering at her through thick, eye-shrinking lenses. “May I ask what you were doing up in that tree?” His voice was an annoying whine.

“Don’t we need to get out of here? Aren’t you here to rescue me?”

“Rescue you?” The tall man took a step backward.

“Trident’s about to erupt. Right?”

The tall man shrugged. “We just came from your central research station. They didn’t say anything about an eruption. I assume they’ve been monitoring.”

“But it was venting all night. The whole valley was filled with SO₂. If I hadn’t found a sealed plastic bag to breathe from, I wouldn’t have survived to reach the tree.”

“Venting?” The tall man stepped away from the cabin and cast a worried glance up at the overshadowing peak.

“Trident isn’t known for venting. It could signal a major eruption.”

“Why didn’t you evacuate? You’ve got a jeep.” The small man’s voice carried an accusing tone.

“In an SO₂ blanket? Who are you guys? You’re not from the research station.”

“I’m sorry,” said the tall man. “I’m Steven Perez and this is Roger Abrams. We’re from NASA. We’ve reviewed your Astronaut Candidate Application and were hoping for an informal interview. We’ve been trying to get in touch with you for weeks.”

Valkerie dropped the sample heater. Blood surged into her face and throbbed with a pressure that made her nauseous. Her ASCAN application? Steven Perez? The director of the Johnson Space Center, Steven Perez? An interview? She looked down at herself. Dirty and bleeding. Barefoot and wearing a flimsy nightgown—for an interview. Not just any interview—the most important interview of her life.

* * *

Wednesday, August 15, 2012, 10:55 a.m.

Bob

Bob checked his watch again. 10:55. Almost showtime. He walked out of the elevator onto the fourth floor of Building 1 and headed for the drinking fountain, mentally cursing every flight surgeon who'd ever lived.

Flight surgeons had trashed the lives of more astronauts than he cared to remember. Jim Lovell's bilirubin. Deke Slayton's heart arrhythmia. Al Shepard's inner ear. Now they were coming for him.

Tell 'em what they want to hear.

Right. But what did they want to hear?

It was easy to guess what they didn't want to hear. Bob had spent the last six months going over the Ares 10 flight hardware with a microscope. That was his job. If anything went wrong on the mission, it'd be his neck in the noose. But some of the contractors had complained that he was too picky about safety.

Bob snorted. *Too picky about safety?* An oxymoron. Or it would have been in the old days. But modern NASA had a new mantra. "Faster, cheaper, better." What about "safer"? If you forgot that, you got an Apollo 1 fire. A Challenger explosion. A Mir collision. The smart guy didn't trust his safety to anyone. *Anyone*. Trust yourself first, last, and only.

Bob swigged some water at the drinking fountain and wiped his mouth on his sleeve. *Now go. Relax. Be cool. Amble in. Act nonchalant. Don't give them anything to grab hold of.*

And tell 'em what they want to hear.

He ambled down the hall, his gut knotting up. How would Josh handle this? *With cool.*

Bob pushed open the door and smiled. "Hey, docs! Ready to shrink some heads?" It sounded stupid the instant he said it.

A severe-looking fiftyish blond woman stood up and extended a hand. "I'm Dr. Hartmann." She introduced her two colleagues. Dr. Avery, an African-American guy in his forties, very no-nonsense. And a pink-faced kid who looked fresh out of psycho school, clutching a fat notebook. Bob didn't catch his name.

"Sign this consent form." Dr. Hartmann held out a three-page document.

Bob studied it. "You're going to *videotape* this?" So that's why the side wall had a big mirror.

"Standard practice. Dr. Perez wants an objective record."

Right. Bob hadn't heard much that he liked about Perez, but he was The Man now, so you

had to live with it. Bob read the entire release form slowly, including the fine print on the last page. He didn't like it, but this seemed a bad time to argue. He signed.

"Have a seat, Mr. Kaganovski."

"Thanks, Ms. Hartmann."

"That's *Dr.* Hartmann."

"Oops ... sorry." Bob felt his ears turning hot. *Great start, Kaggo. Just put that other foot on the banana peel and try for a split.* He slumped into the chair. *Be cool. There's still time to recover.*

"Dr. Perez has asked us to evaluate various relationships among the team members of the Ares 10 prime crew. Please relax and answer the questions as quickly as you can. We're interested in your *first* reactions to these questions. Is that clear?"

A smoke screen. Shrinks never, ever told you what it was really about. Bob tried to relax. "Sure thing. No problemo."

"Please tell us about Dr. Alexis Ohta. Does it bother you that a woman is on the team?"

For crying out loud, did anyone still think that mattered? "Hey, she's just one of the guys, you know?" *One of the most gorgeous guys you've ever seen in your life.* "I think she's the best man on the team."

Dr. Hartmann gave him an incredulous stare. "Best *man*?"

"Um, you know what I mean." *Great, Bob. Kick your tonsils while you're at it.* "Lex is just a ... regular person. We kind of forget she's a girl."

"Girl." Dr. Hartmann scribbled in her notebook.

"Lady. Woman. Y-chromosome-challenged person." Bob rolled his eyes. *Oh, give it up.* "Girl." *Good grief! Lex called herself a grrrl. Wasn't that the same thing?*

Hartmann kept writing. Dr. Avery just looked at Bob. The kid studied his notebook intently, his tongue poking a knob out of his cheek.

"Fine, Mr. Kaganovski. Could you tell us about Mr. Kennedy Hampton? How do you feel about his privileged background?"

"We kind of kid him about his name." Bob leaned back in his chair. "You know, about how the only good Kennedy is—" *Oops, bad idea.* Bob cleared his throat. "Actually, Josh and I like to call him Hampster. He thinks that's funny, you know?"

"I'm sure it is." Dr. Hartmann pursed her lips and wrote for half a minute, scratching her pen noisily on the brittle paper. Dr. Avery studied Bob, his smile chilly. The kid licked his lips and kept his eyes fixed on his notebook.

"Excellent, Mr. Kaganovski." Dr. Hartmann looked at her clipboard. "I'm sorry, it's Dr.

Kaganovski, isn't it?"

"It's Bob."

"Fine. Dr. Bob, could you tell us about Mr. Joshua Bennett? Do you have any question about following his orders, considering that he doesn't have a Ph.D.?"

Bob shrugged. "Josh is a terrific pilot and the best leader I've ever known. He's good at making decisions and it's his job to give the orders. If you can do that, you don't need a fancy-shmancy degree."

Dr. Hartmann nodded and scrawled something. "But you have quite a fancy degree—a Ph.D. in physics from Berkeley."

"Um, yeah, well, it's not like I'm using it or anything. I do engineering physics, not the real stuff like cosmology or quantum field theory. I'm basically a glorified mechanic."

"But suppose Mr. Bennett gave you an order about something where he lacked expertise? Suppose you considered it wrong, even dangerous?"

Bingo. It was safety after all. Here's where they'd try to nail him. *Tell 'em what they want to hear.* Bob cleared his throat and sat up straight in his chair. "That's a very good question, but the fact is ..." He scratched his nose and then gave her his best smile. "The fact is that Josh is a pretty smart guy, and he's just not going to ask me to do something dangerous. I trust the guy." Which was mostly true.

"You'd obey his orders, then? You seem a bit hesitant."

"It's my job to obey the commander. He's not going to send me into harm's way, I'll tell you that. He's John Glenn, Jack Ryan, and Captain Picard, all in one." Bob tugged at his chin. "So, yeah, I'd obey his orders." *Unless he was wrong.*

"Thank you." Dr. Hartmann wrote something and circled it several times. Dr. Avery leaned back in his chair and shut his eyes. And the kid closed his notebook.

Closed his notebook. Bob went tense in every muscle.

Dr. Hartmann stood up. "Have a pleasant day, Dr. Kaganovski. I'm sure the mission will be very successful." She gave him a stiff smile and walked out. Dr. Avery followed her, his expression blank. The kid nodded to Bob on the way out. "Good luck, guy."

Bob's mouth hung open for a long moment. That was it? The whole interview? He'd come prepared for a one-hour dog-and-pony show, and they walk out after ten minutes? Yow!

Then he remembered that some technician on the other side of the mirror was probably still running the videotape. He stood up, trying to look unconcerned, and ambled out the door.

The shrinks had already disappeared. Bob suddenly needed fresh air. He headed down the hall toward the elevator.

One thing was for sure. They had come looking for dirt on him. And they'd found it, big

time.

But how? What had he said?

* * *

Wednesday, August 15, 2012, 6:20 a.m.

Valkerie

“Interview? Me? Now?” Valkerie backed away from the NASA director, looking wildly around the cabin for something big enough to hide behind. “I’m not dressed, I just—” She ran her fingers through her hair, trying to press down the tangled mass of frizz and twigs. “You’ve got to leave. I mean—the volcano. It could go anytime.”

“Are you sure?”

Valkerie hugged her arms to her chest and nodded. “It was belching SO₂—” Her lungs tightened, and she doubled over, coughing. Her throat was raw and her chest was full of fluid. Dark spots moved across her eyes.

“Roger, run back and tell the pilot we’re leaving right away. I’ll help Dr. Jansen with her equipment.”

Valkerie listened to the short man’s retreating steps with a growing sense of panic. The director wasn’t moving. He wanted her to go with them.

She dropped to her knees and pulled the bulky thermal suit toward her, holding it against her body as she went through the motion of folding it. Her head surged with pain. He was still looking at her. Why didn’t he leave?

Perez stepped toward her and stooped to pick up the sample oven. “What else do you need? One of those backpacks?”

Valkerie followed his gaze and blushed. Her bra hung from a loop on the pack frame, and a pile of dirty underwear and socks lay in front of it on the floor. “No. Please. Just the oven. I need to change, and I ... I won’t take long.” She rose unsteadily to her feet and moved to block Perez’s view of her underwear. “Tell the pilot I’ll be ready in a few minutes.” Valkerie held her breath and waited, forcing herself to look him in the eyes.

“Of course.” Perez pointed toward the door. “Pile anything you need out there.” He stepped outside and struggled to shut the plywood door behind him.

“Just leave it. It doesn’t close all the way.” Valkerie shoved the pile of underwear into her pack and crept to the doorway to peer through the gap. Good! Perez was on his way back to the helicopter.

Breathing a sigh of relief, Valkerie hurried to a small pile of dirty clothes at the foot of the cot. Great. They reeked. She had stretched the three-day field trip to five, and all her clothes were covered with sulfur-saturated mud. It wasn’t fair. Why did this have to happen now?

She stepped into a pair of stiff jeans, bracing herself against the wall. The jeans felt rough and cold, like dirty clay pots. Valkerie chose a gray sweatshirt that camouflaged the mud and changed quickly with her back to the door.

Ridiculous to interview looking like this. They'd have to go back without her. Maybe she could tell them she had to drive the jeep out.

The helicopter roared to life. Seconds later she heard a loud knock.

Valkerie stumbled to the door and poked her head through the gap. "Go ahead and fly out. I've got to drive the jeep." Her shout ground gravel into her raw throat.

Perez shook his head. "What happened to the tires?"

"Oh yeah." Valkerie looked down at her feet. "I needed the air—to breathe."

"To breathe? How did... ? Oh, I see. Very clever." Perez squinted up at Mount Trident and frowned. Valkerie dragged her two packs outside, and Perez followed her with the thermal suit and air tanks. She could feel the weight of his eyes on her back. Great first impression she was making. First a nightgown and now clothes that weren't fit for a mud wrestler.

They stepped across the bodies of two dead birds. "See? Ravens!" she shouted over the helicopter's engines. "Killed by the SO₂."

Perez nodded and kept on walking past her. Valkerie stumbled behind him, feeling like an idiot. She pushed her way through the helicopter-generated storm, shielding her face with her free arm. Someone took her packs and disappeared. She waited, staring at a chip of olive drab paint on the helicopter door. What if Trident didn't erupt? Some volcanoes vented for decades without erupting.

Perez appeared at the door and shouted, but she couldn't make out his words. Grabbing the doorframe, she tried to pull herself up into the bay, but her head exploded in nauseating pain. The world went black, and she felt herself falling. Unseen hands grabbed her. Lifting. Pulling. Setting her on her feet. She tried to pull away, but her legs buckled, and she collapsed into an expensive silk tie and the smell of men's cologne. Stetson. Just like her father wore. Tears welled in her eyes. Her father loved NASA. NASA and football. She had to get the job.

Valkerie opened her eyes and found herself sitting on a bench with Perez crouched before her, looking up into her face. She braced herself with her arms and forced herself to sit up straight. Feet apart, lean slightly forward, make eye contact. It wasn't too late. She could still salvage the interview.

"Is she all right?" The short man shouted above the roar. Was his name Roger? Panic surged through her. This was an interview. She was supposed to remember. Sit up straight. Eye contact. Lots of eye contact.

"Dr. Jansen? Are you okay? Can you hear me?" Perez held her by the arms, searching her face.

"What, me?" The force of her words throbbed in her head. "I'm fine. I love flying. I'm

just tired. I've been collecting samples around the clock. I think I found a new bacteria that can survive one hundred eighteen degrees. It could be a really important discovery, if—"

"The bump on your head—did you fall?"

Valkerie reached to her forehead. A huge welt felt hot beneath her hand. Her face was crusty and tight. Blood? "I guess I must have scratched it."

Perez tilted her head back. "I don't like the looks of this. We'll get you to a doctor soon. Think you can make it?"

Valkerie nodded. "I'm really sorry. I know I must look a mess. If I'd known I had an interview I would at least have worn a blazer to match the mud." She forced a smile and brushed at the crust that covered her jeans.

Perez frowned. "Try not to move."

Valkerie sat rigid, afraid to relax under the scrutiny of the two men. "This was a long way to fly—just for an interview. You must have some pretty important questions to ask."

"Actually we just wanted to meet the woman Dr. Romanov keeps talking about."

"I didn't know you knew Leonid."

"Everybody knows Leonid." Perez searched Valkerie's face with a worried expression.

Why wasn't he questioning her? Had he already made up his mind? "Um, did Leonid tell you I build my own equipment? I don't have an E.E. degree, but I grew up building robotic sensors. My father—"

"Dr. Jansen. Are you sure you feel up to talking?"

"I'm fine. Go ahead. Ask your questions." Eye contact. Lean forward. Valkerie's chest constricted, doubling her over in a fit of coughing.

Perez was in her face in an instant. "Dr. Jansen, look at me. Are you okay?" Perez held her head, forcing her to look into his eyes. "Is there something we should give you? Water? Medication? Do you have any respiratory problems?"

Valkerie tried to pull away. Her brother's asthma. That's why they had come. She should have known they would do a background check.

"No, you've got to believe me. After my brother died, my parents took me in for checkups every year." Perez's face twisted in on itself, throbbing to the beat of her pulse. She squeezed her eyes shut. "It's just the gases. My lungs feel like they're filled with battery acid."

A warm coat spread itself around Valkerie's shoulders. The smell of Stetson.

"Dr. Jansen, I think you should lie down. You may be going into shock."

"I'm fine, really. I can do this."

“Dr. Jansen, please. You’re going into shock. Do you know what that means?”

“Of course I do. I know I quit the surgery fellowship, but I finished the M.D. I had to quit. My father needed me.”

“Dr. Jansen, please.”

“And when I got accepted at Florida, there wasn’t much point in going back to finish the fellowship. It—”

“Dr. Jansen—”

“When does Astronaut Candidate school start? I could finish the fellowship as soon as it’s over.”

“It’s okay. Your medical record is fine, but ASCAN training has already started this year. That’s why we’re here. If you had gotten your application in four months earlier, we wouldn’t have a problem, but the next session isn’t for another two years, and we really needed someone now.”

A black haze closed in around Perez’s face. “Two years? But I’ve got student loans. Postdocs don’t count as ... education.” Valkerie felt herself falling. The beat of the helicopter blended into a smooth and creamy roar. She knew she should say something, but what? She had already blown the interview. Two years wasn’t soon enough—she needed a job now.

The helicopter lurched and the pitch of the engines fell to a low whine. Smooth fingers pried at her eyelids and a flashlight shined in her eyes. Voices surrounded her.

“How’s she doing?” It sounded like Dr. Wiseman, the head of the research center.

“I’m fine.” Valkerie tried to sit up, but a half dozen hands held her down. “What do Trident’s seismograms look like? Has she erupted?”

Dr. Wiseman shook his head. “A little activity, but no eruption yet.”

“But it was venting all night. Sulfur dioxide filled the whole valley.”

Two strange men lifted Valkerie onto a stretcher and started to carry her out of the bay. Valkerie fought to sit up. “Hold up a second, I’m fine. I’ve got an interview to finish!”

“No interview necessary,” Perez moved toward the stretcher and took Valkerie’s hand. “It was good meeting you, Dr. Jansen. We can talk some other time. Believe me, you’ve given us more than enough to think about.”

Chapter 3

Monday, August 20, 2012, 3:15 p.m.

Nate

Nate Harrington stalked out of the elevator. That should have been a routine press conference. Except that some pea-brained journalist had somehow found out about Josh Bennett's motorcycle accident. Whoever leaked that was going to be force-fed his own liver.

An African-American woman stood outside Nate's office alongside a small boy in a too-large wheelchair. Behind them, a video crew. And Steven Perez, smiling broadly. Anytime the cameras rolled, you could count on Perez showing his pearly whites. Even today, with the Johnson Space Center turning into an insane asylum.

Who were these people, anyway? The red light on the videocam turned on. Great. Whatever happened next would be on tape.

Steven Perez stepped forward. "Nate, you had an appointment at three with this young man, Darnell Simmons. Remember? Make-A-Wish?"

Nate clapped his hand to his forehead. His secretary, Carol, had reminded him at noon. But that was before the press conference, which should have been a walk in the park. Instead, it would be six-o'clock news, with *COVER-UP?* splashed across a picture of his sweating face.

Okay, give the kid his photo-op and get rid of him. He was dying of something horrible. And he was a space junkie. Wouldn't be alive two years from now when Ares 10 set down on Mars. Tough case. Smart kid too.

Nate hunched down in front of the boy. "Son, I'm sorry for being late. My fault. Got mauled by some pit-bull reporters who don't know squat about space. Come on into my office and you can sit in the chair of the Mars Mission Director. How's that sound?"

The kid's eyes lit up.

Nate opened the door of his office and led the way past Carol into his inner sanctum.

* * *

Fifteen minutes later the game was over. The kid left happy, clutching a genuine hundred-percent-pure moon rock. Okay, a moon pebble—1.27 grams of lunar silicate from Fra Mauro, circa 1970. Technically, it was on loan to the kid, since the law didn't allow an individual to own lunar material. A six-month loan, if the kid's doctors were right.

Nate slumped back in his leather executive chair, massaging his temples.

Perez walked in and sat down. "I hear the press conference was some kind of fun."

"Sure, if you're the kind who likes crawling over broken glass with the Dallas Cowboys on your back. It was quicker in the good old days when they only burned you at the stake."

“Why didn’t we release the accident report three weeks ago?”

“What’s next? Do we report every hangnail? Does the public really need to know every little thing?”

Perez stood up. “Free and open flow of information, remember? That has been the policy of the National Aeronautics and Space Administration since Apollo 1, and—”

Nate slammed his open palm on his desk. “I don’t need a history lesson, okay? I’ve got thirty years of service here, and I know the rule book.” *And you’ve been here how many months?*

Perez leaned over the desk and glowered at him. “Then follow the rules.” He spun around and strode out the door. A second later he poked his head in again. “You’ve read the transcript of the Kaganovski interview?”

“Yeah, I can read too. I’m multitalented.”

“I want to discuss it tomorrow at four.”

“a.m. or p.m.?”

Perez didn’t crack a smile. “a.m. will be fine. Thanks for asking.” He disappeared, closing the door softly behind him.

Nate shut his eyes and cursed his smart-alecky sense of humor. But come to think of it, 4:00 a.m. was as good a time as any for a lynching. Perez would come looking for blood, but he wasn’t going to get it. No way was some newbie Johnson Space Center director going to foul up a mission this soon before launch.

Carol’s line buzzed. Nate grabbed the phone. “I’m not in.”

“I have an Agent Yamaguchi here to see you.”

“Don’t know him. I’m not in.”

“That’s right, sir. From the FBI.”

“I don’t care if he’s from the pope, I’m not in.”

“Very good. I’ll show—”

Nate slammed the phone down. Some days it rained. Some days it poured. Some days you got the whole Niagara Falls.

Carol’s stiletto heels *clack-clacked* outside his door. It opened and she stepped in. “Mr. Harrington, Agent Yamaguchi.”

Agent Yamaguchi turned out to be a woman, about forty-five, made up to look quite a bit whiter than she probably was. Bright red lipstick. Matching nails. What were the Fibbies coming to?

Nate shook her hand and motioned her toward a chair. “Yeah?”

Ms. Yamaguchi pulled a blueprint out of her briefcase and spread it flat on Nate's desk. "Mr. Harrington, do you recognize this?"

Nate stared at it. The Hab for Ares 10. It wasn't labeled, but it was obviously version 3.4.1B, the one with the revised shower unit. Better privacy. Perez had pushed that idea through all of about three weeks ago. Nate hadn't even seen hardcopy on it yet. "Where'd you get this?"

"So you recognize it?"

"Maybe I do and maybe I don't. Where'd you get it?"

"Mr. Harrington, obstructing an investigation is a federal crime. When I ask a yes-or-no question, there are two possible answers, and *maybe* is not one of them."

"So shoot me. Put me out of my misery."

Yamaguchi leaned back and studied him through narrowed eyes. "Mr. Harrington, let me make it clear that I am on your side."

"Before I answer any questions about this blueprint, I need to know if I'm going to have another PR atom bomb going off in my face."

"I'm afraid I don't understand."

"Long story. Watch the six o'clock news."

"All right, then. I'll cut you some slack. For the moment, you never saw these prints, and I never talked to you. Off the record, just so I can do my job, how old are these plans?"

Nate shook his head. "Maybe three weeks."

"And what are they, exactly?"

"The Hab."

"Hab?"

"Habitation Module. For Ares 10. This is the tuna can our boys and girl are going to ride to Mars in. Where'd you get it?"

"Overnight delivery. It came in this morning from Tokyo."

"Where'd they get it?"

"An autonomous radical cell. We're trying to trace connections now, but it's difficult. One reason I'm here is to ask your advice. Why would terrorists be interested in your program?"

Nate leaned back in his chair. "For publicity, I guess. Isn't that the usual motivation?"

"They typically have a political agenda. But why would Japanese terrorists care about an American space program?"

“It’s probably a nationalism thing. The Ares Program is a hundred percent American. Right from the start, we cut out the Russians, the Europeans, and the Japanese.”

“Why? Aren’t we working with them on that other thing?”

“The International Space Station?” Nate scowled. “That boondoggle! Do you know how many years late and how much over budget that thing ran? International cooperation is great PR for the politicians, but if you actually want to get something done, forget it. No way you could get to Mars that way—not in my lifetime or on my budget. Even NASA by itself was too big and bureaucratic to go to Mars. We had to create a NASA-within-NASA to make it feasible.”

“But why would terrorists care about your program?”

Nate leaned forward. “Certain countries—and I won’t name any names, but their initials are France, Russia, and Japan—are mad as hornets that we’re doing this on our own. It’s called nationalism. They want one of their people putting footprints on Mars. And our answer is *no*. On top of that, they’re really hurling a hissy fit that we’re landing on July fourth.”

“Why are we doing that?”

“Because we can—if we go in the next launch opportunity. July fourth happens to work, and we’re not going to miss it.”

“What if somebody ... makes you miss it?”

“Then Congress zeroes our funding and we miss Mars. You’ve heard of Senator Axton?”

Ms. Yamaguchi nodded. “He’s the guy saving us money with all the big budget cuts.”

Nate clenched his fists. “He cut 40 percent of my program. If we hadn’t sold the coverage rights to NBC—and we’ll get the biggest payoff if we land on July fourth—we’d have missed this coming launch opportunity. We lose Mars and we’ll spend another forty years picking our nose in low-Earth orbit.”

“What are the antiterrorist arrangements for your Mars flight?”

Nate shrugged. “Not bad. Terrorism has always been NASA’s biggest security concern. We’ve got the normal precautions in place. But truth to tell, on this mission we’ve been more worried about fundies than terrorists.”

“Fundies?”

“Religious fundamentalists. They’re afraid we’re going to prove evolution. They stage a protest every week or so over at the Rocket Park entrance, jam up the traffic, yell their slogans. Nothing too exciting, except when one of ’em gets heatstroke.”

“Mr. Harrington, I think you may need to increase your level of security against terrorist attacks. The cell we penetrated is very determined. If there are others ...”

That's all we need. Nate picked up the phone and punched a button. "Consider it done."

Carol answered on the first ring. "Yes, sir?"

"I need to talk to whichever sorry excuse for a brain-dead moron runs Security these days."

"Right away." Carol put him on hold. Nate got an earful of some oldies station. "Stairway to Heaven." Led Zep.

Agent Yamaguchi stood to leave. "I'll get back to you when we know more."

Nate reached up and shook her hand. "Thanks for the tip. Can I keep the blueprint?"

"Do you have a safe?"

The music switched off. "Security. Daniel Collins here."

Nate nodded to Yamaguchi and made an "Okay" signal with his hand. She headed for the door. He slumped back in his chair.

"Collins, we have a problem...."

* * *

Tuesday, August 21, 2012, 3:00 p.m.

Valkerie

Valkerie stared out the oval window, watching the blur of browns and greens that rushed up to meet her plane. She shut her eyes and took a deep breath. If a plane was going to crash, it would crash on landing.

Valkerie lifted a hand to her bandaged forehead. The swelling had gone down days ago, but it still looked awful. The doctor said she'd been lucky—as if suffocation, concussion, and humiliation were things everybody aspired to. It was hard to be thankful. It had almost ruined her chance of getting into the ASCAN program.

Almost. But by some miracle the interview had been good enough to get her into the air. Dr. Abrams had called from Houston two days after meeting her. They wanted her to fly out for some tests. Abrams had warned her not to get her hopes up. He was letting her take off, but it was clear that he expected her to crash on the landing. Obviously, he had been checking up on her.

Valkerie sighed. It seemed that no matter how well she performed, she was never going to be able to escape the mistakes of her past. They already knew about her quitting the surgery fellowship. Did they know about her freshman year at Yale? She had signed the release form. Surely, they had already checked her transcripts, but maybe they didn't care about her grades. Right. More likely they hadn't gotten around to checking. When they finally did, those two D's and an F would spell "Doomed, in Debt, and a postdoc Forever."

She had been such a fool. Skipping classes. Partying every night. Going out with every guy who asked ... After enduring four years in high school as Valbot the Metal-Mouthed Brain, she had gone absolutely crazy. If her dad hadn't flown to New Haven to talk to the vice-provost, they would have kicked her out of school. As it was, she had to endure the shame of academic probation—not to mention the look of disappointment on her dad's face. How many years had he spent working his way through college? How many hours of overtime had he put in so she wouldn't have to work at all?

After that she had knuckled down and worked her tail off. Med school. Grad school. A postdoc ... But that one year of foolishness would haunt her for the rest of her life. No matter how hard she tried, she would never be able to shake it. Even now, it still tugged at her heart. She had felt so free. Had so much fun. Made so many ... friends.

But where were those friends now? The fun hadn't lasted. It couldn't last. You either worked hard and got ahead, or you had fun and got left behind. In academia there was no in between. If only she could get into NASA, things would be different.

God, please let me get into NASA. Just this once, let them pass the transcripts by.

The plane taxied to a stop. Valkerie extracted her carryon from the overhead bin and shuffled forward through the crowded plane.

A wall of heat hit her the second she stepped into the jetway. She wheeled the case quickly up the long ramp, racing the dampness that prickled at her arms and legs. Once in the air-conditioned terminal, she moved self-consciously through a gauntlet of expectant faces, searching for somebody with a sign. A cold, impersonal somebody who would greet her respectfully and drive her in awkward silence to the Johnson Space Center.

"Dr. Jansen?" The voice came from behind and to her right.

Valkerie turned. "Dr. Perez?" She gaped at the director. "I ... I'm sorry. I wasn't expecting to see *you* here."

"I wasn't sure I could get away." Perez's face lit up with a warm smile. "Welcome to Houston. Did you have a nice flight?"

"Uh, yes. Thank you. Much better than the last one."

Perez grinned and directed her down the concourse. "So has Trident erupted yet?"

Valkerie shot him a wary look, but he was still grinning. "Volcanoes are very unpredictable," she said. "It really could have erupted."

"I never doubted, but Roger checked up on you after we got back. Burst into my office raving about how you had followed protocol. He was impressed. Roger's very big on protocol."

"Well, I still feel bad about our so-called interview. I wasn't myself at all. I appreciate your giving me another chance."

"Dr. Jansen." Perez stopped at an elevator.

“Please, call me Valkerie.”

Perez raised an eyebrow.

“I know it’s different, but they’ve been calling me Valkerie since the eighth grade. It’s kind of a nickname. It was the name of my first robot.”

Perez pressed the button marked “Parking Garage.” “Okay—*Valkerie*, I don’t think Roger made our position clear. We didn’t ask you here to give you ‘another chance.’ We’re very interested in your knowledge of microbial ecology, your medical training, your equipment designs. And the way you handled yourself out there in the Katmai Preserve.... Breathing from your jeep tires? Very impressive. That kind of resourcefulness is exactly what we need. If you pass the physicals and psych tests, I’ll push as hard as I can to get you into the current ASCAN class.”

“The *current* class. You mean I won’t have to wait until the next one?” Valkerie felt her face starting to glow. “What can I say? Thank you!” She followed Perez from the elevator out into a dimly lit parking garage. “But aren’t you the director? Why would you have to push?”

“The *new* director. NASA is a huge bureaucracy, and bureaucracies are very resistant to change.” Perez put Valkerie’s bag in the trunk of a white Ford with government plates and opened the passenger door for her.

She could feel the old excitement coming back—the same excitement she felt before going off to grad school. But this time she was going to be part of a team. She could settle down and make friends—friends who wouldn’t graduate and leave every year.

Perez slid behind the wheel and started the car.

“Are you allowed to tell me anything about the tests?”

“Pretty standard physical and psych tests. We mainly want to make sure that you are a healthy, stable, sociable individual. With Mars looming large on the horizon, we can’t afford to have our astronauts going postal on us.”

“Mars? Is there really a chance I could go to Mars one day?”

“Anything’s possible. Does that worry you?”

“No—just the opposite.”

“Good. The *life question* is one of the main driving forces behind the Ares program. It has all kinds of scientific and philosophical implications. Microbial ecologists will always be a crucial part of our Mars teams.”

Valkerie nodded weakly, feeling overwhelmed. Perez drove down an isolated freeway, surrounded by stunted hardwoods and scrubby pines. Not nearly as bad as she had imagined. At least Houston had trees. Perez rambled on about NASA and the unmanned missions to Mars. Valkerie interjected a question here and there, but it was all she could do to pay attention. If she could go to Mars ... The thought was staggering.

The trees gradually gave way to a vast wasteland of concrete, metal, and dust. Tangled oil refineries and filthy smokestacks stretched to the horizon as far as the eye could see. Flaming chimneys painted black streaks across a sooty sky. Perez droned on about government bureaucracy and budget cuts, but all she could think about was Mars. What could she accomplish if she were free from the money and time pressures of academia? What would it mean if she discovered a totally new life form on Mars? What would her father think?

By the time they left the freeway, she had already won two Nobel Prizes and was working on a third. They drove slowly through a small town dominated by parking lots and strip malls. It was a little seedy but better than the refineries. The air looked almost breathable.

“We’re putting you up at the Holiday Inn.” Perez pointed across the car at a large building on the right. “But if you don’t mind, I’d like to get you started right away on some of the tests. We’re under a huge deadline crunch.”

He turned at the next intersection. A white concrete sign read “National Aeronautics & Space Administration.” Valkerie watched as an outdoor exhibit of enormous rockets loomed larger. The car slowed and Perez emitted a throaty sigh of disgust. “Freaks.”

Valkerie followed his gaze from the security gate to a ring of protesters, circling beneath a cluster of pines. Clumsy handwritten signs drooped across their shoulders. “Say No to Mars.” “Evolution Is Dead and Mars Won’t Help.”

Oh no! Please. Not protesting NASA. Of all the humiliating ...

Perez rolled his eyes. “Welcome to the Bible Belt, Valkerie. Home of fundies, freaks, and fruitcakes.”

Great. Valkerie forced a smile. If Perez’s hostility spilled over to all Christians, then she was dead on arrival.

* * *

Wednesday, August 22, 2012, 11:00 a.m.

Bob

Bob’s personal purgatory this week was a treadmill in the Environment Simulation Lab. For two hours a day, he had to walk on the thing, the lower half of his body encased in a near-vacuum gizmo. The flight docs’ idea.

Bob thought it was bogus, but no astronaut ever won an argument with Flight Med. *Flight Med.* He cringed at the name. What had he said wrong in that interview with the flight surgeons last week? He’d asked Nate about it, but Nate just skittered around the question like a puppy on ice. What had they found?

It couldn’t be the safety thing. He’d promised to follow Josh’s orders. But maybe they thought he wasn’t careful enough? No way. Not with his record. They had to know he was fibbing. Maybe they didn’t care what he said at all. Maybe they’d just been watching his body language. Maybe they’d finally caught on to him.

Astronauts were supposed to be macho, high-flying daredevils. Stunt pilots. Skirt chasers. Afraid of nothing.

Bob wasn't any of that stuff. He hadn't even planned to be an astronaut. Six years ago, when he'd been doing robotics for NASA, one of the supervisors put Bob's name on an application for the Ares program and arm-twisted him into signing it. And somehow, *somehow* he'd wound up on the crew. Because he was good at fixing things.

Nobody knew how scared he was. He wasn't a pilot. Got vertigo on anything higher than a kitchen counter. Didn't want to be a hero.

But he *did* want to go to Mars. Mars was a new world, waiting to be discovered. What would they learn about how planets worked? What amazing new materials might they bring home? Had Mars ever harbored life? Could the Red Planet provide a second home for future generations of humans? The crew's geologists and biologists would answer those questions—maybe.

But somebody had to ride along to keep the ship running.

And if that *somebody* was a fraidy-cat flight mechanic named Bob, well ... he'd just have to swallow his fears and go. It was just something he had to do, like Sam going to Mordor. If they meant to pry him off the mission, they would have to use a crowbar.

Bob wiped his face with a towel and took another swig of the oversweet sports drink that NASA forced him to drink.

“Wow, that was fun!”

Bob turned to look.

“Sarah?” Bob stumbled forward, catching the treadmill controls hard in the chest before he could pull himself back up. *Sarah McLean?* Bob looked again. A woman at the far end of the lab staggered along beside Steven Perez. Dark blond curls. A face right off a natural soap commercial. No way. It couldn't be.

“You did great, Valkerie.” Perez led her by the arm.

Valkerie? What kind of name was that? She was probably a reporter. Perez was always bringing in media people, letting them try out the equipment, staging impromptu interviews. It was nuts, trying to train with somebody always sticking a camera in your face, but after a while you got used to working in a fishbowl.

The woman scanned the lab, registering amazement at the equipment. When she saw Bob, her eyes lit up with recognition.

A chill ran through Bob's gut. Oh no! Not another interview. He always came off looking like an idiot.

Perez's cell phone chirped. He yanked it out. “Steven Perez here.” A funny look spread across his face. “White House calling? I'll need to take this on a secure line.” He covered the

phone. “Valkerie, would you excuse me? I’ve been trying all week to get the president, and she’s finally got a few minutes to talk. Look around, and I’ll come get you as soon as I can.”

Bob smiled with grim satisfaction. Perez was mucking up NASA but good. About time somebody started putting *his* feet to the fire.

Perez trotted off. The reporter turned in Bob’s direction and strode toward him with purpose. She didn’t seem as aggressive as most media types. She looked ... nice.

“Hi!” she said. “Aren’t you Bob Kaganovski?”

“I’m afraid so.” He still didn’t know what to say when strangers approached him. Not that people cared much about him. It was Josh Bennett everybody wanted to know about—especially the women.

“I read about you in the *Scientific American* article. And your paper in *Nature*. What’s that contraption you’re on?”

“A treadmill.” Bob waited. The polite question was out of the way. Now she’d ask about Josh.

“I can see that. I’m guessing that shroud over your hips is a low-pressure unit.”

Bob raised his eyebrows. *Pretty smart for a reporter*. “You know about that?”

“Does it work? Do you really get a redistribution of body fluids?”

He shrugged. “Haven’t the foggiest. Far as I can tell, it’s flight-doc mumbo-jumbo. They make me do it because I’m the tallest.”

She looked skeptical. “You’re only five inches taller than Josh Bennett. That’s an 8 percent effect. What’s the big deal?”

“It’s supposed to be nonlinear. And I’m about twice as clumsy as Josh, which is 100 percent effect.” He narrowed his eyes. “You’re not a reporter, are you?”

“Excuse me?”

Bob pointed in the direction she’d come. “I saw you with Dr. Perez and figured you had to be a reporter. But you’re not dumb enough.”

She laughed. “Thank you ... I think.”

Bob felt like a moron. “Sorry. That came out wrong. Blame it on oxygen deprivation.”

Her eyes smiled at him. “No big deal.”

He looked at the timer. Ten more minutes. *Close enough*. He hit the Stop switch and let the treadmill coast to a standstill. “So, um, what was your name again? Valerie?”

“Valkerie.” She stepped forward and shook his hand.

Her grip felt firm and sure. Very nice. “Right. So what brings you to NASA today, Valkerie?”

“Dr. Perez asked me to come take some tests. I may be joining the astronaut corps.”

“The astronaut corps?” Bob stared at her. “But the new class began training in July. You must have one hot resume. Are you a pilot?”

“A microbial ecologist.” Valkerie looked down at the treadmill. Was she blushing? He tried to swallow, but suddenly his throat felt tight and constricted.

“Actually, I’m kind of dizzy about it all,” Valkerie said. “Last week, I was collecting thermophilic bacteria in Alaska. Today I’m in Houston trying to figure out where to find an apartment.”

“I ... uh ... I could help you with that.” Bob swallowed again. This was where he always blew it, but he might as well try anyway. “Tell you what. To make up for calling you a reporter, I could buy you dinner tonight.”

Her eyes glowed. “I’d like that, but Dr. Perez has me booked solid for tests through Friday. I just got here yesterday, and I’ve already taken three physicals.”

“Well, how about Friday night? I could clue you in on where to look for apartments, and maybe we could ... you know, talk about biochemistry.”

“Biochemistry?”

Oh great, that sounded pretty stupid. “I’m cross-training,” he said hastily. “My main job is to be the Ares 10 flight mechanic, but I’m supposed to play backup to Josh on the biochem stuff. Frankly, I’m kind of behind. I don’t think it matters, because Josh has it down cold, but you know how NASA is.”

“Actually, I don’t.”

“I could fill you in on that, too,” he said. “Anyway, I’d like to hear about your work. Microbial ecology—is that what you said?”

“That’s what my degree says.” Valkerie shrugged. “But I’ve always liked electronics and robotics. I spend most of my time building equipment. Basically, I’m just a glorified mechanic.”

“Uh-huh.” Bob licked his lips and reached for his sports drink. He missed the bottle and the drink toppled over the edge of the treadmill.

Valkerie caught it in midair.

Great. On top of everything else, she was coordinated.

She handed him the bottle.

Bob managed a half smile. “Thanks. And, um ... welcome to the ASCAN program.”

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