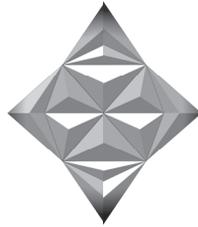


**THE FOREVERS** SERIES

BOOK 1

# FIXER 13



A Novel by

**G. Michael Smith**

Agio   
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## DEDICATION

To my wife, Cheryl Cameron, for her love, her confidence in me, her support of my work, and for that most valuable of commodities – her time.

To my friend Leslie Gilmour and my daughters, Ashley, Lindsay and Christian, whose support I cherish.



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*The Forevers, Book 1: Fixer 13*  
ISBN 978-1-927755-56-3 (paperback)  
ISBN 978-1-927755-57-0 (ebook)

Cataloguing information available from Library and Archives Canada.

Printed on acid-free paper.

Agio Publishing House is a socially-responsible enterprise, measuring success on a triple-bottom-line basis.

1 0 9 8 7 6 5 4 3 2 1 .

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Book 1

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## CHAPTER 1



# I Passed!

The end of the world was coming. This wasn't some religious prophecy or ancient warning. It was fact. The end of the world was coming. *When* was not clear, but two hundred years was the initial estimation. There was really only one course of action for humanity—Get out! Leave before the meteor field—that some said was a thousand times bigger than the entire solar system—strikes and destroys everything. In fact it was likely that the entire planetary system would crumble in its wake, the remnants joining the gargantuan meteor storm on its eternal rush through space. Sol was large enough to survive, but without her family, what would be the point?

It was Jayne Esther Wu's 13th birthday. Rolling over onto her back, she clutched a pillow to her chest and slowly exhaled as the white glow of her room lights intensified. She was finally an adult—not yet a woman but still an adult—and, as such, she would no longer have to live in the nursery. She would no longer have to go to nursery school. She would no longer spend her days playing with the other children. She would no longer have time to play at all. She would have to work.

Today she would start her adult life with adult responsibilities. After two years, if she worked hard, she would become a full-fledged fixer—a Technical Electrical Mechanical (TEM) fixer. But two years felt like an eternity. She had heard stories of washouts, mostly girls that couldn't hack it. They would get moved to the cleaner class or back into the nursery as a helper or child bearer.

Jayne knew she would hate working in the cleaner class and she

was too young to bear children. Some of her friends wanted to work as helpers but, as far as she was concerned, being a helper would suck. All they ever did was look after old people and babies. Yech! She wouldn't wash out! She was going to be a TEM fixer and that was that.

A shiver of excitement ran with the thought of leaving the nursery and becoming part of the great adventure—the saving of the human race. She pushed her blanket aside and the cool air brought goose bumps to her arms. She'd dreamed, for as long as she could remember, what it would be like out there in the real world. She wanted to make a difference and somehow she was sure she would.

Jayne swung her feet to the floor, scanning the room for anything she'd missed. Her knapsack sat beside the door, accompanied by two boxes of her stuff, mostly book keys with holographic projections of equipment she'd been studying in preparation for the TEM Aptitude Exam. She had passed despite the fact that most kids her age had to go to INTER (Intermediate Technical Educational Reassessment) or Internment, as it was commonly known, for at least two years. She smiled. There would be no INTER for her. She had passed on her first try and had felt a thrill of accomplishment when she received the notice on her VID (Visual Identity Designator) pad stating:

*ID—Wu F 302875106592253*

*Name—Wu, Jayne Esther*

*Class—Fixer*

*Sub Class—Technician—Electronic Mechanic Apprentice*

*Exam Result—PASS*

*Report to HUB 169 entrance M,*

*Friday January 13, 2113 at 13:00 hours.*

Jayne smiled again. She had passed. The notices never gave an actual score, just PASS or NOT PASS. She had passed. Her head swam with a warm joy as she remembered how she had spent that first day packing her worldly goods. It hadn't actually taken that long because she didn't own much. Just two boxes and her knapsack.

Jumping out of bed, Jayne headed out of her cubicle to the showers. On the way, she stopped at the sink array and scanned her palm. The sink was programmed to promptly dispense 100 ml of drinking water into a container. With surprise, Jayne looked down at her glass which was filled to the brim with clear cold water. The glass had a capacity of at least 400 ml. The dispenser had given her way too much. She smiled at her luck. The dispenser had behaved strangely before, but usually it dispensed less than the standard amount, not more. She looked at the glass and smiled again. She knew that today was the start of something exciting.

Furtively, Jayne looked up and down the sink-lined hallway. No one else was up yet. She had the space to herself. She took another sip of water and then poured half of the remainder into her cupped hand and splashed it over her face, focusing on her sleep-crusted eyes. She rubbed it all over and quickly dried her face with the tail of her nightshirt. Gulping down the remainder, Jayne replaced the glass and headed to the showers.

She heard the flop of sandals on the tile floor. She turned to see a young boy dressed in a nightshirt standing in front of her. He was sniffing and rubbing tears from his face. Jayne recognized him. It was little Ajax. Ajax's cubicle was across from Jayne's. Jayne was his informal mentor. He had arrived the previous year—an orphan from the Wilderlands. Jayne had helped him learn a new language and had helped him cope with his new life without parents. Jayne had never known parents herself but she knew what loneliness felt like.

"Ajax, it is too early to be up," said Jayne softly.

"I gon'ta miss you, Jaywu. Please not go," he sniffed. *Jaywu* was what he called her when they first met and it had stuck.

Jayne had said her goodbyes the night before. "I have to, Ajax. I'm too old to stay. I have to go to a new and bigger school."

She spun him around and led him back to his cubical. She hugged him and he climbed back into his bed. Jayne resumed her trip to the showers.

The showers used water, but it wasn't drinkable. To use them, a

person stood with arms and legs outstretched and a mixture of water and soap would spray every square cm of skin, hitting you at such high pressure that it stung. After about 10 seconds of cleaning time, a second stinging mist would blast your skin and rinse away the soap. This was followed by gusting air and ending with an ultraviolet bacteria wash. The whole process took about one minute. When you stepped out of the shower you were as ‘clean as an omie’s whistle.’ *Omie* is slang for a biome dweller.

Jayne Esther Wu stepped out of the shower, slipped on her night-shirt and skipped happily back to her nursery cubicle for the last time.



## The PUT Pad and the Dumb Giant

The meteor storm was discovered in 2029. The best scientific estimates gave planet Earth and the rest of the solar system 182 years before the cosmic rock storm would blow in from intergalactic space, obliterating everything in its path. Each projectile was 1 to 10000 km in diameter. In essence, the coming storm consisted of a wall of space rock a trillion km across, all hurtling towards Earth. No one knew how deep that wall of destruction was. It didn't really matter. The fact that it existed at all spelled doom for all living things and destruction of the planet itself.

Jayne arrived at biome HUB entrance 169M at precisely 13:00 hours. She had to get used to using the 24 hr clock; after all she was no longer a nursery baby. She was on her way to becoming a tech. The HUB entrance was an archway made of concrete and steel with three massive roll-up steel doors set equidistant across the face. The right door was painted green, the left door was red and the center door was yellow. To the side of the large left and right doors were two regular doors painted the same colors—red and green. There were guards at each of these doors. Jayne breathed in deeply and held her breath, before slowly letting the air back out with a sigh. A chill ran outwards from her core, down her arms and legs, seeming to spark out her fingers and toes just as another chill swelled in her chest, running the same path. She shook her hands and snapped her fingers as if to speed up the passage of what felt like electricity surging out her fingertips. She slipped the knapsack from her shoulders, setting it down in front of her. The rest of her belongings would be

sent once she settled into her new accommodations. This HUB would be her home for the next two years.

Jayne turned slowly in a circle, allowing the sights and sounds and smells to waft over her. The cacophony of active machinery swelled and ebbed around her. The big transports clicked as they moved onto the monorail, some passing through the green door, others exiting through the red door, then clicking back off the monorail before driving away.

A swarm of people buzzed around her, some moving purposefully while others just stood in place. Jayne removed the VID from her hip pouch and pressed her thumb over the scan core. The VID lit up. She touched the screen, double checking her location against the coordinates contained in her orders. She took one small step to the left, then checked again. The VID app beeped red. She stepped backward a bit while watching the screen. Finally, the VID app beeped green. She was in exactly the right spot.

Jayne sighed in an effort to push the tension from her body and looked around. The number of people had continued to increase while she had been adjusting her position. More people were now standing near her, checking their VIDs and adjusting their own positions in this PUT (Pedestrian Unit Transport) area.

Jayne sniffed, wrinkling her nose. A new person appeared and was now standing just one metre to her right. She glanced over inconspicuously and quickly looked away so as not to be noticed. A boy stood uncertainly and was clumsily trying to adjust his knapsack. He fumbled around inside the bag with hands that seemed almost too big for his arms and finally pulled out his own VID. As he checked his location, Jayne could see the red glow from the VID screen through his oversized fingers. The boy looked down, then up, then around, panic beginning to swell in his eyes, although his fear was partially hidden by a shock of dark hair that hung in front of his face. Tapping the VID screen, he looked around as if searching for someone to help him. He didn't seem to even notice Jayne standing within arm's reach to his left. He looked right over her head, his height seeming to prevent

him from seeing someone so short. The concern on his face began to swell, his eyes repeatedly flicking back to the VID screen which continued to glow red.

Jayne cleared her throat. She interlaced her fingers, inverted her hands and stretched them out in front of her. She felt, as well as heard, the satisfying crackle as some of her finger joints popped. The tall boy turned toward the sounds and looked down at Jayne, seeing her for the first time. Jayne smiled up at him. He breathed out and glanced back and forth from his VID to her face.

“It’s red. It won’t go green,” he said, managing a weak smile.

“You sure the COORs match?” Jayne asked. (*COORs* is slang for coordinates.)

“Yeah!” he retorted, seeming irritated that she would even ask the question.

“Sorry, I was just trying to help. I didn’t mean anything by it,” she replied. “Sometimes the VID sensors can be off by a few centimetres. At least that’s what I’ve noticed in the past.”

“The past! You sound like you’re 30 not... what?” he paused, looking her up and down while he tried to come up with an accurate age, “15 or 16? What’s a kid like you doing here anyway? There is no way you could have passed the TEM exam.”

Jayne didn’t react. She had dealt with this kind of prejudice before. She looked carefully at the boy beside her, starting with a head that rested on shoulders at least a metre above her own. His hair was dark and coarse and clumped into short and long blocks. It looked like it had been cut by a butcher using a dull knife. His eyes were so dark she could not tell where his irises stopped and his pupils began. The darkness of his eyes made it impossible for Jayne to determine how his pupils were reacting to this situation. Normally, she would use a person’s pupil response to tell if they were lying.

Moving down his face, Jayne found a jaw that was strong with just a few wisps of whiskers. The rest of his body could be described with one short word—*big*. Sweeping down his body, Jayne’s eyes came to rest at his feet. They weren’t big, they were *monstrous*. He stood with

those gargantuan feet sticking out to the side, looking like a bow-legged Bozo the clown.

A smile crept slowly over her face at the image of the huge, overbearing boy dressed as a clown. She looked up at him with confidence and said, “Never mind how old I am. I got here fairly.”

Rolling his eyes in dismissal, the boy turned back to the problem at hand. He needed to figure out why his VID screen stayed red, despite being in the right place on the right day. He looked up at the digital clock that inexorably counted down to the end of the world. Over the years, it had been adjusted to reflect more accurate measurements. The latest adjustment had given Earth a little more than 82 years. Right below that was the local time. That clock read 12:46.

“Crap!” he said as he tapped his VID screen again, looking frantically around for help. There were hundreds of people in and around the PUT area, but none were close enough to talk to without shouting and he was unwilling to move, just in case that made the situation worse. Finally, panic superseded the doubt he had about the small girl and he looked down at Jayne, who grinned back up at him.

“What are you smiling about?” he snapped. “This is a serious situation.” He looked up to the sky as if he were imploring the deities to come to his aid.

“I think I can help,” giggled Jayne.

“Yeah, right. You’re just a baby and you don’t get how serious this is. If this VID doesn’t go green—.”

“—Like this,” she interrupted, waving her VID, glowing green, in front of his face.

“Yeah, like that. If mine doesn’t go green, I will have to go back to INTER and start over. I would rather die,” he finished, sighing, “and you are so stupid you don’t get it.”

“Oh, I get it alright. Give me your hand,” she commanded. She held out her hand to him, annoyed when he hesitated. “Give me your hand. I will make that VID of yours go green.” She glanced up at the clock which now read 12:47. “Look, you can try to solve this problem

yourself within the next 13 minutes, or you can put your hand in mine and I'll solve it in just a few seconds."

"What are you going to do?" he asked tentatively.

"Just give me your hand. I don't bite..." she paused and smiled, "hard enough to draw blood anyway."

His eyes widened.

"I'm just teasing," she retorted, rolling her eyes as she reached up and grabbed his hand. "Now, follow my instructions carefully and precisely. First, look down."

He looked at her strangely for a moment before she continued, "Look down at your huge feet, you silly boy."

He found himself following her instructions and looked warily down at his feet.

"That's right. Now, I want you to concentrate on moving the toes on your left foot closer to the toes on your right foot. Do you think you can manage that?" she said, suppressing a giggle as she let go of his hand.

"What?"

"Just move your feet together so that the heels touch and the big toes touch."

"You want me to take my shoes off? What good would that do?"

"No, silly, just place your feet together, with shoes on, like mine," she said, pointing at her own feet.

He moved his feet together.

"That's right. Well done. Now check your VID."

He stood, with feet together, and snapped open his VID. It was glowing green. He looked at her with stunned relief and said, "How did you do that?"

"It's the PUT pads. You can't have any part of your body extending more than 50 cm past the PUT center point. I figured, with the way you were standing, legs apart and feet sticking out, that you had gone past the edge. If the PUT pad were to activate, it might leave your toes behind."

"Thanks."

“You are welcome, and don’t ever call me stupid again.”

“OK, but why did you want to hold my hand?”

“People are more willing to listen to each other when they are connected in some way. I just figured a little hand-holding would calm you down.”

As he blushed, they both turned and looked straight ahead. They stood in silence, tension mounting, waiting for the PUT pads to activate and take them to whatever awaited them in the HUB.

## CHAPTER 3



# The New Quarters and the Star

The human race wasn't about to go down without a fight. There were a lot of ideas bouncing around during the first 10 years after the meteor storm was discovered. Everyone thought of those rocks hurtling through space, not as inanimate objects like a hail storm, but as a swarm of hateful living things, like a group of crop-killing flying insects or blood-sucking bats. You could hate living things. You couldn't hate rocks. So the meteors became malevolent monsters bent on the destruction of the human race.

**W**hen the PUT deactivated, Jayne found herself standing in a strangely curved hallway that snaked away, blocking her view after about ten metres. She imagined observing the hallway from above and seeing an S-curve. There were doors spaced three metres apart on her side of the hall. The other wall shone with smooth, unbroken metal, following the bend.

Jayne walked down the hall, away from the spot where she had materialized. She wanted to get a better view of where she was going to live for the next two years. As she approached the opposite wall and was about to turn around, something happened to a one-metre circular section of the wall in front of her.

She stared. It was as if a hole formed in the wall. She reached out, expecting her hand to go right through, but it felt just like a metal wall should feel—cool and smooth. The hole-that-wasn't-a-hole provided a live view of the huge tech floor below. There were hundreds of workers milling about. It was the largest tech floor she had ever seen. She stared and as she walked to her left the viewing area

followed. It was an electronic window—new tech she had only read about until now. The entire wall was painted with nanoparticles programmed to show an image just as if the viewer was looking through a window. Electronic windows were activated by the presence of the viewer and followed as the viewer moved.

Jayne smiled and ran quickly to her right. The viewer kept perfect pace. When she jumped, it jumped. She tried jogging along the wall and was pleased to see the screen keeping pace beside her. Finally, she returned to her starting point.

She then walked down the hall and stopped in front of the metal door to her new quarters. The door had no discernible knobs or locks, just an outline where the door would retract into the wall. The number 2197 was etched into the frame above the door. She thumbed her VID while pointing it at the door. The door to her new quarters opened silently and she stepped inside.

The room wasn't big but it was a million times better than the cubicles at the nursery. All the surfaces were curved in the corners. No sharp corners were evident anywhere. Everything was white.

The bed was formed by a horizontal alcove set in the right wall with shelves and drawers inset both above and below the sleeping platform. Jayne assumed these were meant to store her belongings.

On the left side of the room, the floor ballooned upward to form a table and chair. The back wall featured a small bathroom with her own vacuum toilet and misting UV shower. That was it. But after years in the cramped nursery, Jayne thought it was a mansion. She had never had her own bathroom before.

She giggled and turned in a circle. She stopped on the third spin when a panel inset in the wall beside the door caught her eye. She moved closer, intending to reach out to touch it when a soft voice spoke. "Good afternoon, Wu F 302875106592253. If you prefer, you can be addressed as Jayne Wu or simply as Jayne, please state your preference now."

Jayne stared first at the wall and then at the ceiling. The voice seemed to come from both nowhere and everywhere at once.

“Wu F 302875106592253, we can continue this introduction to your new residence at a future time if you so wish,” crooned the voice.

“No. You may address me as Jayne or, when you get to know me, as ‘Thirteen.’ That’s kinda like my nickname,” said Jayne.

“Alright. Do you prefer ‘Jayne Thirteen’ or ‘Thirteen Jayne?’” asked the voice.

“Just ‘Jayne’ or ‘Thirteen,’ not both together,” Jayne said.

“Alright, Thirteen, would you like me to continue with the introduction to the many functions of the residence?” asked the voice.

“Sure,” said Jayne, shrugging even though there was no one to see her.

The voice continued, “You are standing in front of the control panel for residence 2197. I will be your guide until you are familiar with all of the functions of your residence. You may shut off any audio output from the AIU—Artificial Intelligence Unit—once you have customized the residence to your liking. I do discourage this as I can often be very helpful.”

The voice paused for a moment and Jayne took the opportunity to ask some of the questions that were running through her head.

“How long will this take? And what do I call you?” asked Jayne.

“It will take approximately 20 minutes. What would you like to call me?” asked the voice.

“What did the last resident call you?” asked Jayne.

“Thirteen, I have never worked with any other resident. I came into being the moment you entered this residence. I will be 13 minutes old in 3, 2...” the voice paused, “now.”

“That’s funny. Well, 13 is my lucky number, so I guess I’ll call you Lucky,” giggled Jayne.

“Thank you for my name. If you wish to speak with me in the future, just say my name,” Lucky said. “Now, do you wish to continue, Thirteen?”

“Sure,” said Jayne.

Lucky continued with the short tutorial. Jayne learned how to change the temperature, the lighting, and the humidity in the room

to suit her liking. She could play music or watch the netvids on an instavid. Any of the walls would open with instavid programming of her choice at her command. She could even change the color of her walls or the firmness of the mattress. Finally Lucky stopped.

“This is the end of the basic tutorial. If you wish to receive more information about the specifications of the residence controls, I will be more than willing to help,” said Lucky.

Jayne looked around at the room’s white walls. “Can you make the walls a little less white?” she asked.

“Yes. I took the liberty to study your medical file and I see you are a tetrachromat,” stated Lucky.

“I’m a what?” she asked, a little confused.

“Oh, it is a very rare genetic variation in vision that is only found in females. Tetrachromats have an additional type of cone on the retina of their eyes. Cones are color photoreceptive retinal cells that are located in the back of the eye. Most humans have three kinds of cones, hence they are considered to be trichromats. Those with four types of cones are known a tetrachromats. They are able to differentiate far greater variations of color than those found in the typical trichromatic range. I mentioned your tetrachromaticism because I have the ability to transform the wall to display any color you can perceive and you can perceive of millions of different colors.”

“Any off-white with a hint of pink will do,” said Jayne.

“Is this satisfactory?” asked Lucky and Jayne noticed that the walls had changed slightly, seeming far less bright.

“Perfect,” said Jayne as she sat down on a molded chair that was really just an extension of the floor. She finally had a space she could call home. She breathed deep and smiled when a chime filled the room.

“Shall I open the door, Thirteen?” asked Lucky.

“Who is it? Can you tell?” asked Jayne in retort.

“Yes, I can tell. No one is there,” replied Lucky. “There are, however, some containers. I suggest that your belongings may have arrived.”

“I’ve got nothing else to do. I guess I might as well unpack,” she said. “Open the door.”

The doors slid silently apart. On the threshold were three containers with scanlocks in the center of the lids. Jayne carried them inside and set them down in the middle of the room. She placed her hand on the scanlock and she felt a slight scratch on her palm as the scanlock confirmed her identity. You never knew where the scanlock was going to scratch you, but it never took more than a few skin cells. It took just enough to run a DNA comparison to her last formal scan. If the cells matched, the computer would open the lock. Now the lock popped open and the lid slid into the side of the packing case. Since the cases were part of one shipment all the locks disengaged once her identity was confirmed.

Jayne started to unpack the cases. It only took a few minutes to take out her clothes and put them in one of the sealed drawers by her bed. She wouldn’t have the opportunity to wear any of them again except when she was in her own quarters. All ‘out of quarters’ clothing was supplied and required by the HUB. Personal clothes were not allowed to be worn in any working area of the HUB. HUB clothing was highly specialized. Contamination of materials and equipment destined for the biomes was of primary concern.

After unpacking the remainder of her things, Jayne put the empty packing crates outside her door, sat on the edge of her bed and picked up her most valuable possession—a small music box. She opened it and her favorite piece of music began to play. A tinny version of Pachelbel’s *Canon* chimed from the box.

“I have many versions of this music. Would you like me to play a better quality version? I promise you, the sound will be of a much higher fidelity,” said Lucky.

“No. I like this version. This music box belonged to my birth mother. It is the only thing I have left from her,” she said, as she closed the box. The music did not stop. Jayne looked at the box, slightly puzzled. She opened it again and looked inside. Usually, closing the lid stopped the music. She spotted something caught on the small closing

lever. She picked at the obstruction with her fingernail and it caught on what appeared to be a fine chain. She worked it from the lever and started to pull it out of the box, discovering that the chain threaded from a small hole in the corner of the tray sitting on the bottom of the box. She lifted out the tray that covered the inner workings of the box and then lifted out the chain, discovering that it had a pendant dangling from one end. She had never seen it before. It was silver in color and had an unusual star-shape. Connected to the star's center hexagon were six spokes, each approximately one cm in length. These spokes rose to a center point, forming a six-sided pyramid. The pendant had thirteen vertices. Thirteen was her lucky number. Her nickname was Thirteen.

Jayne touched her finger to the sharp point of the thirteenth vertex. She sucked in her breath and instinctively brought her finger to her mouth. The vertex had suddenly become very sharp and had pierced the end of her finger. She looked closely at the end of her finger. A small bead of blood bubbled up. She felt an unexplained wave of nausea rise and fall.

She absently sucked the blood from her finger, looking at the pendant again. She was surprised to find that it was growing warm in her hand and, as she watched, the sides of the hexagonal pyramid slowly shortened, folding down to the same level as the rest of the star. It now appeared as a simple flat piece of silver jewelry on a chain. The sharp point had disappeared.

"Is everything alright, Thirteen?" asked Lucky.

"Fine," she responded, as she slipped the pendant back into the music box. "I think someone gave me a birthday present."

"That's nice. Happy birthday," Lucky cooed.

Before she closed the box, Jayne latched the play lever so the music would not play the next time she opened it. She placed the box on her bed. "Play some music, Lucky," she said.

"What would you like to hear?" asked Lucky.

"You choose," said Jayne.

Jayne spent the remainder of the day scanning the instavid HUB

overview, its purpose and layout, in preparation for her new life. Tomorrow was an important day—the first day of her apprenticeship. She smiled as she prepared for bed and slipped happily under the covers. She quietly opened the music box under her blanket, slipping the silver star necklace out from within and sliding it over her head and around her neck. It felt warm against her skin. She instinctively popped the star-pricked finger into her mouth and sucked away the pain. She wondered who could have given her such an odd present. As her consciousness slowly faded, so did the soft music Lucky had been playing. She drifted off to sleep.

## CHAPTER 4



# Off to School We Go

Many probes were sent out into space to study the galactic storm. But those probes were looking at more than ‘The Swarm’—the name given to the massive meteor field. The exploration of space led to the discovery of new planets beyond the Swarm’s path that were potentially reachable by the doomed population of Earth. Some of these planets held promise for habitation.

The first discoveries were two fraternal twins aptly nicknamed PLG and PHG. Translated: Planet with Low Gravity and Planet with High Gravity. PLG and PHG had almost everything that was required to support human life. PLG was smaller than Earth and had a much less dense core. As a result, it had lower gravity than Earth. PHG was the same approximate size as PLG but it had a very dense core and greater gravity.

Other discoveries soon followed. None were exactly like Earth, but twelve were close. All of the scientist’s best estimates predicted that they were ‘probably’ habitable. If humans wanted to survive long-term on any of these planets, the population would have to adapt. The people in charge decided to give the adaptations a head start.

“**T**hirteen. It is time to get up. Thirteen,” said Lucky. “Thirteen, please get up. It is time. You must get up now. We will be behind schedule if you do not get up. Thirteen?”

Jayne Wu opened her eyes. Despite her difficulty in waking up she felt fully rested and clear-headed. She had slept perfectly. She turned over on her back, feeling the mattress adjust around her new

body position. She lay for a moment waiting for another prompt by Lucky. She did not have to wait long.

“Wu F 302875106592253, it is time to get up,” said a flat voice that did not sound like Lucky.

“Lucky, did your voice change?” asked Jayne, sitting up in bed.

“It was not me. If SYSTEM feels I am being ignored, it will...” Lucky paused and cautiously continued, “it will... intercede.”

“Oh,” said Jayne, sensing the hesitation in Lucky’s voice. She drew back the cover and sat up fully, her legs dangling over the edge. She wondered who or what SYSTEM was, but the first day was not a good time to ask. “What next?”

“That is very simple,” replied Lucky. “You follow the green arrow and respond to the green prompts. You avoid anything that is red.”

Jayne’s next question was answered by a ten centimetre green arrow that just appeared in the floor at her feet. It was pointing to the bathroom. Jayne got up and followed arrows and responded to the prompts. After about twenty minutes, she was clean, dressed, fed and standing at the door waiting for it to open.

“Thank you, Thirteen, for being so efficient on your first day. The prompts will appear less and less frequently as you learn the routine. Have a good day,” chirped Lucky.

With that, the door opened and Jayne stepped out, following a green flashing arrow in the floor that terminated down the hallway in a one-metre circle of green light indicating a PUT pad. She stood in the center and waited.

A few seconds later she appeared in an alcove with a 10-unit PUT array. She stepped off the pad and entered the adjoining room. She was standing in another, high-ceilinged room with twenty other apprentices being organized into four rows of five. The flashing arrow directed Jayne to the third row, third from the end. Position Thirteen. She never really understood why she was always somehow connected to the number thirteen, but it occurred too often in her life to be a simple coincidence. Lucky thirteen. A small man with graying hair walked up to each of the apprentices and handed them a rectangular

badge. The only person she recognized in the group was the big-foot boy she met on the external PUT. She didn't even know his name. He was standing one row ahead of her and two positions to the left. He didn't seem to notice her. He towered over everyone else in the room. The small man handed Jayne a badge with a bright orange *I3* printed on a dark background. She took it and waited.

After all the badges had been handed out, a woman walked up to the front of the group. She held a larger version of a standard VID in her hand. She stared down at her VID, never making eye contact with the group in front of her. "Place the ID marker you received into the small pocket on the left breast of your clothing unit," she stated casually.

No one responded, though they all looked down at their shirts to find the pocket.

The woman finally looked up at them, seeming irritated at their inaction. "Now!" she commanded.

There was a rustling sound throughout the room as everyone slipped their ID marker into the small pocket on their chest. As the ID marker hit the bottom of the pocket, the material on Jayne's shirt glowed, the marker disappeared and a number appeared on the front of the pocket.

The woman looked down again, resuming the inspection of her VID screen. Once she confirmed that all of the ID markers were inserted properly into pockets, she looked up at the group. "I had hoped that this day would be uneventful, but it appears I was wrong. It seems there are some VIP's visiting the HUB today. Some scientists from HUB Central are being shown around and they requested to meet and inspect some of our newest fixer apprentices. Why, I cannot imagine. But who am I to question the reasoning of scientists?" she sighed in resignation, her tone changing quickly back to the sharp voice she previously used. She barked, "Stand sharp and answer all questions clearly!"

A group of five people entered from a small room that held the reserved PUT array. They all appeared to be quite old, at least from

Jayne's viewpoint. There were three men and two women. Each of them smiled and approached the group of apprentices.

One of the men spoke first. "We thought we would like to welcome you to HUB..." He paused and turned to the young man who was guiding the group.

"169," the guide responded.

"Yes, 169. Welcome to HUB 169. I am sure all of you are more than competent and will excel in your chosen careers. My colleagues and I would like to talk to some of you. This is nothing formal so try to relax," the man said with a smile on his face.

Moving into the group of apprentices, the scientists began to converse casually with several of them. The oldest woman in the group didn't hesitate, but walked straight to Jayne. She had white hair and wrinkled skin. Jayne was surprised that she didn't have to look up, but was able to look directly into the woman's eyes. The scientist was, in fact, slightly shorter than Jayne. The eyes that gazed back at her made Jayne take a small step back in surprise. They were a sharp green color that shone so brightly that they seemed to contradict her first impression of the woman's age. They were the eyes of a much younger person.

The woman stared at her in silence and Jayne began to feel uncomfortable under her silent gaze so she spoke first. "Hello," she said.

The woman did not respond but continued to inspect Jayne like she was something to be purchased.

Jayne continued hesitantly, "My name is Jayne Wu..."

The woman finally acknowledged Jayne and spoke softly. "Yes, dear, I know who you are." She reached out and touched the long braid that hung over Jayne's shoulder. "You are very beautiful and so young."

She smiled a wrinkled smile and reached out and lifted Jayne's necklace. The silver star popped into view. "Yes. Good. Perfect."

"Thank you. I'm not..." Jayne started to respond. She stopped and felt an inexplicable cramp accompanied by a hint of nausea in the pit of her stomach. Jayne's face contorted with the pain.

An odd smile crept over the old woman's face as if she were relishing in the pain Jayne was feeling. "Maybe we will meet again," she said cryptically and abruptly turned and walked away, not talking to any of the other apprentices before rejoining the other scientists.

The nausea in Jayne's stomach slowly faded as the guide spoke to their initial facilitator, "Thank you. You may continue."

The group of scientists walked away and Jayne was left deeply unsettled and confused at the encounter.

Their facilitator also seemed confused at this unlikely encounter, but shrugged and resumed her stern lecture. "I will now continue. Each day you will be required to insert a new ID marker into the pocket of your clothing unit. Once you have done this, you must step off the PUT pad and follow the indicators in the floor or wall displaying your number. These indicators will decrease in frequency as you learn where you have been assigned. They will increase in frequency if you go elsewhere. I strongly recommend that you do not stray from the designated path very often," she said. "If your assigned location changes, a new set of indicators will redirect you. If this protocol is understood, please proceed."

A series of small green arrows with numbers at the base appeared in front of each person. As each moved, his or her respective arrows reoriented themselves and pointed in the required direction of travel.



## Don't Leave the Path

Many proposals to ensure the survival of the human race were rejected, but one idea was embraced by both scientists and politicians. It was originally expected to take 50 years, but 102 years had passed and it was still not complete. A huge part of its eventual success depended on future discoveries and future tech. The leaders of the time decided that the human race would have to begin the research effort as soon as possible to have any chance of survival. Thus, the biome project began. There were twelve in all. Twelve asteroids were towed to Earth orbit and transformed into space ships—biome ships that would transport a sampling of the human population to new planets.

Jayne didn't move with the rest of her group, but stood in place for a moment. She had felt a rush of pressure in her head just as the facilitator had said, "Proceed." The rush started in her earlobes, swelling into her head and neck, running out through her arms and down her spine. She felt someone watching her. Instead of looking down at her directional arrows, Jayne looked around at her fellow apprentices. She scanned the room, noticing that the apprentices were moving slowly and in seemingly chaotic patterns, as if they were being controlled by the arrows displayed on the floor. Jayne smiled at how silly they looked. Most of the other pedestrians were moving purposefully to wherever they were going, but some had paused to smile and watch the strange sight of indicator-controlled apprentices bumping into each other, trying to follow the arrows as

they crisscrossed. Jayne smiled at what must be a comedy act starring that month's apprentices.

Jayne looked beyond the pedestrian traffic to the concourse that surrounded the PUT anteroom. Here, people were moving normally, heading intently toward their destinations. No one out there was standing still. Raising her eyes higher, Jayne scanned the high row of windows that looked down on the concourse. Most were lit from the inside but they appeared empty. Her eyes were drawn to the one window in the center of the row that was slightly tinted. Despite the darkened glass, Jayne could see someone behind the window. It took only a second for her eyes to focus on the person looking out at her and, in that second, Jayne once again felt a wave of nausea, but this time it was so intense that she couldn't suppress the retching sound escaping her lips. She turned away from the window and instinctively put her hand over her mouth to stop the threatening spew of vomit. The nausea faded but her heart continued to beat rapidly in her chest.

She turned back and glanced furtively up at the window. It was no longer dark and now looked the same as the rest. In fact, she wasn't exactly sure through which window she had noticed the observer. The person she had seen was gone.

She looked down and saw a green arrow in front of her, the number 13 illuminated at its base, increase in size and begin to pulse from small to large. It seemed to demand that she move. She stepped forward and walked in the direction of the arrow as the still-decreasing nausea washed and faded like the foam from crests of gentle waves.

There were six sets of stairs leading up out of the concourse and six other sets of stairs leading down to places unknown. All but two of the apprentices followed their arrows to one of the sets of stairs leading down and had already disappeared into the bowels of the HUB. Jayne and the overly-tall boy she met yesterday still remained. Jayne followed her arrow and was confused to discover that it led towards the boy. He was moving in a two-metre circle with what seemed to be a perpetual expression of puzzlement on his face. His arrow, with the number 7 flashing at its base, was travelling in a circle and he was

attempting to follow it. As he moved to the edge of the circular path the arrow was scribing out on the floor, the whole circle moved to seemingly capture him at its center. He looked like a cat chasing its shadow. When he finally stopped, the arrow flashed and continued to run its circular path with the boy at the center.

The boy shook his hands in frustration and muttered, “This is stupid.”

Jayne stopped in front of him. “What’s wrong? Why aren’t you following your arrow?” she asked.

“Look!” he retorted, pointing at the ground at his feet.

Jayne looked at the arrow at his feet. It was flashing and pointing in the same direction as her arrow. “What’s wrong?” she asked.

He looked down at his arrow and, seeing that its confusing motion had finally changed, said, “I don’t believe it.” He began to move in the direction his arrow was pointing but had taken only three of his giant steps when the arrow resumed its circular motion, once again keeping him in the middle.

“Oh for frack’s sake!” He looked up at Jayne. “Are you seeing this now? The damn thing seems to want me to stand here while it makes up its mind where to lead me. Where is that woman? This thing must be broken.”

He looked around the anteroom but the facilitator was gone. Everyone else ignored them as the crowd streamed past.

“I think she’s gone,” said Jayne, looking down at her arrow and taking a step toward it. The arrow continued to lead her straight to the boy. As she walked past, Jayne quipped, “See you around. Ha, a-round, get it?” She giggled as she walked past him, following her arrow.

“Finally!” she heard him exclaim behind her. He looked down and began to blindly follow his arrow. He took only a few steps when the arrow began to circle again. He looked up, exasperated, only to find Jayne standing right in front of him.

“I thought you were outta here,” he said. “It looks like I’m going nowhere quickly.”

Jayne was watching him. Her arms were folded across her chest. “I think I understand,” she said slowly, “and I don’t like it.”

“You understand this circle business? Look, I don’t need you, so just buzz off, OK? I’ll figure it out. It’s probably just some weird test. Go!” he ordered.

“Look at me,” Jayne said.

“I’m not holding your hand again. If that’s what you’re looking for, then you should apply to go back to the nursery. You’re just a baby anyway,” he almost spat the words out with disdain.

“Don’t be an idiot! Look at me, shut up, watch and learn,” she said and she began to walk backwards. She took three steps. The boy’s arrow stopped circling and pointed right at her. “Now follow me.”

The boy stood, staring at his arrow, his hands clasp his own face in confusion. He took a single step forward placing him directly in front of Jayne and the arrow began to circle him again. “What the —!” he exclaimed.

“Don’t you get it?” she asked.

“Get what? This arrow business is messed,” he said.

“I think you’re supposed to *go with me*,” she said. “Every time I stop, your arrow goes in circles like you’re supposed to wait for me.”

“Turkey twattle,” he said dismissively.

Jayne became pensive, ignoring him. After a moment she said to herself, “I wonder...” She looked up, ran across the room and stopped. Her arrow pointed in the direction it had always pointed—towards a door situated between sets of stairs, leading down to somewhere or other. She called back to the boy. “What direction is your arrow pointing now?”

“Towards you. I don’t believe it,” he said, shaking his head as he walked slowly towards her.

“Believe it. It appears you have to go wherever I go,” she sighed.

“Frack!” he said matter-of-factly.

“Gee, that makes me feel good,” she said, exaggerating the sarcasm to cover the hurt she felt. She started to follow her arrow towards the door and reluctantly the boy followed. She opened the door and

stepped into a small room where the light shone in a stronger yellow hue than in the other room. There were two PUT pads on the floor in front of them, each with a pulsing green light around its circumference. Both of their arrows pointed to the pads.

“I guess that’s what we’re supposed to do,” she said, gesturing to the pads. “What’s your name anyway? Mine’s Jayne Wu.” Jayne stood with her hands on her hips and a ‘bit lip’ smile on her face.

“Joseph Kane,” he replied.

His eyes traveled from her toes to the pendant dangling from the chain around her neck. Jayne had followed his gaze. She felt her face flush red. She slipped the object of his gaze under her jumpsuit, flipped her long braid over her shoulder and pertly said, “Let’s go.”

They each stepped onto a PUT pad—Joseph placing his feet tightly together—and promptly disappeared.



## Games and Waiting and TechElecMech

The twelve biomes were designed to mirror twelve newly-discovered, potentially-habitable planets. They were also ships that would take the human race out into the galaxy. Society had faith their scientists would be able to develop the technologies that would make the project viable. Each biome would remain a ‘work in progress’ right up until launch day. Scientific research would take two paths: tech—the development of artificially-controlled environments and space propulsion systems; and controlled evolution—encouraging changes in the humans inside the biomes through environmental and genetic manipulation. Space propulsion systems would take priority. There would be no point in building the biomes if they could not escape before the Swarm’s arrival and reach their new homes. Survival on the new planets was a secondary concern.

Jayne and Joseph materialized in a small waiting room with windows along one wall. On the other side of the windows were small groups of people. Some were sitting at tables, some were standing at high counters, some were rolling on mats, some were wearing breathing masks and white suits, some were throwing things, and some were avoiding things thrown at them. There were even more people over at the far side of the room, but the view was obscured by the people in front. Each group had a leader or, as Jayne assumed, a teacher or instructor. Everyone wore the same basic style of jumpsuit as Jayne with numbers on the left breast pocket. The only difference between the industrial blue jumpsuits worn by the instructors and the apprentices was the color of the numbers on their pockets.

Those on the instructors' suits shone white instead of orange. In one glance Jayne processed everything that was going on in the room. She was sure that there would be a great deal more to see if she could only stay and watch.

Once more, a green arrow, with the number 13 at its base, began to flash on the floor in front of her. She stood, staring at the flashing arrow for a moment and then her gaze strayed back up to the windows and into the large room beyond. When she forced her gaze back down again, she saw the green flashing arrow double in size, as if yelling at her to follow along. She stepped from the PUT pad and headed in the direction of the arrow. Joseph followed along without so much as a glance down at his own flashing arrow. He'd finally figured it out. It was his job, at this point, simply to follow Jayne and go wherever she went. He couldn't imagine why it was so important to follow such a young girl, but time, as it usually did, would tell.

Jayne's arrow pointed towards the far end of the small room, which slowly tapered down in width until it turned into a two-metre wide hall. The off-white walls curved to the left. Once the pair had travelled a short distance, the smooth inside wall was broken by a door. But the arrow didn't stop at the doorway, instead continuing to travel down the hallway, past more doors, finally stopping in front of what Jayne determined to be door number four, since they had passed doors one through three as they progressed down the hallway. The door slid open as soon as Jayne came near, and she stepped through without hesitation. She was surprisingly even a little excited and her heart rate jumped as she passed through into the next room.

Suddenly she heard a loud klaxon blare behind her. She turned to look and saw Joseph frozen by the alarm just as he was about to step through the doorway. She glanced down and saw a red light flashing on the floor in front of him. His green arrow turned into a red octagon with a white diagonal bar. It was pulsing in size from small to large and back again. Joseph looked at it for a moment and finally stepped back. The klaxon silenced and the red octagon turned into an orange flashing circle as the door slid shut.

Jayne found herself in a small room with air suddenly rushing at her from many different directions. The wind threatened to whip her hair into tangles and knots. After a few moments the rush of air stopped. She stood and looked up at a window that was positioned directly above the exit door. She could see no one behind the glass but she could feel that someone was there. She wondered if they would open the door. As she waited Jayne thought back to the darkened window in the concourse. She felt the nausea begin to swell inside her again at the memory but it was interrupted as the door in front of her slid open.

No one greeted her. With trepidation, Jayne stepped into the large room she had seen through the windows. She was expecting to be assaulted by the noise that such a large group of people would produce, but the silence that met her was both unexpected and disconcerting. The people were in distinct groups and appeared to be talking, but she could hear nothing of what they were saying. The subdued echo of her own footsteps was the only sound she could hear. She glanced down at the floor and the green arrow flashed reassuringly in front of her. She followed as it weaved in and out of groups of people, none of whom seemed to take any notice of her. Straight ahead she saw two boys and a girl moving around inside a five-metre circle painted on the floor. Almost invisible netting formed a wall around the circle. Suddenly they stopped moving. The girl's eyes became wild as she glanced around as if looking for some unseen enemy. Jayne suddenly heard a very subdued popping sound that seemed to have escaped the silence. The girl's hand went to her thigh, rubbing back and forth. Jayne noticed a small bean-bag-like object at the girl's feet that she was sure hadn't been there before. The blond boy suddenly raised both hands to his face, his eyes grimacing in pain. Bright red blood oozed between the fingers covering his nose, and a small bean bag, stained red, sat at his feet. Five other bean bags were scattered on the floor, at the base of the circle of netting. The third person—a dark-haired boy—was crouched down on his haunches. A sardonic smile

crept over his face. He looked up and saw Jayne staring at him. His face quickly blanked of emotion and he looked down at the floor.

The floor in front of Jayne beeped. She looked down at the green arrow swelling and shrinking at her feet. She followed it again. It stopped at a table covered with burgundy felt. An instructor sat at the table, shuffling a deck of cards. As she approached, he smiled. She could see his lips move, but she heard no sound. She stepped forward and caught the end of his sentence: “—hear anything outside of each area due to the sound dampening fields. Come, sit. You are the first. We are waiting for two others. We can play while we wait.”

“Play? Play what?” Jayne asked, taking a seat directly opposite the dealer/instructor.

“Simple game. High card wins,” he said with a smile as he dealt out one card each, face down. “I’ll turn my card first.”

Jayne did not wait. She flipped her card over. It was a Three of Clubs.

“Dear me. You may not be here for long,” he said dismissively, flipping over the card in front of him. It was a Two of Clubs. His eyes widened. “Interesting. You win.”

At that moment, two others arrived, from different directions, and they, too, were welcomed by the dealer and invited to sit. A red-haired girl in her early 20s and an overweight boy about 16 or 17 sat down on either side of Jayne.

“We are all here. This part of your assessment will only take a few minutes, but it will determine where you are sent next. I will refer to you only by your numbers because that is easier for me to remember. So, let’s get started. I will deal a card to you and then a card to myself. If my card is higher than yours, you will leave the table and continue to follow your arrows. Understood?” asked the dealer.

Both the red-haired girl and the overweight boy nodded.

Jayne stood and scanned the room. “Where will we go? Where will the arrows lead?” she asked, slowly slipping back into her seat.

“That depends,” said the dealer. He offered no more information.

“On what?” pressed Jayne.

The other apprentices seemed startled by her continuing to question the instructor and they both looked down at the table, trying to avoid Jayne's gaze as she turned to them. "Well, I would like to know," she said. "I was told I would become a TechElecMech." She scanned the room again. "Nothing in here seems to have anything to do with tech. Maybe I'm in the wrong place."

"You aren't in the wrong place," the dealer said patiently. "I have your number here." He looked down at the built-in screen on his side of the table. "Thirteen, Wu 13. Right?"

Jayne nodded.

"And you two—let's see—Kieren 37 and Moss 124. Right?" he said as he nodded towards the girl and the boy sitting on either side of Jayne.

They nodded back.

"Right then—let's get this done. It usually only takes a few minutes for me to beat you. I am, after all, a dealer, and dealers are lucky." He smiled at them. "Remember, as soon as I beat you, stand and follow your arrows and, to answer Thirteen's question, I have no idea where you will go next. It all depends on how many times you win, or if you win at all."

He smiled at Moss 124. It was not a nice smile. "You're first," he said and he dealt a card first to 124 then one to himself. Both were face down.

"I always flip my card first. If you beat it, you can stay for another round. If not...." He let his words hang and flipped his card. It was a Seven of Clubs.

124 peaked at his own card for a moment before flipping it quickly over. It was a Queen of Hearts.

The dealer turned to Jayne. "You have already had a turn," he said, turning to 37 and dealing two more cards. The dealer turned his over immediately revealing a Jack of Diamonds.

"Doesn't look good, 37," he chuckled.

37 turned over her card, exposing a Ten of Clubs. The dealer waved

good-bye to her, but she seemed relieved as she left the table, following a green arrow with 37 at the base.

Next, the man turned and dealt a card first to Jayne, then one to himself. Jayne's Nine of Spades beat his Seven of Clubs.

He dealt two more cards, looking at the remaining player next to Jayne and flipped his over. It was a Four of Diamonds. 124 followed with a King of Clubs. "Not bad, 124. A winning streak of two does beat the odds, but not by much."

He dealt to Jayne. She won with a Six of Diamonds to his Four of Spades. The process continued to the fourth round with both Jayne and Moss 124 winning their hands.

On the fifth round, 124 lost. His King was beaten by the dealer's Ace. He left the table, following his arrow out of the space.

"How long will this go on if I keep winning?" asked Jayne.

"A little cocky, aren't we?" the dealer said. "Don't worry. It will be over soon. The record holder had only eight wins in a row."

He dealt another set and looked surprised to have lost again. His look of disbelief continued to grow as he lost 19 times in a row. He kept shaking his head.

Dealing hand number 20, he flipped his card. He lost again. "This is *impossible*," he muttered to himself. "No one is this lucky."

He was about to deal the 21st hand when his screen chimed and flashed red. He looked down at it, then looked up at Jayne. He shook his head and sighed. "That's it. You're outta here. Go!" He turned around in his chair and stared off into the space behind him.

Jayne rose from the chair, looking down at the arrow at her feet. It was pointing to the left of the card table. She followed it across the room until it stopped at the circle of netting she had previously observed. Three stools sat at the edge of the circle. Two were occupied. Jayne recognized the dark-haired boy on the left as the one she had observed earlier. The boy who sat on the second stool was tall, blond, and unfamiliar to her. A woman with a portable tech screen stood behind the stools.

As Jayne entered this area, the woman looked up and asked, “Are you Wu 13?”

Jayne nodded, staring at the blood on the floor inside the circle where the boy had been hit in the face with a bean bag. A man with a portable wet vac moved into the circle and cleaned it up.

“Sit here,” the woman said, gesturing to the third stool.

Jayne sat.

The woman looked at her screen, looked up at Jayne, then back down at her screen. “Ooooh, this should be interesting,” she said. “Alright, boys and girls, take your places.”

The two boys stood up and wandered around the circle, pausing occasionally before finally taking up a position. The blond boy lay down on his side on the floor along the edge of the circle. The dark-haired boy crouched down and waited.

Jayne stood up, but waited and watched, trying to determine what she should do next.

“13, please enter the circle and take a position,” said the woman.

“Why?” asked Jayne cautiously, remembering the boy with the bloody face and the bean bags.

“It’s a test,” the woman answered. “Weren’t you apprised of the process?”

“Apprised?” retorted Jayne.

“Everyone who gets this far is apprised of the dangers. Obviously you must have been told because you are here. Now, take your place in the circle,” the woman ordered.

“I was winning at cards, and when the game was over the green arrow brought me here. I wasn’t apprised of anything,” Jayne retorted sharply.

“You came from cards to here?” the woman asked, as she scanned her screen. “Dear me, you are right.” The woman looked up at Jayne. “This is very unusual. Alright, I will give you the short version. You take your place in the circle and stop in any position you feel comfortable.” She gestured to the boys in the circle. “Like they have. Once everyone is in the circle, the timer will start. Ten seconds will

pass. You can watch the time on the timer at your feet and move to wherever you want in that 10 seconds. The bean bags will fire in random directions through the space enclosed by the circle. The test starts with one bean bag and progresses to as many as 20 bags fired at the same time. There will be 10 seconds between each successive firing. The objective is to avoid getting hit. Getting hit hurts. It won't break any bones or anything, but it *will* hurt. That's part of the test. Fear can affect your performance. The other players can affect your performance, as well. After you are hit, the test is over for you. If both the other players are hit before you are, that round is over and new players will join you for the next round. The test will run until you are hit at least once. This is 91's third round," she said, gesturing to the dark-haired boy.

"What if I don't want to get hit at all?" Jayne asked.

"You have to take part or you will be sent back to the nursery. Do you want that?" asked the woman.

Jayne stiffened. "I didn't say I wouldn't play; I just won't get hit."

"Everyone gets hit sooner or later, but it's better for you if it takes longer. Your mark will be higher. Higher marks mean better..." she paused, "...more... interesting jobs."

"Alright," said Jayne, entering the circle and stopping right at the inside edge. A timer appeared in a blue circle at her feet, replacing her green arrow. It began to count down from ten. After seven seconds passed, the dark-haired boy stood up and stepped one metre to his right and stopped. Jayne watched him. He smirked at her.

Suddenly there was a pop and a bean bag whizzed down at an angle through the space previously occupied by the dark-haired boy. It came to rest at the base of the netting. The blond boy got up and moved near the center of the circle and crouched down.

The dark-haired boy moved to the opposite edge of the circle and again smiled at Jayne. Jayne swallowed and turned around, facing outwards, her nose poking through the netting. There was a pop. She felt moving air tug at the hair behind her head. One of the bean bags had just missed. She turned around and watched the two boys move

to another position. She looked down at the blue floor timer and saw a three flashing at its base. Three bean bags this time. Jayne did not move. The pop came. The bean bags flew. The blond boy cried out. A bean bag seemed to come up through the floor right in front of him, hitting him in the chin. He stood and walked out of the circle, rubbing his chin.

The timer restarted as soon as the net closed around the exiting boy. The dark-haired boy, 91, moved again, crouching in place as he stopped. Jayne didn't move. Instinctively, she didn't feel a need.

The usual pop rang out and the netting billowed out as each bean bag hit. Four billows meant four bean bags and neither player was hit.

This time, 91 moved and Jayne crouched down.

Pop! Five bags zoomed through space. Two came straight down to the floor and three hit the netting. The time continued to count down and the bags, in ever increasing numbers, continued to pop. Neither Jayne nor the dark-haired boy were hit.

Finally, the counter in the blue circle timer displayed the number 13. Jayne returned to her original spot against the netting and felt a rushing sensation swell from her core, moving through her body until it faded slowly as it passed out through the tips of her fingers.

The dark-haired boy stared at her, his face contorted as if he could feel that he was going to lose. He scanned the circle, his gaze stopped at a group of bean bags gathered in a pile at the edge of the circle. He smiled and walked over, stopping in front of the netting; then he turned and issued a mock salute in Jayne's direction. He must have figured that the odds were in his favor and that the bean bags would not hit where they previously hit. Jayne didn't move.

There was a pop and 13 bean bags flew at various angles through the netted space. Jayne watched as the dark-haired boy was hit by two bean bags at the same time. The boy's knees buckled, as his hands, unsure of where to go, clasped both his face and his groin. He fell to the ground with a groan. There was a cut below one eye and the blood from the wound trickled down his cheek. He didn't seem to

notice that wound as he clutched his crotch. As the pain welled up in his guts, he moaned again. He didn't get up.

At Jayne's feet, the timer turned to a red octagon and flashed slowly. Two men rolled a gurney into the circle and gently lifted the dark-haired boy off the ground and wheeled him away. As he passed Jayne, he met her gaze. The arrogance had disappeared from his eyes. What Jayne saw in his face filled her with dread. The boy's eyes were manic with fear. He was afraid of her. She frowned. She was puzzled why anyone could possibly be afraid of her.

Jayne was directed back to the stools. She sat down, breathing deeply, carefully considering her next set of actions. The dark-haired boy's look of fear unnerved her. She wanted to leave the game. She didn't want to see that look of fear in another kid's face, but she could only leave the game if she was hit. Well, she could be hit, but on her terms, not theirs.

After a few minutes of waiting, two more apprentices arrived, and the contest started anew. Jayne was oblivious to the others, as she entered the circle. She stood slightly off center, placing one foot out in front of her. The institution-issued boots had reinforced toes. They were safety boots.

There was a popping noise and a single bean bag flew straight down and hit the steel toe of Jayne's work-boots. She smiled, nodded at the woman instructor, and walked out of the circle. The woman nodded back and turned to her portable screen.

The green flashing arrow reappeared on the floor in front of Jayne. It led her back towards the door she originally entered. As the door slid open, she spotted Joseph sitting on the floor, his back leaning against the hallway wall. An amber light ran in a circle around him. He smiled as he saw Jayne. She smiled back. As she stepped into the hallway, the amber circle around Joseph transformed into a green arrow and pointed directly at Jayne.

Jayne and Joseph followed their arrows back toward the concourse, up a set of stairs and into a reception area. The walls of the room were covered in posters advertising TechElecMech and three

booths with screens and scanlocks were positioned in the center of the room.

A disembodied voice spoke. "Please sit in one of the booths, place your hand on the scanlock, and state your name."

Both Jayne and Joseph complied and were unsurprised as an artificial face appeared on their respective screens. It also displayed their names and numbers and the same, disembodied voice stated, "You have been admitted. Please stand and proceed to the PUT pads located in the room to your left." Jayne got up and entered the room and stood on a PUT pad. Joseph followed.

"It felt like I was waiting forever," said Joseph, finally. "What happened to you in that other room?"

Jayne was quiet. She hadn't had time to digest and analyze the reasoning behind the other room's activities. "I don't know," she said.

"Look, that isn't fair. You go in and do stuff, I have to sit in the hall and wait for you, and then you won't even tell me what happened," he complained.

"I played cards and ducked flying bean bags, OK! It wasn't fun, and I would rather have sat in the hall. So, consider yourself lucky," she muttered angrily.

The PUT pads activated and, as they stepped off at their destination, their green arrows flashed and led them to a door at the far end of the room. When they reached it, Jayne stood in front of it, lost in thought. Joseph looked sidelong at her, reached over her shoulder, and knocked on the door.

The door opened and they looked into what was obviously a classroom. The man who opened the door spoke. "Yes?"

Joseph spoke first. "Kane 37, reporting."

The man at the door looked expectantly over at Jayne. She looked up and said, "Wu 13."

He glanced at his VID. "You're late. I make a rule of not repeating myself, so you'll have to find out what you missed from my posted notes. Your VID will have the data. Read it tonight," he said flatly. "Sit down."

As they entered, Jayne and Joseph took note of the eight others sitting in desks with their VIDs open in front of them. They sat at the two empty desks. No one paid any notice to the new arrivals. School was a familiar activity for both of them, so they relaxed, and turned on their VIDs. Classes were what classes always were. You listened; you read; you studied; and you learned.



## Theoretical TechElecMech

In 2046, they held a lottery—filled with promise and hope. The winners would be permitted to live in one of the newly-designed biomes. Their progeny would travel to new worlds, spreading humankind throughout the galaxy. Those left behind on Earth would work to save humankind; work to build and maintain the biome ships; and work to find new planets with various degrees of suitability. They would work to alter the very genetic structure of the biome dwellers to enable them to survive and prosper on the newly found planets.

**T**heir classes continued for three months. Exams were coming up very soon, and it was made crystal clear by each of their instructors that passing would require a perfect score. In order to pass, they must get every question right. The students studied during every waking moment to ensure that they passed.

Jayne hadn't spent much time with Joseph after their first morning of forced company. His arrow no longer followed hers. He was older, and he spent time with the students who were of the same age. Jayne was the youngest by far, and the others all ignored her. That didn't bother her because she knew that she couldn't waste time socializing if she was to pass this test. Everything she was learning now was much more difficult than her lessons from nursery school and they seemed to cover the material at an incredible speed. Each new concept followed the last at a machine gun pace. If they wanted Jayne to be perfect then she would be perfect. She would not wash out!

Jayne stood at her door, pressing her thumb to her VID screen, and pointing it at the door. It opened silently, and she stepped inside.

“Welcome home, Thirteen,” said Lucky softly. “To celebrate the end of your classes, I have prepared your favorite dinner.”

“No time to celebrate. I’ll celebrate when they tell me I’ve passed this exam,” she said.

“No problem. You will eat, and I will help you study. I have a rather large database of possible exam questions.”

“Lucky, I need to be perfect. Do you have any idea how hard it will be to get every question perfectly right?” asked Jayne.

“You do not have to be perfect. No one has ever received a perfect score on any TechElecMech exam. The instructors just say that to scare you into doing your absolute best,” said Lucky.

“What score do I have to get to pass?” she asked, surprised that the programming allowed for such a revelation.

“I don’t know the precise score required for a passing grade,” replied Lucky.

“That’s just peachy! If I don’t know what I need to pass, I’ll have to aim for perfect anyway!” she exclaimed. She wrapped her hands and arms around her head. “Oh crap! I *know* I’m going to fail.”

“Stop! Eat! Study!” commanded Lucky.

Jayne sat at the table and ate and studied until she fell asleep. She must have stumbled into bed at some point because she woke up refreshed and ready the next morning.

“It’s now or never,” she said to herself as she washed, dressed, ate and finally left her quarters.

The exam was supposed to take three hours but Jayne finished it in two. She knew she had done her best. She didn’t have any idea if she had answered any of the tricky questions correctly. She sat and scanned the room, looking at her classmates who were still working busily. She didn’t want to leave first and draw attention to herself. Instead she sat and tried to imagine what the practical part of the apprenticeship would be like.

She expected that she would now get to go places and fix and

install equipment. Maybe she would even work inside one of the bi-omes. She might even meet an omie. Two other students got up and left the room. She looked around and noticed that Joseph seemed to be reading through the exam with a puzzled look on his face. She was about to try to get his attention when he quickly looked down at his VID. Deciding not to worry about him, she got up and headed back to her living quarters.

The exam results would be classified. No one would ever know who got what score. If you passed, they would send you to practical TechElecMech; if you failed, you would simply have to follow your arrow out of the HUB and back to wherever it was you started, never to be heard from again. Jayne sighed and lay down on her bed.

“Are you feeling well?” asked Lucky.

“I’m fine. Say, Lucky, can I ask you about something strange that happened to me on the first day I was here?” she asked.

“I suppose. What do you want to ask?” Lucky replied.

“On the first morning, I was led to this odd room and a boy was required to follow me wherever I went,” she said.

“Why would a boy be required to follow you?” Lucky asked.

“I was hoping you would know,” Jayne said. “Anyway, that’s not the strangest part. I was directed to this large room with lots of people in it. There must have been a sound dampening device because you could only hear the people closest to you. I was directed to a table where I played cards and then to what I’d call the *bean bag shoot*, where I and others were the targets.”

“Were you hurt?” asked Lucky, sounding concerned. “I don’t remember you returning to the room with injuries. I would have noticed and reported it if you were hurt in any way.”

“I wasn’t hurt, but others were. Nothing hit me. I was able to avoid the bean bags,” she paused and reconsidered. “No, it was more than that. I knew where the bean bags were going to land before they were shot. In the end I even let one hit me. I wanted to leave and they said I could leave when one of the flying bean bags hit me. So I let it. Then I left.”

“You must have been hurt if one hit you. You told me you were not hurt. Where were you hurt? Has your injury healed properly? Please let me see where it hit you. There might be some damage you cannot detect. I have a subcutaneous scanner, but you will need to stand over it. Please report to the flashing green circle in the corner, and I will scan for long term damage,” Lucky babbled.

“Stop!” said Jayne, annoyed. A green circle began to pulse in the corner of the room. “I stuck out the toe of my work boot and that’s where it hit. As you know, my work boots have steel toes. It didn’t hurt me. I was just wondering if you knew what that was all about? Do you have any idea why some boy would have to follow me around and then wait outside while I did these things?”

“I am sorry, Jayne, but I have no information about any of this,” replied Lucky.

A beeping sound came from the walls, startling Jayne.

“Your exam has been scored. Do you want me to read the message to you?” asked Lucky.

“Oh, crap! No. Yes. No!” said Jayne. She put her hands over her ears. “Yes!”

“You won’t be able to hear me if you continue to hold your hands over your ears,” stated Lucky.

“Just tell me!” cried Jayne.

“Pass,” said Lucky.

Jayne let out a sigh. “Thank the heavens.”

“There is a footnote message. Do you want me to read it?” asked Lucky.

Jayne nodded her head in affirmation.

“It says, ‘Always wear the Silver Star.’”

Jayne’s eyes grew large. She had not worn the star pendant when she went to write the exam. She felt as if she would somehow do better without it. Jayne walked over to her bed and opened up the music box. She lifted out the silver star that she found on her first day. She put the chain around her neck, lay on the bed, and fell into a troubled sleep.



## The Connectome Scan

In the early 21st century, scientists began to explore the connections within the human brain. Unlike the mapping of the human genome—which was initially seen as an almost impossible task but took only 13 years to complete (two years less than predicted)—the connectome was much more complex. It's complexity surpassed all predictions and the scientists were unable to reach any absolute conclusion. Much was discovered and mapped, but since the brain was such a dynamic organ, filled with complexity upon complexity—especially concerning the connections within the frontal lobe—scientists were still filling storage pits with xonabytes ( $10^{27}$ ) of data.

Jayne woke, feeling a little thick-headed. She didn't mention it to Lucky because that generally resulted in the AIU putting something in her food to make her feel better. He never asked if she would like this drug or that. Lucky just followed his programming. It seemed as if he was really paranoid about her health. Sometimes the drugs he gave her made her feel a little dopey.

Today was the first day of practical TEM and she knew that she must keep her mind sharp. She shook off the last of her thick-headedness as she walked to the PUT pad, thinking about how cool her first day was going to be. She was on her way to becoming a real Technical Electrical Mechanical Fixer.

When she reached her destination, she stepped off the PUT pad, and followed the green arrow as it directed her past a series of doors, finally stopping in front of a door with a sign that read 'Professor Greenway'.

Jayne couldn't see a scanlock or video lock of any kind. There was just an old-fashioned doorknob. Jayne assumed that the knob turned a latching mechanism that would allow her access to the room beyond. Turning the knob, the door opened for her and she stopped just inside the room, leaving the door open behind her. She found herself inside a combination of an office and a laboratory. There was a desk in the corner, piled high with sheets of white material covered with text. More pieces of the same material were stacked on a series of shelves and even more were piled haphazardly in the corner. She identified the sheets as printed paper and books. She had seen pictures of books in the past, but she had never seen a real one up close. There were countless books in this space; more than she could have imagined existed in the whole world. Humans stopped printing books almost 70 years ago, and yet this office was filled with them. Jayne's eyes scanned the rest of the room, coming to a stop when she saw a man standing with his back to her, leaning over a magnavid, staring intently at some multi-colored blobs on the screen before him.

Jayne cleared her throat, trying to get his attention, but the man ignored her.

Annoyed, she spoke loudly, "Excuse me."

The man continued to stare at the magnavid. He twisted a knob and the view altered. He didn't turn around.

Stepping further into the room, Jayne repeated herself, "Excuse me."

No response came from the man. Finally, she stepped closer, about to tap the man on the back when he straightened, reached behind his ear, and touched his skull. Apparently he was listening to something and had just turned it off.

As he turned around, he found himself face-to-face with Jayne.

A surprised "Oh!" escaped from both their lips. Jayne took a step back.

"Who are you?" asked the man who Jayne assumed must be the Professor Greenway named on the door.

"Thirteen," said Jayne.

“No, no. Not your HUB number, your birth number,” he said with irritation.

“Oh,” Jayne hesitated. “My number is 302875106592253.”

“Why are you here?” he asked.

“I have no idea. This is my first day of Practical TEM. The green arrow directed me here,” she said, “so here I am.”

“Yes, well, close the door and I’ll figure this out,” he said and he picked up his VID. “Give me your birth number again.” Jayne repeated her number and the man keyed it into his VID. After a moment, he spoke again. “Mmmm, that is odd.”

“What?” Jayne asked.

“Nothing, really. I guess they’ve decided to be a little more thorough with you. They want the usual—fluid extraction, deep retinal scan and a skin biopsy. They also want a partial connectome scan. Now *that is* very unusual,” he mused.

“What’s a connectome scan? What are you scanning?” Jayne asked apprehensively.

“Don’t worry. It’ll hurt far less than the skin biopsy. It just takes a little longer,” he said. “Now sit here and roll up one sleeve.” He gestured to a chair at the end of one of the lab benches.

Jayne sat down and rolled up her sleeve. Professor Greenway took some blood and scraped the inside of her cheek to retrieve skin cells. “Now, I want you to relax. This always works best when you are relaxed. Conscious thought and dreaming can affect the results. Here, drink this,” he said as he handed her a small paper cup with a pink liquid in it. “It’s sweet with a cherry flavor.”

“What are you going to scan?” asked Jayne.

“Your brain. More specifically, a small section of your frontal lobe. That’s right behind your forehead,” he said, tapping her with his finger. “It won’t hurt a bit, but it will take a few hours to complete. There are a lot of data connections in there, and they keep changing. This connectome scan will mark the static connections that are established and try to determine the pattern of the dynamic ones. Nothing

for you to worry about,” he said as he smiled condescendingly down at her. “Drink up.”

Jayne drank the liquid and made a face at the foul taste. Professor Greenway took a circular strap, placing it around her head before attaching two devices to it. He stepped over to the large VID and adjusted some settings.

“The thingies on that band around my head are moving,” said Jayne. “One of them is caught on my hair.”

“Oh,” Professor Greenway attempted to free her hair from the scanning device but it was caught on the chain that held the silver star around her neck. He lifted the chain, pulling the silver star into view. “Oh my,” he whispered, sucking in his breath. He dropped the chain as if it were going to bite him, and his demeanor changed so that he was even more all-business than before. “This will take a while, so relax. Go to sleep. It will be over when you wake. I have other important things to attend to, and I must go. A lab tech will remove the apparatus and send you on your way when the test is complete.”

“How long?” asked Jayne.

“I don’t have time to answer your silly questions,” he snapped back at her. He glanced back at the star hanging in full view on Jayne’s chest. Jayne saw fear in his eyes. “I must go.” He turned and left the room.

Jayne reached up, grasping the silver star between her fingers. It seemed to grow warmer in her hand. Closing her eyes, she soon drifted off to sleep.

She didn’t dream, but woke suddenly. Opening her eyes, she found herself alone in the now dimly lit lab. Her head was pounding; her stomach was growling and she needed to pee very badly. The devices on her forehead were humming and occasionally moved. Jayne tried to sit up, but quickly realized that she was restrained with metal clamps at her wrists, elbows, knees, ankles, neck and head. She couldn’t move even if she tried.

Suddenly, a blue flashing light filled the dim room, followed by a warning klaxon. Jayne was starting to panic, but just as suddenly, the

flashing lights and alarm stopped. A woman, wearing a white coat with a stethoscope around her neck, entered the lab and smiled at her.

“I guess you’re done. I’ll get you out of those restraints. Sorry, I usually have them off before the patient wakes up, but when I checked you after two hours you weren’t finished,” she said to Jayne.

“I have to go to the bathroom very badly,” said Jayne.

“Won’t be a moment,” the woman said, undoing the clamps, and gesturing at a door. “The bathroom is through there.”

Jayne went quickly to the bathroom and, when she returned, she found the woman putting the strap and scanning devices away in a cabinet. “How long have I been here?” she asked.

“Let’s see,” the woman said, looking at the VID, “a little over six hours. That’s odd. That’s really long for this test. It usually takes less than two hours.”

“I’ve been here for six hours!” exclaimed Jayne incredulously. “I feels like only a few minutes have passed, except for the fact that I’m starving.”

“Yeah, this test can be like that. You can go now,” said the woman, walking to the door. “I have to close up the lab.”

Jayne followed and quickly found herself alone in the hallway. She was a little disoriented and her stomach was growling. She looked down at the floor, but found no green directional arrow to show her the way. She walked a dozen steps to her left, but found nothing that resembled the entrance to the PUT pads.

There was a different sort of door in front of her. There was a small window in the door just above her head and a hand scanlock just below the window. She placed her hand on the lock. Nothing happened. She jumped up, trying to see through the window, in an effort to see if this was the PUT pad room. A series of fleeting glances, from repeatedly jumping up and looking through the small window, only revealed a dark room with more chairs like the one she used for her connectome scan. These chairs were different only in that the straps

and steel bands were already attached to the chairs. Jayne guessed they were designed to keep the occupant prisoner. She shivered.

On her fifth jump, a voice boomed out behind her. “Who are you and what are you doing?”

She turned to see a security guard standing at the other end of the hall.

“I’m just looking for the PUT pad room. I just came from Professor Greenway’s lab, and there are no arrows to show me where to go.”

“Well, it’s not that way. It’s right down there,” he said, pointing at a door at the other end of the long hallway.

“Thanks,” she said and she walked down the hall, past the guard and onto a PUT pad. A moment later she was at her own door which opened as soon as she approached it.

“Come in, Thirteen. I have made you something to eat. There is an analgesic for your headache on the table.”

“How did you know?” asked Jayne.

“I know how grueling a first day in Practical TEM can be,” Lucky replied.

“But I...” she started to reply but stopped. For some reason, she felt that keeping a few secrets from Lucky wouldn’t be a bad thing. “Yes, thank you, it was a tough day.”

“I know—it will get easier. Something to eat and a good sleep will do you wonders,” said Lucky.

Jayne sat and ate, and moments later was fast asleep.



## Secret Heart Cupboards

The development of the Gravity Generator Suppressor (GGS) changed everything. Massive superconducting disks were cooled to just above absolute zero, supported in magnetic fields, and set to spinning at high speed. Any object placed below the spinning superconducting platters would gradually decrease in weight. Gravity's effect on the object was lessened. The opposite would also be true if an object were placed above the spinning disks while the disks were travelling in opposite directions. Gravity's effect on the object would be increased.

The GGS design went through a number of changes. The enormous mass of the disks, and the power required to spin them so they would maintain their magnetic suspension fields, made their practical application difficult, almost impossible. In the next design iteration, a heli-blade-shaped rod of ultra-cooled superconducting material replaced the massive disks. It was spun on a center point in a vacuum, while the pitch of the blade was controlled separately on either side of the center point. An array of these devices, with controlled speed of spin and pitch, could manipulate the force of gravity over a much larger area and to a much greater value. It was as if the device could create dips and bumps in the gravity well created by the planet's mass.

One of the first applications of this technology was the spavator (space elevator). The spavator idea was conceived in the 1950s, but was found to be impractical and unsafe, given the strength of Earth's gravity in relation to the strength-to-density ratio of known materials. However, when carbon nanotube interlaced graphene ribbons were developed, in conjunction with GGS platforms, the tech became commonplace.

Jayne's Day Two was what everyone else experienced on Day One. She stood with a group of apprentices in front of the journeyman in charge of their training. She assured him she could catch up on the safety protocols that had been introduced on the first day and, if she was unsure of anything, she would ask for clarification. Today would be spent learning to perform basic maintenance at the base of the spavator.

Despite the fact that Joseph was in the same group as Jayne, he never spoke to her or even looked her way. This irritated Jayne a great deal and she decided to give him a dose of his own medicine. She would pretend he didn't exist. Even so, a part of her wished she could talk to him about the luck testing and connectome scan she endured and see what he thought about it all.

"You will work in pairs to complete specific tasks that will be sent to your VID. Collect your tool pack from stores and report to the spavator undercarriage. Once there, the VID will provide further instructions," said the journeyman fixer. "If you remember what you were taught, this will be a breeze."

He started to call out the names and numbers of those that were partnered together. Jayne stopped listening, thinking instead of Joseph trying to fit his big feet on the PUT pad and that thought led to the memory of the day he followed her and waited for her in the hallway. She smiled.

She heard 'Kane 37' being called, followed by 'Riley 23', and glanced up as Joseph and Riley headed to the stores to collect their tool packs. He wouldn't be working with her today. She felt a twinge of disappointment and wondered again why he was required to follow her around on that first day.

Finally, the instructor said, "Wu 13," followed by nothing. "Well, I guess you get to work with me," he said.

Jayne nodded. The instructor looked at her more closely, seeming puzzled by her appearance, finally motioning her toward the stores and saying, "Get your tool pack, 13, and meet me back here in five."

A heartbeat after Jayne turned to walk away she heard the instructor mutter, “Boy, she’s a young one.”

Jayne headed to the stores. She waved her VID in front of the scanlock, hearing an answering click as a small door opened in the drop bin. She reached in and grabbed her tool pack. Slipping it over her shoulders and heading back to the marshaling area, she discovered that everyone else was gone. She waited for 10 minutes for her instructor to show up, growing more and more annoyed. She was about to take off the heavy pack and sit down, when he finally arrived.

“Sorry. I got delayed. Some strange problem with the ID scanner at the spavator intake port. One minute it wouldn’t let anything through and the next it let in everything,” he said, shaking his head. “Follow me.”

They headed toward the hall, but stopped before exiting the room. “Well, where are we going?” he asked, looking pointedly at Jayne.

Jayne looked at him, puzzled, as he looked back querulously. “Oh!” Jayne said, finally realizing that she was responsible for the assignment. She looked at her VID and said, “This way.”

There was no green arrow to direct her, but the VID screen displayed a map with a simple ‘You Are Here’ flashing red dot on the screen. With Jayne leading the way, they soon found themselves in a narrow hallway with a curved wall of test contact points.

Thinking back to her training, she surmised that she would need to check each pair for degradation. Each strand of spavator cable led up to the geosynchronous tether point 100,000 km straight up. There were a series of seven colored diode lights at the base of each set of test points. These series indicated which tests she should perform. Jayne recognized the codes and quickly opened her tool pack, applied the lockout tie, removed the test core and connected it to the contact point. The diode’s colors changed.

“This one has three months left before failure. It will need to be replaced in two,” she said. “I will record this and order retesting in one month.” She removed the lockout tie.

She turned to look at the instructor, waiting for his approval.

Before he could say anything, his VID beeped and flashed red. “What now?” he exclaimed. He looked down at the terminal, frowning. “I have to go. I’m sure you can handle this task. As you can see, there is lots of work to be done here.” He gestured toward the blocks of shining colored diodes disappearing down the long room that curved slowly to the right. “If you need me, don’t.”

“Don’t what?” she asked naively.

“Need me. Or call me. Get done what you can and report to staging at 16:00. By the looks of this,” he gestured toward his VID, “I will be busy. Have a good day.” He left the way they came.

Jayne shrugged. She was used to being alone; it didn’t bother her. She went back to work.

After a few hours Jayne paused briefly for a food and water break. Not having anything else to do she returned to work. Stepping up to the next panel, she paused as she realized that the long room in which she was working curved in a circle, but never seemed to bring her back to the beginning. She assumed that she would end up back where she started, but the small marks that she put on the wall next to each panel never reappeared.

“It must be a spiral,” she whispered, and smiled. “I must be traveling in a spiral.” And she noted a gradual incline in the floor that she had not noticed before.

Trying to visualize the diagrams she studied of the base of the standard spavator, she realized that all of the connections between the carbon and silicon nanotubes spiraled up to a main cable. There was a great deal of redundancy in the design to prevent catastrophic failure of the spavator.

She looked down at her VID. She still had 10 minutes of personal time left before she was required to get back to work. Noticing that her legs were starting to cramp from the continuous standing and crouching, Jayne decided that she could use some exercise.

She started to run up the spiral. The size of the circles decreased and the slope of the floor increased the further she ran. As she climbed, the LEDs on her left blurred. Suddenly the hall ended in a

circular room five metres across. She'd arrived in what she assumed was the core room. She noticed the core cable sitting in front of her, encased in clear plastic that morphed down into what she assumed was a GS (Gravity Suppressor) device. She'd learned that the GS would be found in this kind of super-cooled casing. Across the room, she noticed a door with a small window. There was a scanlock beside the door. Keeping her back to the wall, she circled the room. Halfway around, she stopped at the door. She turned to face the door just as her VID beeped. There were three minutes of personal time remaining. She would have to hurry if she were to start work on time. It wouldn't look good on her record if she started late.

Curious about where this oddly-placed door might lead, she placed her hand on the scanlock. Nothing happened. She jumped up to see through the small window, but could see nothing in the darkness that blanketed the other side of the door.

She jumped up again, trying to peer through the window. She felt the silver star pendant bounce out from beneath her jumpsuit and flash in front of the scanlock. As her feet touched the ground, she heard a definite click. She did not make any connection between the click of the lock and the silver star around her neck. Her eyes widened as the door slid open.

"Beep! Beep!" went her VID. Two minutes left.

Deciding that she could explore for just one more minute, Jayne stepped inside. A light came on as soon as she crossed the threshold. She looked around. She found herself inside a small storage room whose only feature was six recessed niches in the wall, each covered by a glass door. Most of them were empty, but she was intrigued when she saw that one contained a white plastic box. Feeling like she was moving in slow motion, Jayne reached up and opened the lone occupied cupboard. A cloud of cool water vapor rolled out in a white wave as Jayne removed the box. She set it down to examine it.

It didn't seem to have a lock or latch of any kind, so she proceeded to lift the lid. The back of the lid featured a stylized image of a human heart. Another box was nestled inside the first. It was securely

sealed with a strap that read ‘Human Organs—Open For Immediate Transplant Only.’

“Beep! Beep! Beep!” went her VID. Jayne’s heart pounded in her chest. She was out of time, but she was still struggling to make sense of what she found. Why would a human organ be stored here, at the base of a spavator?

With no time left to spend on this mystery, Jayne quickly closed the white box, placed it back in the cupboard and closed the door. She stepped out of the small room, hearing the door close behind her and moved as quickly as possible back to her work.

Her mind, however, continued to stray from the task at hand. The image of the heart wouldn’t be banished from her mind.

As she worked, she realized she was re-approaching the room containing the human organ. “Maybe the box was empty,” she thought. “Maybe that’s where they store empty boxes.”

After all, she hadn’t seen an actual heart inside the box. All she saw was another box inside the organ container. It was probably empty. But she could still see the seal, vividly, as if it were in front of her, and it was unbroken.

At the sound of approaching footsteps, Jayne turned to see her instructor. He watched her work for a few moments before speaking. “Wow! You’re quite the worker.” He glanced down at her tool pack. “You’re nearly out of lockout ties. We’re really close to a satellite supply room. Come, let me show you.”

He began to walk up the spiral toward the core room, continuing to talk once he saw that she was following. “You look like you could use a break. The core is only a few loops of hallway ahead.”

They walked into the core room. The instructor moved assuredly to the door on the far side and stood waiting. Jayne came slowly behind, not knowing what to expect. There were only refrigeration cupboards in that room, one of which contained an organ box with a heart inside. She shivered.

“It will open if you place your hand on the scanner. I entered your palm into the system just before I returned,” he said, gesturing to the

scanlock, “but I really didn’t think you would work fast enough to need more lockout ties.”

Jayne hesitantly placed her palm on the scanlock. She heard a click and the door opened. She looked up and was shocked to find a small room with a wall lined with small containers fitted with thumb locks. The refrigeration cupboards were gone. Confused, she looked blankly at the instructor.

He smiled, not noticing her bewilderment, and pointed to the lockout ties in one container.

“Put your thumb on the thumb lock,” he said.

Jayne pressed her thumb to the pad, her mind still whirling with questions about the changes in the room, and barely noticed as the container opened. Numbly, she removed a package of ties and stared up at her instructor for a moment before she allowed her eyes to search the room in an effort to determine how it could have changed. She wondered if her instructor knew about the true nature of the room. He didn’t act as if he had any idea about what Jayne had previously seen. She was even beginning to doubt the existence of the first room herself.

“These storage rooms usually have all the supplies you’ll need,” he said, as they walked back toward her tool pack, still sitting at the base of the wall where she’d left it. “I’ll help you finish this fiber analysis. Tomorrow we’ll add to your education.”

They started to work together on the testing. After an hour, they were nearing completion when a worker approached from below. He was carrying an empty backpack and his work helmet was tipped down, concealing most of his face. He signaled with his hand and mumbled, “Need some supplies,” as he passed. Jayne noticed a chain on his left wrist with a dangling star—a silver star just like the one around Jayne’s neck. He seemed to be missing the pinky finger from his left hand, but he was moving so quickly that she couldn’t be certain.

“That’s odd,” muttered Jayne’s instructor. “I thought this area was restricted.”

A few minutes later, the man reappeared. He said nothing as he passed them and, curious to see if she could spot the star bracelet again, Jayne turned to look at him. His pack was fuller than before, and a square object pressed against the fabric. She could clearly see the outline of the carrying case. The corner was sticking out from under the flap. It was white, just like the case she saw in the refrigeration unit—the case she suspected held a human heart.

She sucked in her breath, in wide-eyed shock as she watched the man disappear down the hallway.



## Gravity Ball

The game of GravBall (Gravity Ball) evolved after the Gravity Generator-Suppressor went mainstream. A lot of companies incorporated this technology into their exercise equipment, but its most famous use was in the GravTube (Gravity Tube), so-called because it formed a playing area enclosed in a cylinder of controlled gravity. The game became an integral part of the modern culture worldwide. [See Appendix 1: diagram of the gravity tube and details of the game.]

The rest of Jayne's week consisted of more jobs similar to the first. It lacked the excitement of discovering hearts hidden inside cases in strange rooms that morphed into other rooms and were visited by secretive-looking men with missing fingers and silver stars around their wrists.

The supervisors seemed to take less and less interest in the group of apprentices under their charge. They experienced several problems involving the materials moving up and down the spavator. Packages would appear in an initial count, but wouldn't be listed in the manifests or vice versa. Nothing seemed to come of it since all of the problems were resolved, being dismissed as miscounts or manifest errors. The panic that had overtaken the supervisors at the first occurrence was lessening. As computer error seemed to be the culprit, a recent upgrade was being rolled back in an effort to pinpoint the specific code responsible. This resulted in the apprentices being given some time off.

Jayne woke to the sound of classical music that gradually increased in volume.

“What is the title of the piece?” asked Lucky.

It was a game they played: identify the music and the composer. Jayne quickly learned to recognize much of the music that Lucky chose. This morning, however, wasn’t a good one for Jayne. This was the third morning in a row that left Jayne with nothing to do. She missed going to work—it kept her mind occupied.

As the music played on, continuing to increase in volume, Lucky spoke again, “Get up, Thirteen. I have made you something to eat. You can attempt to identify the music after you have eaten.”

“I’m not hungry and I feel yucky,” moaned Jayne, rolling over and pulling the pillow over her head.

“You do not feel well. Oh dear. I see you have not had a proper physical since you arrived. I will schedule—” started Lucky, but Jayne cut him off.

“Stop. I don’t need a physical. I just feel yucky and I am bored out of my mind,” Jayne wailed.

“Why don’t you go to the gym this morning after you eat?” suggested Lucky.

“Gym? There’s a gym in this place? Why didn’t you tell me earlier?” asked Jayne. She got out of bed. “Where is it?”

“Eat. Your VID will direct you, once you have finished your breakfast,” said Lucky.

Jayne ate, then dressed and was soon on her way to the gym.

“Maybe this day off won’t be so boring after all,” she thought. Apparently she wasn’t the only one to have thought about using the gym this morning. It was packed with apprentices. Some were working on machines, others were playing Gravity Ball in a mini GravTube (one-third regular size) designed for amateur play. The only major differences between this and a normal tube were the size and lack of cameras. There were also only three rows of seating for those who wanted to watch the amateur games.

Jayne’s heart jumped in her chest when she saw the tube. GravBall

was her favorite game. She learned to play when she was a little girl and, though some might say she was *still* a little girl, she knew she could play this game well. In fact she'd discovered that being little and quick was an advantage, especially on the high gravity lines. Her strength-to-weight ratio was often superior to that of many of the bigger players. She could speed up while travelling on a high grav line, and when that line changed to low grav she couldn't be stopped. In low gravity Jayne was able to reach any goal position with a single leap. From there it was a simple matter of slamming the ball home.

Jayne sat and observed from the near-empty viewing area near the center line. There was a 'drop-in' game in progress. She glanced at the clock, noting that the period was nearly over. She noticed Joseph playing, acting as the Ball Carrier (BC) for one of the teams.

The teams weren't using complicated pro scoring. Casual 'drop-in' games scored one point per goal no matter how many players were on each team. A balance was often achieved by balancing the skill of the players.

Jayne watched as Joseph ran down a neutral grav line. She could see how strong he was. A seeker on the grav line to his left told him to move across and he veered left and back, just dodging a knocker. The robo-ref nearly called him for forward progress in space as the area between the lines was called. Then Joseph hit a low grav line. He misjudged his acceleration and went sailing up to the center axle. The axle bumped him with an anti-grav pulse. He lost his balance and went spinning out of control. He hit normal space and plummeted to the ground, but luckily his suit's safety field kicked in and he landed softly.

The robo-ref finally called him for forward motion in space and Joseph was forced to give up the ball to the opposition. Jayne smiled. That was her signature move. She would see a seeker indicate another low grav line on the opposite side of the tube, then she would execute a high leap on the line, followed by an anti grav bump from the center axle, moving down to another low grav line, before flipping

back again until she was in scoring range. If everything went right, she was unstoppable.

Jayne keyed her name into the game panel and it asked for her level of play. She had never played anywhere other than the nursery community tube. She had no idea what level she played. She took a guess and pressed five on a scale that went up to ten.

The computer assigned her to the blue team, which was presently rated four points lower than the red team. She would be their seventh player. According to the computer, she would almost balance the teams. She grabbed the smallest suit and helmet she could find which would provide some protection to her elbows, knees, wrists and shoulders. The helmet fit well on her head, but the suit needed some adjustment. She rolled up the legs and sleeves and cinched in the wide blue waist belt. She knew that she probably looked a little silly, but that might make the other team underestimate her. They would do so at their peril. After she scored a few goals no one would care what she was wearing or how she looked. She waited for the period to end and, once the buzzer sounded and the door opened, she stepped into the grav tube. All gravity would be normal until the game started. Jayne walked over to the blue team as they gathered in the player pit.

She strode up to the group of four guys and two girls. She didn't recognize any of them, but she assumed that they came from some other apprentice group, or maybe they weren't apprentices at all. They were all breathing hard and sipping water as she approached.

"Did you see that big goof mess up an easy run on that low grav line?" a large blonde girl said, laughing.

"I'm your seventh," said Jayne, "I'm supposed to balance the teams. My name is Thirteen."

Everyone stopped and looked at her. "We use names here, not numbers," said one of the guys.

"That *is* my name... and my number. I've been called Thirteen for as long as I can remember, but if you don't like it, just call me Wu, Jayne Wu," she said.

“Have you played this game before, Wu 13?” asked a small boy, who was sitting near the end of the bench. He stood, and Jayne noticed that he wasn’t much taller than she was. She realized after a moment that she was staring, for he was shaved completely bald except for a small horse tail sticking up from the top of his head. He had even cut a hole in his helmet to allow the hair to remain upright and visible.

“I’ve played a little,” she finally replied, “and you can just call me Thirteen. What are your names?”

The boy with the horse tail sticking out of the top of his head spoke first. “We all have GravBall names.” He pointed at each of the team members as he named them off. “That’s Busy Izzy, Jumper, Cannon Ball, Eye Spy, Pinky and I’m Spike. The next game will start in a few. What position do you like?”

There were seldom set positions in drop-in GravBall so everyone generally played a bit in each of them. The BC would have to run the ball down the lines and try to score, while the knockers could choose to play defensively or offensively. Depending on the team strategy, they would either guard the grav lines, trying to knock either the BC or the ball off the lines, or they would guard the BC and bump defensive knockers off the line. Seekers were in charge of communicating whether the grav lines were running high or low gravity, using coded gestures to tell the BC the best line to use. The trailer, as the name suggested, would play behind the BC, always ready to receive the pass back. Every player needed to be familiar with every position.

“Whatever,” said Jayne offhandedly. “What are the signals?”

“We are signal minimalists, meaning that we keep our signals simple. Thumbs up means a low grav line and thumbs down means a high grav line. The further you move your thumb back and forth, the more the line wiggles. A still hand means a straight line. Opening and closing your hand means a pulsar. If you signal with your other thumb up, then the line is moving towards the goal; thumb down means it’s moving away,” Spike said, opening and closing his right hand like a claw with his left thumb switching from up to down.

“Wow, this tube has pulsar tech! That’s cool,” said Jayne. A pulsar line could send high and low gravity pulses down the line. Running in a low gravity pulse moving towards the goal would make an offensive player almost unstoppable.

“I’ll start as a knocker,” said Jayne.

“You and Pinky play back knockers and we’ll play the front when we are on defense. On offence, it’s all open,” said Spike. A buzzer sounded. “Let’s go!” he said, thrusting his fist in front of him.

The other team members placed their fists on top of his and, as one, the team shouted, “Score!”

As she ran out into the tube and took her position, Jayne glanced over at Joseph. He looked a little surprised to see her and raised his eyebrows in a mock salute.

Spike noticed their interaction and glanced back at Jayne. “You know Big Foot?” he asked.

Jayne shrugged, just as the ball popped out between Joseph and Spike. Joseph reached out and flipped the ball back to their BC who was already standing on a low grav line off to the left. The BC started running, glancing to the right at one of his seekers. Jayne saw the seeker give a wavy motion with his thumb up and assumed it meant that the line was low grav but not straight. Running it would be difficult. If a player jumped up too high, they could fly right over normal space or, even worse, into a high grav line. Falling like that could hurt, even with an anti-grav protection suit.

The opposition’s BC glanced left, seeing his seeker raising and lowering his arm, hand edge up. There must be a low grav line running straight to the goal. He took the new line, just as Jayne moved to knock him aside. Anticipating that the BC would jump, Jayne jumped toward him, expecting to meet him in the air and hoping to knock the ball out of his hands. Unfortunately, she misjudged. The BC did not jump but instead ran right under her, then jumped for the goal located halfway up the wall. The ball disappeared and the score light turned red.

Jayne watched as it flashed from red to amber and finally to green,

and waited for the ball to spit back out of one of the four holes on the center line.

“Tough one, Thirteen,” yelled Spike, just as the ball popped out right in front of Cannon Ball. Cannon Ball passed it over to Jumper as Jayne ran a zigzag pattern through the grav lines, trying to determine what was what. She discovered what she thought was a straight low grav line and signaled to the BC. Jumper ignored her, continuing to run from line to line, avoiding all of the other team’s knockers, while watching Eye Spy, who took up position about 20 metres from the goal inside of normal space. (Jumper liked twin high grav lines, especially when the knockers were closing in on him. He would snake through them. Anyone that tried to follow would be bogged down the moment they hit high grav. But his legs were like posts. Jayne found out later that Jumper could not jump, even in low grav.) Suddenly Ispy ran behind him, became the trailer, got the ball, ran down the low grav line, jumped and scored.

Jayne clapped her hands and cheered, then took her place as the right back knocker. Pinky stood to her left, Busy Izzy was playing the mid, and Cannon Ball, Jumper, Ispy and Spike were playing the line. The ball popped into the air, hit a wavy low grav line, and sailed straight up. The ball crossed through a high grav line and careened straight down at Jayne. Grav balls were not designed to bounce so it landed with a thud, rolling to a stop at her feet. She picked it up, feeling like she was deep in the zone as Pinky moved behind her, into trailer position.

Jayne looked around at her teammates for a signal of where to go. All she saw were thumbs pointing down. She started to run to her right, but she hit one high grav line after another. Some of them were so strong that she could barely cross them. She needed to find a low grav line soon or the opponent’s knockers would be on top of her. Looking up, she saw Joseph bearing down on her, his big feet flapping against the floor. Trying to avoid him, she ran up the curve of the wall. The 30 degree mark was the highest level that a grav line could run. Now she could see her seekers sending warnings. She would hit a

reverse pulsar in one more step that would take her in the wrong direction and Ispy was signaling that there was a straight low grav line on the far left, but it was too far away to reach from the 30 degree line on her right. Jayne had no plan. There was no time to plan. She didn't have enough information to form a plan.

With no time to think, she just reacted, trusting in her luck. Jayne always trusted her luck and part of her knew that today would be no different. Luck was her friend.

Smiling to herself, she started to run towards her own team's goal. She heard Spike shout, "Thirteen, what are you doing? Pass it off."

But there was no one to pass to. She no longer had a trailer. Pinky was now in front of her.

Jayne jumped into the reverse pulsar, catching a low grav pulse heading right toward her own goal. She jumped again in the low grav, sailing up to the center line. Arching her back like an old fashioned high jumper, she felt herself bumped upwards by the anti-grav field on the center line. She rolled over, moving into the low grav line on the left which sent her dropping straight down the line to the floor. She glanced to her right, seeing that all of the opponent's knockers were on the right side, leaving her with a clear line down to the goal. Even if she walked, they couldn't catch her before she scored. The goal was high up and stable, and Jayne decided to show off. Running down the low grav, she hopped, skipped, jumped, did a somersault in mid-air and scored. She pushed off the wall into another somersault and landed near the tube center in the low grav line.

Jayne turned to her teammates with a smile on her face as they ran toward her.

"That was fracking fantastic," shouted Pinky, slapping Jayne on the back.

"And stupidly dangerous," said Spike, "but very cool to watch."

The rest of the team agreed and congratulated her.

A moment later everything stopped. The hum of equipment and grav field generators halted. The lights dimmed and the doors to the gym clicked and locked.

A computer voice droned over the PA. “HUB 169 is in lockdown. Please sit on the floor and wait for further instructions.” The message continued to repeat, stopping suddenly when the last person sank to the floor.

One person decided to stand up, for whatever reason, and the droning computer voice started again. After a few similar episodes, everyone was so sick of hearing the announcement that they resigned themselves to the situation and sat and waited. And waited.

## CHAPTER 11



# Lockdown

The biomes were constructed in orbit. Given their size and complexity, there was no practical way they could have been built on Earth and still function as ships that could travel to the stars. The spavators allowed materials to be transported into orbit without the great expense of chemically-powered rockets. Each transport was tightly controlled and monitored. Nothing could be transported to or from the biomes without being subjected to extremely high levels of security. The scientists constantly worried about contamination. This led to the microscopic inspection of anything that entered a biome to ensure that nothing would upset the delicate ecological balance they'd designed. Shipments coming out of the biomes were less stringently checked. This weakness in security protocol opened up a black market in biome materials, some of which were no longer available to the general population back on Earth.

**B**oth teams drifted to the center line of the grav tube. They sat in a circle; Joseph sat directly across from Jayne. He sprawled out until he was practically lying down. As she looked at him, Joseph smiled wickedly at her, wiggling his fingers in her direction.

Annoyed, Jayne turned away, glancing around to see if any of the others saw Joseph's finger wiggle. Before she could sigh in relief that none of the others saw that smile and wave, she made eye contact with Spike, who was sitting beside her. He fixed her with a 'what's that all about?' glance and Jayne felt her face flush. She put her hand to her forehead to hide her eyes, looking down at her feet, noticing how they stuck out of the oversized uniform. She kept her eyes

down, intending to hide until she was sure that her face no longer advertised her embarrassment, but looked up as a new announcement broke the silence.

“All GravBall players, please exit the tube, remove your suits and prepare for a detailed inspection!” a new voice ordered.

Jayne and the other players exited the tube, removed their suits, and sat on the benches to await their next orders. Jayne was the only one who seemed to notice a quiet boy from the red team taking a detour, walking back to the suit lockers, and placing something into one of the empty lockers.

Suddenly, the gym door opened and a security team entered pushing a large cart full of sensor equipment and a portable body scanner. Each of the GravBall players was first checked using a handheld device, then directed to enter the body scanner, which resembled a giant bell jar with a sliding door.

Inside the scanner, a whirlwind of air was directed around the subject then sucked back through a filter. Any resulting material was collected and analyzed. A light on the front panel would turn green if nothing significant was found. The panel displayed only green lights as Jayne waited for her turn. She noticed that the quiet boy from the red team seemed nervous, continuously glancing at the security techs who were scanning the lockers. A tech stopped as the light on her scanner turned red. She reached into the locker, removing a small gravity metre. She carried it over to the senior security tech.

“Tisk tisk,” he said, a satisfied grin appearing on his face as he inspected the device. “What kind of GravBall player needs a grav metre in the tube? Not a very good one, I would say. So, which one of you is going to own up to it? This isn’t what we were looking for, but it’s still a serious offense. All of you nubes should be well aware that this is a restricted device. Obviously, one of you was trying to get an advantage in the game by checking the grav lines.” He held the grav metre aloft. “Now which one of you was it?”

He scanned the row of players, stopping in front of Jayne. He sneered at her. “You look like you could barely lift the ball, much less

run with it. Did you think this would even out the playing field so you could show off your nonexistent skills to your friends?”

He turned to Spike. “What about you, pony-tail boy, how did you get this out of stores?”

Spike stood indignantly. “I don’t need a stupid metre to read a grav line.”

“No, I guess you don’t, but it might be worth something on the black market. What could a kid like you be looking for? Maybe you planned to sell it for some hubtokes. What would you need cash for? Maybe a haircut!” he sneered, shoving Spike back onto the bench. “Sit down, pony-tail boy.”

He turned to Joseph, who was staring at the floor. “Whatcha looking at, son? Them’s some mighty big feet you got there. Have a little trouble movin’ them down a high grav line? Needed a little help figurin’ which line was low? You know what they say about big feet....”

Joseph didn’t move. He didn’t even look up.

The senior security tech turned to the other tech and chuckled. “You know what they say, Nora?”

“Yeah,” Nora answered, “isn’t it *Big Feet, Small....*”

“Ha! I think the word you’re looking for is *brain*,” laughed one of the other techs.

“Small something for sure,” the senior security tech laughed, slapping his leg. “Did you steal this out of stores?” He tossed the small metre into the air, caught it with one hand and looked at it pensively. “No, I guess you didn’t. You’d need some brains to pull that off,” he said, turning away from the group.

“Well, I know one of you babies took it, and I want you to remember that I’m watching all of you.” He turned and scanned the group of players in front of him. “And, just so we’re clear, I couldn’t care less about this.” He dropped the metre on the floor and stomped on it, crushing it under his foot. “What I care about is *how*. How did one of you little pukers get this past the scanners? Until I find that out, you are all under my microscope. Just so we’re clear, that’s a very unpleasant place to be.”

There was an uncomfortable silence as Jayne and the others took their turns in the large body scanner. The technicians seemed disappointed as they were cleared, one-by-one. They finally dismissed the group with nothing more than a warning that their investigation would continue until they discovered how material was being transported past the scanners.

A short time later, Jayne breathed a sigh of relief as she arrived back at her quarters. She was greeted by Lucky.

“Everyone is under lockdown,” said Lucky.

“I know,” said Jayne, “do you know why?”

“There has been a serious security breach. A series of biologicals have been removed from one of the biomes. I will check for more up-to-date data.” There was an almost imperceptible pause before Lucky resumed. “Yes, security was looking for some rodent DNA from a jungle biome. Each biome has a unique nucleotide marker inserted into the DNA of all biologicals. This is done to prevent cross-contamination between biomes. The filters at each biome are programmed to prevent the entrance of any foreign biome DNA. Security is currently searching for whomever is responsible for the theft, not only to recover the stolen property, but also to determine how the perpetrators were able to bypass security. They are also trying to determine the motive behind the choice of these particular rodents. Thus far, they have been unsuccessful. The lockdown will continue until biome security is restored to 100%. That may take a while. Would you like to play the Guess the Music game to pass the time?” asked Lucky.

“No game, just music,” said Jayne. “I’m a little tired from playing GravBall. I want to sleep. Wake me if something happens.”

She crawled into bed and soon drifted off to sleep. Music played softly in the background. She dreamed of Joseph and Spike and the quiet boy who had stolen the gravity metre.

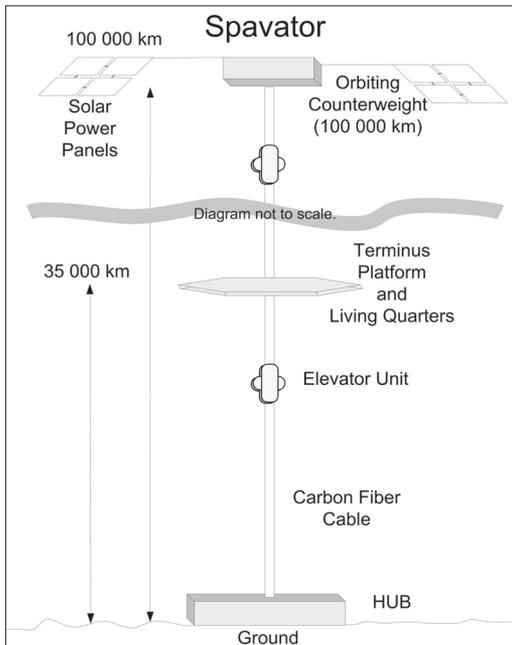
CHAPTER 12



# Hi Ho, Hi Ho

The spavator systems were the first step to creating the biomes. These space elevators, often described as the tallest man-made structures on the planet, were critical to the development and construction of the biome ships.

The HUBs were built around the base of each spavator and served several purposes: maintain the spavator; serve as a depot for transport of materials into orbit; house the myriad of fixers that worked to create and maintain the systems; and provide laboratory space for the scientists to develop the tech required for such a massive undertaking.



The lockdown finally ended. It still wasn't clear whether anyone was apprehended for the rodent theft. It became a running joke. The apprentices took great joy in calling each other Rodent Thief, Rat Man, or Mouse Marauder.

At lunch on the day after the lockdown, someone asked Jayne if she were saving carrot sticks for her pet rats just because she was eating a salad. This was said only half in jest: it seemed like everyone was a suspect.

Rumor circulated that nothing had actually been stolen. The theory was that a computer glitch or a test of the security system was the real reason for the lockdown. After all, who would want to smuggle rats out of a biome? What possible motive could anyone have for stealing rats? If you wanted a rat, there were plenty of legal ways to obtain one.

Jayne mulled over the strange situation as she munched on her salad. Yes, why would anyone steal rats? An idea began to form in her mind as she chewed; what if these rats were somehow different than other rats? Her brain quickly filled in the blank. These rats would have been implanted with special biome markers.

But why rats? Jayne straightened in her seat as her mind whirled through the possibilities. Rats reproduced quickly, which was the main reason they were used in research. Reproducing rats meant reproducing biome markers. Having a steady supply of biome markers would enable someone to move anything in or out of the biomes without alerting security. The scanners on the spavator would ignore anything with the correct biome markers. She pictured the white box with the picture of a human heart on the outside, and her own heart began to beat faster. Had that box contained a heart from one of the biomes? Whose heart was it? How had it been removed? Where had the man with the missing finger taken it and why? Who would want or need a heart anyway? Would a transplant recipient want a heart from an omie? She shook her head. She had too many questions and not enough information. She would have to ask Lucky later.

Jayne stood up and was about to leave when Joseph stepped in

front of her. “How are you squeaking, Mini Mouse Girl?” he asked and he squeaked a couple of times for effect. “Have any other boys been assigned to follow you around?”

“No, only you. I just realized that you must feel so special. What a pleasure it must have been, to follow me around, waiting for me while I did important stuff,” she sneered.

“Well, Mini Mouse Girl, things have changed. I got some very special orders today that you’re not going to like. In fact, you’re going to hate them ’cause you’re going for a little....” He paused as his VID began to beep loudly. He took it out, looked at the screen briefly, and quickly put it away. He turned his back to her, still speaking. “This afternoon, you get to follow me. Get used to looking at this,” he said, sticking his bum out at her.

Jayne didn’t respond. She just opened her VID to check the afternoon’s assignment. It read: Kane 37 and Wu 13 report to Section Sub D Levels 1 and Level 2 by way of the PUT pads in the East Rotunda.

“We’re just working together,” she snorted. “I’m not following you. In fact, I suspect that it’ll be the other way around once we get our assignment.”

“Nice try, Mouse Girl, but I just figured out where Section Sub D is located. It’s at the base of the spavator. We have clean-up duty,” he said. “We were shown that area on the first day. The day you were somewhere else. The day you missed all the rules about what to do and what not to do. There were a couple of second-year apprentices cleaning up and they did not look happy. You will have to follow my orders so be prepared to get dirty.”

He walked away and Jayne hurried after.

“You wish!” Jayne retorted. She slowed down, intending to show him that she wasn’t about to let him take charge. After a moment, she realized that she couldn’t see Joseph anymore, so she sped up and was relieved when she found him standing in the rotunda. He was looking back and forth between his VID and the room.

Finally he spotted Jayne. “Come on, Wu, I don’t want to be late. There will be no spots on my record. I plan to make foreman in three

years. It was bad enough playing a game of GravBall with some kid that stole a grav metre. Guilt by association is sometimes worse than true guilt. You can't even defend against it."

"Stupidity by association is even worse," she muttered quietly.

They both stepped on the PUT pad. Jayne sneered at Joseph, watching him trying to arrange himself onto the pad. "Now, Joey, make sure you tuck in those feet."

A moment later they found themselves inside a small equipment room at the base of the spavator. They grabbed some dust masks and vacuums and proceeded to Section Sub D Level 1. The room was large and circular. It was the terminus of the spavator cable. At this initial point the fibers did not form a single cable as they did further up.

Each fiber bundle joined together and entered the ceiling at the edge of the room, travelled down the wall and fanned out in lines, with each successive fiber bundle reaching further and further into the room and disappearing into the floor. Under the floor, they connected to the GS array. It was designed so that a failure on any given line could not cascade. It was over built. Even a failure of 20% of the lines would have little effect on the overall spavator performance.

As they entered the room, Jayne felt the electricity in the air. Her hair began to stand up and out in all directions, but she was annoyed to see that the static had little effect on Joseph's buzz cut. They reached down to their boots simultaneously, exposing the ground plate in their shoes to the floor. Jayne's hair dropped as the static went to ground. The massive amount of static electricity was a by-product of the GS array. Like a giant precipitator, it attracted any particulates in the air, creating a coat of grunge that would quickly build up if left alone. That was their first job of the day—clean all of the dust and dirt off the fiber contacts with high-powered vacuums.

"I'll tell you what," said Jayne smiling, "you go that way and I'll go this way and we will meet in the middle. That way we can work together without working together. It's a win-win."

"Sounds good to me," said Joseph.

The job was pretty simple. The vacuum head fit perfectly over each fiber connection point, sucking away the dust and dirt in seconds. It took them a little more than an hour to finish the dusting.

“This didn’t take as long as I thought, but we still have Level 2 to complete. It’s pretty bad down there,” said Joseph.

Jayne looked at her VID, calling up the map of the spavator. “That’s where the line-vacs terminate. The small ones ascend to 15 kilometres. As they descend they remove dirt and moisture, and reduce the weight on the cable. The larger line-vacs transport the dirt to Level 2. Most of it gets taken away on the conveyors, but a lot finds its way to the floor.” She looked up at Joseph. “I guess that’s our job today.”

They returned to the equipment room to collect the tools they needed. Carrying the large flat shovels, Jayne and Joseph trudged down the long set of stairs to Level 2 and entered a dark room. As Joseph stepped forward, the lights came on. Jayne looked back and forth, examining the long narrow room with high ceilings. A conveyer belt ran the full length of the room along the far wall. Between the conveyer and a monorail that ran parallel to it, Jayne recognized the focus of their current job. A lot of dirt and debris was strewn beside and around the monorail and in front of the conveyer belt.

“According to this,” she said, holding up her VID, “we’ll have to shovel—yes, you heard me right—shovel the garbage onto the conveyer so it can be removed.” She held her hand over her nose. “Yech, it stinks in here. I don’t believe it. I joined TEM to become a journeyman tech and here I am shoveling sh—.”

A loud klaxon horn sounded, cutting off her last word. A line-vac rolled down the monorail and slowly tipped forward, dumping its contents onto the conveyer belt. Most of the debris made it to the belt but some inevitably missed, resulting in the collection spread all along the floor at the edge of the conveyer. Righting itself, the line-vac continued on its way, exiting the room at the other end. The klaxon silenced as it exited.

“I didn’t think they were that big,” said Jayne. “It must hold three or four cubic metres of debris.”

“Only the ones at the lower end are that big. They collect what the smaller ones clean from higher up and dump it here. The conveyor takes it away to be processed. The majority is line dirt and vegetation. There’s even some algae that grows one to two kilometres up,” stated Joseph.

“Boy, aren’t we the expert,” she retorted sarcastically. “Let’s get this done. It really stinks in here.”

Moving to the edge of the conveyor belt, Jayne started shoveling. Joseph joined her and soon they’d cleared a small section of floor. The belt continued to run quickly past them, carrying the material away to places unknown. Jayne was leaning on her shovel when the klaxon sounded again. They both stepped back from the monorail and waited. A line-vac appeared, tipped, emptied its contents on the belt and returned to its upright position. It clanked as it continued down the line, dragging spillage along the floor and disappearing as it exited at the far end of the room. Jayne looked at the mess left behind and groaned. The entire area they’d cleared was, once again, littered with cable trash and rotting vegetation.

“You’d think they could have designed these things to be more accurate when they dump on the belt. Now we have to go back and clean that whole area again,” she said, indicating the fresh pile on the floor.

“It won’t take a sec to clear,” said Joseph, stepping over to push it all onto the moving belt.

Just as he finished, his VID beeped. He stopped and checked it. “That’s weird,” he said. “It wants us to stand right...” he moved to the center of the room, “... over... here.” He stopped and looked over at Jayne who was still standing, leaning on her shovel. “It said *both* of us. Get over here!”

“Since when do I have to do what your VID says? If I was supposed to move over there my VID would have—” she stopped in

mid-sentence as her VID beeped. “Damn!” she said, moving to stand beside Joseph without even checking her VID.

He took her shovel, threw it down, grabbed her by the arm, spun her around so she was facing away from him and said, “Well, would you look at that.” Joseph shifted so that he was now holding her by the shoulders. Jayne was too startled to move. No klaxon sounded, but a line-vac entered on the monorail, stopping in front of Jayne. Instead of tipping trash on the moving belt, a door on the back of the line-vac slid upward. Jayne could see a clean interior with padding on all of the inner surfaces. Any curiosity as to why the inside of a line-vac would be clean and padded was cut short—quickly and roughly.

Jayne staggered as she felt a very unexpected shove from behind, propelling her inside the line-vac. She didn’t even have time to raise her arms before she face planted into the far padded wall, hitting hard. The door closed behind her and she found herself enveloped in darkness. As the line-vac began to move, Jayne could hear it clanking along the monorail and out of Section Sub D Level 2. Her hands went to her face, trying to alleviate the stinging pain of the collision with the wall. Her nose hurt and a tear slid down her cheek. She wiped it away as she bit her lip. She heard a voice call out, “Sorry Wu u u u,” then there was a hiss. Jayne smelled something strange and then she felt nothing at all.

## CHAPTER 13



# Captured!

The biomes became the incubators for new humans. These new humans were isolated from Earth and the biome habitats were tightly controlled as they were gradually transformed from an Earth-like habitat to an alien-planet habitat. The change was to be gradual, happening over a period of 300 to 800 years, the exact time dependent both on how far away the destination planet was and the degree of mutation that would be required for human survival on that planet. The process of genetic manipulation started as soon as the biomes were inhabited. The changes would occur gradually during the long journey to the new planet over the dozen or so generations it would take to get there.

Jayne opened her eyes, trying to focus slowly on a grey, plaster mottled ceiling. Nausea roiled in her stomach and pain speared her face. Her nose and lip ached. As she sat up quickly, the pounding in her head multiplied a thousand fold. She closed her eyes again and lay back down with a groan. She willed the pain to subside.

It took a few minutes before the pain eased, but when it did she opened her eyes again. She was in a small windowless room with a bed and a bathroom, but nothing else. She slipped out of the bed and stood for a moment, holding onto the edge of the mattress and looking at herself. She was still wearing the clothes she wore when she was cleaning the debris scattered by the line-vacs, but the oversized coveralls were gone. As she attempted to walk toward the bathroom, she hesitated and a wave of dizziness swelled in her head. She stopped and concentrated on keeping her balance. Trying again,

she slowly slid her feet across the floor, gasping as the light in the bathroom came on automatically. She looked at herself in the mirror. Her right eye was blackened and her lip was cut and swollen. She remembered being pushed and hitting the far wall of what looked like a line-vac. She remembered the hiss. Gas. Knockout gas. That's why her head ached. She needed water. She filled the glass and slowly brought it to her mouth. She drank on the left side. Water dribbled from her swollen lip on the right side. The water was cool and she greedily drank it all. She felt better except for the pounding in her head. She turned around and forced herself to focus and dismiss the pain. Her body wanted to slide back to the bed, crawl under the blankets and sleep, but her mind slowly filled with fear. She wanted to escape. She took a step towards the door of the room, but her head started to spin. She lost her balance and fell to the floor, unconscious.

When Jayne regained consciousness she could hear people speaking and quickly realized that she was tucked back into bed. She felt a pinch on the back of her hand.

"An IV tube," she thought, keeping her eyes closed and breathing slowly, feigning sleep as she listened.

"She must have gotten up to get a drink of water. I found a used glass on the bathroom floor. She never made it back to bed. You used too much gas. I warned you about her size. She can't be more than 45 kilos. That much gas made her sick," said a female voice.

"I had to be sure she wouldn't try to escape from the modified line-vac," a male voice responded.

"Who was the idiot that gave her a fat lip and black eye?" she asked.

"One of the nubes. He only joined the cell last month. I've had an eye on him since the day he arrived. He's a big kid, not too bright, but his size might come in handy. We took over his training and can now send him wherever we want. You never know when we might need a big strong kid. He probably doesn't know his own strength and pushed her too hard," he answered.

"Is he the one we've been watching?" she asked.

“Yeah, we’ve been watching and manipulating him to keep an eye on her. We were subtle because *they* have been watching her very closely,” he answered, then paused. “She’s not awake, is she?”

Jayne became increasingly tense as she listened to this strange conversation. She wanted to hear more, so she concentrated on relaxing her body and slowing her breathing. The woman touched her wrist.

“She seems to be sleeping quietly, but I’ll keep her sedated so she’ll sleep off the effects of the gas,” she said.

Jayne heard footsteps as she walked away from the bed.

The man chuckled. “We even made him follow her for the first couple of outings. I knew that *they* would try to do something and I wanted to know what, so I set his floor directions to follow her. But *they* were careful. He never got into the psi testing hall, but I can guess what they discovered. And after a few tests of our own we’ll know too.”

“Didn’t he suspect something was strange?” she asked, as she injected the sedative into Jayne’s IV shunt. As soon as the sedative hit her bloodstream, her consciousness slowly submerged, like slipping into a warm bath. Jayne fought to remain alert, wanting to learn more.

“Not at first, but once we recruited him, we told him about it. He didn’t think it was funny. In fact, he was a little angry,” the man said and Jayne could feel his gaze as he stared down at her. “I sure hope she really isn’t what *they* think she is.”

Jayne struggled to hear more but the drug dragged her down into a dark sleep.



## The Interview

The end of the world was coming. Society changed. Governance changed. Education changed. Family changed. Commerce changed. Entertainment changed. Religion changed. Every world system changed as the planet turned its focus to survival. Survival of the species became the primary driving force for everything and everyone—at least that was the spin.

Jayne woke from a dreamless sleep, her bladder screaming, her stomach growling, and her mouth completely devoid of spit. As she sat up, her head swam, but it soon settled. Looking down, she was relieved to see that the IV was no longer in her arm. All that remained was an empty bag of saline hanging limply from a pole.

Awareness of her body returned and she slid out from under the blanket and slipped quietly out of bed toward the beckoning bathroom. Before she could take her first step, a woman in a lab coat entered the room and strode up to Jayne, grabbing her by the arm.

The woman said nothing, but Jayne was surprised as she was helped into the bathroom and allowed to close the door behind her. The woman was waiting when Jayne emerged and kindly helped Jayne back to the bed. The woman stared at Jayne with an unreadable expression on her face before she finally spoke. “I’ve ordered you something to eat. It will be here in a moment. Are you hungry?”

Jayne nodded, looking furtively around the room. She felt like a cornered cat in need of an escape route. She saw none she could manage—yet.

Taking a tube of ointment out of her coat pocket, the woman

leaned down and dabbed a little on Jayne's lips. Moving efficiently around the room, she picked up a small container with two pills in it and a glass of water and handed them both to Jayne. "Here, take these. They'll make you feel better."

Jayne hesitated and the woman seemed to understand as she spoke again, "They *will* make you feel better. It will help to stop the aching and relieve the swelling."

Jayne reluctantly downed the pills with a small sip of water just as a man carrying a tray of food entered and set up her table. The woman stood and watched Jayne as she ate voraciously, finally realizing how hungry she really was.

"Everything will be back to normal soon," said the woman. "Someone will be in to talk to you shortly." She passed a bundle of clothing to Jayne. "Here are some clean clothes. As soon as you are dressed, press this button and someone will come to escort you to the interview room."

The woman turned and left.

Jayne was alone. She dressed, continuing to scan the room for possible methods of escape. Jayne made sure she was totally aware of her environment—tools, weapons and escape routes. As she dressed and stood up, she scanned the room for cameras. None were in obvious sight but, as she glanced up to where she would have put a camera if she were trying to spy on someone in the room, she spotted a blemish in the wall opposite the bed. "There it is!" she thought.

As she reached down to retrieve a pair of shoes from the floor at the base of the IV stand, she spotted a small needle that someone had carelessly dropped.

Crouching to put on a shoe, she turned her back to the blemish in the wall, reached down, picked up the needle and tucked it into the side of the shoe she was tying. After tying the other shoe she stood, walked over to the door and tried to open it. To her surprise, it wasn't locked and swung open easily.

Jayne poked her head out into the hall, surprised to find a hallway that was warmly decorated and obviously not part of a hospital. A

uniformed man sat across the hall and he stood as soon as he spotted Jayne.

“Jayne Wu?”

She nodded.

He continued politely. “I am to escort you to the interview room. Is there anything I can get you before we go?”

Jayne shook her head. She hadn’t been expecting kindness. As far as she knew, she was a prisoner and captors were not usually subservient to their detainees. She was escorted into the interview room, which was also not what she expected. The decor was warm and inviting. She sat down in a comfortable chair to wait until someone could clarify what was going on. After only a few moments a group of people—two men and a woman—entered the room, holding large VIDs in their hands. Jayne was perplexed as to why they were all standing around the table smiling at her.

As she leapt to her feet, intending to express her indignation at her treatment and detention, one of the men spoke. “Miss Wu, please relax. We are not here to hurt you in any way, and we sincerely apologize for your treatment so far. It was never our intention to cause you harm. The collision in the line-vac...” he paused and pointed to his own eye and lip, “...was an accident. I personally apologize for the overdose of gas. One of our technicians miscalculated your weight, resulting in too much gas. That caused the headache you suffered.”

As Jayne lowered herself back into the chair, her eyes shifted from person to person. They took chairs around the table and continued to smile at her. Jayne pulled both her feet up into the chair and wrapped her arms around her legs. Her index finger felt a slight poke from the needle hidden in her shoe and she was comforted by the knowledge that she wasn’t completely weaponless.

The woman spoke first. “We needed to speak with you privately, and that just wasn’t possible... out there.” She waved her hand vaguely towards the door. “What we are about to say is for your ears only. It will be your choice whether you stay or go. However, if at any time, you do choose to go, we will be forced to administer a compound that

will erase your short-term memory. If that happens, you will wake up in your quarters thinking that you had an accident in Section D Sub Level 2, were treated and sent back to rest. However, if you take the time to hear us out, we are fairly certain you will find what we have to say intriguing and will perhaps choose to join us in our endeavors.”

Jayne nodded, her finger still touching the needle. She tried to think of some way she might get it out quickly if she needed to protect herself.

The woman let out a relieved breath. “Let’s get started. First of all, you need to know that we are just like you. We,” she gestured to the others at the table, “are all fixers. As you well know, the mandate of the fixer class is to both ensure the smooth running of society and also to maintain the security of the biomes. Our mission is to simply do our job.”

Jayne’s arms pulled her knees closer. She tucked in her chin and whispered, “Why am I here?”

This time, one of the men answered. “You’ll need some background information before we can explain that part. If you choose not to take part in our quest, we will erase your memory of these events.”

“What if I don’t want my memory erased?” rasped Jayne.

“Then you must agree to join us. What do you wish?” asked the other man sharply.

Jayne’s hand slipped down to her shoe, and she slipped the needle out and into her hand. Her heart began to beat faster; her legs tensed, ready to run.

The woman seemed to sense her fear and sought to allay it, speaking softly and slowly to Jayne. “It’s alright, dear. You have nothing to fear from us. We aren’t trying to hurt you. Relax.”

Jayne felt anger surge out, supported by the needle she clenched in her hand. The anger burst from her lips and once started, could not be controlled. The words spewed forth. Everything she heard and the strange things she saw before she was drugged—the *they*, Joseph, the nine-fingered man and the heart in a box—leapt into her mind. “You

are threatening to erase my memories. Are you planning to brainwash me like you did Joseph? Who are *they*? Who is the nine-fingered man that stole the box with a human heart inside?” She felt the silver star, hanging from the chain around her neck, become warm against her skin and on impulse she stood on her chair, pulled it out, and shouted, “Did you give me this?”

She held the star, dangling from the necklace, out in front of her. As it hung, the center spokes rose up to a point like the first day it drew her blood. The light caught the tip, and it sparkled.

There was a collective gasp from everyone in the room. They seemed to be frozen in place. Every eye was drawn to the silver star.

Only two heartbeats of time passed before the man who initially presented Jayne with the ultimatum jumped to his feet, flipped open a small panel by the door, placing one hand on the lock pad, while pressing a red button with the other.

Metal panels dropped from the ceiling, covering the door and window that led to the hallway; the clang reverberating in the small space, sealing the room.

A droning voice began to speak through the PA system. “Interview room M is now running dark. A level 7 lockdown has been initiated.” The announcement continued to repeat its message over and over.

“Please silence that,” snapped the woman after a few tense moments.

The man reached over and replaced his palm over the lock pad and the announcement stopped. Jayne slid down into her chair, clutching her legs again. She still concealed the needle in her hand. Her eyes were wild. Not knowing what to expect next, she remained tense, holding her body as tight as a bowstring.

When the spokes thrust from the star, Jayne released the chain to prevent the needle point of the pendant from piercing her skin. It now hung loosely from its chain, openly displayed. The center spokes were still elevated to a shimmering sharp needlepoint.

The interviewers stood, forming a semicircle, facing Jayne. “Where did you get that?” demanded the woman, pointing to the star.

Jayne hesitated.

“Answer her!” barked the man who activated the security system. “Where did you get that... thing?”

“I found it...” Jayne trailed off, unsure of what to say as she studied the tense faces watching her. “I found it in my music box on my first day here.”

She looked down at the pendant, hanging from its chain around her neck. “It’s usually flat. It was a simple flat pendant when I first got it. Then I received a message telling me to wear it. So I put it on. I thought it was something I was supposed to wear. I don’t understand why you’re all reacting like this. It’s just a necklace.” Jayne paused for a moment, thinking about the truth of her words.

“Well, except for the first time when it did this and pricked my finger.” She indicated the still shimmering point of the pendant. One of the men reached under the table and pressed something, causing a small section of the table surface to retract in front of him, revealing an empty, rectangular space. One of the other men began to move cautiously closer to Jayne. Jayne turned to face him, the needle from her shoe clenched tightly in her fist.

Aware that the situation was about to explode, the woman walked calmly around to the other side of Jayne and spoke to the men. “You’re upsetting our guest. There’s no need to be rude.”

She turned to Jayne and spoke softly to her. “It’s alright, dear.” The woman smiled as Jayne turned to face her, and at that same moment, the man reached out and grabbed the pendant chain in his fist, tore it from her neck, carefully avoiding the sharp, gleaming tip and quickly dropped it in the open compartment at the other end of the table. The cover lid snapped closed.

Jayne’s hands reached up to stop the theft, but she was too slow. The star was gone. She saw the compartment lid close. She saw the compartment in the table vanish into the tabletop. She saw the star disappear. She heard it disappear. She felt it disappear.

Suddenly a tsunami of nausea rose from the pit of her bowels, rising first to her stomach, then to her throat. She tried frantically to

swallow, to keep the contents of her stomach in their rightful place, but it was impossible. She vomited on the table. She vomited on herself. She leaned over and vomited on the floor. She vomited over and over again. A cold sweat sent chills outwards from her core and she shivered, even as she retched again and again. Her stomach soon emptied and still she retched.

Jayne caught glimpses as the woman removed a syringe from her lab coat pocket. One of the men held Jayne, keeping her body still as the woman injected her. Jayne felt the nausea ease as she slipped into unconsciousness.

When she woke she was in a bed again. The nausea was gone, but her throat was sore and the muscles in her stomach, neck and chest ached when she tried to move. She felt a warmth in her chest, as if it were flushed with blood. The flush swelled outwards and, as it did, the pain in her muscles ebbed and faded.

She reached out and lifted a glass of water from the side table, sipping slowly from the straw and sighing in relief as the soreness in her throat eased and faded. She lay back in the bed and relaxed as she could feel her body growing stronger every minute. She reached up, relieved to feel the warmth of the silver star on its chain around her neck and closed her eyes.



## Some Truth

With the advent of the Swarm, society divided into three main groups: the scientists, the fixers, and the omies.

The scientists took over the role of the old politicians. As the scientists rose higher in the scientific community, they acquired more and more political power.

The fixers ran the biome system and created whatever the scientists deemed important both scientifically and politically.

The omies were the saviors of the human race. They were the chosen ones, and were given the privilege to live in one of the biomes orbiting the planet. It was soon discovered by many that this privilege was not as prestigious as first believed. Once someone was sent to the biomes, there was no returning.

The next meeting between Jayne and the others crackled with an almost electric tension. The room was different. It was more like an office; a woman's office for there was an air of femininity about it.

Jayne sat. Her feet were on the floor and her hands were flat on the table in front of her. The needle had disappeared from her shoe. The silver star hung around her neck on the outside of her clothing. She was very weak. She slowly sipped the water in front of her. Her eyes darted between the woman and the man seated on the other side of the table.

The woman spoke first. "Well, Jayne, firstly we must say that we are sorry for what happened yesterday."

“It seems you are sorry for a lot of the things that you do to me,” said Jayne.

“Yes, we are sorry and we did not do anything to you yesterday, not on purpose anyway,” said the man.

“I did not start the day sick but so far, thanks to you, I have been sick twice in two days. It has been two days, has it not?” asked Jayne. “Who are you people anyway?”

The woman spoke up. “We have decided to tell you everything. It is a risk on our part but having you on our side far outweighs the risk.”

“Me!” exclaimed Jayne. “I am just a lowly fixer apprentice.”

“Believe me, you are far more than that,” said the man.

Jayne made a face of disbelief. “Really! How?”

“You were chosen by *them*,” the woman said, emphasizing the last word. “I know that doesn’t make much sense to you but if you allow us to explain, it will become clearer.”

She waited, staring at Jayne. Jayne stared back and the woman held her gaze. Finally Jayne nodded.

The woman continued, “Since we last saw you, we have done some research and we discovered things about you that you are probably not aware, in any conscious sense. You got *their* attention after you wrote the TEM exam. That exam has some questions that are open-ended. Every question has a basic answer that makes it right or wrong but a few can also be answered with increasing depth, depending on the student’s level of understanding. You went way beyond what was expected from an applicant for the TEM apprentice program, especially for a 13-year-old still living in the nursery.”

“Those problems are the ones I like the best. I look at them and I see a tunnel that wriggles about, swelling and narrowing and spinning in front of me. I simply follow it. Sometimes I get to the end and sometimes I don’t. I didn’t get to the end of any of those problems on that test. I was worried I failed,” said Jayne in a flat tone.

“Well, as you now know, you didn’t, not by a long shot. You set off

a lot of bells at the top and, from that point on, *they* have been studying you and trying to manipulate you.”

“Who are *they*?” asked Jayne. “For that matter, who are *YOU*?”

The woman looked at the man. He stared back and finally nodded.

She continued, “I will tell you who *they* are first because that will really help explain who we are. It will also help explain what happened yesterday.”

“OK,” said Jayne.

The woman let a long breath escape her lungs and started, “We call them ‘The Foreverers.’ No one knows what they call themselves but they see themselves as being the true answer to the survival of the human race. We know they are made up of politicians and scientists. One cannot really exist without the other in today’s political landscape. The politicians supply the money and the scientists provide the expertise. The other key ingredients are power and secrecy. If what they are doing were ever made public, the resulting chaos would collapse the whole system. Nobody wants that, least of all us.”

“I thought the biomes were the true answer to the survival of the human race,” said Jayne almost reciting.

“Yes, that is what we believe. Creating a system to transport humans to new planets, with the required biological changes, will truly enable our species to populate the galaxy. *They* believe that the extension of human life expectancy is the real answer. They are afraid that the biome population will have lost the ability to maintain the legacy of the human race or even have the skill to inhabit the planets by the time they arrive. They want the brightest and the best minds to live until the biomes reach their new home planets even if that takes 1,000 years. They will use anyone or anything to achieve their warped goal,” lectured the woman.

“What is wrong with wanting to live forever?” asked Jayne. “I think it is rather noble. They are not giving up. They just want what we all want. They don’t want to die.”

The man stood up. He smiled, raised his arms and clasped his hands together. He spoke. “You are right. There is nothing wrong with that.

What is wrong, truly wrong, is that they are willing to sacrifice everyone else to achieve it. They would sacrifice you or me in a heartbeat if it served their purposes. Many have already been sacrificed to serve their need to keep themselves alive. I think you have already seen one of the common examples of their inhumanity.”

“I have?” queried Jayne.

“They designed the spavators and the biomes. They incorporated ‘back doors’ in the designs. They can easily transport materials to and from the biomes without being discovered. You must have seen one of their organ transports. Didn’t you mention that you saw a human heart being stolen by a nine-fingered man? Just so you know, we have identified him thanks to you noticing his missing finger.”

“Did you arrest him?” asked Jayne.

“We are not the security police. We can’t arrest anyone,” said the man. “We can only watch and record.”

“Maybe someone really needed that heart,” said Jayne.

“Yes, I am sure they did, considering they took it from a healthy living person in a biome,” said the woman. “Someone was murdered to keep one of the Forevers alive. *They* decided that the survival of some old scientist was more important than an 18-year-old boy in Biome 6. Our agent informed us that the formal investigation revealed that the kid wandered into the wilds of Biome 6 and was attacked by some large carnivore and was killed. It seems that this carnivore was very selective in that it only ate the boy’s heart.”

“Are you saying that *they* killed a healthy person in order to give an old guy a new heart?” asked Jayne.

“I’m surprised they did not take all of his organs. After all, a healthy heart usually means a healthy liver, lungs and eyes. I understand the beasts in Biome 6 have an affinity for eyes,” the man said sarcastically. “I bet they were in a hurry and the heart was all they had time for.”

“Now you—what do they want with you? That is the million credit question,” said the woman.

“I have no idea,” said Jayne. Her forehead wrinkled. “Why did you make me sick yesterday?”

The man puffed out air and raised his hands and eyebrows in defense. “*We* did not make you sick. *They* did. More specifically, *THAT* did,” he said and he pointed at the silver star hanging around her neck. “We spent some time and called in some hard-to-come-by expertise to analyze that little treasure. You were knocked out so you wouldn’t puke yourself into oblivion. You have never been very far away from that star since you got it or you would know about that particular effect. The only thing we did was to put it in a safe box to protect us from possible explosions. The safe box also blocked its connection to you. That is why you started to vomit. The connection is like an artificial addiction designed to make you feel better wearing it than not wearing it.”

“You thought my necklace was a bomb?” asked Jayne.

“Yes. It is not, but we did find out what it really is and that, as far as you are concerned, is much worse. It is also much more dangerous to us than any bomb. We have seen that symbol before in a golden locket. Only this golden locket exploded and took out three fixers. You do not want to know what happened to the young lady wearing it,” warned the man.

“Should I take it off?” asked Jayne, as she reached for the silver star dangling from the chain around her neck.

“You could but you shouldn’t. We have altered its effect on you. When you first got it, it must have injected some nanobots into your bloodstream. Did it form a sharp point and stick you the first time?”

Jayne nodded.

“That’s why you puked when you took it off. When the connection between it and the nanobots is broken, the nanobots tell your brain to tell your body to vomit. We changed their programming a little. Now, if you are more than five metres distance from it, you will feel a shiver run down your spine. That is just a reminder to always wear it. We also noticed what we assume is a flaw in the programming. It is really a transmitter that sends biological data to a receiver. Whenever

it transmits, the nanobots react as if you have taken it off, hence you would feel nauseated. Have you ever felt sick for a few seconds and then it passed?” he asked.

Jayne thought a moment and said, “A couple of times. Just for a few seconds. I felt like someone was watching me.”

“They probably were. Just so you know, the only thing we changed was the effect. No more nausea, just a little shiver down your spine. If you feel it, you will know that *they* are receiving a transmission from the star. You must continue to wear it so they do not suspect we know what it is. We can read its transmissions and are working on a way to use it to find out more about their plans. We really want to understand why *they* chose you because it is more than just your intelligence,” he explained.

Jayne flushed.

“That brings us to the most important reason why you are here,” said the woman. “Will you work with us? Will you help us? Will you be a real fixer and help us fix this horror that has infested our society?”

“You really mean, will I be your spy. Right?” challenged Jayne.

“Yes,” the woman said without hesitation.

“And more,” the man said.

“If I am going to be a spy, I would like to know for whom I am spying. So again, who are you?” Jayne demanded.

The man and woman looked at each other. They nodded and came to an unspoken agreement. They would trust Jayne. The woman spoke first. “We call ourselves the *Sentinels*. We watch and we record what we see.”

“We watch more than just fixer society. We watch in the political and scientific realms as well. Lately, that has been our focus,” said the man, “our secret focus. We would like you to join us. We don’t know why the Forevers are interested in you but we do know that they have gone to extremes to test you. We also know that they are a very secret cabal made up of scientists and politicians. They will go to any lengths to keep their activities from becoming public.”

“We want you to work for us but we also want to protect you. You

may be in much more danger without us than with us. We think this will be a mutually beneficial relationship,” said the woman.

“Are you willing to join us?” asked the man.

Jayne looked at the man and then to the woman and back again. She fingered the star hanging from her neck. She took a deep breath to pose the question inwardly and then made up her mind on the exhale. She nodded to the woman and tucked the silver star under her clothing. It felt warm against her skin.

The woman smiled and said, “Good. We need to get you reassigned. We will support an application by you to the Biome Tech Program. With your skills in TechElecMech, it will not be difficult. *They* might suspect something so be prepared for some...” she paused and quickly continued, “odd occurrences.”

“Odd occurrences?” echoed Jayne. “What does that mean?”

“Well, if *they* stay true to form, they will want to test and scan you. *They* are particularly fond of connectome scans. We have not really figured out why, but the possibilities are rather macabre,” said the man.

Jayne swallowed. “How do I contact you?” she asked.

The man and the woman looked at each other and back at Jayne.

“You can’t,” they said in unison.

The woman continued, “It is far too dangerous to our purpose to have any uncontrolled communication between the Sentinel home and Sentinel satellites. You are now a Sentinel satellite. All you need to do is observe and remember. Occasionally, we will need to brief or de-brief you. Only then will you report. If you see this symbol, we are responsible.” On a sheet of magnetic scribe, she drew, with her finger, a small oval with a dash in the middle.



It was the Greek letter *theta*. She held it up for Jayne.

Jayne watched as the symbol slowly faded.



## A Trip to the Neuroscience Center

Governance changed. The planet was now a single political entity. Humans must cooperate if they were to survive. All citizens on the planet had equal rights. No one would go without food or shelter. No one would go without proper medical care and adequate education. Everyone must work together if the species was to survive. At least, that is how the propaganda engines spun it.

Reality sketched a different picture. There were those who sought absolute power to further their insidious purpose. That purpose had not changed since the cavemen learned how to make fire. They wanted power for power's sake and they wanted it forever—literally.

Jayne woke up in her quarters. She sat up in bed. It was morning. The room had not changed in her absence. She could smell food and looked at the table. Breakfast was set.

“Good morning, Thirteen,” crooned Lucky. “Breakfast is ready. I see you have applied for reassignment. Are you bored with TEM apprenticeship?”

Jayne smiled and then frowned. She thought it odd that Lucky didn't ask her where she had been for the last three days. Lucky was nose-y that way. She wondered if perhaps a little reprogramming had occurred. The Sentinels told her that they could not be directly involved in changing her assignment without risking exposure. In fact, she was told that they could not intercede at all. She was to do it on her own. All they could do was make recommendations that would be mutually beneficial.

Applying for Biome Tech was first on the list. Biome Techs were the apex of the fixer class. It was deemed the most difficult and dangerous job of all. It was even more difficult than High Wire Tech. Those were the fixers who maintained the spavators from the counterweight down to the space platform in Geostationary Earth Orbit (GEO). They lived on the space platform 35,000 km up and worked the cable all the way up to the counterweight at 100,000 km above the surface of the Earth, directly above the biome HUB at the base.

Biome Techs maintained the biomes. These huge habitats orbited the earth. They were designed and built in stages. Some of the final stages started just recently. The biomes were slowly being turned into biome ships that could travel to their designated habitable planets. During the trip, the inhabitants would ‘transvolve’ into humans that could flourish on the new planet. This made-up word defined the process of Evolution by Genetic and Environmental Transformation, EGET (*eee get*) for short. Genetic scientists introduced specific mutations supported by gene splicing to stimulate physical changes in the omies. The environmental scientists created a biome that would gradually mimic the environment of the new planet. It was thought that these two processes would vastly improve the chances of survival of the omies on their new home.

You couldn’t apprentice to become a Biome Tech. You could, however, apply, once you proved yourself in one of the other tech areas. A tech apprentice was a very unlikely candidate, even one of Jayne’s ability. Jayne researched the records. She could find no examples of anyone her age being accepted into the Biome Tech program. She felt the silver star grow warm against her skin and thought of the watcher. That was her name for the person or persons she sensed observing her. She also thought they directed her to the Luck Games Room and her appointment with Professor Greenway.

Lucky spoke again. “Jayne, are you alright? You seem...” Lucky paused, “...distracted.”

“I’m fine. I am just wondering if I will be accepted,” said Jayne.

“You will be. Your test and practical scores have been exemplary.

I would recommend you,” Lucky said smugly. “I looked up the scores of some of the previous inductees and you have them all beat. But it is not just based on scores. There seem to be other considerations.”

“Such as?” asked Jayne.

“Well, some specific scans. I do not understand why they would be deemed necessary for the job, but apparently they are,” said Lucky.

“Let me guess,” said Jayne, thinking of Professor Greenway again, “—connectome scans.”

“You have been scheduled for a series of connectome scans this morning. How did you know?” asked Lucky.

“With Greenway?” Jayne asked.

“Who is Greenway?” Lucky asked back. “Just a moment, I will check. You are to report to the Neuroscience Center and Training Facility today.”

“Where is that?” asked Jayne, concern creeping into her voice. The Neuroscience Center sounded like a very unpleasant place to visit.

“Well, it is not here in the HUB. It is seriously out of PUT pad range. You will have to take a flier. You leave today,” said Lucky and then he paused. “It looks like there will be two of you going, at least there have been two bookings made.”

“Who else is going?” asked Jayne.

“I am sorry but I am not privy to that information. It has been blocked,” replied Lucky.

“When do I leave?” asked Jayne.

“An hour from now,” answered Lucky matter-of-factly.

Jayne stood up and ran to the clothes drawer. “I have to pack.”

“Not required,” stated Lucky. “According to the reservation, you are to leave immediately. You are to take a PUT pad to Flier Station 3. I will program the PUT.”

Jayne stood and walked out of her quarters to the hall PUT pad. She stepped on it and breathed in deeply. She thought of the Sentinels and the Forevers and of puking and of human hearts in boxes and of murdered omies and of GravBall and, finally, of Joseph following her like a puppy. That made her laugh. She stopped laughing when

her nose, which was not quite healed, twinged with pain. She thought of Joseph pushing her into the line-vac that was not a line-vac. She frowned as she stepped off the PUT pad in Flier Station 3. She would make him pay for that push.

The fliers were totally automated. They used grav propulsion. All fliers flew between 1,000 and 2,000 metres from the ground. Their flight path was designated by a flight computer system. They travelled like a train along a monorail except the monorail was digital and dynamic. They were fast and silent.

Jayne entered a thirteen-seater with three sets of three seats, an aisle down the middle and a back row of 4 seats. She slid into the back row. She had never been in a flier before. She had never travelled very far. For short distances, the PUT pads were all that anyone needed. As the time ticked down to departure, she thought she was going to be alone on her two-hour flight, despite what Lucky had predicted. She looked out the window and saw a boy running down the platform, onto the gangway and onto her flier. Jayne slid down in her seat. She would be invisible to anyone entering the flier. The boy, out of breath, flopped down in the front set of two seats. He tossed the small bag he was carrying onto the seat across the aisle from where he was sitting. He exhaled air loudly and said, "Made it."

Jayne peeked out the side of her seat and looked down the aisle. All she could see was a pair of feet sticking out from the seats that held the reclining boy. He moved and Jayne ducked back out of sight. Jayne peeked between the seats and could see a head of dark ruffled hair. She blinked and looked again. He turned and she could only see the back of his head. She saw him become alert and start to scan the cabin. She ducked out of sight again. Jayne could hear him opening his bag and she peeked down the aisle again. The boy was reaching into his bag. Suddenly he stopped and froze. Jayne ducked back. There was silence. The silence seemed to go on forever. Jayne could wait no longer. She slowly stuck her head out into the aisle. Her eyes grew wide as she stared into the wide eyes of the boy looking down the aisle at her. They both stood and they both looked quickly from

side to side as if searching for an escape route. They both knew there was no escape.

Jayne recognized the dark-haired boy from the bean bag game. Number 91. She never knew his name. The dark-haired boy recognized Jayne. Fear clouded his eyes but it soon dissipated and was replaced by anger.

“What the hell are you doing here?” he spat. “I am not sure what you did to me that day in the Psi Center but you sure are not going to do it again. After I looked at you, it was all gone. You somehow sucked it all out me and took it for yourself.”

Jayne pulled her head back behind the protection of her seat. Her body tensed. Questions rumbled through her mind. What was he talking about? She had not taken anything from him. Was he sick? Had one of the bean bags caused permanent damage? Was he going to the Neuroscience Center too? Maybe he suffered brain damage. She remembered one of the bean bags hitting him in the head.

She heard him start down the aisle toward her. She stood up. The idea of him standing over her was an unpleasant one. They stood facing each other with the width of one seat between them.

Jayne did not know what to say. She spoke anyway. “I’m sorry you got hit. Is your head OK?”

“What are you talking about? Does my head not look OK?” he asked viciously.

Jayne stepped backward for a moment and then forward again. “You must be deluded. I never took anything from you. That day, playing the bean bag game, you made a wrong choice and got hit. I made a wrong choice right after you left and got hit. That’s just the way it goes sometimes. Sometimes you’re lucky and sometimes you’re not.”

“I am always lucky unless you are around. And, no, I do not have a head injury. I am going to the Neuroscience Center because I am being sent there. Why are you going?” the dark-haired boy asked.

“I have no idea. I am being sent there too,” she answered. “I had