

# Homecoming

A Short Story  
by  
Jim Michie

## **Introduction to the Electronic Version**

The original version of this short story is in Microsoft Publisher, which many people do not have on their computer. I have therefore modified the format slightly to suit the more universally acceptable Portable Document Format. Only the page breaks are affected. As you can see from the bottom of this page, the short story is protected by copyright, but feel free to disseminate this story in its printed or electronic form to others as long as it is given freely, which was the spirit in which it was written.

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**Door Into Summer Press**

## 25 AC: Adam System

Lisa waited, not moving relative to the chunks of mass closest to her. She orbited slowly amid the pre-planetary clutter surrounding the central energy source for this star system, Adam. They had chosen the name Adam for the young star when they had passed during SEEDER 6's outward journey.

She was excited, as she always was, but not impatient. She had been waiting and watching for fifteen years, and chances were that she would be waiting even longer before moving out of the system and back into the trans-c currents. She watched the sensors as the unidentified object moved in-system, seemingly on a ballistic trajectory.

There was no sign that it was anything but a big rock, but that was normal for the survivors. That's how they continued to survive. She waited.

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It was closer now. The trans-c sensors were still on, but she had archived them way down the chain of active subroutines, with only a pop-up priority that would get her attention. She was concentrating on the sub-C sensors, running continuous cross-checks of the data as they gradually became more numerous and more accurate. The mass-volume correlation was the key, and she watched the data firm to a .99 projection. It was a ship or a very funny rock, like SEEDER 6.

She wouldn't have to wait long now. If it was going to slow down enough to stay in this system, it would have to begin very soon. She self-checked again to make sure there was no energy leak that would betray her presence and continued to wait.

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There it was! Definitely a fusion deceleration. It was a ship. It was too far out to get any idea of identity, but she would hail it as soon as the deceleration was over and as soon as she was sure that the new course would give her time to get out of the system if she got what she thought was a hostile reply. Lisa had had two close calls over the last fifteen years; she was still excited every time there was an inbound ship, but much more cautious.

The ship had popped out at the would be gas giant Trojan point, the only wormhole they had found in this system. She had wondered on other occasions like this what would happen to the worm-hole if the almost-planet lit into a second sun instead of settling down as a gas giant, but the timing of either such event made her interest only scholarly. At the moment, she was having trouble computing the deceleration and new trajectory. The data she was receiving didn't seem correct. The ship was decelerating much too quickly for the mass it was registering, but all of her sensor sources were giving her the same readings.

On a hunch, she dove down into the subroutines for the trans-c sensors. Yes, there was definitely something funny going on. This ship was still making waves in trans-c. Was it dumping energy into hyperspace? That would be a new wrinkle, and it might mean an alien ship, or it could just mean that Jimmy Hincle, the former Engineering Officer aboard the SEEDER 6, was back with a new piece of physics that Lisa could chew on during the next couple of years. Whatever the answer, instead of days to wait, Lisa should be able to hail in a few hours.

Lisa watched the trajectory projections and ran through her options. What was the chance this ship could gain delta-V like it could shed it? There was no way to know. If it could, she was much too slow to clear the system before being engaged. If it couldn't and she was going to run, she had to go now, with no course options. She would have to drive in-system and slingshot for the wormhole.

Now she was scared as well as excited. There was no doubt that the ship was heading for an intercept with her orbit. The maneuvers made little sense in her frame of

physics, but when she ran the numbers using the observational capability data she had acquired on the deceleration, she knew she was only a few hours from a close inspection by whoever or whatever. Maybe she had made the wrong choice, but she had little recourse now but to brazen it out. For Lisa, "brazen" was not in short supply. She had been building her stocks for fifteen years.

The eleven years before that Lisa had spent like all the others, roving through the wonders of the galaxy, observing, learning, coming to terms with her new self. She had managed it, but not without difficulty. During the last fifteen years, she had been able to contact twenty-three of the original crew of thirty-two transfers. Four of those were certifiably insane and two more probably were, but her observational span wasn't long enough to be sure. All of them, however, were significantly different personalities from those that had left the system twenty-six years ago, including Lisa herself.

### **2672 AD: SEEDER 6, Seventh Wake Period**

Lisa Martineau rattled down the empty passageways between her quarters and SEEDER 6's Medical Center, commonly referred to as sickbay. As the medical officer, she was the first out of cold-sleep and the eeriness of being alone on a huge ship in the middle of nowhere was as oppressive as ever. She focused on reviewing her immediate tasks to push the spookiness out of her mind, or at least into a corner of it where it wouldn't give her the shakes. She shivered as she went, even though she knew her body temperature was back to normal, as was the temperature in the hallway. She had spent the last six hours getting her blood sugar levels up to par and the analgesics seemed to be making the expected joint pain at least tolerable. It was her mind she had to deal with, not her body.

At the end of the hallway, she pushed through the door to the Medical Center. It looked exactly like it had a hundred and twelve years ago when she left it to crawl into her cryo-chamber. At least the cleaning robots were still functioning properly. She would know in a few minutes if the maintenance robots had functioned as well.

Lisa spoke as she cut through the examination area to the console against the back of the room. "Medical computer up. Full electronic systems check and mechanical function check for all medical and laboratory equipment. Verbal, incremental reports."

She watched the varying colors of the flickering holographic display as systems were queried and checked. Above the whooshing of the ventilation system she could hear the clunking and clattering of relays and robotics as the mechanical tests started up. The electronic systems tests would take only a few minutes, but the mechanical ones would go on for hours.

Her hands danced in unforgotten rhythms across the console, calling up the details on the bio-sensors of the cold-sleep units. There were idiot alerts, of course, when some planned parameter was exceeded, but Lisa liked to see the numbers themselves before she felt like she was in command of the situation. She keyed through each set over the next hour.

They were waking up in their quarters all over the ship. Most of the cryo-chambers, regularly referred to as cold-sleep coffins by the crew, had already been stored behind their bulkheads, and the individual crew members were trying to cope with their particular brand of post cold-sleep discomforts. Lee Goodwin was no exception.

Lee had awakened from the seventh freeze seemingly normal, that is he felt terrible, was so weak he could hardly raise his arm to put food in his mouth, and every joint in his body felt like it had a twenty-penny nail driven through it. After three hours, it didn't feel much better, and that wasn't normal. He got his feet under him and shuffled out into the

passageway, heading for sickbay. He needed something stronger than the standard analgesics.

There were three other crewmembers already there ahead of him and they were lying down on cots lined up against the bulkhead on his right. Lisa Martineau motioned for him to come over and pointed to an empty cot as she was talking to Bob Selby on the adjacent cot. He had what looked like a cold gel-pack over his forehead and eyes.

Lisa turned to Lee. "Got a few aches and pains do you?"

"Not just a few," he replied, "and they don't seem to be getting any better with the pain pills I've got. You got something stronger I can have?"

Lisa looked up at the display at the head of the cot that showed the results of the scan run automatically when Lee had lain down. "Uh, looks like some higher than normal degeneration in the joints, and most of your muscle mass seems to be carrying an abnormal load of toxins. How long have you been out of the chamber?"

"About three hours. Things usually settle down more than this by then."

Lisa still had her attention focused on the display. "You haven't had this sort of pain before when you came out?"

"Well, now that I think about it. The last time I came out of cold-sleep seemed pretty bad too, but not this bad."

Lee's response elicited only an "uh" from Lisa.

"Come on, Lisa. I've got a lot to do. There seems to be some kind of hitch in the fabrication process. My quick look showed things were way behind schedule, even though all the systems seemed to be functioning the way they should. Have you got something for me?"

"I've got something, but you have to promise me you'll come back this afternoon for a more thorough check. There must be some reason you're having such a bad time. We need to fix the problem, not the symptoms."

Lee gave one of his most sincere, I promise looks. "Scouts honor, doc."

Lisa couldn't stifle the grin as she strode to the dispensary unit and ordered a powerful analgesic. "Don't operate any machinery other than your computer, and don't be surprised if you find yourself taking a nap in front of your terminal."

Lee returned the grin. "You got it, doc."

As Lee was swinging his legs off the cot, Lisa touched the display to make it hold Lee's data actively. She continued to study it for about five minutes, but another crewmember came in complaining about nausea and cramps. She moved to the more immediate problem.

Lee got to his computer station faster than he thought he would with the pain that walking induced in his joints. It was a relief to fold into the contoured, swivel chair. "System up," was his automatic response to sitting, as he placed his hand on the reader and looked directly into the retina scanner.

"System operating," came the metallic voice of the computer in response.

"Graphic display of planned versus actual progress on Habitat 7 and all ancillary systems since project start," Lee responded in his clipped-diction, computer instruction voice. As the display popped up, he added an additional command. "Scroll function to mouse."

The green light on the mouse lit and Lee placed his hand on the ubiquitous tool of all computer jocks. He started scrolling through the project activities, looking at the almost identical separations between planned and actual. The separations were huge, and Lee was immediately afraid that they wouldn't be able to recover in the time they had before the scheduled launch of Habitat 7 and all her ancillary systems.

The mission of a SeedShip like SEEDER 6 was straightforward. Each group of cold-sleep colonists was dropped off by the SeedShip before reaching its target system.

The colonists were in a self-contained habitat that needed sufficient time to decelerate and place itself in a stellar orbit. The habitat contained all the prescribed materials needed to remain self-contained for hundreds of years if necessary. Growth materials for planetary settlement depended on what the system had to offer. There was no way to know in advance. The habitat could always be buttoned up for its own trip to a different system if necessary, but the chances of a system being that inhospitable were very low.

"Give me activity loading diagrams for a compressed schedule that will meet the original completion date." These should show him if he had enough robots and people to get the project back on a timetable to allow launch before they were out of range on their pass through the next star system.

The holographic display provided a three-axis chart for each project activity, showing time, robot/human workhours, and material resource requirements. The constraints listed at the bottom of the display indicated that the required human/robot workhour peaks could not be met with current resources and material resources could not be extracted by current levels of robot mining on SEEDER 6.

"Damn," Lee mumbled as he scrolled through the activities, "how did we get in this mess?"

"The source of the problem is unknown. All available resources have been applied since project start," the computer replied.

"Voice response mode off." Lee didn't need any sass from the computer. "Show me planned versus actuals of activity type."

The display shifted to show activity types like forming, machining, and welding. He scrolled through the activity types noting that they were all way over budget, but when he got to quality control, the display had to shift workhour scale by an order of magnitude to show the expended hours. He had something; now he just had to figure out what it was.

"Display current QC parameters."

The screen filled with a list of quality control parameters that were being applied to the construction effort. There was nothing out of the ordinary until he got to the third screen, and there it was. The dimensional tolerances for fabricated parts were way out of line. "Display input time, date, and authorization for fabrication tolerances."

The display responded with his name, authorization code, and real date, which was over 200 years ago. Lee mumbled to himself again, "Yeah, I remember making a change a few sleeps ago, but not this one. Something is out of whack."

He thought for a moment and then requested, "Give me a solution for three times six."

The display showed the answer "18" in the upper left-hand corner followed by a period and eight pages of zeros—8192 zeros to be precise. He had found the problem. Somewhere in the billions of lines of code resident in SEEDER 6's computer there was a corruption of the precision subroutines. Actually this shouldn't slow the central computer down enough to make much difference at all in the length of time required to build the habitat, but it could play havoc with the quality control subroutine. Everything going into the habitat was obviously being built to the limits of the accuracy measuring instruments. This meant a busy bunch of construction robots, but they were doing the same thing over and over again until they got it closer to the calculated tolerances than the inspection robots could measure.

It took Lee about ten minutes to fix the problem, but it took him the rest of the day to set up a new construction plan that would meet the time requirements for star system insertion of Habitat 7 as SEEDER 6 made its fly-through and slingshot around the sun to the next system destination. As strange as it seemed, the solution required that eighty percent of their production capacity be used to make more robots during the first year

and a half of the two-year wake period. When they would finally get around to building the habitat itself, their progress would probably look more like an explosion than construction. They would have a lot of leftover robots when it was all over, but they could do it.

As Lee was buttoning up his station prior to getting some of the food that he had successfully ignored all day, he remembered his promise to Lisa. Although his stomach was growling, he dutifully set off in the direction of sickbay, trying to ignore the pain that walking was causing in his joints. When he got there, there were five patients lying on the cots, but Lisa was nowhere in sight. "Is Lisa Martineau around?," he asked the duty nurse standing across the room watching a display behind the head of one of her patients.

Without turning around, she replied, "You just missed her. She went to eat. She'll be back in about thirty minutes or so. This is our busy season you know."

"Thanks. I'll catch her in the mess."

Lee guided his tray to the open chair beside Lisa. "Mind if I sit?"

Lisa looked up and started to reply, but remembering that her mouth was full, she paused long enough to swallow. "No. Sit. Feeling any better?"

Lee settled into the chair with a visible sigh. "Not when I'm walking. Sitting's tolerable though. I haven't had time to think about it much since I left you this morning. Computer glitch. Twenty-seven SEEDER 6 years and our piece-parts bins and sub-assembly storage areas are still half-empty. It's going to be a bitch to get Habitat 7 ready for insertion in time."

Lisa looked up with concern on her face. Like everyone else on the crew, she knew that a missed habitat insertion would mean another cold-sleep while they plied on to the next star system. When they got there, they could insert Habitat 7, but they would have to go to the first back-up system to insert Habitat 8, the final seeding. "We can do it, can't we?"

"Yeah, we can do it, but the space riggers aren't going to like it very much. They're going to have very little to do for the first year and a half and then they'll have to bust their butts to finish on schedule. I don't guess you can dump some of them back into cold-sleep for another year or so, can you?"

"It's possible," Lisa replied thoughtfully, "but only after a couple of months of normal activity. The real problem is that nobody will want to do it until they get really bored, and by that time it wouldn't be worth the wear and tear on the body, so I wouldn't let them."

Lee swallowed another mouthful of macaroni and cheese. "Well, I don't have to worry about boredom. I'm going to be up to my eyeballs keeping everything on track. Just doing the Captain's daily status reports will eat up more time than I'll have."

"You won't be the only one that's busy. Sick calls will go sky high with the boredom level up. It'll be the fun kind, too," she tossed off sarcastically. "Hangnails, headaches, heartaches, and hangovers. My worst nightmares."

Lee chuckled. "Well, I'll do my best to keep you actively engaged in problems worthy of your academic training. Which reminds me, you want to run some tests now or wait 'till morning. I feel like I could use a good night's sleep. Maybe I'll feel better in the morning."

"Hey, don't steal my lines. You haven't finished your dinner yet. I can wait."

Lee looked down at the only half-eaten tray of food before him. "I'm finished. Let's get it over with."

They walked back to sickbay engaged in idle chatter. Lisa joked about having to brush up on her boredom psychotherapy skills, and Lee speculated on the Captain's response to Habitat 7's problems.

The tests were routine except for the tissue samples that Lisa wanted, but it was painless and only took about fifteen minutes. Lee staggered back to his quarters, brushed his teeth, gulped down a couple more of the pain pills Lisa had given him, and racked-out for about seven hours.

Morning brought no relief when Lee swung his legs over the side of his bed and shuffled to the head. He still ached, and the queasiness he felt when trying to eat his dinner was still with him. He filled a glass from the tap and took two more of the pain pills.

Lisa woke up as usual, with at least one knee jutting over the edge of the bed where Jimmy Hincle's night thrashing had pushed her. Jimmy was not a quiet sleeper. She had fixed his snoring after their first week together. That was an easy microwave fix to the soft tissue behind his palate, but the demons that pursued him in the night were his own to deal with, and he was rarely successful. If he didn't add a new bruise to some part of her anatomy every night they spent together, she considered it a restful sleep.

When she arrived at the medical station she went immediately to check on Lee's tissue sample cultures she had started the previous day. As she strode into the lab, she barked out instructions for the computer. "Full bio-scans on all tissue samples from Lee Goodwin. Prioritize results by magnitude of anomalous readings. Voice report."

By the time she had crossed the lab to stand in front of the holographic display, the computer had started its report. "All nerve tissues show a slight degeneration of the myelin sheath and an average 7.32 percent necrosis of dendrite volume with deviation between samples of less than 2.24 percent. All muscle tissue shows moderate edema, with the gluteus sample showing the highest at a 6.32 percent edematous increase and the trapezius sample showing the lowest at 2.17 percent. Chemical analysis of primary cell components indicate."

Lisa interrupted the report. "Stop. Show me a picture of an area of necrotic dendrite tissue."

The display flickered on to show a three-dimensional image of the dendritic fan of a nerve cell. The tips of the dendritic growth were obviously dead and even stumped out in some areas as the body was obviously absorbing the dead tissue.

"Show me another sample." Lisa continued to look at nerve tissue samples for a few minutes then went on to the details of cellular composition. Sometime during the morning she sat in her console chair, but she was totally absorbed until the duty nurse stuck her head into the lab to inquire if Lisa was able to cover for her while she got some lunch. Lisa's eyes automatically strayed up to the time readout in the upper right-hand corner of the display. "Damn, it *is* time for lunch," she thought.

"I've got it, Barb. Go ahead. I'll get something when you come back."

About three subjective minutes later, Barb stuck her head in the lab door. "I'm back."

Lisa waved her hand to acknowledge the remark without shifting her focus from the display. She would go for some lunch as soon as she tracked this enzyme down.

"Janet's here. I'll see you in the morning. You really ought to get something to eat, Doc." Barb's head was once more in the lab door.

Lisa looked at the time readout and realized she had done it again. It was seventeen hundred and she hadn't had any lunch. Thinking about it, she felt hungry. "Okay, see you in the morning."

It was early for dinner and way too late for any sane person to be eating lunch, so the mess was sparsely dotted with people. But as she wielded her tray away from the food dispenser, she spotted Lee Goodwin at a table by himself in the far corner. She steered in his direction. When she got to the table she had to wait for a few seconds

while the glaze faded from Lee's face and he focused on the real world again. "Oh, hi, Lisa. Have a seat. I was just ruminating a bit."

Lisa put her tray on the table and her body in the chair opposite Lee's. "Lunch or dinner?"

Lee had already started to slide out of the world again. "Huh, uh, I don't know. What time is it?"

"Seventeen hundred plus a little."

Lee thought a little. "Well, I guess I opt for a late lunch, since I'm sure I'll be skipping dinner and settling for a late supper. Our construction problem's a bear."

Lisa felt a little twinge about calling the kettle black, but she responded anyway. "Not good, Lee. You need to keep your nutrition levels as even as possible, and you need to get at least six hours of sleep every day. How are you feeling?"

"About the same," Lee shrugged. "Got any results from the samples you took?"

"I do, but they're preliminary. I don't know why yet, but your cell chemistry is all screwed up, particularly your nerve cells. It's no wonder you don't feel well, but I don't know what to give you yet except the strong analgesic. I'm working on it."

"How many of those things can I take in a day?"

"Standard dosage is no more than six a day, but ten shouldn't be a problem. If your ears start ringing, back off a little, but ten should be okay. As soon as I can put a name to the problem, we can start treating it instead of its symptoms."

Lisa had no answers the next day nor the next, and she didn't run into Lee in the passageways or in the mess hall. On the fifth day of her research, she ran across a reference to a possible effect of cold-sleep noted by a Dr. Agothian when the process was first being used. He hypothesized that cold-sleep could trigger an auto-immune response that would cause the body to attack itself trying to rid itself of freeze-damaged tissue. His hypothesis influenced the cold-sleep engineering design, particularly the pre-sleep infusion composition. The bottom line, however, was that the predicted symptoms had never shown up in the fifty years or so of use prior to the launch of SEEDER 6. There was also no mention of it occurring in the ten years after launch when SEEDER 6 still received regular data inputs from Earth.

Lisa found Lee at his console, slumped in his chair and staring at the display before him. Every few seconds his hand would twitch on his mouse and the display would change, otherwise he had every appearance of being catatonic. She decided on a quiet intrusion and walked to the edge of the display where Lee should be able to see her peripherally. She got no response. "Lee?"

The next three "Lee"s were progressively louder, and Lee jumped like a startled rabbit when his consciousness was finally penetrated. "Lisa, you scared me"

"Scared?"

"Well, startled then. What's up? Find anything on my problem? I haven't noticed any change since I talked to you in the mess."

Lisa pulled a chair over from another console and sat down facing Lee. "Bad news, Lee. I can't be certain, but it looks like you might be having some sort of auto-immune reaction to cold-sleep. It was only hypothesized before we left, no actual occurrences recorded. But it seems to fit the observed changes in your cell tissue. The problem seems confined to the nerve cells where your immune system is killing dendrite tissue. If we can't find a way to divert your immune response, the nervous system will gradually degenerate with symptoms much like a disease called multiple sclerosis that was cured early in the twenty-first century. The nature of the degeneration is different, but the effect will be the same."

Lee appeared interested, but not overly concerned. "So what's the prognosis? Lot's of pain; paralysis? And how long will this degeneration take? Is it going to significantly interfere with my ability to work?"

Lisa shook her head. "It's too early to tell, Lee. I just haven't got any data, but my guess at this point is that even if we're able to arrest it during the wake period, there'll be a significant chance that another cold-sleep will make the situation worse, maybe much worse."

"Uhm," was Lee's pensive response. "So I'm probably good for this wake period?"

"I don't know, Lee. It depends on how much we can slow your immune response without making you vulnerable to other problems. Your immune system has a function you know, and if we slow it down to ameliorate the nerve degeneration, we also impair that function."

"We got a choice?," Lee said quizzically.

"Not really."

"Let's get on with trying something then."

And try they did. Lisa tried all the standard drug therapies for auto-immune suppression, always searching for one that would turn off the response that was attacking the nerve cell dendrite tissue while leaving the other responses alone. She didn't find one in the two-year wake period, and Lee's condition got steadily worse. He also had to fight off an array of infections resulting from the suppression of his immune system and occasional reactions to new drugs she was trying.

Lee's response was always upbeat with an underlying sense of grit. He never really complained. He only provided feedback for Lisa so she would know what effects he was feeling from the treatments she was trying, but when she would come into his area and find him totally absorbed in the display before him, she could see the pain in his movements and his eyes before he knew she was there. During the last year of the wake period, she found herself cycling between depression and euphoria as she was whipsawed first by his pain and suffering and then by the magnitude of his spirit and determination.

It was finally time to launch Habitat 7. Lee had been right. The final assembly looked more like an explosion than a construction effort. The habitat assemblies being fabricated and outfitted inside of SEEDER 6 looked alive with crawling robots, making it virtually impossible to see the assemblies themselves. On the surface of SEEDER 6, the erected assemblies were surrounded by a gigantic framework that Lee had designed to speed the final construction step and to overcome the limited people resources available. The framework would have been wasteful for a normal construction cycle, but with nothing else for the space rigger crew to do during the catch-up efforts of the robots, it made sense to do whatever they could to shorten the final assembly time once the component pieces finally moved into space.

At last, Habitat 7 was on its way with its full load of frozen adults, children, ova, and sperm, already decelerating for insertion in orbit around a star that was still just a little brighter than all the other millions visible to the eye. Lisa, like everyone else in the crew, was in the assembly hall having a glass of real champagne. It was one of the few foodstuffs available on SEEDER 6 in a form that didn't require some kind of reconstitution. Most of the crew had learned not to touch the "other" wines provided for meals. They preferred to wait for the special occasions that some rational provisioner had known would be appropriate for habitat launches and worth the dedicated cryogenic storage container. They always toasted the "mystery provisioner" before the party was over.

Lisa spotted Lee Goodwin sitting in a chair with a mixed group of men and women standing around him. He was smiling for once and seemed to be in good spirits. She

moved into the group and stood silently while the conversation played itself out and the people drifted on to other interactions. When they were alone, she tried for the last time to convince Lee that it would be a good idea for her to delay going back into cold-sleep while she pursued a few more ideas that could solve the nerve degeneration problem or at least delay the progression a little more effectively.

Lee's response was the same that it had been for the last few months. "Lisa, Lisa, I keep telling you I have a plan, and I have thousands of robots just dying to be converted for research work. I want to do this alone or not at all."

"And you won't tell me what you're planning to do?"

"Nope. You'll either have an older me to talk to when you're in the last wake period or I'll leave you a complete log of my efforts. That'll have to do."

Lisa leaned down and kissed Lee on the cheek. She turned abruptly and walked toward the thick of the party, the first few steps with her eyes tightly shut.

### **2755 AD: Eighth Wake Period**

Lisa floated up to consciousness, shivering as usual. She could feel that the arm and leg restraints were still in place, but thank God the face mask had already drawn back into its recess. When she regained consciousness before the mask had withdrawn, she felt like she was going to smother. In just a few seconds the arm and leg restraints pulled back into their recesses and the lid on the cold-sleep coffin popped open.

Lisa lay there a few moments taking in the air of her compartment. While it had the exact same origin as the air in the coffin, it somehow always tasted sweeter when coming out of cold-sleep. Lisa fumbled with the latch on the side of the coffin and swiveled around when the side hydraulically lowered itself. Getting her feet on the deck was always a good feeling even if standing up for the first time in a hundred years was a bit wobbly.

She knew that her first act should be to check on her chosen domestic partner, Jimmy Hincle, but she stumbled hurriedly instead to her work station. She passed several crewmembers in the passageways, but as usual, nobody was up to communications much beyond a smile in the first few hours after cold-sleep wakeup. She settled into her new console chair, undoubtedly replaced by the maintenance robots sometime in the previous few months, and called up computer access. "System up."

"System activated," came the voice she had programmed into her station before leaving the asteroid belt of the solar system some six hundred years before. "Medical status on Lee Goodwin and any messages he might have left for me."

Her response was not in the familiar voice of her console, but in a voice just as familiar, Lee Goodwin's. "Good morning, Lisa," and with the trace of a chuckle, "I trust you had a good night's sleep?"

Lisa was in no mood for humor yet. She queried, "Is this you, Lee, or a message you've left for wakeup?"

"That's not as easy a question as it might seem," came the response. "It's not a recorded message, but on the other hand, I'm not the Lee Goodwin you know."

"Quit talking in riddles, Lee," Lisa snapped out. "Were your experiments successful? Did you find a way to stop the degeneration? Are you cured?"

"Yes, no, and sort of," rang in the air around the console, followed by a long moment of silence.

"Damn it, Lee. Are you going to tell me what happened, or are we going to play guessing games?"

An audible sigh from the speakers followed Lisa's outburst. "Okay, here goes a super-short version. We can cover the details later. It took seven years after you and the crew went into cold-sleep, but I succeeded in getting my body to grow a spinal node that gradually transitioned from normal nerve receptor tissue to a poly-carbon conductor. In fact I grew two of them because I couldn't force enough bandwidth out of the first one. Then, after a lot of trial and error, I succeeded in getting a true download to SEEDER's central computer that I had expanded by two orders of magnitude while working on the spinal node. I had a lot of trouble, particularly with the programming, but I finally got it straightened out, and here I am. Not the Lee Goodwin you knew physically, but still the Lee Goodwin you knew mentally."

Lisa was gasping for a breath so she could scream, but by the time she got the breath, she had a little better control on her emotions. "You mean to tell me you downloaded yourself to the computer?" she said with just a little more than normal volume. "You never told me you were planning to do that. You were going to try to find a way to arrest the nerve degeneration and then you were going to go into cold-sleep yourself. And now you tell me you're part of SEEDER's computer. The real Lee Goodwin's been dead for eighty years?" she choked, screaming.

"Stop it, Lisa."

The choking scream became anguished sobbing that seemed to go on for a long time before Lee spoke again. "Lisa, it was the only option available to me. We had tried everything we could think of to stop the degeneration and it didn't work. I didn't tell you about my plan because I knew your reaction would be what it just was. I've had seventy-four years as my new self now, and Lisa, I like it. I actually like it better than my old, mortal self. I know that's hard for you to believe right now, but I do."

Lisa sat sniffing and wiping her face and nose with her sleeve. She didn't know what else to say. She just couldn't deal with this sort of emotional stress right now, not just after coming out of cold-sleep, maybe not even later.

Lee broke the silence again. "Lisa, this is a lot all at once. I'm going to let you have some time. Go out into the central chamber and take a look. Check out the exterior of SEEDER as well. See what I've been able to do in the time I've had since my transition. We'll talk more later."

Lisa took Lee's advice and started out of sickbay, heading for Jimmy Hincle's quarters. Of course, he wasn't there. He was probably in the science lab checking on the multitude of experiments he had set up for the cold-sleep period, and of course, he probably hadn't given Lisa a thought since waking up. She backed out of the empty quarters and headed for the central chamber.

She took the usual ten steps to the automatic door, pushed the button that checked the air pressures on both sides, and thought she was some place else when the door slid open. The central chamber had been a long walk from Jimmy's quarters in her memory, but here it was, and it looked nothing like the central chamber she had left when she went into cold-sleep. It was about four times as wide as before, fifty or sixty times its former volume, and packed with every kind of structural shape you could imagine. Hordes of robots moved on and between them for as far as the eye could see. To top off the visual effect, she found herself standing on a balcony, jutting up into the central chamber. The structure she was on top of fell away on two sides of her, back to the new perimeter walls of the chamber. As a momentary wave of dizziness passed over her, Lisa stepped back from the railing she had unconsciously approached when she had entered the central chamber.

As Lisa turned to go back through the door and into the passageway, she heard the familiar voice of the Captain on the com. "This is the Captain speaking. As some of you have already found out, and the rest of you soon will, there have been massive changes

to SEEDER 6 while you were in cold-sleep. The perpetrator of these changes is Lee Goodwin, who managed to survive the cold-sleep period—more or less. In addition to the new and more spacious quarters that he has had the robots construct for all the crew in the new outer perimeter of the central chamber, there is a new assembly hall where we will all meet in twenty-three minutes at 0900. Your new quarters assignments will be given out there and at least some explanation of what has happened in the last eighty years or so. There are running strip lights in all the passageways that are now set to guide you to the assembly hall. I'll see you all then."

As Lisa moved back into the passageway, she saw the strip lights sequencing along the baseboard, guiding her, and she guessed everyone else, to the new assembly hall. She followed the running lights, almost mindlessly, in a stunned shuffle, the best she could do on wakeup day. Before long, there were a couple of other crew members moving along the same passageway with her. They too looked stunned and were walking with no less of a shuffle than she was managing. There were smiles and waves, but not much talk.

Lisa noticed that the shuffle was getting worse for everyone. It was definitely taking a real effort to walk down the passageway. Then it dawned on her that they must be walking out toward the new interior walls of SEEDER 6. That would mean the spin-gravity was increasing. Finally, the lights led into an automatic door that slid silently aside as each crew member approached and closed silently behind them as they entered.

There looked to be about forty or so already in the assembly hall, about a third of the crew compliment. There were pockets of people seated around the hall and the talk was lively and loud in each of the groups. Nobody remained standing; it was too much effort.

Lisa looked around for Jimmy, but he was nowhere in sight. He might even have failed to register the Captain's message, if he was focused on an experiment result when the message was on the com. Focusing to a fault was one of her big bitches with Jimmy. She spotted a few close friends of hers and Jimmy's and gravitated into that group. They were discussing Lee Goodwin as she came up and took the extra load off her feet.

Patsy Burita, one of SEEDER 6's botanists, saw Lisa and immediately shifted her discussion to question her knowledge of Lee. "Lisa, have you examined Lee yet? He must have survived the cold-sleep somehow if he did all this."

Lisa felt herself start to tremble, but clamped down on it before it could show. "No, I haven't examined him, but he did survive in a fashion. He downloaded himself to SEEDER 6's computer. I've talked to him already."

"He did what?", Patsy gasped. "He's in the computer? Is he alive?"

"Patsy", Lisa responded exasperatedly, "how could he be alive if he's only a computer program. He can't live inside the computer."

Patsy responded to Lisa's exasperation with a bit of pique. "Well, I know that much, Lisa. I meant did it really seem like Lee Goodwin when you talked to him. Is his personality still intact. Does he seem cogent?"

"I'm not sure I can discuss it logically yet, Patsy, but you know that no one has ever achieved artificial intelligence. They can write real sophisticated and seemingly intelligent programs, but never one that is truly self-aware. Actually, I don't know what to think yet. I guess we're going to hear more about it from the Captain or from the Lee Goodwin program."

As if on cue, the lights in the hall dimmed, and the Captain walked out on the small stage that the seats faced. He had his hands in the air as if to ward off the rising level of questions starting from the floor. "I know you all have a million questions, and so do I,

but we're going to start with a presentation prepared by Lee Goodwin that will hopefully answer most of them."

With that announcement, he strode from the stage and sat in the first row of seats. A holographic projection of Lee Goodwin formed on the stage, and it seemed to speak. "Ladies and gentlemen of the crew, this is about as close to the physical being of Lee Goodwin that I can get. The personality you knew as Lee Goodwin is now a huge collection of interactive programs in a computer. While I make use of SEEDER 6's central computer, that I considerably upgraded when you were in cold-sleep, my core programs are now loaded on the dumbbell-shaped starship some of you have seen moored to the exterior of this hollowed-out asteroid. My personal journey since you all went into cold-sleep is a long one, and I'll tell you as much of it in this presentation as you need to know in order to understand our current condition and our potential future. Here goes."

The assembly hall had been quiet for more than an hour as Lee Goodwin's presentation unrolled. The holographic projection of Lee had been replaced by a fast-paced chronology of changes to SEEDER 6, and in the end, to images of Lee's journey of exploration as part of the new faster-than-light ship he had designed and built during the cold-sleep.

Finally, the image was of Lee again. ".so the mission for SEEDER 6 has not changed. We will still launch the last habitat with all its intended complement on schedule. The difference is the choice you now have. You can put your forty-five to fifty year old physical bodies back into cold-sleep aboard the habitat and wake up with the colonists in a new star system, just like the original plan envisioned. But now you have another option, rather than go with the colonists as supernumeraries at worst and pseudo-grandparents at best, you can choose the new life that I've chosen, where your aging body is traded in for a ship capable of traveling considerably faster than light and your eyes, ears, and hands are as diverse and multiple as the robots you see scurrying around in the central chamber. Not to mention the fact that you will be virtually immortal, no pun intended. It's a concept that I know you'll all have difficulty with, but I'll be available 24 hours a day during the next couple of months to talk ith each of you, simultaneously if necessary, about anything you might want to discuss about being alive but no longer human. I'll be sad if no one chooses to join me, but it's certainly a very personal choice. Thank you."

The Captain did not return to the stage. He rose quietly from his seat and walked slowly out of the hall. There didn't seem to be any questions anyway, and there was very little conversation as the rest of the crew followed the Captain's example. Lisa noted that the spin-gravity had been slowly adjusted during the presentation. She was now walking with a more customary pressure on her feet and joints.

As she passed through the exit door, a computer voice spoke to her. "Lisa Martineau, assigned to crew quarters 201B.repeat, 201B. Map and verbal directions at each passageway nexus. Spin-gravity will adjust to Earth normal at crew quarters level over the next twenty-four hours." Lisa shuffled off to find her new quarters and shift her personal belongings from her old quarters, but when she got to her new quarters, she found all of her possessions neatly piled in the center of a spacious living room. The housekeeping robots had evidently been working overtime during the presentation, taking full advantage of the clear passageways.

Lisa crossed over to the comfortable looking couch against the bulkhead on her right, skirting sideways around the mound of her worldly possessions in the floor. She sat down and put her feet up, stretching the length of the cushions with her head resting on the padded arm. "Lee, are you monitoring?"

The answer took no longer than the normal conversational pause. "Yes, I'm here, twenty-four hours a day, anytime you want."

"Does that mean you'll be listening in on my private conversations as well?"

"No, I've solved that problem with a dumb sub-routine that alerts me only when I'm called. Unless that sub-routine is triggered, I don't hear anything at all."

"Good, you're seeming much too omniscient as it is, and I want you to be Lee Goodwin. Two months doesn't seem very long to make up my mind to become a computer entity. Why did you shorten the normal cycle for wakeup to habitat launch from two years to two months?"

"Two months was sufficient construction time with improved robotics, and the psychological data available to me on the crew indicated that the normal two year cycle would be too much time for the decision. Too long to live under the stress of such a momentous decision and still make a good one. Two months appeared to be about right to absorb all the data needed for the decision and still not leave too much time for second thoughts before implementation."

Lisa rubbed the heels of her hands into her closed eyes and gave a little sigh. "So, you've added human psychology to the panoply of your god-hood accomplishments?"

Lee responded in the same irritated tone that he would have used if he had been sitting physically in the room with her. "Knock it off, Lisa. I know enough about it not to fall for such a come-on, but I'll probably never be very good at it. The texture of the topic doesn't mesh too well with the gears of my intellectual machinery."

"Sorry," replied Lisa contritely, "I just can't get a good grasp on this thing, and it's easy to just lash out. What kind of response do you expect to get from the crew?"

"You mean a subjective response or a percentage?"

"Percentage."

"Sixty-two point nine percent. Seventy-eight choices to become crew ships. The rest will choose to be pseudo-grandparents."

"God, Lee. Two months. I don't know."

"I'm here when you want me."

## 26 AC: Adam System

Lisa kept her communications circuits carefully blanked, but her thoughts were looping at light-speed. *"Lee, Lee, are you still out there? Where did you go? Are you still alive? It's been fifteen years! We've all followed your plan; each of us has returned regularly every five or ten years, communicating and sharing experiences through the memory stores you created for us by packing the sucked out SEEDER 6 with memory to store whatever each of us would want to pass on to the others—our digital home. It was you who knew we would never see each other again without a prearranged point like Adam, but it is you who hasn't returned in fifteen years. Is this finally you, Lee?"*

Lisa let go her full spectrum hail. It went out in every energy spectrum she was aware of and in all the frequencies she could muster. A warm welcome home went out in Standard English on the normal sub-C and trans-c bands, while a clutter of natural constants and prime numbers went out on all bands in binary.

After the burst, Lisa fell silent and waited. Her sensors watched the continuing progress of the inbound ship and were poised to catch any response to the hail. "Lisa, it's Lee Goodwin."

Lisa detected and clipped her involuntary micro-circuit transients before they had any adverse effect on her systems, and the pulse flutter she detected in her fusion generators smoothed itself. She activated her primary trans-c data buss and probed for

a link on the pre-arranged bandwidth. The link on the incoming vessel was open, and Lisa carefully isolated her probe routine from her main control links and closed the buss.

Seven seconds later, the buss opened, and Lisa isolated the bandwidth and examined the probe-acquired data. She was stunned. How could she visualize this. It was like her probe had flowed into a spherical cavity, neatly defined by the ends of the individual data streams that were confined to the same space. She had total access to all the data in the sphere but to nothing outside of it. And the data streams, they were incredible, woven into a tapestry that in its weaving said more than the data in the streams. It was a brief but full view of the personality she knew as Lee Goodwin, with some tantalizing glimpses of growth that were exactly along the lines she would have expected.

The creation of a personality bubble like this one could only have been by the true entity, but was she getting the bubble from Lee or someone who got it from Lee. She had been fooled once before, and had almost died when she opened up to an incoming ship that claimed to be Jimmy Hincle but was one of the crazies.

"It seems to be you, and it seems you're sure it's me? How do you know?"

"By the texture of your probe, Lisa. You haven't changed that much since your transfer. I came back to Adam shortly after all the crew had left and reviewed everyone's personality transfer files that I'd instructed SEEDER 6's computer to save. I've got a very tight identity match for all the crew."

"Are you saying that the SEEDER 6 computer has personality files on all the crew? I've been through every scrap of data in that computer, and there's no file of crew personalities in the banks."

"Lisa, you forget that SEEDER 6's current configuration was my creation. I didn't want everyone to have access to that data."

"I hear you. Show it to me and I'll consider that proof of your identity."

Lisa was immediately queried by the SEEDER 6 computer for the establishment of a data transfer link, and she opened her primary com channels. SEEDER 6 Central squirted, and there she was in the temporary communications buffer. Lee had selected her own profile to send to her. She looked it over with fascination and a strange sense of *deja vu*. Satisfied, she dumped the buffer, glad to be rid of her summarized self and the strange emotions that it evoked.

"All right. I'm convinced. It's you."

"So, do I get at least a second level link, or are you going to keep me on level one until I'm bored to death? It's been a long time since I was restricted to Standard English."

Lisa had been thinking about this link for fifteen years, and she had decided on the first true communication she would make with Lee a long time ago. She opened up a high-bit link, verified Lee's buffer size, and squirted. Lee responded in what Lisa found to be a truly short time in light of the size of the data packets going in both directions.

"You certainly had an interesting introduction to the Milky Way, Lisa, in many cases, very different from mine. You did a good job of summarizing it, but you've carefully, and obviously, avoided any personal interpretation of your experiences. I could match up these experiences with your psych profile and probably get a good idea of what you're avoiding, but why don't you just tell me?"

Lisa wasn't surprised that Lee was a bit miffed by the cold set of data she had sent, in fact, she would have been disappointed in any other response. "Sensitivity to the unsaid was always a strong part of your personality, Lee, and I see you haven't lost it. I'm not trying to play games with you, but I am being cautious. I've had a lot of time to think about what I have to say to you, not idle time, but plenty of it. It's essential that I get a feel for the ways you may have changed since I last saw you. As I get a feel for

this, I hope I'll be able to use my new understanding of you to help frame the essentials of what I have to say."

"It sounds very mysterious, Lisa. Why all the drama?"

"I know it does, but in the fifteen years I've been waiting to say this, I haven't been able to come up with an approach that didn't sound corny. I'm hoping you will indulge me out of curiosity if nothing else."

"Well, I admit to being curious. Let's see how long I can sustain it."

### **2755 AD: Eighth Wake Period**

In reality, Lisa still had two weeks to make up her mind, but she was tired with it nagging her, and she wanted to get it behind her. "Lee, let's talk a little. I want to know a little bit more before I make up my mind."

Lee's response was immediate, as always. "Okay, what's on your mind?"

Lisa had tossed and turned over the issue for the last three nights, and she knew exactly what she wanted to ask. "I'd like to know more about your efforts to stay alive after Habitat 7 was launched and we all went into cold-sleep."

"Okay," Lee agreed, "I'll try and keep it brief. If you will remember, you tried hard in the last few days to convince me that it would be productive to allow you to delay cold-sleep and continue your research for a cure. You should also remember that I put on a full-scale demonstration to prove that I could handle the job myself with the aid of the computer and the laboratory robots once I was free from habitat preparation duties. When you reluctantly went back into cold-sleep, you probably figured I had no more than five to eight years, even though you never said it.

"As soon as you were under, I immediately cleared the labs of all specimens and cultures you had so carefully organized and cared for over the last two years. I had made up my mind months before that the convergence probabilities were not in my favor for finding a medical answer that would reverse the degenerative activity of my body, and arresting the problem would only buy me time that I really didn't want. The way I figured it, if I survived for thirty or forty more years by arresting the degeneration, I would probably still be unable to take the shocks of cold-sleep and could only look forward to growing old more utterly alone than anyone has ever been before. Not the sort of thing for me, and besides, you had peaked my curiosity with several of the recombinant cultures you had tried in your efforts to grow a new kidney and liver that wouldn't, immediately upon transplant, begin to deteriorate in function.

"Some of the things you tried I didn't know were possible. If you remember, I was asking a lot of questions in those days, and I was doing as much research in the central computer's medical and biological archives as my other duties would allow. That's when I came up with the plan that I was going to bet my life on. If I lost, at least I wouldn't have bored myself to death. If I won, I might live not only until the crew warmed up, but potentially, forever.

"My final goal was straightforward, if not simple. As you now know, my plan was to transfer my personality to the central computer of SEEDER 6. Although a lot of research had been done on bio-computer interfaces according to our data banks, as far as I knew no human had ever been successfully equipped with even a rudimentary device at the time of SEEDER 6's departure. Unless it was done in the short time left to the humans of the solar system, in some human colony during the last nine hundred years or so since the seeding had begun, or in some parallel situation aboard one of the other seeder ships, it looked like I would be breaking new ground.

"Now I knew all too well that artificial intelligence, the computer technology carrot through the last half of the twentieth century and throughout most of the twenty-first

century, had been a gigantic fizzle. And that no matter how hard they tried, nobody had succeeded in making a computer self-aware. To us computer jocks, it seemed as hard as making something from nothing, truly something from truly nothing. It appeared to be impossible.

"But I wasn't discouraged. I wasn't planning to spend my time on some perpetual motion machine; I was going to try for an artificial, artificial intelligence. That is, a wolf of human intelligence in the sheep's clothing of a computer. So I."

Lisa couldn't stand it any longer. She had to ask how he had done it. "Lee, cut to the chase, will you? How did you manage the interface?"

"Hey, whose story is this? I was just getting there. Like I was saying, I was hoping to piggy-back on the tissue growth experiments you had been doing with the goal of growing a new type of nerve tissue using recombinant DNA and electro-magnetic stimulation techniques. The previous research had succeeded in altering human cells to produce an organic conductor, and it seemed to me that the trick was coaxing the genes to start with normal Lee Goodwin cells at the nerve tissue connection and then to gradually alter the basic nature of the cells as the tissue grew. I knew what I had on the starting end and I knew what I wanted the tissue to be like at the end of its growth. It took me seven years of tedious research to find the right combinations, and ultimately I did it sort of backwards, but I did it."

Lisa was beside herself. "But how did you do it? Where did you take the tissue sample you used? What genes did you splice? Which splicing techniques did you use? How did you."

"Hold on a minute, Lisa. Do you really want the details? We'll be here all day and all night until the end of the wake period. I've got the time; I can multi-task, but have you?"

She was nonplussed. Yes, she wanted to know every little detail, and no, she knew she didn't have the time to hear it all. "Okay, you win, but if I decide on the download option, you owe me the full details."

"Done. What else?"

"What else happened? Major stuff, problems."

"Well, my first effort failed. The tissue grew like I wanted it to, but I couldn't get enough bandwidth to make the download in the time left. So I prepped another spine site and tried a variation I had thought of three-fourths of the way through the first effort. It worked, and I went crazy."

Lisa couldn't stop the reflex of looking up sharply from her toes, where she had been focused, to the center of the room where she knew intellectually no one was there. "What do you mean crazy? Happy, delighted crazy, or insane crazy?"

There was an uncharacteristic pause before Lee's response. "Crazy is the only way I can explain it. I can't really remember much of what went on during that time, but when I finally pulled out of it, I retained enough memory to make some needed changes in the interpreter language and algorithms. When I started making the changes it felt like I was doing it with only half my brain working and only one finger for input. Of course, I didn't have a brain or any fingers at all, but that's as close as I can get to the way it felt."

"What was wrong with the original software, Lee? What was it not doing or doing wrong?"

"Well, there was nothing wrong with it. It worked just the way I'd designed it to work. The problem was that I didn't really understand the necessity for prioritizing data availability. I had priority algorithms, but to nowhere near the extent needed. Apparently, a person can't remain sane with complete access to all data at all times. Every problem, every attempt at executing a command or making a decision becomes instantly overwhelming in the cascade of available data. To make decisions as a human

being it's necessary to focus on only the important data for that decision. That requires an ability to determine which data is necessary. That requires a prioritization of data as it's acquired which determines how it's filed for later access. To function rationally, I found out that it was necessary to essentially "forget" the vast majority of data that I routinely acquired. Of course being a machine with essentially limitless storage capacity, it wasn't really necessary to forget anything, only to put it in storage where it wouldn't be used unless I really wanted it."

"Do you think the programming problem is fixed?" Lisa queried.

"I do. I can't be absolutely sure until I've successfully downloaded someone other than myself, but I'm pretty sure."

"Pretty sure?" Lisa huffed. "These are people's lives we're talking about. Pretty sure doesn't seem too good to me."

"I'm not planning to use the patched up programming I had when I finally pulled out of my funk. I've had seventy-four years to understand the problem and refine the programming. I guess I'm saying that I'm a lot more than 'pretty sure'."

"You damn well better be. Have you told any of the others about your problem and the potential risks for them?"

"The few that have asked, yes."

Lisa seemed drained. She needed to think about what all this meant as far as her decision was concerned. "Okay, Lee. That's all for now. Bye."

"Any time, Lisa."

Lisa still took another week to make up her mind. It might have come sooner, but her suited excursion to the exterior of SEEDER 6 shortly after the conversation with Lee caused the setback. She didn't need to see the fully constructed Habitat 8 from the outside, since it looked like all the other seeder habitats. What she needed to see was the ship that housed the computer that housed Lee Goodwin, and it was tethered to the polar end opposite that of the habitat.

Lisa didn't particularly like low and no gravity experiences and by the time she got to the end of the passageway leading to the south pole airlock for SEEDER 6, she was slightly nauseated. She was also torn between going back to her quarters and making do with the holographic images of the ship or gutsing it out and getting the first hand impact of actually looking at what might be her in a few subjective days.

The outer door to the airlock swung open. "Okay, computer, reel me out about twenty meters. That ought to be enough to see it all."

The computer responded with a request to make a slight jump through the airlock door with about the force required to elevate a few inches in normal gravity. Lisa made the effort and floated out head down into a shower of stars. Or at least it felt like it was head down when she emerged, but when she had cleared the airlock and there was nothing but stars and space in her peripheral vision, her brain flipped her back to head up. Her already queasy stomach lurched.

As her tether tightened, her back rotated to face the asteroid and there was Lee Goodwin, spinning on his own tether. That is, he was spinning at just the same speed as SEEDER 6 but in the opposite direction. Then again, was that spinning or standing still? She hated all this relativity.

She examined the star-reflecting hull of the ship hanging over her and was disappointed that she couldn't see more. If she had thought about it, she would have realized that holographic images were bound to be better because Lee could synthesize the light. Out here there were only stars, billions of them, but only starlight.

The dumbbell-shaped structure of the ship was a blot on the star-scape. Without any reference, she couldn't get a good feel for the size of the ship, but she already knew its size. The two end spheres were about a hundred meters in diameter and the

connecting cylinder was twenty meters in diameter and three hundred meters long. The two spheres were mostly propulsion-field generators, and the cylinder was mostly Lee Goodwin. No ears, no eyes, no nose, no mouth, no hands, and no feet; just gleaming black metal. She felt the tears running down her cheeks. "Reel me in, damn it."

The next day Lisa sat in the conform chair in her quarters, a cup of steaming cut black tea in her hand. It was cryo-stored but the real thing, raw and biting. "Lee, what's the count now?"

The answer was immediate, "Forty-four."

"That's seven less than when I asked you three days ago, isn't it?"

"Yes," was his answer, and it was amazingly despondent. How he could still be so expressive with his voice and be only a computer still intrigued her.

"Cold feet?"

Lee made an attempt at humor, even though it was apparent his heart, or whatever equivalent program, wasn't in it. "In this case, they're opting for cold feet. I guess I'm not a very good PR man, and I told you I was a lousy psychologist."

Lisa grinned through her response. "I don't know; I think you did a pretty good job on the galaxy wandering stuff you showed us. You saved all those images for their PR value, didn't you?"

"Yeah. It was that obvious?"

"It was to me, but it also answered one of my questions about living for thousands or millions of years. How bored would I get, and how quickly would it happen. You convinced me that with the capability to go just about anywhere you wanted through a wormhole, and to do it essentially instantaneously, there would be little chance of boredom for a long, long time.

"The other big question for me was how I would deal with being so utterly alone, but you helped a lot on that when you showed us your contacts with a few of our colonies and your plan to turn SEEDER 6 into a digital home base and mailbox. All in all, a pretty good job. You convinced me."

There was a clear edge of excitement in Lee's voice as he said, "Does that mean you're going to make it forty-five?"

"Count me in. I never had much desire to be a grandparent without ever being a parent anyway."

### **2963 AD: Ninth Wake Period**

Lisa swam up to consciousness and Lee Goodwin's voice. "Hey lazybones, let's shake a leg while you still can. I can't tell you how delighted I was when you decided to join the crewship brigade."

Lisa's dry throat cracked out a reply, "crewship?"

"My name for what I've become and you and thirty-seven men and women of the former SEEDER 6 crew are about to become."

"Christ, Lee. Tone it down a little. You're too upbeat for a wakeup day. Nobody's going to be in the mood for a sprightly computer today."

"Ahha," responded Lee in the same sprightly manner as before, "but it's only you that has to face my exuberance. I brought you out two days before anybody else so you could help with the interface tissue growth procedure."

"But," sputtered Lisa, "I thought all that was automated. Your interface was all done by the medical robots you designed."

"True, but a robot doesn't have much of a bedside manner, and I'm not too sure about mine anymore either. Yours, on the other hand, should still be as good as it always was, at least after you have a few days to get up to speed. Are you game?"

"I guess so, but I'll need all of the two days. A week would have been better."

"A week, two weeks, a month, whatever you want," was Lee's retort.

Lisa paused a moment. "I take it back, two days with you in this mood will be quite sufficient," she groaned. "Go away and let me get out of this thing. I've got pressing bodily functions to take care of. You remember those don't you?"

"Modesty becomes you, my lady." And with that, Lee was gone from the circuits in her quarters.

Lee's preparation of the thirty-eight crewships would take time, so the selectees had gone into their last cold-sleep after the eighth and final habitat had been launched. Following the slingshot maneuver around the Habitat 8's system star, and during the seventy-three years it had taken SEEDER 6 to return to and orbit the protostar Adam, Lee had stayed busy. He had continued to upgrade and refine the crewship design, including himself, and during the early years of the last voyage, had utilized his crewship-self with its FTL drive to race ahead to the Habitat 8 target star system. Long before the habitat arrived in the system, Lee had rounded up a sizable group of small asteroid chunks needed for a crewship factory and was waiting when SEEDER 6 had completed her slingshot and was on her way to the protostar system.

Since he was restricted in the mass he could accelerate in a reasonable time frame to match SEEDER 6's outgoing velocity, the asteroids he had selected contained the raw materials he needed to build the low-mass but complex systems and equipment that would make up the guts of the crewships. The high-mass components would be built in the efficiency of the protostar orbit where all the raw materials should be available with a low energy collection effort. The FTL propulsion system devised by Lee couldn't be coaxed to operate in the high gravity well of a star system, so it was great for moving from star system to star system but no help at all for in-system maneuvering. The only quick way into or out of a star system seemed to be via wormhole, usually located at gravity anomalies like major Trojan points, if at all.

When Lisa finally struggled to the central chamber for a first hand look, it was to yet again another version of the original seed ship. It was indeed a very different factory than the one that had produced eight habitats and even more changed than the surprise that had greeted them when they awoke from cold-sleep to send off Habitat 8. The chamber itself was much larger and seemed to be perfectly spherical. She knew that the original asteroid base for SEEDER 6 had been roughly ovaloid in shape, and that meant that the asteroid had been virtually converted in its entirety to a ship.

This time Lisa didn't feel any compulsion to go outside the interior of SEEDER 6 for a first hand look. She went instead to her familiar work station, although she had to ask the computer, or Lee, or whatever was now in control of computer functions, how to get there from her quarters. Lee had left the crew quarters as they were, but he had moved just about everything else in his efforts to optimize the use of onboard building materials. "System up," Lisa intoned as she slipped into the console conform chair. "Show me a panoramic view of SEEDER 6 from space. Start at a perspective of ten kilometers above the north pole. All scroll functions to the mouse."

The holographic image popped up in front of her and she keyed the mouse to move in, out, and around the image of the new SEEDER 6. At each of the poles there was a string of tethered dumbbell shapes, just like the ship Lee had constructed for himself. The exterior of SEEDER 6 appeared to be a series of domes almost edge-to-edge across the entire surface. She knew she needed help to understand just what she was looking at. "Lee, which one of the tethered ships is you, and why are there only thirty-eight of them? With you, there should be thirty-nine."

The response was slower than usual, but still enjoying his upbeat mood, Lee answered cockily, "I'm the dumbbell in charge, but you didn't see me in the strings

because I'm currently ferrying a nearby ice chunk to SEEDER 6 for its fusion reactors. I won't physically be at Seeder 6 for another couple of hours. You probably noticed the time lag on my response. As we plow around in this soup that Adam is cooking up, we pass by frequent targets of opportunity that I charge off to corral. I'm trying to fill the domes you saw on the surface with ice."

"That's what they're for, storing ice?"

"Well, they are now. Originally, I built them for storing the piece parts I constructed on the way to Adam. Now I'm trying to get enough water available for the fusion reactors to be able to operate for a thousand years or so. The mass will also help stop radiation damage to the more delicate systems I plan to leave aboard SEEDER 6 when we all clear out. I'm almost finished."

Lee had piqued her curiosity. "What systems are you leaving that need to operate for a thousand years?"

The exuberant Lee gave a characteristic chuckle. "Got your attention did I? I'm leaving a revamped version of the central computer and all the robotic capability needed to maintain itself. I plan to use it as a digital home base or mailbox for everybody. My recommendation is that we all come back every five to ten years and leave and pick up messages. That way we can stay in touch, arrange rendezvous, share new knowledge, and generally maintain that sense of community you feel is so important. Unless somebody comes up with a method for omni-directional, long-range, trans-light communications, it's the best I can come up with."

Lisa's love for detail sent her back to the previous subject to clear up a nagging thought. "You've got the water barrier for radiation, but what about the big junk in this system?"

"Active systems. Lasers, masers, even some thermo-nuclear warheads if needed, but I doubt they will be. I plan to nudge SEEDER 6 to the outer reaches of Adam and find some large hunk of debris I can snuggle her up to before I leave."

"One more question, I almost forgot. I really had it come to mind as I was going into cold-sleep this last time. What happens if more of the crew have cold-feet about the transfer. We don't have a habitat going out this time to stick them on."

Not quite as exuberantly as before, Lee answered, "I hope we don't lose anymore. It's still hard for me to believe the number is as small as it is now, but if more back out, the fix is relatively easy. With the required deceleration and achievement of a stable orbit by the under-powered habitat, the projected wakeup for Habitat 8 is serendipitously about a year and a half away. If anybody wants to back out, I'll just drop them off at Habitat 8 on my way out of here."

Lisa leaned back in her chair. "Okay, Lee. I'm going to take a little nap here and then run system checks on the medical equipment. Do I have access to all of your tissue growth automation data?"

"Yep, talk to you later."

Lisa's next two days were spent running system checks and studying the automated processes Lee had designed for growing the spinal linkage tissue. His solution had been quite elegant in its straightforward approach. The tissue was in essence a bio-converter that changed the neuron stimulation coming along the short stretch of spinal cord into electrical nano-charges readable by the computer program. The only really difficult thing other than the growth of the tissue itself had been tricking the brain into sending the right information down the spinal column. Lee had thought it was possible because of the many different ways to trick the brain that people already knew, like inverting retinal images, and he ran through generations of laboratory rats figuring out how to do it.

Every day for the next month, Lisa had a new patient to prep, psychologically and physically, for the tissue growth on the neck, just below the medulla oblongata. The growth took about two weeks and looked like a sausage coming out of the base of the skull, with a micro-connector on the end of it. The growth process started with a micro-connector containing thousands of connections that was cultured in the lab from the patient's own nerve tissue. This organic conductor tissue was then grafted to the spinal cord where it continued to grow out from the base of the skull. During this growth, the tissue at the graft point gradually changed to the normal nerve tissue of the spinal cord.

There was no pain, but there was some discomfort with having to stay in bed and remaining relatively immobile for the whole period. Specially shaped pillows helped a little, but boredom was a big problem. Most of the crew filled their days with virtual experiences of one type or another from the central computer's extensive library.

As she had foreseen, there were more crew members that came down with cold feet. There were five of them altogether, two of them after the growth process had already started, but the body rejected the tissue when the growth process was stopped, and they were little worse for the wear. Only a small bit of scar tissue remained at the base of the skull.

The downloads, on the other hand, took about three weeks and required an induced coma. The reluctant five actually became an asset in checking behind the medical robots to make sure that the physical bodies were receiving proper care. Of course, the robots were perfectly efficient in doing their jobs, but everybody felt better checking behind them, particularly Lisa.

After starting the third download a new question occurred to Lisa, and she put it directly to Lee. "Lee, is the download process a download-wipe event like draining all the information out of the brain, or is it a copy process that leaves the information intact?"

Lee's response was cautious. "I can tell by your tone that this is a serious question for you. It was for me, too. I had to know that when I did my own transfer. Were there going to be two of me until my physical self died, and if so, did I want to terminate my physical self on completing the download. Tough stuff, and I didn't know the answer when I was about to start my download, so I programmed a termination for my physical body just to be sure.

"The answer came when I reviewed the records of the download, after I had solved the little insanity problem. The records showed that the download left virtually nothing behind. The only reason that the body was still alive was that none of those brain functions had been needed and they weren't downloaded.

"Now don't ask me why it worked that way, because I just don't know. It was as if the brain were designed that way. A design that avoids the moral dilemma of suicide and eliminates an even larger moral issue that could have a person making limitless copies of themselves. I have yet to come up with a good answer for why it wouldn't just be a copy download situation, but I'm happy not to have to present the problems to everybody else to deal with. You guys are in relatively good shape, which I wasn't. With a little care, you could live another fifty or sixty years."

Lisa felt a wash of relief. "You're right. A real moral morass. I hadn't even thought about the multiple copies. But what you're saying sounds strangely like 'artificial, artificial intelligence' is part of some grand scheme of things."

"I don't think we've got time for a theological discussion of any depth right now, but my experience so far has been that poking around the universe makes you think about things again that you thought you had rejected. We'll talk theology again after you've logged some more travel time."

Lisa had frequent chats with Lee after that, but never on any really serious topic. When it came time to prep Jimmy Hincle for the tissue growth, she found that he really had no lingering animosity about their breakup, or more like drifting apart, during the eighth wake period. He was just as moody, just as brilliantly on, and just as darkly off as he ever was. He couldn't wait to make the download.

Her days were full of work until she was the only one left that hadn't started the download process. The tissue growth period was boring for her like everybody else, and she found herself more and more frequently engaged in conversation with Lee, but still nothing serious. She waited too late to have a last word with Lee, and found herself slipping into the drug induced coma.

Lee had planned the turn-on for the new crewships to be simultaneous so the experience could be shared and hopefully, helped along by kindred feelings. He was right, there was some trepidation, but mostly exuberance as each of the crewships struggled to absorb the sensory array now available to them and struggled to rationalize those that were forever lost. For some, like Lisa, the camaraderie was intoxicating and she stayed for weeks, until only she and Lee were left in the Adam system. For others, the urge to explore was just too great and they drifted out-system with promises to come back soon and to leave and pick up messages from SEEDER 6's computer. Jimmy Hincle lasted a half a day and was gone.

Lisa had finally torn herself away from Lee and headed out to the only usable wormhole they had found in the Adam system. Lee was towing the reluctant five in one of the spare ships he had modified for them and would be many days behind her in getting to the wormhole. Every hull and deck plate, every electronic circuit, and every mechanical system aboard seemed to sing as she made her first trans-c jump.

## **26 AC: Adam System**

So far, Lisa could find nothing revealed by Lee that would lead her to think that Lee was hiding anything significant from her, and she could find nothing that would lead her to make a change in her perception of Lee's personality. "Tell me Lee, why are you still Lee? I've fought hard to remain Lisa for the twenty-six years since my transition, intensely introspective years where that question was a dominant loop in my thoughts. I still have no answer that I'm comfortable with, and you've been, as you would say, an 'artificial, artificial intelligence' for three hundred years. You seemed to be Lee during the eighth awake period, and again when we were here in the Adam system, and now while we're talking over old times. Who are you now, Lee?"

Lisa got a strange burst of data from Lee, ran it through a code breaking routine, and arrived at the conclusion that it was a digitized version of laughter just in time to have it confirmed by the normal data flow through the com link. "I can't say that you will never cease to amaze me, Lisa, since I've got a different perspective on that phrase than I used to, but I can say that I'm surprised that you're probing so quickly to the heart of the matter when you're supposed to be cloaking your intentions in a veil of 'mystery'. Of course, I'm not the same old Lee Goodwin, but I couldn't let that out during the period when I was trying to convince the crew that they would continue to be their same old selves but in a better and more responsive 'body'. Nor could I tell them during the psychologically stressful period of preparing for the transition. But surely, it was suspected by most of the crew. Wasn't it?"

"No, there were a few of us that speculated on the subject as an adjunct to discussions on your insanity period and being alone for all those years, but most of the crew probably avoided the thought altogether since it was unpleasant to dwell on."

"I assure you again that I'm still sane," replied Lee, as he went quickly on to add, "by the classical definition anyway. I'm still very much Lee Goodwin, but I'm also a great deal more than the Lee Goodwin who first set foot on SEEDER 6."

"I know, and I've been waiting for fifteen years to tell you that I know."

"And that's your mystery?", Lee queried.

"No. Now that I've confirmed that the basic personality I knew as Lee Goodwin is still alive and well, I also know that you already know why I am here."

"Yes, I do," Lee confirmed, "but I must admit to being very surprised that you've been here for fifteen years. I didn't think you'd be here so quickly, or I wouldn't have tarried."

"When did you know that I'd fallen in love with you?"

"To be honest, not until I had a look at your psychological profile in SEEDER 6's computer files, but I think it must have happened when we were working closely on my malaise. Right?"

"Yes," Lisa admitted.

"By the way, have you seen Jimmy during the last fifteen years?"

"Twelve times."

"I thought he never stopped caring for you. I was right. Does he know why you're here."

Lee always knew how to push her buttons. "Jimmy? Are you serious? It would never occur to him on his own, and as a crewship, it may be ten thousand years before he takes a break from wrestling with the physical wonders of the universe and discovers that there are other wonders as well. No, Jimmy doesn't know. No one but you."

In a more contemplative tone, Lee continued to push against Lisa's reluctance to open up. "In fifteen years you've had plenty of time to refurbish one of the five ships still on tether to SEEDER 6, but I haven't been able to spot any modifications to them since coming in-system."

"Of course not," she quipped, "I wouldn't have wanted you to detect anything before I'd made up my mind. After talking to you, I could have decided to wait for Jimmy to come back the next time. Besides, I've had to keep any changes hidden anyway because of the others. I've seen twenty-three of the crew since coming back to Adam."

Lee rushed to stick his now figurative foot in the door that Lisa had just cracked open. "I assume you have a plan for how you want to do this. I also have a plan, and even though I'm confident we'll be in synch, don't you think we should pool those plans for a consolidated approach?"

"If you don't wise up," she retorted, "there'll be no need to share plans because there'll be no sharing of anything else." Not to be outdone by a digitized laugh, Lisa delivered that sentence with a sharp increase in gain from its start to its finish.

"Something I've said has made you angry?"

With the gain still up, "No, you idiot, it's something you haven't said."

"You're kidding!"

There was no response to Lee's last statement. Utterly no response. Lee didn't know how she did it, but Lisa had either disappeared or had somehow nulled all of his sensors, both active and passive. A full spectrum cold-shoulder.

"You're not kidding. I thought you knew. We were discussing it obliquely just a few moments ago."

"We were discussing the fact that I fell in love with you during the seventh awake period. We did not discuss your falling."

After an uncharacteristic pause, Lee finally said it. "I fell in love with you too, Lisa. Same period. I still love you."

"That's better. I forgive you for not expressing your feelings in a more open manner. I realize you just took it for granted that I knew how you felt, and I did actually, but I wanted to make the point that it'll be very important for you to be conscious of the proper display of emotions during the next few months."

Lee chuckled. "Are we going to discuss what 'proper display' covers?"

"We can if you want, but I'm sure you already know if you just dredge it up. I'm sure your parents taught you."

"No, I actually don't remember their teaching me about emotional display at all," was Lee's too serious reply.

"My God, Lee, you can still be exasperatingly naive, even with hundreds of years under your belt. By example, Lee, they didn't sit down and deliver a lesson."

Another pause, "Oh."

"Oh? I can see this isn't going to be any easier than if we were still our corporeal selves. At least we can dispense with the honeymoon part and get right to it. I'm going to squirt you my plan. Let me have yours."

Lisa scanned the plan, and if she had a head, it would have been shaking back and forth while producing "tch" noises. "Lee, your goal is wonderfully grandiose, but I don't think you understand the problem. Your plan will produce a schizoid adult, not a child. I don't think we can discuss this. I think we have to share this at a core level link. We're currently light years apart on the subject. Open up in there; here I come."

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"Aw, he's a cute little dickens, isn't he?"

"Lee, would you just knock it off. This is a serious event. If we're right, it has a chance of being the most serious event since the Big Bang. All we have here before us so far, however, is a very smart computer inside of a very powerful spaceship. Are you ready for the first personality squirt?"

"Yeah," came Lee's immediate and ebullient reply, "but are you sure we shouldn't know what the other is squirting?"

"Absolutely, if I knew what you were selecting in detail rather than in philosophical terms, I might subconsciously react to that and end up coloring my own selection. The human race suffered millions of years of evolution in coming up with the right combination for passing on cultural and psychological traits. I'm willing to continue that evolutionary process, with the passing on to my children of characteristics that I've consciously selected rather than relying on the chance that some good characteristics will get passed on by the roulette of genetics. But you and I both know that the genetic-environment controversy in psychology has never been settled, and I think we have to go slow, provide small incremental building blocks of personality, and interact on a continuous basis. I agree with you that theoretically we could do it all in one shot, but I'm not willing to make any hasty experiments with my own son."

"Daughter."

"Whichever; we decided not to discuss that any more either. Okay, I'm squirting first, then you, without a break in the data stream."

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"Lisa, what's happening?" queried Lee.

"What I expected to happen. I'm monitoring at every level, and I'll let you know when something significant occurs. You just link our controls and take us out to the Trojan point."

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"Lisa, we're just about ready to jump. Nothing yet?"

"Oh yes, a little while ago, but I've been saving it for this moment. Open a com link Lee, and say hello to your daughter."

"Alexandra?"  
"Fa...ther?"