

Rome's Evolution

Chapter 1

Year 3460 AD (1379 PR)
Second Planet (Deucado), Tau Ceti System
(11.9 Light Years from Earth)

Rei Bierak bent his head and ducked his six-foot plus frame down as he trotted through the trellis leading up to his home. One close call with a 'falling blanket' last year and even Rome had to admit having one in front of their house was prudent. She had dressed up the trellis with some plants imported from Earth but Rei scarcely took the time to breathe in the sweet honeysuckle aroma that permeated the area. He bounded up the three steps and flung open the all-white front door, hoping to make a dramatic entrance.

"Daddy's home!" he said with a flourish. But his performance played to an empty theater. There was no one about. He shouted out, "Rome? Aason?" There was no reply. He closed his eyes and used his sonar vision to sweep the house, listening for signs of life. The only sound he heard was a strange tick-tack-tick noise coming from the kitchen. Other than that, it was deathly still.

He opened his eyes again, activated the 'cell-phone' in his head and called out, "*Rome? Where are you? Where's Aason?*"

"I'm at the library," his adoring wife replied after a moment. "*Aason is here with me.*"

"What's going on?" Rei asked. "*It's getting kind of late.*"

"I'm so sorry, mau emir," Rome answered. "*We may have had an incident occur and we're trying to sort it out.*"

Rei looked around then set his shoulder bag down on the dining room table and headed toward the kitchen. "*What kind of incident?*" he asked as he was walking.

"Nothing major," Rome responded. "*The interns were away for the celebration of Tamas and when they returned, they found some items missing.*"

"What kind of items?" Rei asked, sauntering into the kitchen.

"As far as we can tell, the only things missing are one of the Deucadon's invisibility cloaks and Hanry Ta Jihn's handgun."

"That's an odd set of things," Rei remarked. "*Do you think somebody took them?*"

"We don't know yet," Rome replied. "*The girls are trying to contact the remaining interns to see if one of them borrowed the items.*"

"OK," Rei said. "*Are you going to be a long time?*"

"No. The girls will figure it out. I'll come back here tomorrow. Let me gather up Aason and we'll come home."

"Don't worry about it," Rei said. "*Take your time. I'll get dinner started.*"

"All right, mau emir. I will see you shortly." With that, Rome cut the connection.

Rei looked around the kitchen. Something smelled funny. It was faint but had an acrid, almost electrical odor to it. Remembering the odd ticking sound he heard when he first entered the house, Rei closed his eyes and performed an aural sweep again. He determined that the sound was coming from under the sink. He stooped down, opened the cabinet and found a large black box sitting there, with elaborate electrical circuitry and wires hanging from it. Mounted on the side was a digital timer that was counting down: 007, 006, 005. Rei leaped up and raced for the

front door. He barely made it out when a tremendous explosion tore the front of their house apart. Rei was lifted from his feet and flung through the air like a rag doll. Something heavy hit his back then his head then everything went black.

Pain has its own chronology. The simplest and easiest to remember is visceral pain, the kind that goes down in the gut and radiates from there. Like the pain Rei felt the first time he ran the marathon or the pain he felt when they froze him alive. Rei also remembered the pain when the auto-defibrillators incorrectly concluded his heart did not start and shocked him an extra time upon being reanimated. The misguided life-saving gesture almost killed him.

Next in line was the pain Rei remembered when he almost asphyxiated in the Vuduri airlock, a result of Estar trying to kill him. He also remembered the pain in his back from 1400 years of degeneration that OMCOM cured with his magic pill.

As Rei's consciousness bubbled up and he became more aware, he remembered emotional pain, like the pain of leaving his parents behind as he traveled to the stars. Like the pain Rei felt when Sally Reynolds told him she was not going to accompany him on that trip. However, the worst heartache Rei ever felt was when Rome was integrated into the Overmind on Deucado and he thought he had lost her forever.

All of this aside, none of it compared to the pain he felt now.

Maybe pain was not the right word. Bone-deep soul-sucking piercing, throbbing ache might better describe it. His head ached. His neck ached. His shoulders ached. His arms ached, especially his right arm. His chest ached. The only thing that did not ache was his legs. His ears were ringing and at the same time felt like they were stuffed full of cotton. His eyes were closed but his head was flat so he couldn't activate his super-hearing to figure out his surroundings.

And that was baffling because he had absolutely no idea where he was. As hard as he tried, his eyes wouldn't open. He racked his brain trying to recall something, anything that might give him a clue. He started with what he did know. He knew his name was Rei Bierak. Recalling the sequence of pain helped him remember being frozen and sent to the stars. He remembered being so cold when they first thawed him out. He remembered that two beings, dressed all in white, were attending him. At first, he thought they were monsters or aliens who resurrected him. Luckily for him, one of those monsters was Rome. Wait, Rome! That was the answer. His amazing, loving wife. He could picture her stunning face so clearly. He thought he caught a whiff of her wonderful smell, like vanilla surgical scrub. He missed her so much. Where was she?

Rei was now more determined than ever to figure out where he was. It took a heroic effort but he managed to get one eye partially open. The bright lights of the room were dazzling. It made Rei blink rapidly. Everything was white. Well everything except for the large black figure, complete with cape, standing with his back to Rei, arms akimbo, set firmly on his hips. Rei looked out the corner of his eye and saw his beautiful Rome dozing off in a chair in what looked like a very uncomfortable position.

"Rome?" he croaked, barely able to speak.

Rome's eyes jolted open. "Rei!" she shouted, jumping up. "You're awake!" Her smile spread from ear to ear as she raced to his bedside and put her arms around him.

"Ouch," he said as she squeezed his shoulders. "Take it easy," he murmured.

“I am sorry, mau emir,” Rome said, releasing him then kissing him tenderly. “I was so worried.”

Rei was finally able to force his other eye open. He tried looking about the room. “Where am I?” he asked.

The large black figure at the base of his bed turned around. It was MINIMCOM’s livetar, his mouth slit curled upward in the largest smile Rei had ever seen on the animated shell.

“You are in a hospital in Vuduri City,” Rome said, caressing his forehead gently.

“What happened?”

“There was an explosion, at our house,” Rome said sadly. “That you survived...”

“An explosion?” Rei interrupted her, confused, “What...”

Rome pressed her finger gently to his lips. “Just rest,” she said. “I’ll tell you everything in due time.” She turned her head. “MINIMCOM, will you fetch the doctors, please?”

“Of course,” replied the livetar and the large black figure strode out the room.

Rei tried to take a deep breath but a sharp pain in his rib cage cancelled that notion. His shoulders slumped and he closed his eyes again. Just their brief conversation had exhausted him. Then he realized he didn’t have to speak out loud to talk to Rome.

“Is Aason OK?” Rei asked mentally.

“Yes,” Rome replied. “He is fine. He’s with my parents back at New Ark City. Junior is there as well.”

“That’s good,” Rei noted with relief. “How long have I been out?”

“Almost two weeks,” Rome said. “I kept calling to you. You didn’t answer. I was afraid that I lost you.”

Even though it was difficult, Rei opened his eyes and tried to smile. “I would never leave you, Romey, you know that.”

Having said that, Rei started closing his eyes again but his peace was interrupted by the bustling noise of two men, one tall, one short entering the room. They were followed by MINIMCOM’s livetar. The shorter man was dressed in a standard white Vuduri jumpsuit. The taller one was wearing Essessoni clothes covered by a white lab jacket. He came around to side of the bed, opposite Rome, while the shorter man, obviously Vuduri, remained at the foot of the bed, staring at Rei intently.

“Hello, Rei,” the man to Rei’s right said. “Do you remember me?”

Rei turned his head slightly to look at the man. “Sure, Russell,” Rei answered. Russell Montrell was the colony’s physician.

“How’re you doing?” Russell asked him while withdrawing a penlight from his pocket. He moved the tubes connected to Rei’s body aside and waved the penlight back and forth, shining the light into Rei’s pupils, observing their reaction.

“I hurt everywhere,” Rei answered in a scratchy voice, considering his own words. He scrunched up his face. “Except my legs. They don’t hurt. It’s weird.”

Russell withdrew the penlight and replaced it in his pocket. He took a deep breath. “You were severely injured. You have a cracked skull. In fact you lost a piece of it. I find it strange to say but you’re actually lucky. You had significant brain swelling and the hole in your head actually allowed the pressure to stay manageable. We only sealed it enough to keep in the cerebrospinal fluid.”

Rei closed his eyes and focused on the back of his skull. It burned and he could feel the wad of bandages piled up behind his head pressed against the pillow.

Rei opened his eyes again as Russell continued. "As far as the rest of you, your eardrums were ruptured and you have a broken arm." Russell tapped on the cast surrounding Rei's right arm. At least that explained why it felt like there was cotton in his ears. And why his right arm ached more than his left. But there was something in Russell's tone that made Rei look more intently at the doctor's face. It wasn't what Russell was telling him. It was what he wasn't telling him. Rei looked down at his feet. He tried moving them. Nothing happened.

"What about my legs?" Rei asked. "What's wrong with my legs? How come they don't hurt?"

Russell's shoulders sagged. "The lumbar section of your spine was smashed. The L3, L4 and L5 vertebrae were crushed. I'm afraid they've pinched off your spinal cord."

"What!?" Rei exclaimed, trying to sit up. "What are you saying?" He looked down at his feet trying once again to move them.

"I'm saying your legs no longer function. You're paralyzed from the waist down."

Rei was stunned. He had trouble coming to terms with the concept. "You mean, like permanently? You're saying there is no way I'll get better?" he whispered.

"We'll put a plate in your skull. Your bones will knit. Your eardrums are almost healed. But there's nothing we can do about your spine."

"No!" Rei exclaimed. He tried with all his might to move his legs. Nothing happened. He turned to face Rome with a panicked look on his face. "Romey, no..."

Rome put her hand up to his cheek. "It will be OK, Rei. We'll deal with it."

"No!" Rei said angrily. "I'm no good to you this way." He stared at the Vuduri man standing at the foot of the bed. "You," he called out. "Are you a doctor?"

"Yes," answered the man in a rusty voice. "I have been trained in the medical arts and on this equipment."

"So can you fix me?" Rei asked. "You people have all sorts of super-advanced technology."

"I am afraid that we do not have the ability to perform a microsurgery in the manner you require."

"So I'm stuck this way forever?" Rei lashed out angrily. The Vuduri doctor shrugged. Rei turned to look at Russell but only saw disappointment in his face.

"I'm sorry, Rei," he said. "There's nothing that can be done."

"Not necessarily," MINIMCOM interjected.

All eyes turned to him. "What do you mean?" Rome asked.

"OMCOM sent along the complete capabilities of Rei's genetic enhancements when he delivered our clone. It is well within Rei's capabilities to heal himself."

"I'd like to hear this," Russell said stepping toward the end of the bed. "How is that remotely possible?"

The livetar held up his hand and the air shimmered in front of him. The palms of his hands morphed into holo-projectors. The image displayed was a three-dimensional projection of a portion of the human spine.

"OMCOM gave Rei a pill five years ago. It contained an extra chromosome which gives Rei some rather unique capabilities. Among other things, it was specifically designed to enhance and restore his spine."

MINIMCOM twitched his hand and separated the 3D image into two sections. **"All I would need to do would be to reform his crushed vertebrae back to their original structures and open up the central canal."**

A section of the simulated spinal cord glowed red. Individual long, thin threads of axons and dendrites glowed with a downward wave connecting the upper section to the lower section. MINIMCOM added an animation of sparkles which presumably represented neural impulses.

"Once his spinal cord has been freed, Rei's natural, or perhaps unnatural, recuperative powers will do the rest of the work. His brain will re-energize or even re-wire the spinal cord as needed. Within a month or so, his spine would be completely and totally healed."

Rei shook his head slowly. "I know you can do just about anything but this? Are you going to cut me open?"

"That will not be necessary."

"Then how are you going to see in there? How will you know what to fix?"

"I will not be able to see directly," MINIMCOM replied. He smiled slightly. **"However there are some ladies who I am certain would be willing to help."**

"What?!" Rome cried out, fear creeping into her voice. "You would inject Rei with VIRUS units?"

"Constructors, yes," MINIMCOM said calmly.

"You're going to inject me with VIRUS units?" Rei said, restating the obvious. "How do you know they won't just eat me up from the inside?" he asked worriedly.

"You yourself have dealt with them before. They will do exactly what we ask and no more. When they are done, they will shut down and your body will eventually absorb them."

Rome's eyes narrowed. "MINIMCOM, have you ever performed this type of procedure before?"

"No," answered the livetar. **"And I do agree there is a difference between theory and practice, I propose that I try this technique to heal Rei's broken skull first. I will rebuild the missing section in layers by using a miniature null-fold and transport some dura mater, bone, muscle and so forth then some scalp. The VIRUS units will assemble them in the proper form. That should be enough to fine-tune the methodology. If I cannot do that, then I will reject the technique as unworkable."**

Russell Montrell shook his head and turned back to Rei. "I've heard some incredible things about your ship but this? It sounds impossible to me."

Rei looked up at him. "If MINIMCOM says he can do it, that's good enough for me. That explosion was caused by a bomb. I saw it. Somebody tried to kill me. And whoever did this is still out there. How am I going to protect my wife and child from a wheelchair? No, I'm in." Rei turned to the livetar. "I'm all yours, buddy."

"Very well," MINIMCOM said. **"However, to guarantee the best chance for success, I would like to do this while you are weightless. I need to reduce the stress on your spine as much as possible. Which means we must go into space."**

Rei turned back to his wife. "What'ya say we go for a ride?"

Rome smiled bravely and nodded.

Chapter 2

Within MINIMCOM's cargo chamber, the hybrid computer/spaceship had set up a modest surgical suite complete with white drapes along his outer hull walls. Rather than take a chance on jarring Rei any further, MINIMCOM had transported Rei and his hospital bed directly into the cargo hold. He also brought Rome and Russell Montrell along. The Vuduri doctor had declined to participate. He wasn't of much use, anyway.

MINIMCOM, the starship, used his EG lifters to gently arise in the air until he was high over Deucado. He fired his plasma thrusters on their lowest setting, accelerating as minimally as possible, until they achieved a circular orbit around Deucado 200 kilometers up.

"I will be shutting off the artificial gravity shortly," MINIMCOM announced from a grille in the wall. **"Rome, Dr. Martell, if you go into the side airlock, you can put on a pair of magnetic boots. That will allow you to remain in one place as I perform the procedure."**

"OK," Rome said. She pointed then walked forward through the main corridor, followed by Dr. Montrell. She showed Russell the side airlock and when they returned, they were using the balky gait required to break the magnetic connection on the under-soles, one step at a time.

After they were back in the cargo bay, Rome said, "We're ready." She and Russell took up positions, standing by Rei's bedside.

"Very well," MINIMCOM said. **"I am shutting down the EG lifters now."**

In the background, Rome could hear the sound of the magnetic shields rotating in place. As they were turning, Rome and Russell could feel all the weight draining from their bodies. Rei started rising up very slowly, held in place only by two loose fitting straps that had been secured around him before they took off. Rome had to fight off the urge to grab him and push him back down. She had to have confidence that MINIMCOM knew what he was doing.

With a whoosh and a pop, MINIMCOM's livetar appeared in the cargo hold. He was holding a syringe in his hand filled with a grayish liquid.

Rei turned his head to look at it. "This is really going to work, right?" he asked.

"To the best of my knowledge," replied the livetar. **"You still have time to change your mind."**

"No, just do it," Rei said. "I trust you."

"Very well," MINIMCOM said. He set the syringe down on Rei's bed and reformed one of his fingers into a very short range PPT thrower. He drew it carefully along the cast encasing Rei's arm. In one smooth motion, the cast split in half and MINIMCOM removed it. The livetar retrieved the syringe and inserted the needle into Rei's bicep. He pressed on the plunger gently and the fluid level decreased slightly.

"I am going to knit your broken arm first," MINIMCOM said. **"This is the simplest test I can think of such that the VIRUS units can learn to work with my miniature null-fold."**

"Whatever," Rei said. "Get to it."

Two holographic projectors lit up and showed a blood-red field with a milky white rod passing through.

"I have equipped these constructors with multi-spectral sensors," MINIMCOM said. **"I am synthesizing their imagery as we would with the star-probes."**

The image in the air shifted and a dark grey, jagged line appeared. **"By using infra-red imagery, we can discern structures within the space. I am using false color**

but that is the actual bone fracture," MINIMCOM said. "I will transport random bone cells from the undamaged portion of your arm to the fracture. The constructors will move them into final position. Watch."

Like an army of tiny ants, little grains of white appeared in the dark area. Slowly but surely, the areas of dark became light and soon there was no evidence that a break ever occurred.

"The bone is set," MINIMCOM announced. "However, there is no actual rigidity yet. You will have to wait several hours for the amalgam to cure. It will take a day or two until the bone returns to its normal state."

"Incredible," Russell said. "This is an amazing leap forward in medical science. Nothing we have can even approach this."

"You ain't seen nuthin' yet," MINIMCOM said, trying to amuse. Actually it was fairly funny hearing the former computer speak this way. "Rei, I must rotate you around your transverse axis to try the next stage and repair your skull."

"You're going to flip me on my stomach," Rei said. "You could just say that."

"Technically, you will not be on your stomach," MINIMCOM said, "but yes." The livetar looked at the two humans. "Will you assist please? We must be very careful not to flex Rei's torso in any way."

"Of course," Rome said and she clomped forward. Together, the two humans and one livetar gently flipped Rei over so that he was facing down.

MINIMCOM removed the bandages and packing from the back of Rei's skull. Rome gasped at the size of the wound. The portion of Rei's skull that was missing was a full two inches in diameter. His living brain was exposed, the grey matter pulsing with his heartbeat. Only a thin plastic film covered the area. MINIMCOM removed it and cerebrospinal fluid started gushing out for a moment then the tiny flood stopped. MINIMCOM held it at bay with an outstretched hand and a small null-fold twist.

"I will place a thin bio-polymer film underneath the remaining bone," MINIMCOM said. "I have coated both sides with an arteriogenic compound that should cause new blood vessels to form. This will help in the healing process. The film will also prevent Rei's brain from leaking any more fluid."

Mercifully, the film that MINIMCOM placed over the wound was opaque such that Rei's exposed brain was no longer visible. MINIMCOM retrieved the syringe with the grayish liquid. However, instead of injecting Rei, MINIMCOM merely expelled a few drops of the fluid with enough force that despite the lack of gravity, they spread evenly across the film, held in place by surface tension.

"First, the dura mater," MINIMCOM said. Cells from all over Rei's skull were transported to the film and assembled by the VIRUS units. Soon a visibly thickened layer of tissue was formed.

"Won't removing the tissue from other parts of his head cause damage?" Rome asked, even as she watched the fascinating display.

"No," MINIMCOM said. "I am taking less than .01% of the cells from any given area. Any micro-perforations this causes will heal instantaneously. No section will even miss them."

Rei grunted.

"Am I causing you pain?" MINIMCOM asked with some concern. "I can apply an anesthetic if you need it."

"No," Rei said. "It's just a little weird being your science experiment. I'm fine. Keep going."

MINIMCOM nodded. Layer by layer, MINIMCOM built up the tissues culminating in a fibrous bony surface covered by muscle. Finally, MINIMCOM took tiny sections of Rei's scalp

and knit them together, closing the wound completely. In another age, it would be considered the ultimate in hair-plugs.

"That's amazing," Dr. Martell said, bending over to inspect the repairs. "If I hadn't seen the wound myself, I'd swear it was never there."

Rome reached forward to touch the newly healed area. MINIMCOM juttied his hand out and grabbed Rome's arm before she could make contact.

"Give it a little while to heal," MINIMCOM chided gently. "These cells have never lived together before. They need a bit of time to get to know each other. It should only be a few hours."

Rome pulled her hand back. "Of course," she said. "I just could not believe my eyes. But I will accept your word."

"Good," MINIMCOM said. "Are we all in agreement that this technique is adequate?"

The livetar looked at Rome who nodded then to Dr. Martell. "We're way beyond anything I know," the doctor said. "But it certainly appears that way."

MINIMCOM looked down at Rei. "Are you ready to begin the main event?" the livetar asked.

"You bet," Rei said facing downward. "The sooner, the better."

MINIMCOM nodded. He removed the bed covers from Rei and opened up his hospital gown so that they could see his naked back. It was clearly evident where whatever had struck Rei made its indentation. The bruised flesh was a mottled arrangement of red and purple/blue. Where the blood had pooled, the contusion was brownish with streaks of gray and even a bit of green. MINIMCOM pressed the syringe into the area and injected the final contents into Rei's lumbar area.

For a long while, the livetar just stood there.

"Are you going to start?" Rei asked, finally.

"I have a problem," MINIMCOM said.

"What kind of problem?" Rome asked worriedly.

MINIMCOM activated the holo-projectors and the air lit up with a pink/grey goopy-looking mass of tissue with flecks of red and white all around.

"The bones have been so thoroughly damaged, I do not know if I can reconstruct them exactly correctly. I could use the vertebrae higher up as a model but then mechanically, they would not fit in the precise fashion required. I have access to some anatomical charts but they are only 2D, not three dimensional."

"Use me," Rome said immediately.

Rei turned to look up at his wife. "What are you talking about?"

"MINIMCOM can inject me with VIRUS units. They can give him a picture of an intact spine, vertebrae by vertebrae. He can use me as his model."

"No offense but I'm a lot bigger than you," Rei said. "I don't think I'd do too well with a girl's spine."

"Rome's idea will work," MINIMCOM interjected. "I will compare her L2 vertebrae to yours to get the proper scale factor. Then we will work our way down, vertebrae and disk alike."

Rome smiled and nodded. "What do you want me to do?"

"Remove your magnetic boots," MINIMCOM said. "Doctor, I will need you to hold her in the same horizontal position as Rei while I perform the reconstruction."

"I can do that," Russell said. "Finally, I can contribute something."

Rome slipped off her magnetic boots and immediately began rising up into the air. Dr. Martell reached out and Rome gripped his arms so that Russell could steady her. Soon she was floating in the air perfectly horizontally. She rested her head on her arm so she could see Rei's face and not think about what was going to happen. MINIMCOM produced a new syringe then came over and injected Rome's lumbar spine. The livetar looked off into the distance.

"Yes," the all-black animated shell responded, "this will do fine." MINIMCOM turned back to Rei and put his hands over Rei's lower back almost like a faith healer. He froze for a moment while integrating the data streams. At last, he was ready.

"Now we begin," said MINIMCOM and he commenced with the reconstruction project.

As he was concentrating on the procedure, MINIMCOM did not bother with the holographic display. Rome and Dr. Montrell could only stand by helplessly as the livetar performed his magic. MINIMCOM did take a moment here and there to announce the next step but mostly he concentrated on his work. He segregated all the bone fragments and gently coaxed them into a shape nearly identical to how they appeared, pre-injury. He reconstructed the vertebral disks, inside and out. He straightened out the dura mater. MINIMCOM was very careful to never move the spinal nerve fibers but rather built around them.

It took about two hours but finally MINIMCOM announced that he was done. He used a pulsed application of the microscopic null-fold field to ensure that the cerebrospinal fluid was flowing properly. Satisfied, he gently rotated Rei around along his transverse axis so that he was facing upward.

"The VIRUS units are shut down. Their carcasses will serve as a matrix to give your spine some rigidity until it is fully healed. How do you feel?" MINIMCOM asked.

"The same," Rei said, disappointed. "I still can't feel my legs. I can't move them."

"The nerves have been severely shocked," MINIMCOM intoned. "There will be a progression of return of functionality. The first neurons to activate should be the nociceptors."

"What are those?" Rome asked as Russell lowered her back to the deck. Rome pressed her feet back into her magnetic boots so she could stand.

MINIMCOM reformed one of his fingers into a sharp point. He stuck it into Rei's left sole.

"Ouch!" Rei exclaimed then he laughed. Rome was confused but then she smiled too. "Pain receptors. I get it," she said.

"Yes," MINIMCOM said. "Proprioceptors next, then motor neurons, then the full complement of efferents and afferents."

"What can we do to help?" Russell asked anxiously.

"There is nothing to do," MINIMCOM replied. "The only thing any of us can do now is wait."

Read more in
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