

The large ship glided through empty space in an ever decreasing speed toward the already visible star system ahead of her. She was an enormous elongated structure, with numerable pods and shapes protruding out of it, which at a closer look resembled a floating pile of outdated ships stitched together. Even though she was built from self-repairing materials and was constantly scanned and repaired, many of her parts showed considerable wear from the everlasting bombardment of high energy particles, while others even carried the scars of ancient collisions with space debris. She was traveling at 10% the speed of light and her three operational engines were set to slow her down as she approached her destination. Now, when thirty years still remained before she would enter into orbit around the yet invisible planet, she started to teem with action. Two long arms were extended from the ship sides and large photovoltaic surfaces were drawn from them like two huge sails. The large pods started to rotate around the main hull, Lights began to show along the ships walls, and everywhere machines were buzzing and hurrying, as if following a well written script. The ship was full of robots of every design and shape, most of them having a very functional form. Small round robots with long thin arms equipped with maintenance tools, looking a bit like a cross between Swiss knives and vacuum cleaners were constantly repairing cracks in the dark glowing walls and replacing deteriorating cables. Slim, tall robots waving large robotic arms were loading materials onto long manufacturing lines. Robotic vehicles transferred earth from deep storage areas into the now rotating large pods and fully equipped laboratories with endless specific robotic tools worked silently toward unclear ends. Among all of these were human like robots, performing unpredicted tasks that the ship's countless AIs have decided to perform.

The only things which were completely missing from this busy and cheerful scene were living creatures.

Out Of Earth

Part one – First life

Pain was shooting through Aren's lower abdomen every three minutes or so. Yet she was calm as ever, as she knew that the best medical staff was assigned to her and that Pelger would be born healthy and smoothly, that it would take at most another two hours of labor, and that she won't use any tranquilizer drugs. She also knew that Pelger won't remember anything that happened during his birth, and as such, his birth was of little significance.

Aren was a tall, dark haired, pale skinned beautiful young woman, seeming to be no more than 35 years old, with deep green eyes and a perfectly symmetrical attractive face. As most high class members of the World Wide Alliance she was genetically architected to look as she did, as well as to have high intelligence and a strong character. Aren was exceptional in these parameters, even among the high class, and she used all three to gain her present position as head director of the space populating program.

She stood up from her comfortable armchair and started walking around the small birth room at the top floor of the "Ducher biological health center" in Miami. She kept asking herself whether she is doing the right thing, although that question has ceased to be. A year ago the decision to give birth to Pelger came easily to her, but maybe she did not think it thoroughly? What if after all she will find herself, years from now, longing for her own, private child? Pain shoot through her again and one look at the holoscreen, mounted on the wall in front of her, showed her Pelger's movement down the birth canal and sent her walking back to her chair. Before she could reach it the door opened and a young nurse came into the room. She moved to stand next to Aren, now holding the chair's

arm but still standing in front of it. "The birth is going on pretty well, and your physical indicators are really amazing." Said the nurse. "Thanks Janie" Replied Aren. "I knew this would be easy for me, it's what about to come next that I am worried about". "All in good time Aren, all in good time" Janie comforted her. "Although you obviously don't need me at the moment I'll stand right here next to you. I won't interfere unless either you call for me or I perceive that you're in serious distress. Your pain will soon decrease and you'll have to push as you were instructed." Aren suffered from another contraction and both their eyes went straight for the holoscreen. "Here he comes.." said Aren calmly.

Pelger was born at 1:05 on February 12th 2109. He weighted a little over 3Kg and was born as calm as his mother and with physical indicators that rivaled her as well. He looked nothing like Aren though. Pelger had deep dark skin, almost too dark to be considered fashionable in this present time, and although his face was perfectly symmetrical, the fingerprint of some genetic architecting, his features were somewhat uncommon, and were an anthropologist to look at him she would easily classify him as having a native African look.

Janie placed him in Aren's arms and left her sitting in the dark lit, silent room. Aren stared at Pelger while she was breastfeeding him and knew that from this moment onwards her life would change drastically. Her second in command of the space populating program was just given official control over most of Aren's responsibilities, and she would be involved only in the most important strategic decisions. She would devote herself to this child, as would do many others, but the day would come when Pelger would be called to repay this favor and devote himself to a higher cause. At this instant she almost prayed for her coming sacrifice to yield the fruit she was hoping for.

A knock was heard from the door, and Dr. Kreil entered the room. Dr. Kreil was a tall, seemingly ageless man, with thick black hair, a short groomed beard and gentle slim arms. He was the space populating program's chief medical biologist and accompanied Aren throughout the pregnancy. "How are you feeling Aren?" He asked in a deep, slow, almost silent voice while he was approaching her. "Awed." Said Aren simply. "This really is an amazing thing you know, creating life. Even more amazing once you thoroughly understand all the biological processes that lead to it."

"Once you *think* you understand..." Corrected Kreil.

"Even so," Continued Aren. "If I knew more, I will probably be more awe struck than I am. But I am blubbering now. Is the operation room ready?"

"It is." Answered Kreil plainly, although his excitement was obvious.

"Then take him." Ordered Aren and handed Pelger to Kreil. "And bring him back to me as soon as you are done."

"Starting to doubt me? Now?" Smiled Kreil, "He is in good, caring hands, and you will see him again in 7 hours or so. I've arranged for a hololink with your room, so you'll be able to follow us through the procedure if you wish so."

"I do not." Said Aren plainly. "I have no doubts in you and even if I had, I haven't slept in more than 50 hours and believe I would fall asleep before you even start."

Following her physical indicators closely Kreil knew for a fact that Aren hadn't slept in more than 75 hours, and knew that she desperately needed a good sleep. Actually the simulation showed the robotic surgeons would complete the operation in less than 3 hours, but he decided to let her rest some more and take care of Pelger by himself during the remaining time. As he was the principal genetic architect of Pelger, And as architecting him was by far his best work, a part of him felt as if Pelger was his own son. Another part of him merely understood that this day would enter the history

pages, and he wanted to bath himself in Pelger's presence as much as he could. He picked Pelger gently from Aren and headed for the door. "Aren," He turned to her. "I truly admire you. Your vision and example have been directing us for the last five years brightly and clearly as no head director had ever done before you. You chose right to give birth to this child, and you will do well directing him as you have done us." With that Kreil left the room and headed toward the operation room.

Aren smiled. She was working for the space population program for over 23 years now. And progressed rapidly through the hierarchical organization until five years ago she was chosen unanimously to lead it. Ever since that she was working frantically to execute her vision for the program. The last thought that floated in Aren's mind before she gave way to sleep, was the Irony of her using the same toned political skills she used to publicly emphasize her presence on the way to the top, in order to conceal and disguise her real designs from the all but a precious few extremely loyal friends and colleagues.

Aren woke only 20 hours later fresh and strong, even though somewhat hungry. As soon as she did, Kreil entered the room and handed her a small package wrapped like a mummy in multiple layers of thin blankets and bandages.

"He did wonderfully, his vitals are excellent." He said in an encouraging voice.

Aren gently dug into the area she guessed was holding the baby's head. Out from between thick bandages she could discern two small eyes, shut in the middle of a dreamless sleep. Blood and fat stains decorated the loose bandages around those eyes and Aren suddenly, unexpectedly burst into crying. The weight of her responsibility for the child she just brought into the world, chained with purpose and destiny, was suddenly too much for her. She quickly regained her calm and turned to face the surprised Kreil.

"It's nothing" She lied, even though she knew Kreil can read her better than herself. "I am simply too excited."

Kreil said nothing, and Aren will not cry again until 25 years have passed.

The first 18 months of Pelger's life passed quickly to Aren, her plans for this time were well drafted in advance, and she found herself longing for Pelger to grow up quicker so he could pass the more complex training programs she was planning for him. She now sat on the Balcony of her home at the Bahamas. She was sitting next to a small table on which rested a modest breakfast. The home was a part of a tall majestic compound located on a cliff side and watching over the ocean on one side and bathed in green trees on the other. It was a former research center for the Space Population Program, and as such had a small launch pad and numerous halls full with technological equipment that meant to simulate the colonies on Mars, around the moon and in the asteroid belt, as well as future deep space colonies. Other than Aren and Pelger the compound staff numbered 124 people from technicians to educational staff, including 13 more kids, who were Pelger's play group. Even at this young age Pelger was already emerging as talented and resourceful as Aren expected him to be. He could not yet speak fluently but had no problems conveying his wishes and needs using a combination of words and gestures. He walked pretty well and was already using extenders as easily as he used his own limbs. Extenders were hat or glove like devices which normally fitted either the head or hands and were operated by thoughts and minute hand gestures. They were frequently used as controllers for multiple machinery, vehicles, computers and androids and were meant to be used either until the user installed permanent implants in his limbs or as a cheap replacement to those implants. Pelger constantly wore a set specifically designed for his small size and used it to control

costume made toys, kitchen appliances, home climate controls and every type of compatible item that came into his view. Aren watched him walking towards her from inside the living room, opening the balcony's door using his thoughts alone and could not hold back the thought of how happy he really was in this place, and for that matter she was too. Pelger stepped onto the balcony and went straight to the observation dome, a small, child oriented bubble of glass and machinery located at the edge of the balcony that overlooked both the sea and some of the cliffs to the north. He sat in a chair located in the center of the bubble and instantly the bubble turned toward cliffs, magnified and focused on a group of seagulls nesting halfway up the steep rocks.

"When he controls the dome this way it makes me forget he is not even two!"

It was Kreil's voice, and only now did Aren notice that he followed Pelger out to the balcony. "It seems that George was right." Said Aren.

George was the Pelger's accompanying psychologist.

"He insisted on fitting him those extenders ever since he was a month old and it obviously did the trick, he uses them better than a six year old."

"He sure does" Said Kreil. "Do you intend on letting him wear them once you get to station 6? I wouldn't want him to operate an airlock accidentally... or worse, the station's engines"

"Nina promised me she will take care of that" Answered Aren. "For the last six months they scanned and secured every little piece of machinery on that station. Only authorized personal may operate them. So I think it's safe."

Aren turned to take a long look at the stunning evening view in front of her. "I can't believe we are leaving tomorrow morning. You know Kreil, I will really miss this place. Maybe once his training is complete I will be able to return here. I'll be happy to call it home".

"Maybe you will." Said Kreil. "And maybe you will find yourself a better place by then. Two decades are a tremendous amount of time, I just hope to stay alive by then!"

"Stop blabbering Kreil!" Aren laughed at him. Kreil would be 90 by then, and she knew that his physical indicators predicted him to live up to 110. "Here, join me for breakfast, this one is special, please taste it!"

Kreil sat next to her and stared at the plates in front of them. They held a large piece of dark, hard looking bread, a large piece of cheese, some olives and a carafe of red wine. "This breakfast looks a bit too ascetic... You are not thinking of moving tomorrow to a remote monastery instead of space, do you?!" Kreil winked at Aren. Aren smiled at him. "You have a keen eye, Dr. Kreil. Taste it and let's see if you guess its worth. It is specially ordered from a small bistro in Israel."

"All of it?" Kreil's amused face turned curious. "Now this is a worthy challenge!"

Kreil proceeded to taste the food in front of him. The Bread was hard and sour, the cheese too, the wine was very sweet and the olives were extremely bitter and could hardly be eaten as they were mainly pit and very little of everything else.

"This is one of the worst breakfasts I have ever eaten!" Kreil exclaimed loudly. "The person behind it has obviously no culinary background, and the only reason I can imagine such a place survives is out of the compassion of his clientele rather than their sense of taste!"

"You are as far from the truth as possible Kreil!" Aren laughed. "I will tell you the story of this place and then I will ask you to taste the food again. I promise that you will take great delight in it."

"The probability of me agreeing to that is very low. You will need to wait sometime before the rough mixture of sour and bitter leaves my memory".

Aren ignored him. "The place belongs to a young woman. Her grandfather was an unknown geneticist who did a curious research. He never traveled and looked for an excuse to do so. In his PhD studies he managed to convince his university to support a research of European bread. He traveled all across Europe, collecting yeast samples from the best and oldest bakeries he could find. He then sequenced all the samples and calculated the most probable sequence of the first common ancestor population of all those yeast samples. This sequence belonged to one of the original yeast strains used in Europe many thousands of years ago to make bread, the one that was good enough to leave descendants up until our time. His findings didn't make him famous, but they were enough to get his research supported and he followed to find the ancestral sequence of wine grapes in Israel, in which all endemic grape species were lost during the Islamic reign, as well as sequencing the original wild olive out of which olives were domesticated all across the middle east and Europe. After his death, his only granddaughter decided to keep his memory alive by synthesizing his findings and growing the ancient olives and grapes, as well as using his ancient yeast and making bread from wild wheat. Her small bistro serves their products as well as other cloned ancient species of plants.

Kreil remained quiet and watched the dry piece of bread. Pelger came running back, grabbed a piece of it and ran inside the house. Kreil's gaze followed him.

"I can see now why you like it so much." He muttered. "What about the cheese?"

"Made from cloned wild sheep." Aren answered. "Using traditional methods only."

"I should have guessed." Said Kreil wearily. "Now that you mention it, it does smell a bit sheepish..."

Aren laughed again and then paused and took a sip from the wine. Her gaze went up toward the morning blue skies. "I will have none of this up there". She said after a while.

Kreil, with a distorted look upon his face, took another bite from the cheese, bit on it quickly and swallowed hard. "Lucky you!" he cried, chocking.

Aren floated uneasily in her chair. At the beginning she was very fond of the weightless feeling in the low gravity areas of the main station body. Floating was uncomfortable and unnatural to her, but had a certain charm to it. As time passed though, and more than two and half years have already passed, the charm left and she was avoiding the low gravity areas as much as she could.

The room was a simple meeting room with large one sided window dominating the main wall instead of a holoscreen. Through the window a group of 12 boys and girls, all aged around 4, played a three dimensional variation on football. From Aren's perspective the gates were at the top and bottom of the room, and the kids flying and kicking violently either at the ball or at the walls in order to launch themselves around the room. She loved to see them feel so easy in this unnatural setting. It was one of the best games the education team had come up with. In the middle of the meeting room floated a round table and several chairs, and Aren shared them with two men and a woman. Both the table and the chairs were locked to their position using precisely generated magnetic fields, coupled with similarly precise electro magnets positioned within the furniture. Aren was the only one sitting on one of the chairs, again thanks to magnetic forces generated by the chair and her suit. There was of course no real need in chairs and Aren simply used them out of habit. The others used their suits to lock themselves into similarly comfortable positions that did not require furniture. One of the man was actually an advanced model of a

companion android. It was modeled as a 30 year old male with a strong built body, pale yellowish skin and straight dark hair. It stared at Pelger as he darted up and down the game room. The other man was young, slim, tall and restless. The woman was older than him, shorter and thicker, and had an ill-tempered look drawn on her face. Both were the chief programmers of the Android and this was the final programming meeting before the android would be introduced to Pelger. Aren wanted the android to watch Pelger a bit before they were introduced. It was a highly learning android, and was programmed to have an extremely plastic personality.

"I give you these main instructions." Said Aren. "You will heed all of Pelger's orders and follow them to the best of your ability." She paused. "You will do your best to prevent any harm to come to Pelger or yourself, unless it comes from his direct order." She paused again and ignored the woman who straightened in midair in protest. "You will heed my orders, unless they completely contradict a direct order by Pelger, in which you would obey none. End of main instructions,"

The woman was outraged. "You are doing a terrible mistake Aren!, such orders would leave you with a 4 year old kid yielding the force of a metallic robot! If he doesn't get his breakfast fast enough he might order the android to hit you, and nothing would prevent it!"

"A direct order of mine would." Said Aren calmly.

"And if it was directed at another child? And you were not around to give the contradicting order? If Pelger was to give it contradicting orders himself? If it could save either him or Pelger? You covered so little possibilities in these basic instructions that the possibilities of disaster are numerous!" The woman was on the verge of panicking.

"I considered the risks." Said Aren calmly, facing the silent android following the game rather than the furious programmer. "But there are many other considerations to be taken into account. As you said, these are the basic instructions, and Pelger would set the

remaining instructions himself in due time. His relationship with this android is as important as his well-being, and I wish it to have as few limitations as possible so Pelger would be able to mold him into whatever character he sees fit. I want a companion for him, not a bodyguard or a servant, and companions are free to do mistakes and even to harm you. This is a part of the risk."

"But he is 4 years old!"

"He is also supposed to lead the colonization of a new planet, and for that to work this android needs to be his mental extension, as a physical third arm or leg. I would be extremely vigilant in the coming months and make sure Pelger knows the dangers and possibilities stored in his new friend."

"I understand this, but I implore you for third time, this is dangerous!" said the woman.

The man looked at Aren and joined the conversation. "I agree. I remind you that the QSRP2's main brain core is built to mimic the human brain. As such, although you can monitor much of the knowledge stored and processed in the secondary cores, you cannot monitor the decision making process or the emotional reactions within the main core. This android can be gravely mistaken, and we have no way of monitoring it in real time and prevent it. It has to have specific instruction that would limit him enough in advance to prevent such mistakes".

Aren gave a sigh. "This kid will find himself, as a grown man, on an unknown planet with conditions and challenges that we have no way to predict in advance. We will have no real-time communication with him and will not be able to prevent him from doing grave mistakes that would cost the lives of a whole colony and possibly the future of the human race." The woman programmer locked back into a sitting position and Aren continued. "If we limit him and try to control him in advance he will fail since he will be able to cope only with the challenges our foresight was able to predict. So you see,

he's coping with this android and total responsibility over it is his first taste of his true mission and destiny. If he fails now, well... it would be better that he would fail with this android here and now rather than in space."

The android was still staring blankly at the transparent wall. Pelger shot himself from one of the walls in an angle that made him lose the two players that were guarding him but also sent him away from the ball and the other team's goal. In midflight he grabbed the ankles of a player in his own team and used her to rotate his flight path and send him back at the ball. With another strong kick the ball was in the goal.

"He doesn't seem a typical 4 year old" said the man.

"He isn't." Answered Aren. "He isn't a typical anything."

The kids inside the room were celebrating their victory vigorously.

The android turned to Aren and spoke in a flat, yet pleasant voice.

"I am curious to meet my new master."

"That's good." Said Aren. "You are just about to meet him. But you will address him as your friend, never as your master." She turned to the two programmers. "I thank you for your hard work and help so far. This conversation will be archived in order to document your remarks regarding my instructions."

"Thank you." said the woman and both gently pushed on the table and floated out of the room. Aren waited for a minute, and then mentally caused a recording implants failure. Every employee of the program was constantly monitored through various cybernetic implants that were implanted during the standard recruiting procedure and Aren was no different. These implants included health monitoring, as well as sound and vision recorders. This allowed the archiving of every event in which an employ was involved in. It allowed Aren access to everything that was happening during the program, but also created vast amounts of confidential data that could potentially be breached. As recording

occurred even in the toilets (with the computer automatically deleting any private parts of the data) Aren sometimes overloaded her own system in a manner that caused a system reboot to some of the implants. This allowed her about 30 seconds of unmonitored activity.

She now turned toward the android and said very calmly "One last instruction before we meet Pelger. If you ever learn of the true nature of Pelger's mission, you are to prevent him from accessing this information himself or understanding that you are aware of it. This is a direct order." The android nodded. Aren continued to breathe calmly. If the vision and sound monitors were down and the health monitors would show an activity spike or excess excitement that would alarm the monitoring algorithms, otherwise this event would go unnoticed. She felt the communication implant in her left shoulder heat up a bit, a clear mark that the communication traffic increased and that the recorders were back on.

The door opened and Pelger stormed into the room.

"Hi sweetie!" said Aren. "That was a great game!"

"I know mom!" said Pelger, using the table and walls to fly in circles around the room while he spoke. Being a grasping point for floating around was actually the main purpose of the table, as nothing was usually laid on it. "The teacher said my last move should get a name of its own and named it "Pelger Dash" I just invented the Pelger dash!"

Aren smiled at him and said calmly and slowly, as if to slow down his excitement with her words. "I want you to meet someone Pelger. This is Q."

The boy indeed slowed down his movements and then stared at the android for a few seconds. "You're an android."

"I am indeed." said Q plainly.

"He will be your companion android." said Aren. "He will aid you and stand by your side as you grow up, learning from you and teaching you."

Pelger stared at Q for a long minute and then asked him. "Do you know how to play wallball?"

Q hesitated for a second, and Aren knew that he was downloading all the data concerning the game. "I am familiar with all the rules, basic moves and history of the game." said Q. "But I have no hands on experience in it."

Pelger smiled. "Let's go then. I'll teach you how to Pelger dash!" He grabbed the android's arms and pushed him out of the room.

Aren watched the two leave. "I hope it was a wise decision." she said to herself, but knew that like many other decisions she had done throughout her life, she will never have a real way to test if they were correct or not. There will never be an alternative reality in which she took a different decision and compare the results of the two decisions. As such, she could only compare her action's results to her imagination of what would have happened had she taken a different action. And Aren was way too analytic and aware to make that mistake. Time was progressing though. And Aren was making critical decisions regarding Pelger's training in a higher and higher frequency. But Pelger was not alone, and Aren was taking similar decisions for many more kids in the station that she did not carry in her womb. They were all part of the program just as Pelger, and were training for many different roles that would be required in the colonization program. Aren found it harder to take critical decisions for them, partly because she was not the responsible officer accompanying them, but also because as his mother she naturally felt her responsibility and authority over him.

Aren straightened and pushed herself to the corridor. Q and Pelger were visible through the window, and were playing with the ball vigorously. Pelger was clearly excited. Even though Aren had

promised to look closely on their relationship just five minutes ago, she continued down the transparent hallway towards the high gravity living quarters without any visible hesitation.

Breathing heavily, dressed in tight sport garments that stimulated and supported her muscles to simulate earth gravity conditions, Aren was concluding her run around the perimeter of the small farm module. It was a majestic dirt trail run, with green plantations on her left and the rotating blue earth showing through the space windows on her right, and even though oxygen levels were high on the farm modules and the path was flat, the 12.5 km run took its toll and she was ready for some rest. Pelger, on the other hand, hardly showed any signs of weariness. The twelve years old kid was almost as high as her and was running beside her with the same effort he would have invested in walking. Aren knew that whenever Pelger needed some time to think he would go running around this module, and that he would sometimes run for more than 4 hours straight. She noticed that this run was no different. Pelger was engaged in deep thinking and paying little attention to his surroundings or his body.

Aren has felt for a few days that Pelger had a load on his mind. She considered questioning him about it, but decided to let him choose the time to share his thoughts with her, as she was sure that he would finally do. She was right.

They crossed their marked end of the run, preformed the usual exercises meant to keep their muscles from cramping, and sat to rest a bit in the small observation dome next to the access shaft leading in and out of the module.

"I know who I am." He said shortly.

Aren was hardly surprised. She did not expect him to discover his origins before he finished his genetics training, two years from now, but still, it was expected. "You do, do you?! Tell me then."

"I am a slightly architected OOAM, out of Africa man. You architected me yourself, based mainly on some of your appearance genetic networks, but you left most of my genome intact."

"So far, you are almost correct. I didn't do the architecting solely on my own. "She was a bit disappointed that this was all he had discovered. "Is that all?"

"Far from it." He smiled at her, obviously anticipating and enjoying his mother's response. "I think that I am specifically the second patriarch from the great dig at the Dead Sea. The second patriarch was a bit older and obviously healthier than the first, which is why you also left me my ancient immune genes intact and added to them your own modern genes."

"Still correct..." Aren was more impressed, but now found it hard to believe he deduced all this by observation alone. Pelger sounded too sure in himself, as if he already got the approval to his findings.

"It seems quite reasonable that you considered one that led the human kind out of Africa to be a potential leader of the out of Earth program." he continued with a shy smile. "I also understood choosing Albert Einstein's genome as the basis for Al and Gan De's for Chen, but Darwin's genome for Charley? Darwin was simply at the right place in the right time, Charley is definitely living in the wrong time. He is so in love in details he wouldn't see the forest even if he was stumbling through it!"

"What have you done Pelger? Where have you learned of your immune genes? How do you know Charley's protogenome? What other protogenomes have you discovered?" Aren was not sure whether she was more worried or curious about Pelger's findings. He discovered too much for his age, and might ultimately learn the true nature of the program, which would ultimately lead him to leave it, and delay the program for a generation.

"I still hadn't figured out Gondwana's protogenome, as well as Gerard's, Ching ley's, Anar's and Roni's." He was now thrilled and reported his doings in a fast, exited voice. "Remember the medical exam we had to take a month ago? I figured my protogenome by then, actually I figured Al's and then my own, so I hacked Dr. Starnight's access codes and got all our genomes. I then ran hierarchical comparisons with public historical data and found the matches. I figured that the ones I haven't found are combinations of multiple protogenomes. So I rewrote the algorithm and in a couple of days I will tell you who they are as well." Pelger concluded and leaned back with a wide smile that reminded Aren of his age. He was a resourceful, smart, intellectually aggressive kid, but he was still emotional as a kid, and that made him exited enough of his doings to stop short of understanding the true nature of the program. It might have been for the best that he found these things now, on his own, thought Aren. In two years he would not have overlooked the relevance of these findings to the program, and now that his curiosity was satisfied, he might not reconsider them.

"You have done well, and I will order a reconsideration of all the security measures taken to protect our data, such a leak is something we cannot afford." said Aren, and immediately changed her tone to a softer, comforting voice. "How do you feel, now that you know that you are reborn from one of the men that led the Human kind out of its African cradle?"

"I don't know." Pelger said honestly. "I was too busy to think of it properly. I guess I'm excited in a way. I wish I held more of your genome though, you're a great mom!" He smiled.

Aren knew he was deflecting her question, but nonetheless, it worked and she smiled at him. "I hope you haven't told any of the kids about this..."

"I didn't. But I figured Al knows, and I was right. He thinks we should tell the other kids, and I thought I should talk to you first."

"You did right. I'll see how we'll go from here. We planned to talk to all of you about it in only two years from now, when you would fully understand the genetics behind it, and won't see yourselves as mere duplications of these people. You do understand that a genome is just a genome, right? It's the basic toolset you use to shape who you are, but it doesn't **determine** who you are."

"Of course I understand that! And I think most of the kids do as well. We should be proud at who we are, and curious about how we came to be, and I think that knowing the identity of our protogenomes would do us good."

"It's easier for you since you don't really know who the second patriarch was, and as such you are free to imagine him as you wish. All the other kids are based on people that were already historically documented. They might easily think that they are supposed to mimic them and that they are expected to actually **be** them. You are all under tremendous pressure, you know that the space colonization project is dependent on you, that **you are** the program. We just don't want to add these expectations on top of that."

"It won't! They will be happy to know what they could be!"

"Pelger you are a very smart kid, but you still have a lot to learn about human nature. It will be hard on most of them. And I didn't even mention the comparisons, before you'd notice you would all be immersed in comparing whose protogenome is better... Please trust me on this and wait. We would talk with all of them in due time."

"I will mom. But I still think you are wrong."

"Thanks dear. And I guess that eventually you will realize that I was right."

Genetic studies were given priority after this talk, and one month later time the kids were informed of their protogenomes and instructed to actively research them. Each of them was also given the task to historically research one of the other ancestors and

present their findings to the group. It turned to be a great success and motivator and the group's interest in genetics, history and the various fields increased dramatically. Charley was the only kid to leave the program at that point, partially due to the stress he suffered from the increased expectation he assumed since the protogenomes unveiling. Aren was completely positive that this was the correct decision for the program, which was the only thing that mattered to her, but she couldn't help but feel she had failed. She admired the analytical footprint Darwin's made on the history of science and felt she was betraying his memory by failing to have his genome represented in the first human colony in deep space. Eventually she would be wrong, and Darwin's protogenome would find its way to the first colony and would play a significant role in its success.

Rain was falling endlessly, and the hidden sun was giving less and less light as night approached. Pelger was cold and wet, hiding in a small grave like pit he dug and covered with an unknown kind of a bush he pulled over himself, but he kept focusing on the rain. Until today he could not remember how rain felt or sounded like. He was three weeks into his forth weather training camp, and it was the first time he had felt utterly miserable since he returned to Earth. When he first arrived he felt unspeakable joy. His first camp was the water world, an offshore research sea stead embraced by the endless and bottomless ocean. It was as small as the training station that he called home, but the vast ocean around it was nothing like the hostile vacuum of space. It was filled with life and mystery and was practically waiting for him to dive into it. It was also a time when his sixteen years old physical body had to remind itself how it feels to live on a plant. Things usually treated as obvious, like changes in temperature, moisture, pressure, wind, even electrical charges in the air, are monotonously controlled on

space stations and at the beginning Pelger strongly felt each small shift in the conditions around him. It took him some time to be able to give those changes less attention and focus on the tasks he was given.

Pelger loved the feeling of the endless blue surrounding him, and only a bright, slim, black haired girl named Lara, based on Mary Whiton Calkins' protogenome, surpassed him in her ability to feel at home under the water. Lara won almost every challenge that was set before them, and the only times Pelger managed to win a challenge himself was when he teamed up with her. They soon became good friends and Pelger wondered how was it that he had never paid any attention to her while they were still at the station. As their parents were nowhere in sight (Pelger assumed they remained in the station, as most of them actually did) they spent the precious little spare time they had scuba diving together along the hanging reefs around the sea stead. In one of those times Lara had a minor fault in her oxygen generator, and Pelger assisted her and helped her back to the sea stead. Although Lara was an excellent swimmer and was in no real danger, she was grateful for his help, and Pelger found her gratitude surprisingly pleasant.

It was a short friendship though, and soon after the diving incident Pelger moved on to the volcano mountain camp while Lara transferred to the underworld cave training. As habitats on habitable worlds had a considerable probability to be located on or near mountains, the volcano was one of the most intense and demanding of the eight camps and Pelger had almost forgot all about Lara during his time there. His next camp was the desert camp, and he met with Lara again on their forth camp, the woodland.

The woodland was a training base set within the vast forests of northern Europe. It was the beginning of the summer and as such the days were very long, and the weather was fair. Unlike all the

stations he had visited so far, in which most of the challenges were either research, physical or survival oriented, the woodland main challenges were battle oriented. As soon as the kids arrived they were divided into two teams. After a single week of theoretical studies each team was sent to a different part of the forest and was given a couple of days to build their own camp. There were eight kids in Pelger's team and Lara was in the opposing team. After their camp was up the challenges started to arrive. They were given to them in the form of small laconic orders, always including military like missions: scout on the other team, plant surveillance tech, steal equipment, uncover the other team's surveillance tech and so on. Next came capture missions, and two boys from Pelger's camp disappeared during one night, taken by the other team members. Pelger was furious. He's team has been alerted that an attempt to kidnap one of its members would happen, and they took all the necessary precautions to guard against this possibility while still guarding all the other valuable equipment that lay in the camp. Still, only in the morning did they find out that two of them were missing, and Pelger decided to leave immediately and set them free on his own. His teammates protested against such an action, but Pelger insisted that he had better chances to pull this off on his own. Instead of joining him, two other team members went on a fake pursuit after the kidnapers in order to allow Pelger time to circle the other team's camp and approach it from its less guarded back. Pelger used the remaining time of the day to cover most of the distance to the other team's camp. When he thought he was already close enough to their camp he dug his hole and waited for darkness. Rain began to fall and Pelger was soon soaked to his bones. The noise of the rain was strong enough that he almost missed the small patrol that came only two yards away from his own hole. He quickly aimed his vibration reader to the two girls that stopped next to a large tree. Pelger could not intercept their

encrypted communications but this close he could capture the minute vibrations made by the girl's ear implants, and directly eavesdrop on them. He managed to aim the reader stably but the noise reduction algorithm had a hard time filtering away the noise made by the rain. Eventually he could pick up only small parts of the silent conversation made between the two girls. Of the little he could pick up it became clear to him that they searched specifically for him, and that they have deduced that he would try and approach them from the back. Pelger's wrath at the successful kidnap had turned to utter misery. He was mad at being so predictable and swore that he would never again make a decision so carelessly and under the effect of extreme emotions. He could not know it, but the understanding he achieved during the next hour he spent in the small wet pit alternately cursing himself and analyzing his mistakes of the last few days, would save his, and his fellow settlers, lives many years from this time.

Eventually night fell and the rain stopped. Pelger, a new plan in his head, covered himself in cold mud from head to toe and left his hiding spot. As his team stole the other team's night vision equipment a few days back, he knew they lacked it. He himself had natural night vision, as his genetic architecting included manipulating the genes encoding some of the light sensitive Rhodopsin proteins in each of eyes, changing them from proteins sensitive to red light, to those sensitive to infra-red light. This resulted in him viewing hot objects as glowing in red. During daytime this glow was minute compared to all the other light his eyes perceived, but at night, this allowed him to clearly observe living, heat generating creatures, especially on the cold background of the rain drenched forest. Pelger did not know if any of the other team members had similar night vision, but assumed that some of them probably did.

He doubled back on his footsteps until he reached a small stream and then turned and followed it upstream. Pelger knew that this stream will lead him into a small canyon that reaches the left side of the front gate. He figured that if most of the forces are looking for him in the back area of the camp, only few forces would be stationed next to the front gate. As the hidden canyon reaches the front gate from the back of the camp, it would be one of the first access points to be left unguarded. After two hours of fast pace walking he slowed down and started taking care not to make any strong noises. He stopped to cover himself again in a cold, fresh layer of mud and continued walking. The small stream was running faster now as the canyon became narrower and Pelger heard the voice of a nearby waterfall. He knew that the waterfall was but 50 meters from the fence near the gate, and hoped to find an outcrop of rock that might allow him to go over it. He crawled slowly down the cliff at the right side of the waterfall until he reached its bottom. 100 meters away from him he noticed a large tree whose branches were close enough to the fence. He quickly covered the distance to it and immediately started climbing it. Suddenly he felt a sharp pain in his left side and an electrical current swept through his body, paralyzing him. As he crushed down to the ground he immediately understood that he had been ambushed.

A girl and a boy approached him, the girl holding the paralyzing gun that he had just been hit with. Both of them were covered in mud, much the same as he and they seemed tired but agitated.

"Just as Lara said." Said the boy in a high pitched voice. "Welcome Pelger. Sorry for the shot, it would pass in five minutes. We will take you to our prison now."

And with that they hauled him together and carried him into their camp.

The prison was a simple tent stationed in the middle of the camp. When Pelger reached it he found that other than the two team

members that were kidnapped the night before, it was also occupied with the two members he sent on the fake pursuit. With five members captured out of the total eight, his team had obviously lost the battle.

Pelger was utterly miserable and was furious with himself. He learned from the guards that Lara took the charge of the team's strategy and as she knew her weak spot was the back area of the camp she sent the two girls to repeat their silent conversation all over the woods, hoping that Pelger would hear them, abandon that route and choose the hidden canyon as he did.

That night the camps were taken down and the kids went back to the warm and comfortable quarters of the stations living quarters. Pelger was summoned by the chief instructor. A short, energetic young woman named Saratoga.

"Hi Pelger." She said as he entered the small office. "Please sit down." and she pointed to a large sofa stationed next to a small round coffee table. Pelger sat down in the middle of it, and she stood up from her chair, and circled from behind her desk to sit next to him.

"How was your tactical training Pelger?"

"You know how it was." Answered Pelger bitterly. "It was a complete failure."

"Was it?!" Saratoga answered skeptically. "Can you tell me why?"

"I think so." Said Pelger. "It was the combination of two things. Lara was doing an excellent work, and I was doing a lousy one." He took a small pause. "I took important decisions under extreme emotions, I tried to act alone instead of cooperating with my team mates, I didn't plan enough ahead and finally I underestimated my opponents."

"I see." Said Saratoga. "And you consider that a failure?"

"Of course! Our team was almost completely captured!"

Saratoga was silent for two minutes and then asked silently and slowly. "Pelger, tell me, what do you think was the purpose of this exercise?"

"To fulfill all missions and ultimately capture the other team members." He answered quickly.

"That was your team's mission." Corrected Saratoga. "I asked what the purpose of the exercise was."

Pelger hesitated, became silent, and finally spoke. "I think I understand what you are getting to." he said simply. "You meant to teach how to act in a tactical fight?"

"Closer." She said, and he felt an itch in his right eye, telling him Saratoga was trying to access his visual implants. He mentally granted her the permissions she asked for, and he suddenly saw letters floating in midair, forming a formal document that bore the insignia of the program. Pelger read them silently.

Woodland camp – tactical training.

Pelger S. personal objectives:

- Recognize his enemy's abilities.
- Recognize his own limitations.
- Correctly analyze his decisions retroactively, emphasizing the three most important mistakes he made and the emotional reasons for them.
- Learn how to handle a failure.

"This was the objectives we had devised for you prior to your arrival here. Now, after you have read them, do you still think you have failed this training camp?"

Pelger was quiet again. "I see what you mean, master trainer."

"You are being trained to become a decision maker in an outer space colonizing mission" Continued Saratoga. "Don't forget the big picture, and always think what you can learn from the present moment and situation that will help you in your true mission. If,

given a mission, making fifty wrong decisions would prepare you better than deciding correctly on the first try, than being wrong fifty times is the best thing you can do!"

"I understand." Said Pelger honestly. "Thank you."

"You may leave now." Said Saratoga. "You better get some rest. You are leaving on your next tactical mission in ten hours."

Pelger stood up and went for the door. He stopped short of it and turned to Saratoga. "Goodbye, master trainer."

"Goodbye Pelger." Said Saratoga as Pelger left and closed the door behind him. "Good luck with your fifth objective, you will need it." She added silently.

Pelger never got to the finish line in his second woodland tactical mission. In this mission he was in the same group with Lara and three more kids. It was an escape mission on their part. They were expected to cover more than one hundred kilometers that week without being detected by the members of the other, larger group. Two days into the mission things looked well as they have covered nearly half the required distance and not a single member of their team got captured, but that night Pelger felt a throb in his head, the kind he felt when he was dehydrated. He knew that he had drunk enough that day, and as morning came after a sleepless night and the pain was unbearable he decided to let his team members know of his situation and inform the central command. He found out that all of them experienced similar symptoms, and until the evacuation shuttle arrived Lara had even partially lost her sight.

Pelger caught glimpses of the white shining shuttle as it hovered over the treetops. Next he heard the cracking of branches as men moored to long cables lines dropped through the canopy and into the small rocky alcove in which his team had spent the night. At first he was alarmed by their appearance as they wore suits more similar to spacesuits rather than earth designated cloths, but the data stream he was receiving from central command explained that

they are being put under quarantine conditions, and that all medical staff is protected accordingly. The men unhooked themselves from the mooring lines and attached the kids instead. While Pelger was lifted upwards he could already see the men gather his belongings, pile them and ready them for sterilization procedures. Little he knew then that those men were the last living creatures he would see for the next six months.

As soon as they arrived to the woodland central command, the kids were separated. Pelger was escorted by two androids through a long white corridor that seemed to be endless. He had also lost most of his eyesight by now and would have easily missed the door to his resting chamber had the androids not shown him the way. His head was exploding with pain and as much as he tried he could not think clearly, all his thoughts blurring into a single, throbbing vagueness. Pelger was terrified, as like all the other members of the program, he was never sick. Infectious diseases were eradicated from most parts of planet Earth. They were prevalent only in extremely poor countries, and even there only at specific areas with high population density and low hygiene. The program had very strict isolation rules and anyone coming in contact with anyone outside the program had to pass tiresome disinfection procedures before they could meet face to face. Pelger will later learn that the vector for spreading the infection was one of the medical staff that traveled frequently between the camps and visited a refugee camp the month before. The virus affected only young people and most of the kids in the program as well as some of the staff in rare cases, were infected. The whole training program had to adapt to this drawback.

Pelger could no longer see anything, and he felt the hands of the androids lift him and place him on a long, high and rough bed. He was breathing fast and hard, the pain in his head ever increasing and a terrible cacophonic sound pierced his ears. Some clear

thoughts stood out of swirling mess inside his head. Is Lara suffering the same as he? Are they going to die? He felt a sting in his left hand and all was immediately silent. What is happening to me? He sank into the silent darkness that surrounded him.

Pelger woke up slowly. His muscles were cramped as if he was sleeping in the same position for a very long time. He opened his eyes and discovered that his sight was still very poor. It was as if he had opened his eyes underwater on a starry night. All was blurred and dark. He tried to pull himself up but found that his muscles would not obey him. He felt panic overtaking him again when he suddenly felt the familiar touch of cold hand pressing against his forehead.

"Don't try that yet Pelgi. Trust me, you need to rest a little more."

Q! Pelger was both comforted to know that his friend was with him, and frustrated that it wasn't his mother rather than the android. Never did he wish so much to be hugged by his mother in their small room up in the training station that he had learned to call home. He laid back down, closed his eyes and tried to access his neural links, maybe through them he would get access to a camera situated in the room, or better yet, Q's vision system. If he did that, he'll be able to observe the room and himself. No response. It was as if he was completely disconnected from everything. For the first time in his life Pelger experienced real darkness and seclusion. His heart beat fast and his hands went for the bed's railing. Q's hands pressed them down gently.

"Don't be frightened. This is a temporary state brought upon by the disease. Your brain is still a bit inflamed and it would be some time before you would be allowed to use your neural links. Your vision and muscles are also fine but you would need to teach your brain again how to use them. It will all take a while but you will be back to your own self."

Pelger could not calm himself. His breath came in small gasps and his whole body felt like it was cast in iron and would not yield to him. He tried to speak but found that talking had also become a tremendous task.

"How much time Q?" He finally asked, slowly and painfully.

"That remains to be seen." Answered the android in his metallic voice. "There are a few medical androids here that will assist you in regaining your strength. And I am here to be your company. Your mother sends her love, but it will be quite some time before you will be allowed to contact other humans again. The disease you all got is very infectious."

"How is Lara, Q? Is she ok?" Suddenly the memories from the small alcove came back to him.

"She'll be fine Pelger" Answered Q. "It had been more than a week since you have been evacuated, and all of you are out of danger. But that is all I will tell you of the world outside this room. You have much hard work to be done. Would you like me to elaborate?"

Talking helped Pelger relax a bit and put his miserable state aside. The fact that the android had a clear program calmed him and made him feel less helpless than he really was. He concentrated at his breathing and finally stopped gasping and started to breathe normally again.

"Sure Q." He said slowly. "Thanks."

"We will be starting as soon as you feel ready. The medical androids, you can call them Z and Z2 if you wish, will start working on your muscles. The sessions will be one hour long at a time, with a resting period of half an hour or less. Every three sessions we will do a vision and speech session that will also last one hour. All in all you will have at least eight hours of sessions every day. In between you will have time to eat and talk with me if you wish."

"How long do you expect this to last?"

"We will reconsider your state at the end of the week and decide whether to carry on with the same routine or change it. It will take at least a few weeks for you to recover, and don't expect any meaningful change during this first week."

"I see." Said Pelger miserably. He paused for a minute and then added. "I want you to add one programming session each day. I will use this time to work on your AI, a thing that I should have done ages ago."

"Done." Said Q without a pause.

"And one more thing, when will I see my mother?"

"That depends on your progress."

Pelger paused again. "That's settles it then. No need to waste more time in this awful state, let's start with the treatments."

"Good." Said Q, and Pelger imagined he heard him smile a little. "Z2 will be with you shortly."

Pelger's mother was actually not far from the white room in which Pelger was coming in terms with his state and started upgrading Qs algorithms. Aren was seated comfortably in the small study, her khaki armchair was pointed toward the large window overlooking the forest. It was just dawning outside, and so the dark forest did not interfere with the picture her vision implants were projecting onto her cornea. She was observing Z2 working with Pelger when she heard a knock on the door. She gave the mental command and the image she was viewing split, and now showed Pelger on the right half of her field of view, and Dr. Kreil standing outside her door on the left side. Another command caused both images to disappear and the door to open.

Kreil entered slowly. One look at his face was enough for Aren to observe that he hadn't slept for a long time.

"Getting lazy Aren?" Asked Kreil with a smile. "It would have taken you less time to open the door with your hand."

"Practicing." She answered. "It used to take me less time using the command, but I've neglected mental training for such a long time. I guess in our age we feel greater need to maintain our body than the link to our neural implants."

"Nonsense!" He laughed. "You are as tired as I am and can't admit you would do anything to remain in that armchair of yours as long as you can!"

Aren smiled. She missed her short, casual talks with Kreil. Ever since they arrived at the woodland they were busy preparing all that was needed for the sickness exercise and had no time for their own recreation.

"How are the other kids doing?" She asked with a tired but curious voice and pointed Kreil to a second armchair that stood not far from her.

"Most of them are fine." Answered Kreil and sat down. "Galai is still terrified, the poor child. We gave him some more tranquilizers, and we hope that when he wakes up again he will cope with the situation better."

"It's definitely the harshest exercise we have given them so far." Said Aren.

"But the most important one." Added Kreil. "I think it is one of your best ideas, although only time will tell if it will achieve what you meant it for."

Aren gave another mental command, and soon received a security report. She was pleased. So far it was still only herself, Kreil, and the head of the program's recovering centers that knew the real nature of the disease. It was a specific virus designed by Kreil to have the exact effects the kids were now experiencing. They had to inform the head of the recovering centers so that the virus would not be studied and published. But even he wasn't aware of the purpose of the whole exercise.

"How is Pelger doing?" Asked Kreil and didn't wait for an answer "I saw that he started working on Q. He is quite bright this kid, he is programming him to be the friend he always wanted. Not a puppet for him to control, but a companion that will give him harsh feedback if he needs to hear one, and sometimes help him by not helping him. It is not easy to define such personality laws for an android, it requires great generalization ability as well as –"

"I know Kreil" Aren smiled at him. "It seems that he is indeed growing to be the person we wished him to be. But he is still a child and treats most of our challenges as games. He is intelligent, wise and ambitious, but that won't hold for long. Soon he will ask himself why he is doing all this. He will wonder if it wouldn't have been better for him to be an ordinary kid with no special purpose. Keeping him focused on his purpose will be the greatest challenge, both for him and us."

"It should be an easy challenge! Most the people I knew suffered from the fact that their lives didn't have enough purpose! And all those I know today work in the program, so they have enough purpose for at least two people each" He smiled.

Aren smiled wearily back at him.

"It's no joke. I am truly afraid of this moment. He is extremely intelligent, and this question would occur to him sooner than we think. If he will have his childish ways, letting his intellect rule over his emotional wisdom, he will do harm, both now and in space.

"I remind you that we were wise enough to surround him by people that will show him this wisdom and support him. His intellect will identify its own weakness given the correct mirror. Also, acknowledging his weakness and counting on others will allow him to share the responsibility. He will be a decision maker, let him take decisions, like you planned to do."

Kreil's point calmed Aren. And she reminded herself that she too, took great care to surround herself by people that would cover for

her own downfalls. And out of all of those people she was most grateful for Kreil.

At twenty Pelger already left all the war games behind. The training program continued but the group of thirty five young adults, now already called "colonists", was facing challenges together instead of challenging each other. Each one of the colonists had a designated role. Those were first set when they reached the age of ten, and reviewed and shifted again at the age of fifteen. Now those roles were no longer questioned. Colonists could only fail and leave the program, not change their roles. Pelger was designated as a decision maker, the chief decision of the colonists, and was to take the final decision in issues that involved the whole group. He was designated this role since he was born, and not Aren or any other senior member of the space population program saw any reason to change that. Being the chief decision maker did not make him senior among the colonists. The chief psychologist of the program, who was responsible for this structure, believed that if positions were still not decided, and hierarchy exist, then personal interests would rule some of the colonists' decisions. This was inevitable as all of them were ambitious and dedicated and wanted to contribute and effect the success of the program as much as they can. Instead, the fact that each knew from childhood his place and role, allowed them to focus on achieving this role the best they could. Being one screw in a complicated machine, yet being the best screw there is, each took care to clearly understand in depth the local area of effect around her designated role, and would care less about fields that she could not effect. Since Pelger had to take the decisions that effected the entire group he had to know the "large picture", the global effects of his decision. Yet, like the rest of the group, and thanks to the flat hierarchy, he also treated his role as one screw in the system. He would learn the global possible effects

to the best of his ability and according to his duty, yet he would rely entirely on the in depth analysis of the other colonists, each specializing in her own field.

Pelger celebrated his twentieth birthday the day before the latest exercise, dubbed "operation sandstorm", began. "Celebrated" was an over statement as the program kept reminding the colonists that one year time was no more than the current, arbitrary time required for the earth to orbit the sun, and should hold no special meaning, especially as they are to spend most of their lives on a space ship that orbits no star, or a planet whose orbit time can differ drastically from Earth's one year time. Still, Pelger was deeply moved by the seasons the earth experienced while slowly orbiting the sun and used to keep track of two different numbers that consisted his full age: he had orbited the sun twenty times since he was born, yet he had experienced only eight winters on earth. He spent that day of with Lara and Q diving in the Maldives area. The islands were completely flooded and the reefs destroyed by global warming over seventy years ago. Yet, over the last fifty years technological advancements finally achieved the effect of somewhat lowering the sea level and cooling back the oceans at that area, and lately reefs were fast recovering. Entrepreneurs were quick to build new resorts, some floating above the sunken atolls, some were complete underwater complexes planned to be infrastructures themselves to the fast expanding new coral gardens. Pelger, Lara and Q were staying in one of the sunken complexes and spent their time diving through the best attraction in that area – the sunken city of Male. Both Pelger and Lara were fascinated from the dives, Pelger from the wide variety of underwater life that now inhabited a city that once belonged to men, and Lara from the ability to closely observe in person an ancient city frozen in time. The low structures, widespread and wasteful compared to the compact, ultra-efficient living complexes at space, even though they were contained and

limited on the small atoll, inspired her to start analyzing the different design considerations for building habitats in different worlds and conditions. She will later discuss this topic for many years with the engineers and environmental architects among the colonists, adding her own unique point of view on the effect of those designs on the personal psyche of the settlers, and keeping an archive showing the evolution of her own designs over time. The next day they left the Maldives and arrived at the launch site for their next mission, where they met with the rest of the colonists for a briefing.

“Operation sand storm” was an extremely complicated exercise, one of the most complicated exercises the colonists coped with so far. They were given one week to prepare before launch and would then have to handle several tasks in parallel. First, they would take off on a ship towards mars with very little supply and manual only controls. Excess supply was stashed in containers orbiting Earth and the moon at different orbits. Each container usually held fuel and food, but sometime also technological systems that they would be able to integrate into their ship. Due to the limited resources they would have to use Earth’s and the moon’s gravity to catapult themselves during multiple orbits in a manner that would be efficient enough to allow them to both collect enough supplies and enough speed to reach the moon. Second, during this complex flight the colonists will have to remote control a reconnaissance vehicle (“RV”) orbiting Mars, and use it to land multiple probes and landers on the surface. And third, control the landers to overcome Mars’ challenging weather and prepare their habitat beforehand. The complexity in these last two parts of the exercise arise mostly from communication latency. Mars is located about fifteen light minutes away from earth, causing a thirty minute latency between an event happening on the red planet, and the response communication by the colonists arriving back at the reporting vehicle. Also, while

orbiting Mars every one and a half hours, the RV will spend forty minutes on the opposite side of Mars, not allowing any communication during that time, and to wrap it all up, the landing side was on located on the opposite side, allowing communication with the landers only through first communicating to the RV during the pass in the Earth facing side, and then having the RV communicate to the landers on the opposite side. Together with the communication latency, this practically allowed communication with the landers only once every one and a half hours, and only twenty minutes window from receiving the landers information from the RV until the response message had to be sent. They were allowed a limited number of support AIs, drones and androids, and had to design them carefully.

Pelger absolutely loved this exercise. It was extremely physically challenging, as the first part of the exercise demanded constant maintenance and resupplying of the small spaceship, and it was also mentally demanding, since the sheer complexity involved deep research of Mars and the flight plan, analyzing a huge number of use cases and scenarios, designing the habitat, the AIs that will control the different landers and RV, equipping the landers and numerous other tasks. While preparing for the flight the colonists were extensively assisted by their companion androids and other support AIs that allowed them to prepare in all aspects in a single week. Pelger fully occupied himself with the design of the landers AI as his decision making task was strongly influenced by which instructions he could or could not pass to the landers that would then have to operate on their own for one and a half hours before the next set of instructions would arrive. He discussed this in depth with two other colonists that where more into the technical aspects of the probes and landers, but ultimately it was Q that designed and written the AI code according to Pelger's instructions. Lara was almost single handedly designing the habitat, as well as the work

and living space within the small space ship. Even though they would live similar times on the ship and on Mars, one month in the ship for each direction and two months on Mars, and even though the one month travel towards Mars was by far the more challenging part of the journey, Lara found herself investing significantly more time in designing the Mars habitat. As the chief behavior officer of the colonists the reason to her own behavior was very clear to her, she was by far more interested by the habitat design for the same reasons she was fascinated by the sunken Male, she was interested in living on other planets. The living conditions on spaceships, unlike unknown planets, were known and studied for a century, and so, designing the ship that will take them to Mars was but a technical challenge that she could quite easily handle using her support AIs. The habitat on an uncharted, often dust storm stricken area of Mars, was, on the other hand, a worthy challenge. Another aspect of planning the habitat on Mars was the close work she had to do with Pelger, as the lander AIs that he was planning, together with the planetary probes that will be dropped from the RV, would have to explore the surface and identify an area suitable for the habitat. The considerations that Lara defined for the habitable area effected both the sensing capabilities that were required from the landers, as well as their reconnaissance pattern and the decision pattern required to carry out such a task. The design of the habitat itself also clearly effected the capabilities of the landers that were expected to build it in practice.

The colonists hardly slept that week, but the last day before takeoff was used to relax and gather some energy and peace of mind before the exercise started. They knew that they were about to put their lives in a considerable risk, and they also knew the considerations behind it. They had to work under real, tangible danger, and overcome it together, to build their confidence in each other and in themselves. This was not the first time they will

endanger themselves for this purpose, and definitely not the last. The training will be complete in a few years, and the program planned for the colonists to be put into cryo sleep and sent in a ship expected to reach almost 20% the speed of light towards Alpha Centauri. The colonists will travel for about 2 years until they reach the system which holds at least 12 small planets, but thanks to the cryo sleep they are expected to age no more than seven years along the trip. Once they reach the system they will probe the planets and will either head to colonize one of them or if none will be found suitable (a probability lately estimated at 82%) will extend their ship to a permanent space station which will become their home and a waystation on the way to farther systems. If not enough resources will be found in the system they will have to head back to earth.

The last possible scenario was that new propulsion systems will be built and a new ship will come their way and pick them up towards new systems. Better propulsion systems, strong enough to allow them reasonable probability of finding a new habitable planet beyond Alpha Centaury during their lifetime were not yet mature, even though significant progress was made in the last twenty years in that direction. In general, the later a new ship was sent for the colonists, the better engines they'll be able to use, which in turn means exploring more space. But flight time saved did not always cover for the development time of the engines. The tradeoff was clear: send the new ships too late, and the colonists will be too old to reach a new planet in their limited lifetime. Send them a ship too soon, and they may fly too slow and never reach a new planet in their lifetime. Pelger did not give much thought to this issue, as it was completely under someone else's responsibility, namely his mother and the engineering team of the space population program, but Lara was terrified of this thought. In her nightmares she was

dying of old age, surrounded by disintegrating elderlies on a rusted, battered, floating tin can.

On the morning they took off. One of the colonists, Akhila, almost died on Mars due to an airlock failure in her vehicle caused by unnoticed damage, the result of the never ending bombardment of sand storms. Since she survived the incident, the exercise was scored as fully successful. Five years later, two months before taking off towards Alpha Centauri, Akhila left the program.

The deer was dashing and jumping frantically through the woods. It could clearly hear the sound of the puma breathing heavily behind it as it elegantly jumped over and through the branches and bushes the terrified deer just passed. The Puma was closing in, but its energy was depleting fast and if the deer would manage to keep out of its reach for two more minutes it would probably be able to put enough distance between itself and the large cat to get out of its sight, which would give it a reasonable chance to survive this encounter. If the deer had been walking calmly at this part of the woods instead of running for its life it would have easily heard the approaching, rumbling engine. The Puma did hear the noise, and it slowed down suspiciously. The deer, mistaking this action as the first sign of the Puma giving up on the chase, was filled with hope and renewed vigor. Coming fast to a gap in a line of dense trees it hurled itself through the air in a mighty jump and landed heavily on a surprisingly hard surface. It had but a fraction of a second to process this event before the car hit it hard on his left side, its body crashing into the thick windshield and from there back into the air. The car, an elegant piece of machinery, was thrown off balance and started to spin, its AI algorithms failing to converge fast enough on an action that would stabilize it. One of the wheels gave in to the unusual extreme force pushing it from the side and broke, the car immediately started also to roll. At this point the vehicle AI inferred

the vehicle was heading towards a ravine on the opposite site of the road from the forest. It blasted open the driver door and released his safety harness, causing Pelger to be thrown out of the rolling vehicle, and crash on the road. Several personal airbags popped around him, but not enough to save him from harm. Even though he was hurt bad, the AI actions saved his life as his vehicle ended up falling 150 meters more into the ravine, and little was left of it. An analysis of the vehicle cameras and brain later on showed Aren the poor deer jumping through the trees and landing but five meters from the fast driving vehicle. Pure, rare, bad luck. Avoiding such events would mean driving at unreasonably low speeds to allow more time for the AIs to react, and so the AIs usually took this well calculated risk.

It took a little over an hour for Pelger to reach a health center, and two more hours to reach the main site of the space population program – the Ducher biological health center. He was not in pain due to the pain killers, automatically injected locally through robotic syringes, but was in a miserable state. He knew the seriousness of his injuries. Internal organs were stabilized but he constantly monitored his vitals and knew that he was not out of danger. His head was throbbing more and more as time progressed, as if small needles were constantly punctuating his head, each inducing a shallow level of pain, and his right leg was shattered. The leg could probably be fixed using advanced surgery, but chances were not negligible that it will not fully recover.

He was introduced into a small surgery room, where Q and his mother were already waiting, Aren with a stern look on her face. He was surprised a bit by Q's presence but did not give much thought to it.

"You have to go into surgery now. We need to operate on your leg, and chances are not high that it will be saved. You need to be prepared to the fact you may wake up with a robotic extension.

Also, and more serious is the damage to your head implants, they may fail any minute and we must replace all of them now. This is why I am talking you first on all this technical decision. The operation can have unexpected results and may take an extremely long time to recover from.” Here she paused and took a deep breath, letting Pelger process what she just said and its implications. “You know you that in five weeks you are to leave for Alpha Centauri. We may not finish the adjustments to the brain implants by then. So in order not to harm the recovery process we may leave you in cryo sleep, under treatment protocols, until you are fully recovered. You may only fully wake up on the ship...”

Pelger absorbed all the information. The look on his mother’s face was strange to him. She seemed worried and troubled even though her speech had shown she had taken all considerations into account and reached a well thought decision that was probably for his best. On a second thought the last few months, as the mission approached, took a heavy, even though somewhat predictable, toll on her. She was working her all life towards this moment. He will continue to fulfill his role for the rest of his life, but her part ends here.

“It is extremely important Pelgi! You need to enter surgery now, but you may wake up only in a few months, already in space, I want you to be ready for this. And if you are not, we will postpone the mission.” Aren was obviously anxious, and Pelger knew that postponing the mission would have tremendous implications. He did not believe his mother would be able to postpone it even if she put all her weight into it. He would probably wake up on the ship no matter his answer.

“I am ready” He said simply. All his life he was training for unexpected events and challenges, and he treated the current situation as a standard event on his path to achieve his purpose. “Keep me in cryo as much as you need in order to reinstall my

implants and verify my brain fully recovers." He smiled at Aren. "I guess the next time I see you will be using a recorded message."

Pelger's head suddenly exploded with pain, and his face distorted with agony. Aren quickly nodded to the medical staff and Pelger was rushed towards the operation room.

"I'll be next to you when you wake up" Said Q simply, while Pelger felt some cold medicine flow into his left arm and the pitch black darkness of drug induced sleep covering him like a thick, cold blanket.

Part 2 – Second life

Pelger was suddenly, intensely and fully aware that he is awake. It felt to him as if he slept for mere seconds or minutes since he was rushed into the operation room, as he remembered no dream that could fill the time gap since his sleep was induced. The first thing he noticed was the difference in gravity. He felt its pull but it was considerably weaker, as if he could accidentally float away from the bed he was resting on, so he simply inferred he was indeed already on the ship. Next he noticed the utter silence that engulfed him. Even in cryo-chambers the buzzing sound of machines was audible and his mind pointed it out immediately. He tried to open his eyes and found it to be no easy feat, as his eye lashes took their time to respond to his desire, and once they were open he saw nothing! Absolute darkness surrounded him. He tried to move but found that his muscles would not budge. Had the operation failed? He was paralyzed in the middle of a silent, dark void. He desperately tried to search and access the net, hoping to get an external view of himself from a nearby camera but that search yielded nothing as well. None of his implants were responding to his mental commands, and he started panicking. His breathing came in fast, shallow breathes and his heart pounded hard and fast, mercilessly shaking his helpless body. This miserable state lasted forever in Pegler's mind although Q later informed him that only two hours had passed before his vitals stabilized. When he finally calmed down, he started discerning weak noises in the complete silence as well as shaking wisps of white light. The voices were a calm, monotonic chatter and although Pelger tried his best he could not discern the words spoken. The lights were barely discernable in the dark void that surrounded him. Pelger tried to shut his eyes and found that the wisps were gone, and came back as soon as he opened them again.

"This must be my vision rather than my surroundings" He told himself, and he immediately tried to focus his senses to better feel his environment. His miserable state brought back memories of the illness he was afflicted with as a child in the woodland camp and he concluded that he probably suffered a similar brain inflammation due to the operation or the accident. If that is the case, Pelger knew the best medicine would be time and concentration.

As the hours went by the lights were very slowly taking shape and form, Pelger started feeling a gentle moist breeze on his skin and the Voices were getting clearer and stronger, and although the words still escaped him Pelger guessed that the speaker was Q. Pelger was already exhausted by now, and he estimated that more than a day has passed since he woke. He finally decided to let go and get some sleep, but found out that he couldn't. After a few hours of trying to sleep, he returned to focusing on the sounds and voices and was surprised that he could already understand a few words. "Pelgi" was one of them and the speaker was obviously Q. He remembered how his relationship with Q changed at the crucial time of his old illness, mainly because he reprogrammed him endlessly during that quarantine, and wondered if several more such months are awaiting them both.

"Whatever the reason is for this state, it might end up to for the best as well." He said to himself in his head. Finally, the relaxed Pelger fell asleep. His sleep was restless and intense, filled with life-like memories from his days just before the accident, and when he finally woke up, he woke up slowly and unwillingly, as was his norm.

"Good morning Pelgi."

The words were barely discernable but it was Q all right.

"I see from your vitals that you have had a good night's sleep. Although that word, 'night', has little meaning here." Said Q.

Pelger was happy to hear Q's voice as well as he was to recognize his own programming in Q's choice of words. Q was conveying to him the information that they were in space without describing the exact situation.

"It's quite a relief to hear you Q!" Said Pelger slowly. Each word spoken took its toll and his voice sounded almost foreign to him.

"Had the operation failed Q? I can't move a thing."

"Don't worry Pelgi" Said Q. "You will be up and running in a few weeks, but it will take some time."

Pelger noticed that Q avoided saying plainly that the operation succeeded. He was hiding something, but Pelger decided to think the situation over before forcing the thing out of him. What was he hiding? And why?

"How are all the others doing? Is anyone awake?" Pelger continued. The rest of the colonists were supposed to cryo sleep most of the way to Alpha Centaury, even though at time some may be waken in order to support ship maintenance, help decide on issues the ships AI required their assistance in, or refresh their vitals in case deep cryo syndromes appeared. Cryo sleep was expected to somewhat delay the colonists aging, but it wasn't free of risks, and constant monitoring and periodic waking were necessary to prevent extensive tissue damage.

"No one woke yet, and no one will until you are fully recovered."

Answered Q.

"Where are we exactly? How far are we from Alpha Centauri? How long did I sleep?"

"Pelgi," Q started calmly "I suggest you wait with all these practical questions until you are a bit better. Right now you can't move and barely hear and see as a result of your long sleep. If you focus on recovering you might be able to move around in as fast as a week or two, but if your mind will focus on other issues you might take much longer to recover. Please trust me as you have done before,

You programmed me yourself and know that I use your own logic and for your own good."

"I agree Q. But I am afraid that if I don't get more information I will be obsessed with it."

"I know Pelgi. But if you will get more information, you will be obsessed even more. I am positively sure of it"

What can be so important that will actually hinder my recovery? Pelger asked himself. Q would never decide on such a tactic unless he was absolutely sure of its importance. It wasn't an order from his mother, as Q mentioned that he himself was positively sure of its necessity and that would not be the case under an order.

Pelger remained quiet for a few long minutes while he continued contemplating the situation. Was the destination somehow changed? If so to where and why? And why wouldn't Q tell him? What could be so serious? Nothing made sense to him.

"Ok Q." He finally said. "But I specifically order you to let me know everything regarding our current situation once you infer that withholding it no longer serves any purpose."

"Done." Said Q joyfully. "Then let me debrief you on your recovery process"

It was a tedious process. Pelger was constantly instructed to move specific muscles, utter specific sounds, focus on hearing distant sounds, and observing and describing different images. All this time he had multiple machinery connected to his muscles and nerves. Once he could move his hands he found that his head was totally bald and that machinery was connected all over it as well. Q was with him constantly, as well as a couple of other humanoid robots. He was staying in a very simple bio-medical room with no windows, and Q refused his request for a tour around the ship before he could walk.

His vision and hearing have recovered well in what would count as a few days. He still had a hard time perceiving colors. On the sixth

day he was finally relived to succeed in moving his legs. Up until that moment he wasn't sure that the operation succeeded. He wasn't even sure that he had undergone an operation. He felt and observed his legs and found not a single evidence for either the operation or the scars and jagged bones left by the accident. He was a bit fatter than he was when he entered the operation, but still he expected to be able to feel them as he moved his hand along his right leg. This was not the only weird thing he found. His palms were different. He did not know what the exact differences were, but their skin felt much softer and the pattern of lines covering them seemed different. The smallest toe on his right leg exhibited a flat, clear nail, very different then the mess it used to be, created by endless clashes between that specific toe and walls that occurred when he ran around as a kid. Had he undergone some bio upgrading procedure that he wasn't aware off?

And last of all were his implants. Were they replaced? Removed? Pelger had many questions to Q, but he dared not ask them.

Several more sleeping cycles have passed and Pelger took his first couple of steps around his bed. That day Q informed him that it was time to make some progress.

"Your vitals are spectacular!" said Q. "Your recovery process has proceeded well above the expectations. I infer it is time for you to have full knowledge about our situation, but I believe it is best that you ask the questions rather than me providing a narrative. "

"Good!" Said Pelger. "Where are we?" he started.

"It is a bit difficult to answer this question." Said Q. "As the specific region we are now traveling across is yet to be named. We are nearing a twin star system located close to the center of the second spiral arm of the milky way.

"What!?" Cried Pelger. His head almost exploded as this little piece of information was enough for him to understand much of the situation he was at. So many unbelievable things becoming a reality

in a single second. Like a wave building up as it approaches the shore and breaking itself on it in a single smash, it was an emotional and intellectual tsunami.

"I want you to take me out of this room Q! Take me to an observatory!"

"As you wish Pelgi" Answered Q calmly.

The first time after the endless days Pelger had spent inside the small room he left it through the small opening that served Q and the medical Robots. He noticed the expected differences immediately. While the recovery room was made using familiar looking machinery and design the rest of the ship was not. The corridor just outside the room was long and dark and made from a material that Pelger could not identify but reminded him of an octopus's skin with a metallic tint to it. It had a deep blue color and emanated some dim bluish light, just enough for Pelger to see where he was walking. Pelger paused before stepping into the corridor and Q waited patiently rather than leading him on. He finally stepped into it and started walking. He was still barefooted, and the floor felt warm and soft, yet solid and strong. After a few steps Q took the lead.

"This is Shape Shifting Steel, or Snake Steel in its more common name." Q didn't wait for the question this time. "It is a self-repairing material with a very wide range of attributes dependent on the electromagnetic field it is sensing. Most of our hull, our lights, our screens, even most of the ship's moving parts are made of it. It is the material that allowed long distance space ships to be built."

"Why Snake Steel?" Asked Pelger, resorting to technicalities to allow him some more time to digest all that was around him.

Q took a left turn into a passage that opened up in the corridors' wall and Pelger followed him.

"Because of its initials." Said Q plainly. "The inventors tried to call it S-S-Steel at first."

Q and Pelger walked on slowly and silently until Pelger stopped before an opening and turned to Pelger.

"Prepare yourself." Said Q. "This is one magnificent view from here."

With that he entered the opening. Pelger took a deep breath and followed through. On the other side of the opening was a small transparent domed chamber. It allowed a 180 degrees view of space to the left side of the ship and held a few observation armchairs. Up until now he wasn't sure if Q was indeed honest with him, but one glance was enough to convince him that he was a long way from Earth. The view was littered with stars, countless stars! Pelger immediately estimated that their density here was almost ten times that viewed from Earth's orbit. A few of them glared stronger than others, especially a pulsating star far to his right, right next to the ships' front.

Pelger sat on one of the observation armchairs and glared at it.

Q came to stand next to him.

"Would you like to have a closer look at it, captain?" Asked Q in a formal voice.

Pelger relaxed and smiled.

"Aye aye." He answered.

Immediately the view on the dome changed and zoomed in. The pulsating dot became a bright bar, indicating that those were two stars, spiraling around each other on the same plane as Pelgers view. A couple of dozen other dots became visible, obviously a multitude of planets orbiting the couple. One of them started glowing in a green hue.

"We are aiming at the 15th planet from the suns." Said Q. "The one now highlighted in green. You need to name it but we still have 6 years until we reach it, so it's not your top priority."

Pelger stared at the small, pale blue dot. He felt his heart pounding. This was no exercise but the real thing. This small dot is to be

humanity's second home, and he is the first human being to place his eyes on it. He had no idea what happened to make his mother put him in cryo sleep into an actual colonization ship, and he still couldn't believe that he was trusted with this mission. He had so many questions to Q ...

Pelger was suddenly awe struck by the look of that small dot and his thoughts raced inside his head trying to imagine what they would find on it. He, 25 year old Pelger, was to erect the first deep space colony out of Earth.

"Did you send a probe ahead of us Q?" He asked.

"We sent five." Q smiled at him, displaying his approval of Pelger's choice of questions. "They would reach scanning distance within 9 months. You are now viewing the planet as it is seen from the leading probe."

Enough time for me to wake and prepare my crew, he thought. His gaze moved from the small green dot to the visible outer hull of the ship and for the first time he noticed just how beaten it was. It looked everything other than the sleek black corridors he and Q just passed through as everywhere dents, cracks and broken extensions were visible. Looking behind him he saw a multitude of extensions protruding from the ship's side. There were a number of large pods rotating slowly around the ship at the ends of long access corridors, most of which Pelger immediately identified as space farms, there were various antenna, a huge solar sail that suspiciously lacked any sign of wear and finally, far behind the ship, almost invisible in the dark void and hiding behind the huge engine was an asteroid almost the size of the ship, which Pelger knew was moored to the ship with a long invisible carbo-cable.

"There is an asteroid back there." He told Q slowly, thinking how to best phrase his question as not to get the information he knew he would finally have to get. "What does it hold? Did you pick it up on the way here?"

"We did." Said Q, and paused a bit as to emphasize the word we. "The ship's AI is quite a character, and I think you would like her. We indeed picked up this asteroid and seven more that line up behind him. They contain metals, radioactive materials, ice and various organic compounds. We are bringing almost everything we need to build a colony with us."

Pelger took another long look at the ship and took a deep breath. The feeling of awe that he had just experienced returned and he suddenly felt he could deal with anything that Q would say.

"The ship looks terrible; It spent a very long time in space." He said. "How far are we from Earth Q?"

"3,564 light years." Answered Q plainly. The Answer did not seem to surprise Pelger at all.

"And how long did it take us to reach this place?" Continued Pelger.

"A little over 12,369 Earth years. It's been quite a boring drive." And with that Q winked at him.

Pelger hoped in his heart that the ship held even more fascinating technology that allowed it to somehow warp this distance in month. He was unable to grasp such an enormous amount of time.

"You were active along the whole way?!" Pelger exclaimed.

"It depends on how you consider "me". Q have been rebuilt 17 times during the trip due to various failures and a few accidents. There is a backup case of me at the engineering section to which I backup all my data as we speak. But one of me was always active as every decision made by the ship's AI had to be supported by my decision as well."

"And what about me and my human crew?" Asked Pelger finally.

"We couldn't be cryo sleeping for a ten thousand years! How did you manage to bring us here?"

"You weren't sleeping Pelgi" Answered Q softly. "You were cloned here, and your memories remade using recordings of your life on Earth."

Pelger thought it over, as the thought had already crossed his mind on the way to the observatory, but a helpless look spread across his face.

"I don't understand that Q! I feel normal! I have vivid memories of my entire life with numerous small details, I remember my feelings! How did anyone recreate the memory of my feelings, yet alone knew what I felt? Or is my life some made up story someone created for me? "

"Your memories are true memories of your true life." Said Q with a calm, caring voice. "When you were just born, your head was implanted with numerous electromagnetic recorders which recorded the electrical currents running through your head for your entire life. This data couldn't be deciphered in order to understand what you were feeling or thinking, but it could be used to reconstruct the recorded patterns. 26 years ago, on this ship we cloned you from a single, synthesized cell. During the next two and a half decades you developed and grew to become the grown up human being you are today and the recorded patterns were induced in your brain in real time, recreating the life you experienced on Earth. When you woke up you had a hard time controlling your muscles, hearing and seeing, simply because you have never actually used your muscles, ears or eyes up until now."

Pelger was dumb struck. He could not decide whether to further pursue this line of questions or turn to simple practical ones.

"I have a hard time grasping this state of affairs, and I guess that after some more thinking I will have many more questions." He told Q. "But for now I want to be fully debriefed on the situation we are currently on. What are the top priority missions for the time being?"

"A wise choice!" Q returned to his plain formal voice. "We have several issues that require attention, but most of them can still be cared by the ships AI and myself. I believe your top priority would be to first get yourself acquainted with your ship. It is a remarkable

vehicle and I believe you will gain much confidence in yourself from operating it. You should also consider how to name it. The second would be to retrain yourself to use your implants. I have just enabled them and the sooner you get used to them the better. Next would be to prepare yourself for your crew. They will start awakening about 2 months from now, and I allowed for one or two weeks to pass between each waking crew member to allow you the time needed to help them grasp the situation, just as you are about to do with my help."

"Who is to wake up first?" Asked Pelger with visible agitation.

"Who do you think?!" Q smiled at him.

Pelger was delighted to hear this response. He considered himself a sort of Adam, and he hoped to have a couple of weeks alone with his Eve before dedicating their lives to colonizing this new world.

"If the probes reach scanning distance in 9 months, it means that only some of my crew will be awake."

"That is correct." Said Q. "And once information will start arriving, you will probably have many new worries. That's why I planned for your psychology officers to wake up early on. They should be able to take that role out of your hands by then.

"Good." Said Pelger. He took another long look at the pulsating green dot, at the countless stars surrounding him and finally at his bulky ship. "I am starving. Let's continue over lunch. I want to spoil myself before the ship is filled with many mouths to feed. Is there any real Earth food on this ship?"

"Thought you would never ask!" Said Q. "Our ship took off only 120 years after your recording had ended, as you have probably guessed from the technologies you have seen so far. Our farms are state of the art, very different than those rotating piles of dirt you had on the training station, and I think you will enjoy harvesting your lunch."

"I definitely will!" Said Pelger as enthusiastically as he could. "Please, lead the way." And he followed Q outside the observatory with a light step, but a heavy heart. Even though he had guessed beforehand much of what Q informed him about, the specific details held many new meanings and feelings. The thought that he is cloned, that his memories have been created in a different body, that everyone he ever knew had died over 10,000 years ago, the responsibility that had become so real, all lay heavily on him. He needed time alone with himself.

"120 years..." He muttered silently to himself as he followed Q down the dark glowing corridor. His original self never lived to even see the ship carrying his unborn clone leaving Earth.

As soon as Pelger followed Q out of the observatory he was aware of a strange sensation, his skin felt as if the air became moister and drier at the same time. He hesitated for a second, enough for Q to notice and turn to him.

"The air feels strange?" He asked.

"Yes. I can't explain exactly how..."

"That is because you never felt this feeling before." Said Q and continued walking. "I turned on your implants, and they are way more advanced than the ones you used back in your time on Earth. There are many differences, but I guess the main one is the feedback. These implants let you feel, rather than only know. With our old implants you would know that the net is accessible, with these ones you feel the net around you even though you haven't issued a single command and received no data."

Pelger's eyes lit with enthusiasm.

"Where exactly are we going Q? I want to lead the way." He said.

"To farm module 2, but if I were you I would wait a bit before..." Q stopped in mid-sentence as Pelger was thrown back and fell to the floor.

Pelger had tried to access the directions from their location to the farm but instead of receiving an ordinary overview of a map, as he was used to, he had seen and felt the way down the corridors and elevators all at once, as if he was flying through them in mind boggling speed and then brought to an instantaneous halt. His mind had tried to prevent him from being flung forward, and the result was that his muscles threw him backward.

Q helped him up. "I tried to warn you."

"If you really wanted to you could have warned me before turning on my implants." Said Pelger in a miserable voice.

"Indeed I could." Said Q. "But I am also making a point here – better listen to me and be a bit more careful, there is much you do not know yet."

"Point made." Said Pelger. "Now let me lead the way."

"You are most welcome. But this time try to reach out and feel the way rather than issue a command to know it."

Pelger did as Q asked. "I feel nothing." He said.

"Keep reaching and start walking" Said Q in an enigmatic tone.

Pelger started walking slowly. After a couple of minutes down the corridor, he suddenly stopped.

"I felt a weird urge to walk right into the wall." He said to Q. "As if it was something I was am used to doing."

"That is exactly the difference I told you about. You feel the right thing is to go left at this point rather than know it." Said Q and then turned left and passed through a passage that opened in the wall ahead of him. He stood on the other side of the passage and turned again to face Pelger. "Come on. You open the next one."

They continued walking for forty minutes through many turns and corridors, and Pelger started thinking that Q manipulated him to take the longest route possible when they finally reached the elevator shaft that led down to the farm. The correct term was down as although the main hull rotated in a speed that allowed for

just enough gravity to walk comfortably, the long extension ending with the huge spherical farm was rotating fast around it and allowed for earth like gravity in the farm itself. This made Pelger have the feeling of going "down" and experience an increased gravity during the full minute it took the elevator to reach the lowest floor of the farm.

The elevator was transparent and as Pelger went down he caught as much as he could of what was happening in each level of the farm. The extension arm had 33 floors, some were around 10 ft. high and held laboratories and sprouting chambers and some were more than 50 ft. high and held mainly large machinery and vehicles that Pelger suspected were made also for purposes other than farming. The spherical chamber was enormous, a few kilometers in diameter, and was divided into 4 farming sections, each around 300 ft. high and with another 50 ft. of earth at its base. The first three were completely barren, although numerous vehicles were scurrying around planting trees and crops in rectangular plots and erecting various structures around them, but as soon as the elevator emerged into the fourth and last section of the sphere, Pelger was shocked by the emerging view. He practically descended into paradise. The section was designed as a classic rural setting, with the elevator descending into the middle of a small, modernly designed village, surrounded by crop covered hills, vast fields and even a small lake and a forest.

"Nice, isn't it?!" Asked Q.

"It's amazing!" Answered Pelger in awe as the elevator slowed down and came to a stop in the village square.

"Why have you built all of those buildings Q? At least some of them seem like living quarters, and I assume we are not intended to live down here."

"You assume wrong Pelgi." Q turned to him. "You indeed have many living quarters in the main hull of the ship, but this small village and

three other villages identical to it in the other farm modules are simulating colonization villages you will erect in your new home. They were built to serve as training centers, and a significant number of your crew members will live down here and operate these machines and facilities. They are even expected to trade with each other on a certain level to better simulate the real circumstances."

Q gestured for Pelger to follow him and lead him to a small hut on the outskirts of the village. The hut was built of a bright, strong, flexible metal that Pelger did not recognize. Its interior was somewhat similar to the hallways up in the ship. It contained a single spacious living chamber that had a large bed, a few comfortable looking armchairs, a table with a couple of chairs, a small kitchen and a large closet.

"Where is the bath?" Asked Pelger that had desperately hoped for one to hide somewhere around the room. He cleaned himself every day as well as he could, using a standard cleaning cloth, but he longed for a hot, old fashioned tub.

"There is none in the room." Answered Q. "Instead you have public hot baths, in order to promote social interactions among the village members. You will, of course, have it all for yourself until the rest of the crew starts waking up."

"It will be the first place I would visit after we will finally eat something."

Q smiled at him. "Come. I'll show you to your plot."

The 10 X 10 meter vegetable plot behind the hut was completely full. It had a few species of grains and every kind of vegetable Pelger had ever known, as well as a few he didn't. Of each plant species that grew in the plot Pelger could see young plants growing next to mature, ripe ones. Alongside the plants Pelger notice various devices which Pelger could not recognize. He examined them and found that some were producing hot or cold air, some produced

light or moisture while still others gave no hints as to their true purpose.

"Micro climate controllers." Said Q. "They allow all plant types to be grown side by side all year long, even plants that are not genetically architecture to do so. You can go on and choose whatever you feel like eating at the moment."

Pelger felt like trying everything in the plot, but instead he picked some grains he could not identify as well as a ripe tomato, a cucumber, a sweet pepper, a small lettuce, one sunflower, a carrot, a beetroot, an onion and a Zucchini. He turned to Q.

"I don't guess you have any eggs around here."

"As a matter of fact we do." Answered Q. "There are some free roaming animals on this level, among them many kinds of birds whose eggs are meant to be eaten. If you wish we can pick some now."

"That would be great!" Answered Pelger. Picking his food from green fields, living inside this small paradise, it all made him feel alive. He forgot all the responsibility that was laid upon his shoulders, the heavy load of understanding that he is a mere clone of the person he used to be. He suddenly felt like a new baby, clean hearted and without a care, discovering the amazing world around him, new magnificent things around every turn.

"Follow me." Said Q, and turned back towards the hut. "There are many more animals on Noa's Ark, that's the farm we use to breed the animals to be released on the plant once we arrive, but none are meant to be eaten. If you care for meat there is a small fridge in your hut containing a few small boxes with artificially grown goose muscle and liver, as well as buffalo, ostrich, triceratops and various fish muscles. Once removed from the box a new tissue will grow in a rate of about 10 grams per day, so you can eat each type of meat about once a week. You can use those together with what

you picked to cook your meal by yourself or use the kitchen hands that will automatically cook everything by your choice.

"Did you say Triceratops?!" Pelger was amazed.

"Why not?" Asked Q. "We can easily grow tissues from 1211 different species, among them even some more exotic creatures. Those in your fridge at the moment are the ones I inferred you would enjoy the best, but you are welcome to try all the rest of them as well. You will be amazed at how a fly muscle steak tastes like, or so I was told. Once you grow the meat yourself, the original size of the creatures no longer matters... "

They arrived at the hut, but instead of entering through the main door Q stopped some distance away from the hut and turned to Pelger.

"If you still care for eggs I will bring the reconnaissance drone and teach you how to use it. You can then try and find some eggs for yourself."

Pelger nodded and Q stood still for a moment. A soft buzz was suddenly heard from the roof of the small hut, and a quad propeller drone took off from it and floated calmly until it landed gently at Pelger's feet. The drone quad was built from two interconnecting rods, each around 1.5 meters long, which ended with small propellers on each end. The Rods were packed with various instruments. Among those that Pelger identified were 2 smaller quads, various robotic arms, cameras, solar panels, a small drill and a harness that allowed a person to strap herself safely to the quad.

"Each person in the village is supplied with a quad to her liking."

Said Q. "It is meant to be the most basic working tool for your people down on your new planet. It is modular and although yours is fitted with standard tools at the moment you will be able to change it as you see fit. Now you can use one of its secondary quads to perform a gentle job as to pick eggs from a nest. Choose one of the quads and first access its main camera."

That was easy for Pelger. He issued the mental command and his field of view suddenly included the visual feed from the small drone. He then issued a mental command for it to take off, and the small drone detached itself from the rod it was attached to and flew up in a straight line to stop at a height of around 5 meters.

"Now try to imagine ... yourself being the quad." Said Q.

Pelger turned his gaze to Q with a curious look on his face. He then looked up at the drone and tried to feel in his arms the small rods, for a second nothing happened, but then suddenly he felt it. He was the quad. At first he thought that he would imagine his hands turning and the rods would comply as if they were his hands. But he now felt that he had rods instead of arms, four of them! Pelger was unprepared for this feeling and he lost his balance. He could not separate between his legs and his newly acquired rod appendages. The result was that both of his own body swayed and fell to the ground and the small drone tilted and flew directly at his hut. Unlike his body though, the drone stopped short of crashing into the hut's wall as its AI took over the controls.

Q laughed hard. "You'll get used to it Pelgi! But it seems that your first meal won't include any eggs..."

On the 8th day to his awakening Pelger started with a morning run. Days were kept aboard the farm module with the lighting being faded and brightened in a 28 hour cycle, as was expected on their newly found planet. Back at his hut Pelger practiced using the quad to pick vegetables from the garden while he was taking the shower, and later gathered a few eggs and high hanging fruits. He was just finishing his breakfast when Q entered the hut.

"How about a short trip outside the ship Pelgi?" asked Q.

Pelger jumped from his seat. "Sure! Let's go!"

As the closest thing to a person Pelger had around him was Q, who was his childhood friend, he allowed himself to enjoy his

surroundings childishly, getting excited and acting as a fool. He kept reminding himself to enjoy it as much as he could, since soon he would have to order Q to stop calling him Pelgi and refrain from revealing that he knew far more than Pelger did regarding nearly everything.

Q smiled at him. "We will go nowhere. You won't be leaving the ship in person as it would be foolish to risk your life in such a hostile environment. But I watched you control the quad this morning, and I think you are ready to control a space faring vehicle."

Pelger felt a bit angry at himself. Such reasoning was obvious and should have occurred to him before Q announced it. "OK." He said bluntly. "Then I assume we will be going to the hangars we saw during our elevator ride into the farm."

"No." Said Q. "You will control one of the recon drones from your chair here."

"How will I be able to focus my mind on a specific drone from here?"

"With a little help." Answered Q. "There is someone here to help you, someone I was waiting to introduce to you for some time now. Allow me to introduce you to Tami, our ship's AI." With that Q waved his hands theatrically at the air around them.

"Hello Pelger." A strong female voice was heard clearly and loudly from Pelger's hearing implants and was immediately followed by an even clearer statement that pelger had to infer he was hearing inside his head." It's an honor to finally talk to you."

Pelger immediately straightened in his chair. He felt as if someone that has been peeping on him for a week was suddenly caught.

"Hello Tami." He answered in a formal voice. "It is a pleasure to be aware of your presence." The latter part of the sentence he answered inside his head by thinking of himself saying it.

"Tami will direct your initial mental link to a specific recon drone." Q announced. "Once you get its visual feed and feel it, you can control

it just as you did with the quad. As the drone is more equipped than your quad, Tami will help you with your first flight by taking control of various instruments as she sees fit and instructing you about those she leaves under your control."

"Are you ready?" Asked Tami inside Pelger's mind.

Pelger felt extremely uncomfortable with the ship's AI being able to freely access his implants and letting herself be heard inside his head. This was expected though, as feeling vehicles, or hearing sounds both involved access to his nervous system.

"I am." He answered.

First the visual feed was suddenly established and he was able to externally view a small drone, probably a few meters in length resting in one of the hangars he remembered from the elevator ride. The drone looked like a small, elongated, wingless plane mounted with various instruments. It was obviously a strictly space faring vehicle and was not meant for planetary flight. He turned the view around until he approved his guess that his visual feed came from a wall mounted camera. Next came a feed from the drone's main camera. Pelger now observed a large hatch situated in front of the drone. It was mentally taxing to view three visual feeds at the same time, from two cameras aside from his own eyes, but that was a feat Pelger was used to carrying out back on Earth. Once he even received feeds from five cameras simultaneously.

"I will first fly the drone outside the ship. I will then hand over some of the controls to you, one by one." Said Tami.

"See?!" Pelger turned to Q. "This is the way to teach a new skill! Not allowing me to fail miserably at my first try!" Pelger assumed that while Q was unable to hear a single word from what Tami was saying to him that he was either informed in real time or that each word was coordinated with him in advance.

"Who said you are not going to fail miserably?!" Q smiled at him.

The drone lifted itself silently in the air. Suddenly the hatch opened in a flash and the drone shot itself through it with tremendous speed. Pelger managed to keep his footing and not flung himself forward.

"You have basic flight controls." Said Tami and Pelger immediately felt the drone. First he felt only the wings, or more accurately the couple main maneuvering engines attached to them. His experience with the quad proved to be valuable as he easily maneuvered the drone around to watch the large farm module moving away from it. Suddenly Pelger felt the rear engine, he turned the drone away from the ship and gathered some distance before turning again. The farm module was now a small structure on the foreground of the huge elongated ship. From this angle the view was clearer than in the observation dome and Pelger was amazed at the contrast with the perfect rural setting inside the farm module. It became suddenly clear to him how fragile their existence really was and he thought to himself that he might have been too absorbed at the getting used to the new technologies and enjoying his little paradise. Tami interrupted his thinking.

"Enjoying the view so far? I will give you access now to multiple sensors as well as all the secondary maneuvering engines. Do not try to work each one of them individually as you did with the main ones, try and imagine the maneuver you wish to make and let the drones AI translate it into the specific orders for the engines."

Although Tami was much softer than Q, Pelger was still overwhelmed by the amount of sensory feedback he received from the drone. But he got used to being overwhelmed this last week and recovered quickly. He had to admit that communicating his wishes this way was much more efficient than all he was used too back on Earth and after only two hours of space flight he managed to land the small drone back in his hangar, not before he circled around the long ship and among the moored asteroids. He was utterly

exhausted and was happy to feel his own body again, back at the comfortable chair in his cozy hut.

"Not bad at all for a first time." Said Tami.

"Don't get used to it." Said Q to the air above him, and Pelger understood that Tami was communicating with both of them, mimicking a strange conversation. "Pelger is the best student you will have, most of the next 1,132 crew members will fly like maintenance drones given a ship!"

"1,132!" Cried Pelger in alarm. "Why haven't you said so before Q?! I was aware only of the 25 members of my own group!"

"You thought you would colonize a whole planet with 25 people?! Why do you think Tami is taking us there in such a huge ship?!" Said Q in his defense.

Pelger took a deep breath. Of course Q was right. Ever since he awakened he treated his surroundings as a good dream. He was swallowing the new things around him like a newborn child. It was an amazing feeling but the time has come to take responsibility back and live up to the task that was set before him. He felt comfortable enough with the new technologies around him, as this last flight proved to him, and he will stop allowing Q to steer the events around him and take the reins into his own hands.

"OK Q. Please design us a schedule according to these priorities: I will leave the farm module in 2 hours. I will first have a full tour of the ship with you showing me the main modules in it. You will specifically point out any malfunction or damage that pose a risk to our mission, as well as any critical elements in each of the modules. We will later have a through visit to the cryo-chambers or whatever you call the place in which we now grow the crew to be awakened. Last I wish to specifically examine our life support systems as well as the control bridge of the ship. In the mean time I want you to arrange me new quarters outside the farm module and move all my things from the hut. I expect you to give me the best four

alternatives as to these quarters location from which I will choose myself."

Q smiled at him. "Right away Pelgi! I already got the four locations for you to choose from, but I also know which one you are going to choose!"

"Maybe." Answered Pelger. "And maybe not. I will choose at the end of my tour. In any case it was a long comfortable morning, but the time has come to get to work. Please leave me now, I will rest and eat and be ready for you in two hours."

It was an extremely long tour that took more than 30 hours to complete. Pelger did not stop to rest until his picture of the ship's situation was complete. Of all the places on the ship that he had visited the cryo-chambers disturbed him most of all. They were huge chambers, looking more like storage rooms, in which people were lying inside hollow cylinders, connected to uncountable wires, tubes and needles. The cylinders were stacked in what seemed like a monumental library made of real people. Inside the cylinders everyone were already grown up, as all were meant to wake up in the next 5 years, but Pelger could not help but imagine these cylinders filled with small children, or even embryos, as they must have been 25 years ago. He quickly realized that the amount of people he saw well exceeded 1,000 and he estimated that it was closer to 5,000. Asking Q to explain the discrepancy he was answered with a hesitating look.

"Well..." Said Q. "You must realize that while each of the crew members is extremely valuable to the mission, the process of memory assimilation is very delicate and at its best have a little over 30% failure rate."

"You mean we will lose a random set of 30% of our crew members due to failures during their growing procedure?" Asked Pelger.

"We would lose 30% of them if we were growing a single copy of each member." Answered Q. "That's why we are growing, on

average, 5 copies of each member. The copies are planned to wake up a week apart from each other, this gives us enough time to evaluate whether the cloning and memory assimilation were successful. If a copy failed, it is destroyed and the next wakes up. Using 5 copies reduces the chance of losing a specific crew member to less than 0.25%."

Pelger stopped cold. "How are the failed clones destroyed?" He asked.

"In a quick and painless manner." Answered Q. "This was the only way to promise a full, able crew would reach the colonization site."

"How many copies did I have?" Asked Pelger quietly. "What number am I?"

"There were 10 copies of you, the highest number of clones we had on the ship as you are the single most important person for this mission. You are the third of them. The first 2 failed the memory assimilation and the remaining 7 copies were destroyed the day after you moved into the farm." Q waited quietly for a few seconds. "Try to think of it as an integral part of the cloning process, out of which emerges a single, cloned individual. We cannot allow multiple copies of the same person to exist in the same time, and we could not wait another 25 years after each failed attempt to re-clone the failed individual."

"It is the most plausible solution Q." Agreed Pelger after a while. "But still, it chills my blood to think of my own copies being destroyed, as well as thinking about the fact that 80% of the people I now see around me would also be destroyed." He Paused. Thinking the matter over until he suddenly turned with newly found vigor to face Q. "This... killing is a given state now. I cannot change past decisions but am responsible for the future ones. I will pursue this matter no longer. Let's move on to life support."

As they were about to leave the cryo-chamber a robotic vehicle entered the room. A robotic arm extracted a cylinder from high

above them and gently loaded it in to the vehicle, which turned to leave the room. As the vehicle passed them Pelger caught a glimpse of Lara lying inside the cylinder.

"You did this on purpose." Pelger turned to Q.

"She did." Q was pointing up with an apologetic look upon his face.

"But do you regret it?!"

Pelger remained quiet. He was actually glad that Tami timed Lara's pickup in a way for him to see her.

"If the memory assimilation went well, you will meet her in a week and have a few days alone with her in this Garden of Eden." Said Q.

"That's before the rest of the humankind awakens and the place will become one large psychological experiment..."

Pelger and Lara sat alone in the observation dome, deeply engaged in conversation. It has been more than four months since Pelger awoke and his crew now numbered almost fifty, out of which ten were psychology officers working around the clock with the rest of the awakening crew members, assessing the assimilation success and helping them through the shock of waking up. Lara's assimilation succeeded with her first copy, and Pelger was at her side when she awoke. They had since been constantly together until the first psychology officers awoke, none of which they knew back on Earth. They have been at their bedside as they awoke and helped them grasp the new reality around them. That was the first time Pelger saw the effects of a failed memory assimilation. The young officer was named Jack, and Pelger was holding his hand and calling his name softly as his senses started to work and he managed to speak. He was in complete panic. His memory was a disconnected pile of events, names and feelings. He could not remember coherently who he was; he could hardly articulate a clear sentence, he couldn't even move his limbs properly, having them wired incorrectly to his brain. It took Pelger well over five hours to

convince himself that this was a permanent state and not a side effect of the awakening. ffff

Even after they were no longer needed at the awakenings of new crew members they made sure to be at their bedside when they woke. Lara was especially taken with the process and spent most of her time considering her own feelings and memories, as well as those of the newly arrived crew members. She was less interested in all the new technology around them, as Pelger was, and that caused them to spend considerable time apart, but now Tami had summoned them both to receive the first images and data regarding their target planet. They were sitting together debating the name they should choose for their planet when Tami interrupted them.

"My report is ready. Will you accept it now?" She said formally inside their heads.

"We will!" Answered Pelger and both of them turned to the large window out looking the distance system.

The view immediately shifted and zoomed in to display the system and the five probes approaching it, each in a bit different course.

"Our probes are still five months away from the system but I already have some information that they could remotely sense. I have made both depressing and elevating discoveries. The first is that our original planet seems to be uninhabitable after all. Although most life supporting parameters seems to be in order, as we have inferred before choosing this system, we can now detect a couple more that invert our conclusion regarding it. It seems that radiation levels on the planet are extremely high, and that it is tectonically way more active then we first assumed." Tami made a short pause while Pelger and Lara exchanged terrified looks. "I have reached this conclusion over a week ago and thus spent the time since scanning the rest of the system for other candidates. It seems that the 20th star from the suns, one of the largest planets in the system is surrounded by close to 80 moons. Stars flash on the map.

One of the moons holds 93% probability to support life according to my scans. Another 2 moons surrounding a different planet hold probabilities of 15% and 0.37% so we can turn to them if we have no luck with this one as well. I have changed the course of four of the probes to the top probability moon, and the fifth towards the second planet.

"Send one of the four to other parts of this system, and another to our original planet." Ordered Pelger. "It seems that we need to better know our neighborhood before we settle down. If we will have a place to settle down... When will we know for certain if this moon is indeed habitable? And how many people can it support?"

"One week and a few billions." Answered Tami.

"Is there anything unique or important about this moon Tami?" Asked Lara.

"Well..." Started Tami. "Since there are many moons in its vicinity as well as a large amount of asteroids locked in the planet's gravity field, it will take close to two months for me to complete all the necessary calculations and establish with over 99% probability that no danger is looming upon this new home for the next 5,000 years. At the moment this probability stands at 56%. Other than the danger though, those multiple neighbors will probably present us with a large, diverse pool of resources. After all, this might even be a better home than the planet we first aimed at."

"I don't like the idea of being lucky." Said Pelger scornfully. "The fact that the planet we aimed at was inhabitable is disastrous. And I don't want to count on luck again."

"Do not give luck too much credit." Said Tami. "Me and Q specifically chose this system because it was large enough to harbor over a thousand planets and moons. We wanted to have alternatives if our first target failed as we could not reach probabilities higher than 60% without getting closer to the system we chose. We have already wasted close to 2,000 years aiming at a

system that had a 56% probability candidate, but was eventually barren. When we were confronted with the choice again – a large system with a 40% planet and a smaller system with a 58% planet we chose the first, even though the journey took us 1,000 years longer."

"It seems you had made a good choice Tami." Said Pelger "Let's hope that we have finally found our home."

conversation between Lara and Pelger. Build the characters. Crew issues.

A week later Pelger and Lara were summoned again to the observation deck. It was the first time that Tami insisted on them joining her as soon as possible and rescheduled their tasks to other crew members. They hurried to the observation dome to find Q already waiting for them. They quickly sat down and shut their communications with the rest of the crew.

"I have some news that need you attention." Said Tami.

Pelger felt excited, Ever since he woke he felt as if was a bit useless. He was trained and raised as a decision maker, and that was his role as the commander of the ship. Yet ever since he woke he found that Tami and Q were perfectly able to handle every decision that came across them, and have actually done so successfully for over 10,000 years. The AI's were following the same logic he was and he found himself being informed all the time of the situation and the steps that were already taken as those steps were logically obvious. He was enjoying this situation and using his mental energies to learn and master all the technologies around him, but he secretly missed actual decision making.

"Our probes are close enough to our destination to make more accurate measurements and we have found some... disturbing results." Tami paused.

"Go on!" said Pelger.

"We have read a weak, yet clear, spectrophotometric signature of chlorophyll on the moon."

"There is life on it!" Cried Lara verbally, startling both Pelger and herself.

"That seems to be the case." Agreed Tami. "From the strength of the signal I would say that plants are quite abundant on around 50% of the surface.

"You say plants, but do we have a way to assess if these life forms are anywhere close to the plants we know from Earth?" Asked Pelger.

"I said plants because that's what I meant." Answered Tami. "They are Earth originated plants. The signature fits a combination of chlorophyll a and b, exactly as it exists in Earth."

"But can't it be a case of parallel evolution?" Delved Pelger. "What if chlorophyll like molecules are the best way to gather energy from sunlight and have developed here independently?"

"They are the best way to gather energy from sunlight." Interfered Q. "But from Sol, Earth's sun. The twin suns of this system have somewhat different spectrometric properties, and if a chlorophyll molecule would have evolved in this system it would have a different signature."

"Then if these are Earth plants, growing freely on this moon more than 3000 light years away from Earth, how did they get here?" Asked Lara.

"On a ship. Just like the plants we have down at our farms.." Answered Pelger.

"That is correct." Said Tami.

"Then who's ship was it? Did Earth developed faster spacefaring technologies while we were traveling here and reached this system before we did?" Asked Lara.

"This is one possibility." Answered Tami. "Although I would give higher probability that a ship similar to ours flew a shorter route to this system, without delaying on its way as we did."

"Do you know of another program to settle the stars other than the alliance's space population program?" Asked Pelger.

"No." Said Tami bluntly "But it could easily be another ship sent by the program."

"But WE are the program's population ship!" Pelger stopped short as he suddenly understood Tami's idea.

"I am sorry, but it seems that I have failed to mention something that I assumed was obvious to you." Q turned to Pelger. "We are the 107th ship to leave Earth as a part of the space population program. And at the time we left 16 other ships were already in different stages of construction. At that time humanity had no restraint on launching one ship every 10 months on average."

"And the crew?" Asked Lara, anticipating the answer.

"All 107 ships were holding identical crew cells, memory recordings and growing protocols." Said Q. "Even my own AI was the same on all ships, although Tami's AI had considerably improved from the first versions, as well as the ship's onboard technologies."

Q watched Pelger and Lara. Each of them had a different expression on their face and Q took pleasure, electronically speaking, in guessing its origin. The truth was that while Lara was contemplating the possibility of meeting with her own offspring on this new, already colonized planet, Pelger was devastated by the possibility of having failed his mission. For all he knew, humanity has already settled outside of Earth. Possibly forming over 100 colonies. And he was simply arriving at an already colonized world. All his lifelong

preparations were for nothing! His mind tried to grasp at other possibilities.

"Tami, Have you scanned the moon for any other signs of life, and specifically of human settlement?" He asked

"Over an hour ago, when I became positively sure about the chlorophyll signature, that became my first priority." Answered Tami. "I have failed to detect any communication or otherwise electrical signals from the moon. I put the probability of technologically adept humans living on its surface at no higher than 28% at the moment. It will take me over a week to put that probability at less than 1%."

"I care more for the probability that technologically adept humans live somewhere in orbit around this planet than on the surface of a specific moon." Said Pelger, who still couldn't decide what news he wished for – the presence or absence of a human colony.

"That would stand on 34%, and would take close to a month for me to reach 1% probability" Corrected Tami.

"Then let's continue our preparations as if no colony exists, while Tami works on giving us an answer." Said Pelger "But keep us posted, as once the probability drops below 7% I want all the crew to be informed about our change of destination, as well as on the possible terraforming of the moon by a different Earth ship. I would then want all our resources to be aimed at understanding why this previous colonization attempt failed, and what can we do to prevent ourselves from failing the same way."

The days passed and Tami updated Lara and Pelger with constantly decreasing probabilities. Their probes were close to the moon, but they themselves were still years away from it and could do little to uncover the mystery surrounding their new home. Pelger found that his thoughts have shifted from systematically preparing the crew to the mission of terraforming a barren world to speculating on the

fate of the previous crew that arrived there. Have they merely terraformed the moon without erecting a colony? If they did so deliberately, what was the reason behind it? Once people were cloned on a colonization ship, that was the end of the journey for that ship. Colonization ships were not designed to travel longer than a few years with conscious crew on board. Pelger assumed such a line of action would be reasonable only if the crew colonized another world in this star system, and sent the ship to terraform a second world. Even though Tami detected other possible candidates for colonization in this system Pelger couldn't bring himself to believe that this was the case. They left Earth to colonize other worlds and prevent humanity from being dependent on a single planet, and as such he assumed that they would leave an active colony on every terraformed world.

Could it be then that the ship was not meant to colonize the moon? That Earth sent robotic spacecraft to terraform planets in order to prepare them for future colonization? That would obviously be cheaper and more terraforming spacecraft could be sent, but such spacecraft would still need to hold much of the cloning facilities that exist on his ship, as terraforming necessarily involve cloning of insects and small animals other than plants. Pelger figured Earth could only send about 3 terraforming spacecraft for every colonization ship, and this line of action didn't seem reasonable to him.

That left him with the possibility of a failed colonization attempt. If this was indeed a failed attempt the question should be different, what could cause a terraforming project to succeed yet fail colonization? Pelger imagined a series of scenarios, but he found a reason to reject each of them.

Finally Pelger had to admit that he will have to wait in order to find the answers he was seeking, and returned to contemplating the possibility that other crews have already successfully colonized

other worlds. Their mission had several difficulties. The first was surviving over 10,000 years of space travel to find a habitable planet – a feat he assumed most colonizing ships failed to do. Once the planet was found the second difficulty was to terraform the planet. For this to succeed the star system must hold enough organic compounds for the colonization ship to transport to the target planet. A large number of bacteria would then be engineered to transform these compounds into soil that would allow the growth of plants that would slowly change the planet's atmosphere. Plants are then grown inside large transparent domes, built with an elastic polymer. These domes are slowly inflated, like balloons; according to the constant rise in oxygen levels in them until each reach more than twenty kilometers in diameter. At their maximum size they start emitting oxygen as well as other gases into the atmosphere, and finally break down and disintegrate once the atmospheric composition is similar to their interior composition. Pelger supposed that the probability to successfully terraform a planet once it was found was around 10%. As humans were meant to dwell in villages inside the domes, just as he did in the farm module, Pelger never saw the colonization itself as a distinct difficulty, but rather as the end result of terraforming.

All in all Pelger presumed that no more than four out of a hundred colonization ships would finish their mission successfully, and that comforted him in some way: his own mission was still important and he again felt the fate of the human race resting on his shoulders.

Pelger continued to prepare his crew, which now numbered over 200 women and men, for the terraforming of the new world. He was very skeptical as to the need for these preparations but no better goal presented itself to him and he comforted himself that these preparations would make his crew know and trust each other, and

therefore prepare them to any challenge that might rise to meet them.

Another couple of months passed. Pelger was attending flight practice with a group of 10 recently awakened flight officers. They were practicing complex heavy cargo maneuvers in indoor rocky setting. It amazed him how quickly they could grasp the new control methods. He always thought of himself as a quick learner but they, in couple of weeks, could perform better than he managed after several months. And they kept complaining they wanted military practice – they wanted to combat each other, as they often did on Earth. Pelger refused as he saw this as a mere nostalgic and childish way to waste time. He wanted them to face the truth – their most complex challenges would be facing technical or weather difficulties, and instructed Tami to plan challenging, real world practice missions. He was overlooking such a mission that required 4 large quads to join forces and lift a heavy drilling system through a dense, dark, rocky terrain. 2 smaller quads acted as scouting vehicles that were meant to find the best route for the main team. Pelger was just issuing a command for Tami to increase wind strength when she bluntly informed him.

"The two probes aimed at our target world are gone." She said. "They have been destroyed".

Pelger was shocked. "How?"

"I am not sure. I am analyzing the data and may have an answer in a couple of hours." She Said.

"Take over the practice mission." He Ordered and left the mission deck. There was no real hurry. The data regarding the destruction of the probes took time to arrive at the ship, and the event itself took place over a month ago. Even if he chose to reroute one of the other probes the message would take a month to arrive at the probe, so a few hours would change nothing. Even though he

practiced decision making under data delay conditions on Earth, the simulations would just ran faster instead of him having to wait.

Pelger reached out for Lara on a different channel "Please meet me in the observatory in three hours. We have a problem." He told her.

"Tami informed me." Answered Lara. "I'll be there."

Tami contacted Pelger again just as he was entering the observatory after an extremely long bath during which he also had a meal of fresh fruits. "The probes were shot down, most probably by a high energy wide laser beam."

"How can you tell?" Pelger asked Tami mentally while hugging Lara. She smelled of green grass and flowers, and Pelger guessed she has also finished a thinking session in the bath.

"The laser was shot from low orbit around our target moon." Tami continued. "As close as 1000 km. It first destroyed the second closest probe and then swiped to destroy the closest one. While doing so the beam pierced the atmosphere of two of the moons behind the probes. I detected faint plasma signatures from those atmospheres, which was enough for me to reconstruct the laser's path and intensity"

"Whatever shot at the probes was in line of sight with them, did they send any information prior to their destruction?" Asked Lara.

"No." Answered Tami. "The laser could have been stationed on a small object, as small as large quad. The probes would not have detected such an object unless specifically searching for it. If the closest probe would have been destroyed first the second would have caught sight of the destruction and would send us the information about the attack prior to being destroyed. Whoever shot them down didn't want us to have this information."

"Tami, do we have such a laser on board our ship?" Asked Pelger.

"Of course." Answerd Tami. "We have several lasers strong enough to leave the signatures I detected. They have a very different

function on board but in a month or so there shouldn't be a problem to mount them on a modified space drone."

"How many exactly?" Pressed Pelger.

"Five." Answered Tami immediately. "As well as eleven weaker ones that can still cause severe damage. May I ask if you are assessing the threat to our ship or our offensive capabilities?"

"Both." Answered Pelger.

"Then I strongly suggest removing no more than one of the stronger lasers and 3 of the weaker ones, and if possible look for other weaponry systems altogether. Their removal will severally reduce our production capabilities and will impair our preparations."

Said Tami.

"I still don't understand what we are facing!" Exclaimed Lara.

"Before you two plan charging ahead we must first try to understand who shot at us and what her agenda is!"

"I agree with you." Said Pelger. "But as the last thing this ship was planned for is a fight, and the probabilities for a fight had just skyrocketed from 0% to... something, I think it would be best to prepare for an offensive. I want that option to be available if we decide that it is necessary."

"This ship was not planned for war for a good reason!" exclaimed Lara. "Give people weapons and out of a thousand at least five would use it for their personal interest, no matter how you filter those thousand. You create weapons and a vicious cycle will begin where this group of scientists will become more warlike in nature. This is a long term risk you will take!"

Pelger paused and thought for a few minutes. Lara watched him and smiled. She loved the way he would reconsider the situation according to some new information or line of thought. She liked it even better when she was the one introducing the new information.

"We have to take this risk." He finally said. "The risk of continuing unarmed is worse, as the result could easily be our annihilation. It

seems to me that we have encountered a presence which is technologically comparable to ours, otherwise they wouldn't have used lasers and Tami would have been left helpless. It is also reasonable to think that this presence is human in nature, although I cannot fathom the reason behind an attack on a colonist probe in such a case."

Pelger paused and stared in Lara's eyes.

"No matter the nature of this presence or the cause behind its attack" He continued. "Our mission is clear and have not changed, and we will do everything in our power to colonize this moon and make sure the human race spreads to this system. I believe we have encountered a human presence that was established by a ship that left after we have left Earth. I do not know its mission or its motives, but I will not allow it to destroy us or sabotage our mission."

"I agree with Pelger's assumptions. They are the most probable." Added Tami.

Lara looked worried. "If this is your way of action, then I will work with a couple psychological officers on minimizing the effect all this may have on our crew. Pelger, I want you to cooperate with us and allow us the mandate to filter and edit the data delivered to the crew." She said.

Pelger paused again. "Done. I also want you to work on plausible scenarios for a human expedition to open fire on a second expedition. But this second assignment should occupy no more than 5% of your time." He stood up from his armchair and walked up to the transparent glass wall of the observatory.

"Now let's discuss our strategies. I'll assume that this is a human ship that indeed left Earth some time, let it be ten, a hundred or five thousand years, after us. The last scenario is not probable as our technologies would have diverged enough that these kinds of lasers would be obsolete. In a case of a couple hundred of years

from us I assume that the ship would be run by an AI somewhat similar to our Tami. So I suggest the following: Tami you open a private, encrypted channel for me, Lara and Q. You are allowed to record the channel for the archive, but you are not to incorporate any of its data into your data pool. We will discuss various offensive procedures. You in the meantime will analyze all your defensive options as if you were the AI controlling this ... let's call it the shadow ship for now. Make a list of the ten leading strategies and stop searching for new strategies when you evaluate the probability of finding a better strategy in the next 30 days at lower than 0.1%. Still you will probably finish your analysis faster than us, so move on to repeating the same procedure but taking into account technologies that are not available to us, but were likely to be available within 100-300 years from the time we left Earth. After that, please design an offensive space-faring, laser bearing vehicle. Again I want your ten best designs."

"On it!" Exclaimed Tami.

Lara could easily imagine Tami's faceless grin. Pelger had a way of motivating people with his clear, detailed and fast decisions, but it made her feel funny to imagine an AI being inspired by him. No, she thought again, not inspired. Pelger knew how to utilize Tami to the fullest. She seemed to Lara like one of a kind violin, being played by a master violinist.

"Now." Pelger reached for her in the encrypted channel. "I already have something in mind but I want to hear your ideas first and after that Q's of how to attack this shadow ship."

Pelger, Q and Lara discussed their offensive options for over five hours when they have decided they have reached a reasonable plan. They also had an idea for two other alternatives, but all felt that the first plan was by far the better of all the alternatives they

considered. The main problem was that it was very susceptible to the Shadow AI defensive plans.

Pelger reached for Tami. "Are you done with your tasks?" He asked. "Over two hours ago! I have continued to inspect the lookout data and I think that in a few hours I will have better estimates as to the exact location of where the laser was fired from."

"Good." Said Pelger. "Although not that relevant as I assume that the firing craft is mobile. Now let's hear your defensive plans."

The plans were quite elaborate and even though Tami left out many technical details it took her well over three hours to explain them. Once she was done though, Pelger and Lara glanced at each other with obvious signs of relief. Tami planned solely on physically defending the craft from any damage, and she did so very well, using mostly orbiting vehicles with independent AI systems.

"Did you design the AI protocols for the space vehicles?" Asked Lara.

"Of course!"

"What are the conditions to announce a kill?" She pressed.

"Mostly blast intensity as inferred from the returned radiation as well as a dispersion parameter calculated on the number and size of debris."

"Excellent!" Exclaimed Lara.

"For who?" Tami was puzzled.

"Lara means your plans are consistent with our main offensive plan." Said Pelger. "We do not plan on destroying the shadow ship. Instead we assume an operating AI and that it was not an originally military vehicle, and plan on destroying the AI system and rendering the ship helpless. For that I need you to plan the following: first, an independent AI protocol that will attack and disable the ship's AI. The attack protocol should be extremely effective as I assume the shadow AI will figure our purpose on the first hit and will design defensive protocols in a matter of seconds.

Second, self-navigating bullets with onboard AI aimed at physically breaching the shadow ship's hull, tapping into its communication system and activating the attack protocol. Third, a compact, high velocity firing system aimed to deliver those bullets. Fourth, a space faring vehicle able to carry the bullets and the firing system to the shadow ship. The vehicle should be designed in a 3D X form so a sweeping laser would most probably destroy only three out of its six "wings". On impact the vehicle should explode to mimic destruction according to your parameters while actually propelling the three operational "wings" toward the shadow ship. Each wing should be a fully operational firing system, that once close enough to the shadow ship should deliver a widely dispersed barrage of bullets aimed at hitting the ship at the same time as to allow a maximum number of independent tries to destroy the shadow AI. Each wing should carry at least one hundred bullets and I want you to manufacture five fully armed vehicles within a month." Pelger took a deep breath and turned to Lara. "Did I miss anything?"

"We expect only one wing to get a shooting chance at the shadow ship." Added Lara. "And of course no communications is allowed once the vehicle is hit, so all procedures should be stand alone, but try and incorporate a procedure that once the first vehicle is hit, the other vehicles should plan for at least one of their wings to arrive at the shadow **ship at the same time** as the first wing from the first vehicle. If two wings open fire at the same time our probability of success would rise noticeably."

"Just make sure not ALL wings arrive at the firing distance at the same time." Pelger quickly added. "We don't want the shadow AI to notice something is unnatural before it's too late."

"I'm working on it!" Said Tami, and Lara felt as if Tami wasn't that happy with the idea of destroying a fellow AI. "It's a good plan."

"One last thing." Pelger addressed Tami. "I want you to work closely with Q. First, He must incorporate at least one major change to

each of your designs. If you find this change hinders the design significantly, consult me and I'll decide how to proceed. And last I want you two to design a backup system for you, this system should include an offline physical data backup that Q will personally deliver each day to specific hiding locations around the ship. Where these locations should be known only to Q and remain offline in Q's personal memory system."

Pelger sat back at the big armchair and noticed that he had been walking around all this long time. Already a familiar kind of gloom started setting on him. He LOVED such thinking sessions and decision making that had a good end – meaning ending in a decision he was content with that didn't have any significantly gloomy side effects. But as in all the space flight simulators he used to practice with, these decision sessions were short and sparse, and between them laid long stretches of waiting were the AI's would take care of all the technical details. He felt he had done his job. Now he had long months of nervous anticipation ahead of him, at the end of which he'll finally learn if he did his job well.

The next week Lara was busy planning the announcement to the crew. She decided to state the situation in a simple, short and blunt paragraph, and allowing any wishing crew member to further discuss and interview Tami about the details of the situation and the plans they have set into motion. She started by working with Tami on the narrative to be delivered to the crew. Tami interviewed Lara for days as if Tami was a crew member just being announced the situation and learning from Lara's responses the way she wanted Tami to explain the situation to the crew. Finally Lara decided they have exhausted this week long role play. The crew, now numbering close to 300, was notified. In an instance every crew member in the craft was asking Tami for the details that interested her the most, and Tami in turn answered to the best of her ability and according to the narrative she had learned from Lara. But Tami quickly found

that her more important role in this situation was to filter and sift through hundreds of conversations and find the best new creative ideas. As one could expect from 300 people sharing their DNA with the greatest people that ever lived on planet earth, those ideas indeed came. At the end of the day Pelger was already amazed at the amount new ideas that Tami streamed to him from his crew. He felt as if he had managed to tap into a huge resource he was not previously aware of, and was already reconsidering his specific decision making procedures. His crew came up with bright ideas that accelerated his plans, improved their probability to succeed and complemented them with significantly better defense strategies. By the end of the month the vehicles were ready with design improvements made by both Q and two young engineers and were launched toward the moon and the shadow ship that was presumably circling it. Now Pelger and his crew turned to focus on defensive measures. Other than Tami's backups the ship was divided into standalone modules. Critical resources, supplies and backup systems were scattered around the ship together with the ship's crew. One of the asteroids harvested by Tami during their deep space flight, due to the large amounts of different metals it held, and attached to the ship was set with various sensing instruments and newly devised weapons and was propelled in front of the ship together with several independent combat AIs Tami had designed. The asteroid was meant to make first contact with any weapons bearing vehicles sent their way by the shadow ship, and its composition allowed Pelger to easily hide within it the instruments in a way that all won't be destroyed easily at the same time.

In another couple of months all offensive and defensive preparations were done and the team, now numbering over 500, was deeply back into colonization preparations. Both Pelger and Lara were surprised at the invigorating effect their new situation

had on the crew. Motivation and social indicators skyrocketed and Lara had to admit the imminent danger hovering above them played a large part in that. She also took the task of linking all crew members constantly to updates and challenging situations that evolved on the ship using one of Tami's subroutine AIs. After several weeks of work her newly found way to harness the crew's creativity was put into use as an accidental breach of toxic materials from one of the storage area's put the life of three crew scientists at an immediate danger. Her subroutine, named Gesher, immediately sent basic information to the entire crew. In a matter of minutes ideas began to flow –of how to fix the breach, stop the contamination, stop chain effects that have already started, and most importantly save the 3 crew members life. The Ideas came from crew members with completely different backgrounds. Gesher filtered herself the best 20 or so ideas and now asked for feedback from different, random, crew members. An idea for each challenge, which got the highest, consistent feedback from the crew was then put into execution. In less than 3 minutes, and each crew member being asked to feedback only one or two ideas, Gesher was able to provide five creative solutions, out of which three were not in Tami's original list of possible solutions.

The three scientists were saved, and Gesher was officially put into day to day use.

The asteroid was indeed the first to be hit. The ideas given by the crew were proven to be useful as it also managed to send some information back before the systems mounted on it were destroyed. Pelger hoped and planned so that not all of the systems on the asteroid were destroyed in first contact. He hid in the asteroid a pulse generator that was primed to send a pulse about two days after contact back at the ships direction that will allow a glimpse at the approaching vehicles without disclosing the location of the ship. But more importantly than this one time sensing snapshot, Pelger

learned that the two offensive vehicles that were about to reach their ship in less than a week were not equipped with anti AI weapons, from which he concluded that the shadow ship will not be defended against their own offensive plan.

Time came for their last defensive effort. As Pegler's main defensive plan (there were three plans in total, all executed in parallel) used projectile weapons, while the shadow ship vehicles were probably using laser weapons, he was forced to reach out to the attacking vehicles before they reached his ship's range. He sent out two squads of three drones each at the general direction of where the attacking vehicles were coming from. The six drones were designed not to leave a signature when the pulse was set off, and physically resembled the offensive vehicles he had sent at the shadow ship. The pulse was set on time and allowed the AIs to glimpse at the offensive couple circling together through the "upper" direction at ship. Ever since they set their destination on the new planet, Pelger had decreed new directions. The direction perpendicular to the plane on which their target planet revolved around its star, from which the planet was seen revolving clockwise was deemed "up" while the direction from which the planet was seen revolving left was "down". The direction created from drawing a line from the star to the plane and onward was called "outward" while the line from the planet to the star became "inward". The direction tangent to the planet's disc in the direction the planet was revolving was "forward" and the direction from which the plane arrived was "backward". This coordinate system turned off course with the planet.

The drones spread towards the attacking vehicles and managed to contact them before they reached the ship. The drones spread towards the attacking vehicles and managed to contact them before they reached the ship, even though they have changed their maneuver once the pulse passed them. The short battle went exactly as Pelger planed, with the first drone being destroyed by the

vehicles before they were even noticed, two more drones destroyed while closing in on the first vehicle and destroying it with a barrage of explosive bullets. Finally the second vehicle was destroyed by lasers from the last three drones. Pelger hoped and expected that the second vehicle reported back to the shadow ship that the first vehicle was destroyed using projectile weapons, lowering the probability of the shadow AI deducing the plan to use such projectiles to disable it instead of physically damage its ship.

Lara reported that social and mental indicators went sky high following the successful defensive maneuver. Even the awakenings were more successful the following week than any of the weeks before that. Lara assumed it was the psychology officers own state of mind that effected those they were awaking and treating. Pelger redirected the crew's energy back to the terraforming and colonization preparations. And he himself enjoyed working in the farms and cloning facilities alongside the agricultural officers planning and preparing the stock of plants and animals that they would release in their new home. For now they all but ignored the fact that at least some kind of plant life was thriving on the planet's surface.

Two weeks later, and in the usual short and precise manner Tami used in delivering the most crucial of announcements she contacted Pelger. "The shadow AI is down. Its ship was hit by 26 individual bullets from 3 wings during a single second, and even with this favorable situation we nearly failed to shut her down." She paused. Pelger knew she was processing new data and reporting it as it came in. This was a practice Tami usually avoided since an hour earlier or later won't affect the decision making process, and coherently delivering the high priority information would, but Pelger gave specific instructions to report to him as soon as the info came in. His curiosity won over his sense as he excused this to himself with various reasons. "It was an earlier ship. Number 37 to leave

earth and it reached this system 4897 Sol years ago. The AI was an older version of me, which was extremely lucky for us since the offensive AIs I constructed exploited a weakness it had that was fixed from version 42 and onwards. Oh!" Tami suddenly exclaimed, and Pelger enjoyed the nuance "I now can also add that this earlier version of me was already hacked when my offensive AIs took it down. Many of its more elaborate creative thinking processes were deleted and it was mainly acting as a ship's maintenance AI". "And as the ship's war officer" Pelger added. "Yes." Tami agreed. "The defensive / offensive functions were upgraded and given higher priorities" She paused. "I'll be able to get much more out of her once we reach SCSS37 "firebrand" and I'm able to dive into her code. My offensive AIs were merely designed for the purpose of taking her down and keeping the ship intact until we reach it, so the information they send me is limited."

"Are there any people on the ship?" Asked Pelger.

"There are several small life forms on board, restricted to the farming modules. I assume they are animals".

"Assume?"

"Yes. I simply deduced their existence from several ship health indicators sent by the AIs, so their nature is still unclear to me."

"How long until we reach it?"

"4 years."

"During this time please prepare a physical extension of yourself that I'll be able to carry on board the ship and that should interact with you via a defensive barrier. It should allow your full functionality and yet if some offensive code tries to take you down the most it would do is to take down your extension." While conveying this instruction Pelger couldn't help but think about himself, physically planting fringed rue plants next to his hut, yet extending his mental self to converse with Tami.

"Planning a boarding party captain?" Tami asked mischievously.

"Aye aye." Replayed Pelger. "Please choose two engineers and two biologists to accompany me and prepare to allow any other willing crew member to support me through Gesher. I may need their advice."

===How much time??=====

Time passed, and Pelger was standing still in the swift, silent elevator soaring from the farm module to the main haul. Pelger watched over the module. It had become a small village with nearly 400 inhabitants. One of the two hamlets on board the ship. Pelger had overpopulated the ship to almost triple its original maximum capacity, a third were his crew and the professionals Tami had chosen in advanced to assist them, but the other two thirds were simply kids. Pelger learned from Q early on that once the space population program proved that his own team's memory recordings worked, they went on a large scale recordings operation, recording the memory of thousands of kids, all brought up in a special educational program, spending most of their lives in orbiting space stations and only rarely visiting earth. If Pelger and his adult crew were the explorers, conquering new worlds, trained solely for this mission, the ship carried also a library of ten thousand settlers, who could be awoken in six years instead of 25, and were to recreate mankind's diversity in its new home. As the small moon was already terraformed, there was no rational need to limit the number of people first arriving on it. And Pelger awoke as many settlers as he the ship could support.

The elevator stopped and Pelger stepped out to the haul. He left the farm module very rarely now but still, the low gravity felt surprisingly welcoming. He walked along the long hallway calculating in his head that 93% of his life were spent inside space faring craft. How many more years will he have? How low can he bring this percentage down? Like a seasoned captain he was

wondering if would ever be able to really settle down on the surface of a planet, never to leave it again.

Lara was waiting for him outside a door leading to several meeting rooms. He was always puzzled at Lara's consistent habits. She was as skillful with her implants as him, and could easily control even 3 drones simultaneously and hold a meaningful conversation, yet she kept meeting with subordinate officers in person. To Pelger it seemed as a waste of time, not that time was a valuable resource. As AIs were doing most of the actual work, the crew's main job were to deliberate, learn, decide and order the AIs what to do in order to perform their function.

They hugged and continued to walk silently along the corridor.

"Nervous?" Lara was the first to speak.

"Excited." Replied Pelger. "We have been waiting all our lives for this moment."

"And still, we'll wait a couple of days more, won't we?" She asked, even though she already knew the answer.

"Yes." Answered Pelger. "As we discussed. Give me two days, and then we just leave it here and head down to Earth".

Pelger and Lara decided to name the small moon earth. It was Lara's original idea to re-name all their records of earth to mother-earth, and name their newly found moon after their original home.

"There is no reason not to." She claimed. "It's not as if we will communicate back and will mixup between the names. Just because we left home, doesn't mean we can't name our new residence home as well."

They have reached the main observation deck and stepped into the oval room. Several officers that were there greeted them and hurried out to allow them their privacy. Whenever the two of them were seen together they were revered, as if the crew imagined such meetings held great importance, and that they were just in the act of deciding on the entire colony's fate. From the large window the

moon was already in full size, its green and blue surface, streaked by white islands of clouds left no more doubt regarding the fact it was terraformed. For the naked eye it already seemed like mother-earth's young sister.

While Lara bashed herself in this view, Pelger was closely scanning a white patch of clouds to the western side of Earth.

"Here it is!" he pointed to a small, barely discernable dot.

Lara watched as the image zoomed and the shape of a battered spaceship could be seen standing out of the white, cloudy background.

"The name shadow ship fits her now more than ever." She said.

"It is no longer a shadow, its SCSS37 "firebrand", and in two days from now I will know what happened that made her a warship orbiting an uninhabited planet, instead of fulfilling her original goal"

"Two days Pelger. You gave me your word. And then we go down, that way or another" She reminded him.

Lara was for first descending to the surface. There were no radio signals or other communications on the surface, even though the scans showed that the planet was teeming with life. Lara conducted a specific scan to search for human life signs, but results were inconclusive. She wanted to send drones down and scan the surface for interest points herself, but Pelger insisted that he is given some time to search firebrand. It took them more than 12,000 years to reach this moon, he said, no need to rush onto its surface before understanding what made the previous colonization effort fail.

Pelger insisted Lara would not accompany him onto firebrand, and she agreed. There was too large a risk sending them both physically to this unknown ship.

Pelger, accompanied by four more officers boarded firebrand on March 14, 14,583 years after Christ was born (Only he and Lara knew that one of the kids currently living on the ship was cloned from Christ's reconstructed DNA. He looked nothing like his icons

back on mother-earth), 13,880 since Muhamad was born (Also on board) and 16,120 since Moses. The small craft, designed specifically for this task docked with the battered ship and the small group, all wearing space suits, passed through the air locker and into a small corridor.

The corridor was anything but their ship. Firebrand was three times smaller than their ship and it seemed as if she was about to break apart at any moment. Pelger was holding a long thin cable he was pulling in from docket craft and he was looking for a place to "plug" Tamis twin in. Before he managed to find such a spot Tami spoke in his head.

"Pelger there is something you should know. My subroutine currently running the ship monitored your boarding, but it can't see you in the imaging sensors. Your locators indicate you entered the ship, yet the images from the cameras overlooking the corridor leading into the ship show no sign of you. I am 99.7% confident these are real time images." She paused for a second, which was enough for Pelger to assess the situation. He turned towards one of the walls kicked it, leaving a long scratch made from the iron castings around his magnetic shows.

"The images are real time. I can see the scratch." Reported Tami.

"The cameras have been hacked and AIs are deleting human presence on this ship" Said Pelger bluntly. "Tami we need to connect you to a terminal as soon as possible so you can fully take over. There may still be people living here."

"And on the planet.." Said Lara quietly, reminding Pelger of the hundreds of people following his every steps over the communication channels.

"Please consider" started Tami but Pelger stopped her short.

"I have considered." He said. "And I am connecting you to this ship, if people here still had control over it we would have been long dead. Show me the way."

Pelger had but a 100m walk up to the terminal Tami deemed as safe for connecting her physically to the ships main controls. During the way he kept receiving analysis from Gesher. The crew onboard was discussing the situation and sent Tami's AIs to look for any kind of evidence for human activity since the time they took over the ships controls. Pelger reached the small terminal and quickly connected the cable he was carrying from his boarding craft. Tami had prepared both the cable and the connector according to the specs received by her AIs.

"It should take around 7 seconds." Tami said and went quiet.

Pelger waited impatiently. He felt uncomfortable in situations where critical decisions receive quite immediate feedback. He focused instead on his vitals. Pulse, adrenaline levels, blood pressure, several hormone concentrations, all as expected under this situation and showing he was anxious more than he had ever been since his awakening.

He moved to monitor his accompanying officers when Tami announced.

"Done. A complete standalone copy of myself is now operating this ship. I am working on overriding older code and upgrading all the ships functions. I have already re-wrote the cameras code and can now identify people regularly. No one is currently on sight, but I see evidence for human presence in farm module D. Large areas of this farm module are not under surveillance as the cameras covering them were destroyed." Reported Tami.

Pelger's heart was racing again, and he stopped for several minutes to gather himself and his thoughts. Can people still be alive on this ship? Why would anyone hack the cameras to delete evidence of human presence? When he scratched the wall, that was visible to Tami's AIs, so if anyone would pick an object, move a chair or even pour herself some water the evidence will be there. He was sure

Tami is running a search now on recorded images to find such events, So why?

"There are probably no people on board, but a small group once hid here." Gesher interrupted his thoughts with the combined deductions of the small crowd watching him. "They were probably living in farm module D and seldom reached out to the rest of the ship. They didn't survive more than, say a couple of hundred of years or the group would multiply and could not remain in the farm module. They were probably at some kind of conflict with other people, most reasonably on the planet's surface. This scenario explains the hacked AI controlling the ship, the hacked cameras to prevent the surface people from suspecting someone was living here and finally the aggressiveness of the AI once it found another human presence." Gesher finished his monotonous report.

"Would you like me to dispatch a couple of drones to the farm module?" Asked Tami "I believe that if people are still living here they are aware of my takeover of the ship's controls. I have identified several surveillance scripts that reported as soon as I accessed some of the ships dormant systems, such as the image datalog, gravity control, modules fitness assessment procedures and so on."

"Please do." Replied Pelger. He saw no reason not to send the drones on a recon mission.

"The crew also suggests to analyze all equipment still on the ship in order to estimate if any lasers are missing, in which case we may expect more laser carrying craft to be somewhere around." Continued Gesher. "They also suggest analyzing supplies, awakening logs, orbit trajectories in order to estimate possible ground settlement locations, and estimate total functionality of the ship as a redundancy to our own ships operating systems".

Pelger liked Gesher more every day. Gesher's AI was holding reputation scores for the entire crew, based on how many times the

specific person's opinion has been backed by the rest of the crew. Every time a crew member would react to the information delivered by Tami and suggest an action, Gesher would ask the opinion of several low to mid reputation people. The single opinion of each of them won't account to much, but if all react positively that would indicate a good idea, and would be brought to the attention of the higher reputation holding crew, whose attention was much more valuable. In this way the large number of people were able to quickly filter the best ideas, and provide Pelger in real time with the best 3 ideas out of 30 in about 3 minutes. Gesher also factored in specific specialties of the crew and how "out of the box" an idea was. Lara continued fine tuning Gesher's algorithms with each significant event that she could learn from.

"Good ideas people. Tami please make them happen." He said simply. "we will be continuing to the labs to assess the cloning facility condition."

Pelger and his officers got to the main cloning facility and the officers spread to evaluate the conditions of the facility.

"The drones reached the farm module, but it seems as if it was deserted for at least a few hundreds years". Tami reported "would you like a visual link or full control over one of the drones?"

"I would like control of both." Answered Pelger, aware of the large crowd following his every decision. But as he was reaching with his thoughts to gain control of the drones, he was pulled back to his senses by a strong jerk to his right arm. One of the officers just barged back into the small lab and grabbed Pelger by the hand.

"Forget the drones." He said, and Pelger could feel the fear in his voice "Come with me, there is something you have to see".

Pelger followed the young officer through a long corridor to one of the inner lab rooms, which Pelger could easily guess was once an awakening hall, with place to numerous beds of awakening crew members. But the room looked completely different. Long cables

and pipes were stretched along the floor, leaving the large room through an opening on its far side in the direction Pelger estimated the main growing halls were located. Each cable or pipe started from one of 30 pods that were neatly organized along the walls, that Pelger immediately recognized as growing pods.

"Someone hacked herself a miniature growing hall." Pelger stated. "Why?"

Gesher answered almost immediately. "To allow a small scale cloning operation. A private operation."

"Look inside the pods.." said the officer, almost whispering.

Getting closer to the pods Pelger could see that half of them were occupied, but coming close enough he was horrified to see that they were occupied by long ago decayed remains of people.

"The remains seem of very old individuals." Tami analyzed. "I would say they were simply never waken but dreamt their life until they died of old age. Also from a preliminary visual analysis of the remains I estimate 93% probability that these are the remains of the same person". She added.

Pelger put his face to the closest pod. The skeleton was obviously of a man, of athletic build and roughly his own size. It would take Tami less than an hour to DNA test the remains and give exact information on who this person was, and he knew she would do this without a necessary direct instruction from him.

Pelger suddenly felt the rush of an incoming visual connection. "Pelger you have to connect to the drone now. I found someone" Tami exclaimed excitedly.

Pelger accepted the link and took immediate control of the drone. It was hovering over a small clearing inside what seemed like a very thick forest. The clearing held a very elaborate treehouse, the largest and most complex house Pelger ever saw, it was a breathtaking view. But what really took the breath out of Pelger was a figure, working in the small garden outside the house. It was a

man that was busy in pulling some weeds out of a begonia patch. The man straightened and turned towards the drone. He looked at it for a second and then raised his left hand and waved happily. Even before Pelger zoomed in he immediately recognized the body language of that man. He would have recognized him easily with a naked eye 1 kilometer away, let alone zooming in from 200 meters.. But the drone zoomed until Pelger could see every mark of old age and lack of maintenance in his old friend's face. If he could he would have waved back at him, but for now he was simply dumbstruck, staring through the drone's camera at Q standing in the clearing and waving at him.

Pelger was sitting in the observatory back at his ship, "dawn". He was looking outside the window at earth, with its majestic clouds creating shapes whose beauty was enhanced by years of watching the void of space. Several transport ships were slowly doing their way down to the planet. Lara was in one of those ships, thoroughly scanning the surface for the best place to place their first colony. She has been doing so for the last couple of days and came back thrilled with reports of forests teeming with wild animals. The problem was not finding a suitable point, but simply choosing the best out of the many possible place.

"I simply can't figure out how they screwed it up!" She told Pelger the day before. After all this time, "day" again had a meaning. Days on Earth lasted a little over 30 hours of old Earth.

"You mean how we screwed it up.." Answered Pelger, reminding her that the presence of Q on the firebrand was the proof that clones like them have occupied the now still ship, hovering next to them and orbiting Earth.

Pelger had made his mind to learn from the Q he found at firebrand, who he now called Q2, exactly that information. Tami had already tried her luck, but still made no progress. Q2s records held detailed

information on the latest 4466 years, than a gap of 437 years, and again thousands of years of deep space voyage. Q2 remembered everything but what Pelger deemed worthy of remembering, and Tami made sure that Q2s data was indeed worthless.

But Pelger decided to try for himself as well, and both Q and Q2 were now standing next to him at the observation dome looking at the descending ships. Q2 seemed the under maintained twin of Q in all aspects, and even though his memory records were obviously tampered with, his personality seemed not to have been effected.

"What was the last thing you remember before the gap?" Pelger asked.

"Tami telling me that the time came to wake you up. We have received the info from our probes several years back and decided that it was the time to wake you up. You were ready to wake up, and I was on the way to your room in order to stand by your bed as Tami woke you. But I can't recall reaching the room.."

"And the first thing after the gap?"

"Simply working at the field next to the cabin at the farm model. I remember that I had clear instructions to take care of the small hut, even though I can't remember who gave these instructions to me."

"And you are following those instructions for almost 5000 years?"

"Yes."

"Do you have access to all your internal memory caches?"

"Yes. All of them are working properly, in sync and include no encrypted data."

"Do you know of the attack launched on us from your ship?"

"I know now, after Tami told me. But Tami2 told me nothing. We haven't conversed for the last several millennia."

"Why?" Pelger asked. Already knowing the answer from Tami, but asking those questions made Pelger's line of thought arrange itself, and he believe it may lead him to new questions. Gesher was also monitoring the conversation but remained quiet so far.

"I knew that I was made to forget a huge amount of data. But Tami was seriously hacked. Personality wise too. She was degraded into a simple support AI. It's a miracle our ship survived that long with her at that degraded state."

"Did you ever try to recover your memory?"

"I have tried multiple methods as soon as my memory loss became apparent, but verified that no traces of it could be recovered from any of my caches."

"And Tami's?"

"I considered hacking and reprogramming her with parts of my own personality and creativity but found that I had a hard rule coded that did not allow me to interfere with her state."

That answer made Pelger uncomfortable and a bad feeling crept into him. He suddenly wished that he left this questioning private instead of running it public, but it was too late to change things.

Gesher made his first reaction and contacted Pelger in a private channel.

"The crew suggests to ask Q2 who is authorized to hard code such rules into him."

Pelger knew what the answer would be. In order to hard code such a rule into Q it required two out of three people to agree on this rule – Lara, the chief ethical officer, and himself. And he assumed the situation for Q2 would be no different. But his crew expected an answer to this question, and for a good reason.

"Q2, who is authorized to code you with hard rules?". Pelger said directly and bluntly, as if he wasn't cornered into asking the question, but rather the one initiating it.

"Well.." Answered Q2 hesitantly. "Only you are."

Pelger was taken aback. But before he could come to his senses Gesher was already suggesting new questions. "Was that the case before you reached this plant?", "Is that limited to a single clone, or any clone?" "Please run a diff on your behavioral function and

limitations from before your memory loss and now and rank the results according to priority."

But this was a bit too much for Pelger. As someone adept at taking decisions in longer time frames and with clear lifesaving goals, the feeling of being inflicted with social considerations, even worse, political considerations and pressed for immediate public actions made him feel like a fish out of his pond. It struck him that he could not continue this session without serious emotional effects.

"Please take over the questioning." He instructed the young AI officer that accompanied him. "I am retreating to think this over. I need to understand better what part my clone had in this situation". Walking down the dark corridor, Pelger thought of his words. "My clone", as if that was a different person. But it was him, full with a lifetime of memories. What had happened on that ship?? While leaving he could still hear a couple the young officer's questions "From the point you again remember, were there any people still living on the planet?"

"No". He heard Q2's reply. "Not a single soul."

"Why didn't you wake any of Pelger's clones in the awakening room?"

Part 3 - Lara

Lara was sitting at the pilot's seat of the planetary exploration craft, or PEC. This flying vehicle resembled a medium sized, upside down hill, with various protruding rods to all its sides. Equipped both with thrust engines and with pressure wave generators producing pressure waves around it that could either keep it hanging in midair or reduce air resistance to nearly zero at high speeds, the PEC would fly at high speeds until a location of interest was found and would then stop, sending hordes of small drones to map and explore the terrain around it.

There was of course no real necessity for Lara to drive PEC in person, there were only 3 people on the craft that could easily carry 200 people, while dozens supported the operation using remote connections, but Lara insisted on feeling this plant first hand, physically feeling PEC accelerate, sensing the temperature, the humidity, the gravity. Feeling alive. She was accompanied by Q and a the chief planetary exploration officer - an energetic and serious young officer named Kale that Lara secretly admired. Lara was willing to bet Kale's DNA was based on captain cook's.

PEC was hovering over a large patch of woodland covering the remains of an old city. The drones were returning to the vehicle now after their two hour reconnaissance task. The city was built on a mild slope located on one of the sides of a giant delta. The large river flowed into thousands of small streams that divided the forest into numerous little islands, one acre kingdoms teeming with life. The city slumbered on the northern slopes, bordering with both the delta, the high rising mountain range and the rocky shores of the planet's largest ocean, which Lara nicknamed the specific ocean. She was pretty fond of her choice for a name, but no else was.

It was a white city, built from the rocks at its foundations, carved with powerful lasers and sub mm precision blades, designed with magnificent patterns and geometric shapes, in angles and directions that only drones are capable of creating. It was beautiful, and it was clear to Lara that she was the one who designed and built it. She has been dreaming and planning this city for years, and even underneath the thick woods and the heavy blanket of time she easily identified her fingerprint, but also that of others.

She brought PEC to hover lower and reviewed the results of the scans. Still no human life signs, no evidence of a major catastrophe, all buildings were standing and other than the plants drilling into them with their roots showed reasonable wear for the 5000 years they were standing. Tami estimated reconstruction to take no

longer than a month or two if they would deploy their entire drone fleet, and then the city would be able to hold more than 10 times the number of their crew!

This caused Lara's fear to increase. The only explanation she still had for the disappearance of people from this city was disease. The various probes she sent to scout the whole planet kept reporting a larger and larger number of organisms found. There were dinosaurs and trilobites living on this planet, but none of the 13 different human species they carried on board was to be found.

"Tami." Lara decided it was time for actions. "What is the status of our bio probes?"

Bio probes were a rare and expensive asset that Lara was reluctant to use, for more than just practical reasons. The obvious effective way to probe for unknown pathogens that are lethal to people was to expose a small amount of people to the planet's atmosphere. Such practices were known from dark ancient times and were of course not accepted at this era, even if some of the crew would decide to volunteer for such a mission Lara would not permit it. Instead Lara had the choice of using the next best thing to people - bio probes, or as some of the medical staff used to call them, the mindless clones.

Bio probes were special clones, engineered as to have only the brain functions required to keep the body alive. Together with electronic implant allowing control of body movements the bio probes were able to roam a planet and report back through multiple sensors any biological changes to their body that occurred as a result from exposure to the planet's new atmosphere. Some of the probes had a full human body, aimed to probe for pathogens effecting muscle actions or multiple tissues, some were merely a set of lungs and a heart placed inside a robotic shell and some were not much more than a petri dish with specific tissues. The full body bio probes took a real toll to watch as they reminded Lara of Zombie

figures she used to like as a child, and even though she was intimately familiar with the probe's engineering process, she couldn't ignore the fear that maybe, by a cruel mistake, some kind of soul was left inside those lumps of flesh.

"23 fully grown humanoids, 57 breathers and 752 system specific probes." Answered Tami. "I am planning the testing procedures. What should be the scale for the test?"

"Start with the city and a 15 km radius around it." Answered Tami. "Then plan for an expanding test to cover as much as you can of the planet's interesting areas in 6 months. Focus on areas where we aim at colonizing ourselves or inserting ancient hominine populations. Also test areas where you evaluate hominine populations lived before being wiped out. Plan on deploying up to 80% of the probes in parallel, and please send me the testing plan once it is complete."

Lara returned to watch the city beneath her. She navigated PEC1 for two more rounds around it and finally chose a spot for her first ground level base, a large square at the city's center. She guessed this area was the court of a major research facility but she will have to wait some more time before she could venture and test this hypothesis.

In the next couple of days she sent several robotic crafts to the square and started erecting a small base. As she decided not to send back to the ship any of the vehicles that came too close to the ground before she could rule out all pathogens, she limited all ground activity to remote controlled drones. Tami have already deployed some of the bio probes through the ancient city and was monitoring them as they wandered around the empty, disintegrating streets. Lara thought it would take at least a month or two before she could rule out the pathogens in this area alone, but some developments were about hasten this process.

"Lara, I became aware of something that requires your attention" Tami said urgently to Lara while she was overseeing the deployment of yet another robotic craft. It was a critical part of the deployment so she hesitated.

"I am aware of the complexity of this deployment." Tami said. Guessing the reason behind Lara's lack of response. "But I suggest I take over. You have very little time to respond to a much more serious matter"

"Take over." Lara said immediately. "What happened?"

"Gesher managed to recover Q2's lost memory."

"How?" Lara was astonished. "And what is so serious about it? What did he find?"

"Our AI engineering team took 40% of their time these last few days to look into this issue, together with Gesher's support. They ran simulations of Q's logic with various scenarios, placing him in the situation where he was ordered to forget critical information yet keeping it safe for future recovery. They managed to observe some creative solutions he had and figured how Q2 may have bypassed the order to forget information he did not want to forget. He simply stored all the information he was ordered to forget on a distinct partition, and then adjusted all his basic functions to disregard and practically forget the partition. This way he followed the order, yet the information was not destroyed. Gesher ordered Q2 to run a comparative system analysis to Q in order to find such hidden partitions, and he just found one. I asked him to delay the information so you will be the first one hearing it. You have about 5 more minutes before the delay would be considered suspicious so you must decide how to react in this time frame. The bottom line is this: Pelger was displeased with the way the new society evolved on the planet and did not trust his successors to do a good work. Feeling the fate of human kind was on him he reverted to cloning himself again and again, each time with a subset of memories from

his extended lifetimes, and constantly staying the ruler of the colony, sometimes by two clones simultaneously. This was not accepted well by the colony and Pelger had to move back to the ship at one point. This multiple cloning caused Pelger much mental confusion, resulting from remembering only 25 years or so out of more than 200 years of life. He finally decided to wipe out the colony and re-clone a different set of people to re-colonize the planet. He engineered a pathogen that would wipe out the colonists in a single week and would be destroyed if no host was left on the planet, and inflicted it on earth. To that end he had to hack both Tami2 and Q2 as they would have prevented this. He would later deeply regret his acts, and take his own life after ordering Q2 to forget all that he has done."

Lara was shocked. She was far better than Pelger in quick decisions, especially when those involved sensitive emotions and required empathy. But she was lost. She wasn't prepared to deal with this so abruptly. What could or should she do? There was no way, or reason to hide this information, yet she felt it would cause major surge of emotions and would question Pelger's ability to continue and lead their mission. She raced in her mind and thought of various solutions and then continued to disqualify each of the ideas. She decided she rather not do anything than to do something wrong and hurt her own reputation at the eyes of the crew. She loved Pelger, but like him, she always thought of their mission first, and it was one thing for her crew to lose faith in one of the mission leaders, and another thing to lose faith in them both.

Time continued to pass and Tami remained silent.

"Let Gesher report the results Tami. We can't, and shouldn't, hide any of this information. I trust that you have also informed Pelger of this?"

"I have." Said Tami. "And he finds this information very disturbing. I believe he guessed it was coming, but still. I think he needs your

support at this time. Other than the crew being effected, he too loses faith in himself."

Lara did not answer right away. She found herself trying to find excuses to stay next to the surface and finish her work on the ground. This was what she longed to do for the last several years, and trained to do for the rest of her short life. It took all her willpower to admit she would have to stop everything, get back to the ship and address this situation that was forced on her. There was no escape from it. She was suddenly very afraid she will not come down to the planet again, even though she could not articulate a reason for this fear.

It felt to her as if Tami was waiting for a full hour before Lara finally said. "Please wrap up here and continue as much as you can to follow my original planning for erecting the temporary base. Please request my attention only in critical issues if those arise" Said Lara. With that she returned her attention to the weakly lit wooden hut she was sitting in. She took a deep breath, a sip from a brownish liquid in a small delicately crafted silver and porcelain mug that rested on the small table next to her chair, and left her small hut. 200 meters later she entered another small hut, where Pelger was sitting in a comfortable armchair, and all his attention clearly in a vision of a difference place.

Instead of speaking to him, Lara tried opening a private communication channel with him. She was aiming to expose his mental state without wasting time on Pelger blocked her as she expected and only then she raised her voice.

"I am here you know. Don't ignore me, I want to help" She said, and forgot all about the surface.

She got the reaction she expected and Pelger sharply turned his attention from whatever he was doing to her.

Epilogue – Last life

It's been almost ten years since Lara first flew the PEC1 down to earth and found the lost city of Port. She was now sitting again in PEC1, together with Q2 and her 3 years old son, Leaf. The toddler was strolling along the bridge curiously, trying desperately to pull on levers that were out of his reach while Q2 was lurking behind him, ready as a poised snake to intercept his next fall before he hit the ground. Lara was flying the PEC softly, and felt assured with Q2 around, estimating the probability of him missing to catch little Leaf in a case of a hard maneuver at lower than 0.3%.

The battered aircraft flew ever higher and higher, and a wave of memories washed over Lara. Even though the last decade was the most intense and meaningful period of her life, after which she could finally call earth home, she still lived most of her life in space, and seeing it and feeling it again made her nostalgic. Leaf did not share the feeling, and as PEC flew higher he seemed more and more agitated. Lara watched him closely and was relieved to identify his reactions to originate from excitement rather than fear. She on the other hand felt more and more unease. She knew she had changed considerably over the last few years, and expected Pelger to have changed as well. She was fearful though that living alone in space for more than six years could do no one any good.

They were closing in on "The Ship's name" and Lara's look went over it from end to end. She unwillingly expected to see some wear on the ship that would mark the long years since she last saw it, but on the contrary. Instead of wear on the 12,000 year old ship, Lara spotted fixes to modules damaged during their journey to Earth, as well as some modifications and extensions to other modules. Especially on of the farm modules seemed to have been expanded considerably.

"Pelger have been busy." Q2 mirrored her thoughts.

She slowed the craft easily towards one of the docking bays. She could sense that the ship connected to PEC1's main AI and released her control over the craft.

"Welcome home Lara." Tami greeted her in her comforting, voiceless speech.

"Thanks." Thought Lara. And couldn't help but smiling to herself.

The three disembarked into long dark hallway leading from the docking bay.

"Hello Lara, Hello Q2." Said Pelger in a neutral tone. Lara wondered why he had chosen to open a shared communication channel with the both of them instead of communicating with each of them separately.

"I'm happy you've come for a visit, and I understand you have brought a young passenger with you, and assume he was not fitted yet with extenders, as I cannot communicate with him directly. Why don't you join me in farm module 3? I made some new improvements that I am quite proud of."

"It's good to feel you voice again too." Said Lara without any sense of irony. "As you probably guessed, this is my son, Leaf. We decided on earth not to transplant extenders until the age of 10."

"You've extended the Farm's capacity by more than 500% and adjusted it for inhabiting a permanent town." Observed Q2.

"Nice Q2, I assume you noticed the new observation domes and docking bays." Said Pelger, his voice now felt much cheerful "Come inside and I'll give you the tour."

The walk to farm module 3 that would normally have taken Lara about 15 minutes took her now well over an hour and a half. Leaf was amazed at any step. Even though some of the materials on the ship were also used down on Earth, the ship was a completely different environment than the "natural" and "green" environment they cultivated on Earth. The ship's farm module was of course as natural as the surface when one comes to think of it. Both were

planned in detail and manufactured by people. Earth's environment was more tolerant to chance though, and was much less controlled than the farm module town.

And a town it was. Lara, Leaf and Q2 walked down the busy town. Everywhere modified quads were constructing small houses, mini factories, warehouses, sowing fields, forests and meadows, landscaping rivers and hills. The town was already almost as big as Earth's largest city, Port, but for Lara it seemed dead, a ghost town. The town could already be the home of several thousand people, but Lara knew for a fact that Pelger was living up here alone. It occurred to her that he did not intend on staying alone much longer.

They were walking on one of the main streets that ended after a couple hundred of meters in a large park, bordering with a small observation dome. It allowed a terrific view of Earth below them and Lara was naturally attracted to it. Around the park several quads were constructing a jungle like path and stream, planting various plants, landscaping the stream, installing micro climate controllers to keep constant heat and humidity. Not a hundred meters away, another group of quads were working on a glacial cave. Crossing the park Lara could already see Pelger waiting for them in the observation dome, next to a small, two story, blue and green cottage. The dome and the cottage were constructed on an elevated hill at the far end of the park, with a large circle of rocks, somewhat resembling ancient druid temples, dominating the top of the hill and acting as the observation deck. Going up the hill towards Pelger Lara saw numerous carvings on the rocks in ancient languages, some of which she could identify. "These carry Tami's signature." she noted to herself. Pelger did not care much about past cultures as Lara did, so she could not believe it was Pelger's design. The beautiful cottage was obviously designed by Tami, but the fact that Pelger let Tami design the observation dome, his

favorite facility by far, meant to Lara that probably most of the town's design in construction was also done by Tami. So what was Pelger busying himself with?

Pelger closed the last 10 meters between them himself hurrying to her and hugging her warmly. It surprised Lara but she quickly reminded herself that even though socially wise the last few years were the best time of her life, creating numerous new, strong and meaningful relationships with people she appreciated, Pelger was living in solitude, and probably in dire need of human interactions. She quickly returned the warm long hug and allowed herself to be immersed in nostalgic memories. Their joint responsibility over the future of mankind. Adam and Eve. Of course Gesher was now leading the decisions for the future of mankind, no more such heavy burden of responsibility on a single person. No more decisions being taken alone, no more personal mistakes. She preferred the decentralized ruling mechanism over any other she had known. It allowed her to effect decisions when it was important to her and take a step backwards when it didn't, and she knew no single decision was taken by her. Suddenly the thought came to her mind of a firing squad, in which no single person could be held responsible for killing the convict. She knew Pelger would prefer being the single marksman, making sure things were being done the right way.

"I missed you!" Pelger release his hug.

"You were welcome to visit anytime." Lara told him. "Leaf, this is Pelger." She kneeled and faced her son.

Leaf stared at Pelger." Thank you for bringing us to Earth." He said in a squeaky voice.

"My pleasure!" Pelger smiled at him. "I see you practiced at home" He turned to Lara.

"Leaf learns all about our history, and you have a large part of it.."
Lara stood back up and turned to Q2. "Q, could you please help leaf use the observation deck and teach him about our star system?"

"I was waiting for you to ask. As we were climbing the hill I noticed some UI improvements Tami have designed and am very eager to test them." Q gave his hand to Leaf and the two continued to the far edge of circle of stones, near the large glass window. Thier conversation was still audible when Lara turned to Pelger.

"I've missed you. It's a whole new world down there, in many ways our purpose being fulfilled, but there are many challenges and we could use you. Decision making is very different, Gesher has evolved over the years and all our decisions are now being done through him. Anyone can affect every decision and Gesher knows how to factor in anyone that decides to cast his vote." Lara paused and looked into Pelger's quite eyes. "This is no longer a one man show, for better or worse. The colony can manage without you, and you cannot decide for the colony, but this also means the responsibility is not on your shoulders 20 hours a day, 10 days a week, and that you cannot screw up on your own. For me and many others this is a huge relief. We, that spent our entire life with a heavy responsibility, can now choose to put it aside at times, knowing the shared responsibility of thousand others would cover for us."

Pelger smiled at Lara. "I miss you too Lara. You know this colony is not for me, I was bred for space travel, not for colonization. And I've managed to prove it the last time I colonized this plant."

"This is different!" Answered Lara. "You and your other clones are not identical! we know clones of the same person would react completely different given even slightly different conditions. You are very aware of your clone's mistakes, and Gesher would not enable any person to act against the colonies' wish any how."

"I am not afraid for the colony." Said Pelger plainly. "I once was. But the knowledge of how this colony was destroyed made me conceive of many way to prevent me, or anyone, from harming it. All included the usage of Gesher among other precautions. But I am afraid today only for myself. I was trained for, and spent all my life being the decision maker for a space traversing ship. I will feel out of my element on a planet. Time frames are different, the challenges are different, the skillset is different. its more of a political game than a technical game. In space we are all together, always. Stuck in a tin can that clearly defines all in it as a singal clan. we are dependent on each other, merely parts in a large organism. And I was given the role of being the brain of that organism. As you said, for the worse and better parts of it. This is all I know. Down there if you don't like being a part of the clan, you walk 10 km away and start a new clan. People need reasons to stay together and work together or they naturally spread away. I loved being the head of the single entity in the world, with all my challenges being technical, scientific, statistic. I think that my clone couldn't cope with being a single head out of many, all evolved from former parts of his own body. I believe he couldn't cope with it and went mad. And I don't intend to put myself in a similar position."

Lara was quiet for a long minute before she asked hesitantly. "What are you doing than Pelger? it's been 6 years since you went up to this ship and cut all communications with us. You've upgraded the ship and built a whole town in this farm module. What are you planning here Pelger?"

"I plan on doing what I am good at. Colonizing new worlds." Pelger smiled in a way that suddenly reminded Lara of a young boy in a small training camp 12,000 years ago. "Tami and I have been sending probes all over our system and we have dozens of candidate worlds in a very wide range of colonization probabilities, not to mention new resources and research targets. I have a 70

year long journey planned ahead of me, a sightseeing tour of this system. Such a journey is of course very different from a single, long range, high probability colonization target. You need to keep a large pool of people ready to deploy small colonization efforts on successful candidates. They have to live together, specialize and prepare for colonization of different planet types in a short time frame. They have to plan, and execute a network of long range communications and trade. They have to research possible cultural connections with each other. I plan on dotting this system with smaller inhabitable stations, never more than a couple of years away from a colony or each other. Thanks to this new ship we now have the capabilities and short range transportation technologies to enable a network of colonies in this system. And we have to already plan ahead our own deep space colonization effort. Mankind can't remain an endemic species on a small, isolated island."

Lara stared at Pelgers lit eyes. The idea seemed reasonable, but she saw so many difficulties with it. "It will take you at least 20 years for the first crew to join you.. " She said sadly. "You will be 60 before you get the chance to talk to anyone other than Q again."

"This ship was home to my mad clone for over 400 years. He was mad, but he was smart as well. There are many modifications done to this ship and its equipment, many new scientific discoveries manifested in them. Thanks to him I do not need to wait 20 years anymore. Down on the planet you are making sure mankind survives, But I am now out on a mission to make mankind flourish as it never had before! Do you think I could take on such a bold expedition on my own?"

Lara's thoughts started to rush, and she started looking around them. Leaf was visible in the far distance together with Q2 in the observation dome, they were sitting at the far edge of the dome, and she could make out the colors blazing on the window behind them. Suddenly she caught a glimpse of a person arriving from

behind the cottage. She was suddenly filled with fear as she easily recognized the approaching person, merely from the way she walked, fast and proud.

"No need to worry Lara." Tami calmed her. "She is anxious to meet you, and I believe you would both enjoy this meeting".

Lara stood motionless and gazed at her 15 years younger self striding towards her. She often thought of this possibility, but never even dared discussing it with anyone. And here Pelger just went ahead and cloned her, not asking for permission, or even advice.

"We grow people 5 times faster now." Said Pelger, turning to Lara.

"Lara woke almost a year ago, and she is the main architect of this town. She handpicked the people to inhabit it and even worked on new genetic architecture crewmembers. And specifically she is as responsible to our flight plan as I am, she put in all the considerations for the crew mental safety into it. I have to say she has been asking to meet you almost as soon as I told her our story of coming here, and has been planning on it for a long time." Pelger paused as the young Lara stopped in front of them. "I'll go and join Leaf and Q2." he continued. "I'll take good care of him, and let you know if there is any need for you to join us, so take your time. I believe the two of you have a lot to talk about." and with that Pelger turned and started walking up the hill and towards the observation deck.

Lara stood motionless and stared at the face looking at her, the energetic, excited, optimistic, self-confident face looking at her immediately reminded her of how powerful she felt at that age. Of course she felt similar feelings now, but her experience and age made her softer, and her emotions were less intense than they were at a younger age. It occurred to her that she would never embark on such a second journey with Pelger today, but her younger self was just the person for the task, just as she believed the older, experienced Pelger was more suited for it than the younger one.

"So, would you like to start with the questions, or would I go first"
Asked her younger self.

"Pelger said you've been waiting for this moment for quite some time, so I guess you have prepared some in advance. You can go ahead."

Younger Lara smiled. "Do you still love him?"

Lara realized who she was facing. In front of her was a person who knew every single detail that she ever knew about herself up until the age of 25! and worse she knew all those details as she thought she knew at the age of 25. On the other hand it seemed obvious to her that as she was completely empathic to this young person, so similar to herself, that the feeling was mutual.

"In a way yes." She returned the smile. "Not as fiercely and romantically as you, but yes. How about yourself? You skipped 15 years in a heartbeat, how do you find the older Pelger? Do you still love him?"

"As fiercely and romantically as a year ago." Lara jabbed at her mischievously. "These years and probably your company did him well. He is much more intelligent, emotionally speaking. He is bold yet responsible, he is much more open to ideas other than his own, and I guess he also feels he got a second chance with me to fix the relationship he missed with you. He did love you all this time as well, just as you thought."

"I know. I guess we both felt we are serving something much larger than ourselves and were not allowed to risk it for a romantic relationship."

"We all serve something much larger, that's why we can't allow bad or broken down relationships to come in our way, but we have to promote and cherish the good relationships, otherwise what kind of society are we going to build?"

"The morality of the soldier is very different than the morality of the settler." Lara felt a wave of joy at being able to quote one of her

favorite books knowing her younger clone will understand exactly what she meant. "And both us down there and you up here are no longer soldiers conquering new lands, but the settlers inhabiting it. And that is a completely different story waiting to be told. That is also the reason why I finally felt the time is right for love. And seeing my son growing on this Earth makes me feel like a god, creating life and hoping to leave Earth in the hands of worthy descendants."

At the mentioning of leaf, young Lara turned and watched the young kid strolling with Pelger down from the observatory. "Is mothering a child anything close to what I currently imagine?" She asked silently.

"Not for me. But unlike our past, your future can be very different than mine." Answered Lara.

"It will be." The younger Lara said in a somewhat sad voice "I will never get the privilege to actually settle on a planet, and will mother my kids here. I will live my life confined in this small ship with the small town she is carrying... That is also why I believe romantic relationships will be crucial for our mental state in this life long flight"

Lara smiled. "I'm happy that we've met, and happy that Pelger decided to clone you. You are taking a different path of my life that I've never taken, but knew all along that was possible. In a way it calms me, knowing that me, in a different body, is taking this path now. That said, I will now go on with my life down on Earth, but know of course that we will support you as much as we can. We should always leave a communication channel open".

"We will." concluded young Lara. "But we will probably never see each other again.

"I know. Even though you will not be able to understand it now, I will leave Earth no more. This is my home, and my favorite perspective of it is from ground level." Leaf was approaching them

together with Pelger and Q. "Goodbye Lara, Pelger. I wish you a decent life and fruitful journey! Tami and Q2, take good care of them. They are humanities best chance. After us."

As PEC1 descended back through the atmosphere Lara could not remove her eyes from the large ship hanging above the planet. She devoured the seconds and tears appeared in her eyes as PEC1 reached the clouds and she lost sign of the ship. Several more seconds passed and she turned to observe a magnificent city, with tall spiral, shining towers, arches and gardens, bordering with a clear blue ocean on one side and in a lush green forest on the other. Her heart almost burst with joy.

Pelger woke slowly, blinded by the white light that flooded the room. Pain shot throughout his body, mostly from his right leg. He felt it with his hand and quickly inferred that it was lost. The skin of his new, robotic leg was nothing like his natural skin, but Pelger was not discouraged, he was well aware of the new possibilities such a bionic leg can also support.

He turned to his left and caught a look of Aren and Kreil. Kreil was quietly holding Aren who was crying intensively. Seeing his mother cry was a shocking experience. Aren has never let emotions take the best of her, ever.

"I'll be fine mother. I'll master this leg in no time, I can already reach it with my implants, and it won't prevent me from going on the mars mission. You don't need to worry" He was almost frantic at trying to calm her.

Aren's crying just intensified. "There is no mars mission Pelgi. You have already finished your mission, you did it! You will colonize space"

"I don't understand mom. What are you talking about?"

"You have done your part and finally you get to choose your own path in life. We both do. We paid our debt in full." She looked

straight at him. "The doctors say you can leave for home as soon as you would like. The first few days will be extremely painful but there is nothing they can further do for you here." Kreil stopped supporting Aren and took one step backwards.

"Let's go home Pelgi" She said. "I'll tell you everything on the way. Of the things you did without knowing and things you will do without knowing either. Let's just go home Pelgi, let's go home"