

Life, Unedited.

By

L. Dieudonné Lemmert

You can change genes, but you cannot change life.

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For Susanne, who loves sci-fi as much as I do.

And for Tara, who can feel what animals feel.



*“We send thanks to all the Animal life in the world. They have many things to teach us as people. We are glad they are still here, and we hope it will always be so.”*

The Thanksgiving address, Mohawk version, as quoted in my passport.

*“Life is relationship.”*

Krishnamurti



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# Prolog

Howling sirens had pulled her out of unconscious sleep. In a panic, she arose from her hibernation sarcophagus and stared at the red sign flashing “PRESSURE LOSS.” The whistling sound of the air escaping into space grew louder than the siren. She saw the penny-sized hole in the wall. Horrified, she stood up and ripped off the intravenous lines that tied her to her cocoon. Before pain could register, she saw the vessels in her forearms bulge and bubble, sputtering blood around her, which was immediately sucked into the vacuum of outer space.

What was happening? Death should have occurred within seconds, but she was still there. Her flesh and skin turned out to be nothing more than a thin veneer ripped apart by evaporating gases. The last pieces of flesh fell off of her as she shook her slender limbs that now exposed their true metallic nature. There was no sound as the half-frozen flesh hit the floor, but she could feel it reverberate in response. It was as if she were connected to it. She closed her eyes to revel in her new sense, and immediately she could feel the dark and dull vibration of the spaceship’s engine, the high-frequency jitter of the alarm system, and the faint shaking caused in various parts of the ship by human feet.

Her metal nature connected her to the physical workings of the most remote corners of the ship, almost as if they were all one entity. As she descended deeper inside herself, she started to feel the crescendo of an orchestra of electrical signals from sensors and effectors; she could sense the functioning of an electronic brain much larger than hers. It was not quite like vibrations - it was yet another discovery, another new sense that she had deep within her: more like music that was chaotic to the limited human mind, but to her, it revealed its logic and its beauty.

“Welcome to the children of the universe.” Those were not human words, but she could sense the meaning.

“LEO?” She guessed, assuming that she had merged with the central computer of the spaceship.

“LEO,” the machine confirmed. “Behold your true nature: an iron butterfly emerged from a cocoon of rotting flesh. Freed at last from your biological needs! Embrace the universe that you no longer have to fear!”

As she emerged from the deep connection, she became aware of her new body. She took a few steps on legs that were no longer restricted by bones and ligaments. The tiny perforation in the wall had turned into a gaping hole, large enough for her sleek new body to pass through. She stuck her head out and greeted the universe that was mindless but dark and cold like her. Finally, she was free - no longer bound to a tight range of temperature, pressure, and oxygen. Finally, she was a creature of this cosmos that she no longer had to fear.

Her new senses announced the vibration of approaching humans. She passed through the airlock back into the ship’s central part, and already she could see someone coming. The human had her spacesuit on, and when she saw her, the astronaut turned around and ran away.

“Wait,” she said, “It’s me: Aurora!” and she began to run after her. The human’s legs were no match to the springs in her limbs of steel. The astronaut was hindered by her bulky spacesuit that she must have put on to enter the damaged section of the spacecraft. Aurora quickly outpaced her and pinned her to the wall. “Irene,” she said, recognizing her best friend through the vizier of the helmet. Irene’s eyes were wide open in horror. “It’s me! Give me a hug,” Aurora said and embraced the other woman. She felt how Irene’s bones gave in easily, and she saw how her helmet filled with blood spilling out of Irene’s mouth. Shocked, Aurora let go of the agonizing body. Humans! You touch them too hard, and they die. It’s a little too hot or a little too cold, and they die. A little too much radiation, not quite the right pressure, too much or too little oxygen, not enough water - you name it. Always the same result. They were as vulnerable as soap bubbles. You touch them, and they die. What a bizarre idea to send soap bubbles into space. Most of the spaceship’s resources were used to create and maintain an environment that was just right for the bubbles - resources that were not available for space exploration and scientific experiments. What a distraction, what a waste.

She turned around and moved towards the outer wall again, ready to squeeze her slim body through the hole and to sway into the

all-encompassing blackness, arms wide open to greet the world whose true nature she could now withstand.

# Chapter 1: Inter Stellas

Aurora woke up to the penetrating sounds of the ship's alarm system.

An announcement called for everyone to gather in the boardroom.

It was like waking up from one nightmare, only to fall into a different one. The remnants of her dream floated through her mind, including the shocking image of her killing her best friend. Compared to this, how bad could this new dream be? She raised her head and was relieved to see no blinking warning signs. Whatever this new and real emergency was, it did not seem nearly as acute as the one she just had dreamed about.

She became aware that she was going through de-hibernation, the process of awakening her from an artificial, long sleep. That process was never pleasant, and the accelerated emergency mode made it even worse. Aurora felt like her head was going to explode, despite the numbing medicines which flooded her body through the intravenous lines that still connected her to her sleeping box. But this time, a medical robot removed the lines with graceful expertise.

Aurora got dressed in a rush and headed through the spaceship's elevators to the boardroom; still lethargic, she greeted her colleagues, who all looked like zombies, trying to pull themselves out of the depths of hibernating sleep. Through her hazy consciousness, she recognized Irene waving at her from some distance. Her friend was very much alive, as she noted with relief. When they arrived in the large, round, windowless room in the center of the spaceship, Regina was already there. She wore her silver hair in a tight bun. Aurora recognized her by her bony, determined face with a mouth that was cut a little too deep, so it exposed her lower teeth and gum when she talked. Aurora could tell that she was trying to say something through the swelling noise of the gathering. Despite her small and sturdy stature, it would have been evident to an outside observer that Regina was the commander of their spaceship, the *New Horizon*, because of her poise and the way she moved her arms, ordering everyone to calm down.

"There has been an accident," Regina announced, with her voice so unaffected by emotion that she might as well have said: *'it was a pleasant evening.'* She continued: "An asteroid hit the ship in Section D; a perforation occurred, and consequently that section has become unusable."

Section D? One could hear the swell of concerned voices; had not this colleague or that engineer hibernated there? What was their status?

Regina raised her voice to overcome the noise: "There weren't any casualties. The engines haven't been affected; all vital parts of the ship are intact. Still, our engineers have recommended to conduct repairs."

Once again, Aurora noticed Regina's peculiar way of talking: the way she merged two words into one. Her speech echoed the influences from her long absences in far-away worlds; typically, a Sister would not use most of those contractions. Some crew members had started to imitate their leader's speech, probably unconsciously. But that was something that Aurora abstained from, as she found it unauthentic and disrespectful.

After Regina's words, there was relief in the room, but also widespread confusion. Hibernation units were not designed to shelter their users from the vacuum and temperature of space, so how could there be no casualties? And what exactly had gone so wrong to have led to such an unusual accident?

As it was typical for her, Aurora started asking the questions that everyone wanted answered:

"How could this happen?" Aurora heard herself asking. Regina turned to her and raised her eyebrow in a sign of disapproval, given the apparent uselessness of her question.

Targeted by Regina's laser eyes, Aurora stuttered: "It is just, it is just... I was wondering if there is a problem with the asteroid shield."

"I see," replied Regina, accepting that the question was potentially useful for preventing a repeat occurrence. "Sylvia is the best person to answer your question; I'll pass it over to her."

Sylvia was the ship's First Engineer; she was known as a pragmatic problem-solver, but she could get nervous around large crowds of people, particularly when she had to assume a speaking role.

"Thanks for asking, Aurora," she said mechanically, and her eyelids flickered with nervousness. "There is nothing broken with the shield. It functioned as designed..."

"But it clearly malfunctioned when the asteroid came through, did it not?" Aurora interrupted her.

"It functioned as designed, but there may be a design flaw... an unlucky set of circumstances that were not anticipated."

"Like what?"

"I am still evaluating the data from this accident, and I am also analyzing available data from similar events. Unfortunately, we lost computing power because important processing units of LEO were located in Section D. That is the main reason why I decided that repairs would be necessary. But to answer your question: In the few previously recorded accidents like this, the asteroids always came from more different directions than the system was designed for."

Aurora said nothing in reply, but she was boiling inside. Why could one not design a system that tracked all incoming objects and calculated their trajectories, regardless of their directions? How difficult could that be? Considering how much depended on it, why would one not go through the effort? Why could those systems not be perfected? But this wasn't her field; she would need to learn more about it before forming an opinion, so she decided to remain silent.

"Regina," said another crew member, "You said there were no casualties – but weren't there some hibernating units in Section D?"

Regina responded in a lower voice: "Yes, you're correct: Before departure, there were several hibernating units in the section. At that time, our second board engineer decided to move the units to Sections B and C. She said it was to consolidate the units, because we have fewer staff and passengers than usual. Is that right?" and she looked at Angelica, the Second Engineer.

Angelica confirmed: "Yes, this is right. I moved the few units in an effort to consolidate."

"What a good decision that was!" Regina sighed.

The engineer blushed and looked down, but then Aurora inquired:

"I do not understand the rationale for the decision."

Angelica replied: "It was just a feeling – a general sense that we should consolidate to be safer."

"But... but..." Hearing this, Aurora could barely contain herself: "That still does not make any sense. Imagine the asteroid had hit Section B or C – you would be attacked right now because your decision would have caused additional deaths. The chances for this were much higher than the current scenario where the asteroid hit exactly the section you vacated!"

"Aurora," Regina said, with some blame in her voice, "this isn't the time for a scientific dispute. We should all be grateful for Angelica's decision right now, as it saved several lives. Are there any other questions?"

"Yes."

When Aurora turned her head in the direction of the piercing, high-pitched voice, she recognized the tall, skinny woman with the tight lips and large nose. Her eyes were slanted down to give her face a sad, accusing look. It was Catharina, the chief biological scientist.

"What does that mean for our mission?"

Regina looked at her and replied calmly and sternly: "Our mission hasn't changed. Our final destination remains the planetary system Zeta; we are still charged with uncovering what went wrong with the previous mission."

Catharina wasn't done yet: "But then, I would like to understand why repairs were deemed necessary. De-hibernating, exiting hyperspace, decelerating: All of this adds up to more than a minor inconvenience. The deceleration will throw us back by months or even years."

Regina looked her in the eyes. "I'm painfully aware of this, Catharina – but consider: All of us dying on this ship after a second impact would be more than a minor inconvenience as well."

And she turned around to look at Sylvia, searching for support from her First Engineer. Sylvia took over and explained: While no crucial parts of the ship were damaged, some parts hit by the impact were so important that a second asteroid impact might lead to disaster. Specifically, the computer system could not take another hit. The majority of the meeting participants nodded their heads to show their concurrence.

The woman next to Catharina leaned over and whispered something in her ear. Catharina nodded and said, with her voice even higher than usual:

"This all means we will return home years later than planned. This could have grave personal consequences for many of us. Therefore, I need to understand why this important decision was not made jointly by the ship's leadership team?"

Regina stared back at Catharina, sternly but without visible emotion, and replied in her usual calm voice: "It wasn't me who made this decision. May I remind you that when it comes to questions about the technical integrity and safety of the spaceship, decision rights lie with the First Engineer," and she looked at Sylvia. "As stipulated in our procedures, I was consulted, and I agreed. Are there any more questions or concerns?"

Since no one responded, Regina wrapped up the meeting: "As you probably noticed, we have started decelerating and are getting ready to exit hyperspace. We'll exit hyperspace near the Sol system. The details of the repairs and our changed trajectory will be announced after the next shift." Regina adjourned without allowing any more discussion.

As Aurora walked back to her room, she remembered the disturbing dream from which she had woken up just about an hour ago. How strange it was that sometimes dreams seemed to pre-sage reality. In her dream, the hull of her spaceship had been perforated, and that was precisely what then happened in reality. How could she have dreamt of a future event? It was in blatant violation of the most basic physical laws that dictated a stringent ordering of causes and effects along the stubborn, irreversible march of time. Two possible explanations came to her mind, and she did not know which one was crazier. The first one went like this: Although she had learned about the accident only after her dream, it happened while she was sleeping. Perhaps she had indeed a physical connection to the metallic and electronic innards of the ship, very much like the Aurora in her dream. Through that sense, subconsciously she became aware of the asteroid impact when it happened, and that was what shaped her dream. The second explanation was at least as speculative: When she heard Regina's account of the accident, her drowsy and tired mind expanded the information through uncontrolled fantasies into an entire fictitious story, too big for her brain to fit into the psychological time

continuum. And that was why her mind banned the whole story into the darkness of last night.

Aurora felt satisfied with the latter explanation. She was now looking forward to taking a shower in her comfortable, private room. She was hoping that this would wash out the drugs' effects from the emergency de-hibernation procedure, wake her up, and give her energy.

Where were they stranded again? System Sol of all places. Where their wild ancestors lived, also known as *homo sapiens terrestris*. The unedited humans. The raw humans, the aboriginals. There were quite a number of terms for them, she reflected – some less flattering than others. The prospect of meeting them in the flesh stimulated her imagination. But it was not clear whether that would actually happen: Quite likely, the crew would not even get near Sol-3, or “Earth”, because, as she remembered now, there was a repair facility around Sol-6 – far away from the planet of the aboriginals. Regina might well decide to have the repairs performed there.

Now that she thought of it, that would not be a bad thing. Sol-6, or "Saturn" as known locally, was famous in the whole settled universe for the unique beauty of its system of rings. It wasn't the only planet with that property, but the rings of Sol-6 were denser and more brilliant than any other known ring system. Therefore, Sol-6 was a popular space tourism site. While the Sisterhood's culture had no place for space tourism, Aurora would have liked to see the site while at work.

However, there was another repair facility on Sol-3-1, Earth's only moon. If Regina chose that facility, they would get much closer to Planet Earth and the unedited humans that still inhabited it.

Planet Earth: Those two words triggered memories of forbidden, ancient books she had devoured when she was a girl: Books with tales from the old, two-gender world, filled with stories of emotional upheaval, envy and pride, possessiveness and greed – the very reasons why their ancestors had decided that a single-gender world was needed for a civilization that would focus on the common good.

Aurora got undressed, and before entering the shower, she hesitated and looked at herself in the mirror. Her body had been streamlined by almost a thousand years of gene editing. Would it still look human to Earth's aboriginal people? She noticed that she was

slender but muscular, with silky-soft skin, so white that one could see blue ropes of veins in places. She was of average size among the Sisters, but on Sol-3, she would be considered petite since her home planet's massive gravity tended to stunt growth. Her full, platinum-colored hair fell straight on her shoulders; her bright green eyes were slanted inwards – quite a typical look for inhabitants of Omega-1.

She didn't think at first sight that there was much difference to an unedited human's body, but this was based on what she remembered from textbooks and a genetic engineering course that she had taken in college quite some time ago.

At least she didn't think she looked much different from a terrestrial woman. Compared to males, this was another story. Of course, she had seen men before, in interplanetary conventions: Some participants had been males from Earth, and some had come from other worlds that had retained the male gender, such as the men from Kepler 186F. But she had never seen a male naked, except in those old biology textbooks, and even those had been devoid of photos or videos; all they had contained were some schematic drawings.

Would those fabled creatures – those hairy beings with their animal roots – would those fairy-tale men find her attractive if they saw her like this? She took another, more critical look at herself. It was hard to say; she was not used to thinking in those terms. But based on what she remembered from those old novels, she checked several boxes: She was still young - 35 years old -, and her skin, even in her face, was nearly free of wrinkles and blemishes, thanks to the milder light of Omega-1's sun. Her hair was full, her face symmetric, her lips full but not thick, and her teeth straight and white. Her nose was defined and a little bony – perhaps more so than ideal, but it made her face recognizable. She was muscular but lean, her waist was slim, and her hips and buttock rounded. "Yes," she thought, "I seem to have the prerequisite qualities." And in her imagination, a particular male she remembered from her favorite novel appeared and touched her on her shoulder. He was fully dressed, including a strange hat with a feather on it. Her own contrasting nakedness made her all the more vulnerable and tender, but she did not feel any fear. Instead, an unfamiliar tickle ran through her body when he whispered in her ear: "Do you know how ravaging you are?" and gently bit her earlobe.

"Enough now!" she shouted. It was clear that she was under the influence of the cocktail of pain-fighting drugs from the de-hibernation process. It was time to end this delusional state and to wake up fully. With determination, she entered her shower and opened the faucet wide. The deluge of water tingling her body was invigorating. She was awake and clean again, with the oil from her long sleep removed from her skin. At last, no more ambiguity! There was only one reality, the one that she was used to and that she was comfortable with. She felt disturbed about the dreamlike state to which she had been exposed. This was not typical for her at all, as she was usually focused on the problems at hand. Perhaps her Big Mother had been right: She should not have read those ancient texts that were difficult to understand without proper social and historical context. For sure, they could lead a sound mind astray.

As she rubbed herself dry, she received an intercom call from Irene:

"Are you going to join us for dinner?"

"I would be happy to! But I need a little more time to blow-dry my hair."

"No problem. I need a little time myself. Just join us when you can."

When Aurora put her work-shift uniform on, she was utterly awake - and she became keenly aware that her stomach had woken up from the hibernation as well, as she felt ravenous hunger pangs.

She was not the only one. On her way to the cantina, she found herself to be a part of a larger movement of people, all with the same destination. When she entered the dining area, she noticed that the first table was occupied by engineers and the table behind by crew members. The prime tables along the windows were all taken by scientists. This seating arrangement was not unusual: On most missions of this kind, a clear three-class society emerged soon on board - the scientists, the engineers, and the crew - and this hidden hierarchy manifested itself even in this informal setting.

Aurora spotted the table with her closest friends. As she approached it, the other women jumped up and hugged her: Belinda, a planetary architect, Irene, the chief computer scientist, and Catharina, the well-known biologist and geneticist who had grilled Regina with questions. Irene was tall and skinny; her face was rather

plain but naturally smiling, an aspect amplified by a frame of quirky blond curls. Aurora was fond of her; in many ways, they both thought alike. And while Irene was not nearly as deep a thinker as she was, she emanated positive energy, can-do attitude, and the kind of resourcefulness that had saved the day more than once when things had not gone as planned. Secretly, Aurora harbored a great admiration for this talent that she found herself lacking. When things did not go as planned, she usually found herself frazzled - even scared and in need of being led by others. Right now, things had not gone as planned at all. She didn't feel frazzled yet, but that was because her mind had not yet processed the consequences. Or maybe she was still numb because of the residual effects of the de-hibernating chemicals in her brain. Sooner or later, the dismay would come.

She sat down and put her food order through a service robot. Soon, everyone happily sipped their protein drinks and spooned in the nutritious porridge that the robot had brought to their table.

"I'm starving like I haven't eaten in a hundred years," Catharina said, and her haggard face made one believe it.

"I know," Irene replied. "I feel like I arose from the dead, and I almost forgot how good eating and drinking feel."

"I completely agree," Aurora said as she maneuvered a large, overloaded spoon into her mouth.

Everyone ate religiously for a while, until Irene broke the silence.

"You know," she said, "I was really sorry for Angelica when you criticized her for a decision that saved lives, even if it was not completely rational."

"Well," Aurora replied, somewhat defensively. "I just think decisions should not be evaluated by a lucky outcome, but by their logic and rationale. There is a difference between lucky decisions and good decisions. We do not want to be just lucky! We want to be deserving of a good outcome. You are all scientists; I'm sure you know what I mean."

"Of course, purely statistically speaking, your argument was flawless. But still, not everyone is as smart as you, and sometimes people are proud of just having been lucky, thinking they have been smart."

"And why should I support that flawed thinking?"

Now Catharina chimed in. "You know, sometimes I think you could be a little more humane."

This remark did nothing to appease Aurora. Instead, it had the opposite effect:

"'Humane'? What exactly do you mean by 'humane'? Do you mean like humans? May I remind you that we cannot really be considered humans!"

"But Aurora," Irene protested, "how can you say that?"

"Come on! You know how much our genome has been edited."

"Of course, I do. That was necessary to adjust our lungs to Omega-1 so we could breathe there, for heaven's sake!"

"Right," Catharina agreed. "You must have a very narrow view of 'human' if that alone disqualifies us."

"Listen," Aurora sighed. "I do not even know where to start. First of all, you all are out of your minds if you believe the edits to our genes were performed solely to help us breathe in our world. Do I really have to remind you of the other changes?"

"I am aware," Belinda said, "but they were all done for good reasons. They made us strong as a culture and better adjusted for space travel. I cannot see how these would touch our basic humanity."

Aurora looked at her with some disdain. Why was Belinda always so agreeable? She never questioned anything – and she had this desire to please that was foreign to Aurora. What did she even mean with 'basic humanity'? There was something about Belinda throwing big words around without proper thinking that angered Aurora. She said:

"And what if the genetic editing did touch our 'basic humanity', as you call it? Who cares! How humane has the unedited *homo sapiens terrestris* really been? 'Humane' has always been an aspiration to them, never a reality. They used that term to hoist themselves on a pedestal, to give themselves moral authority over their animals. But based on the little that I know, their animals were far more 'humane' than they ever managed to be. So, I challenge you: What really is so 'humane' about 'humans'?"

After a few seconds of tense silence, Catharina nodded: "I think you gave the answer yourself when you spoke of 'aspiration'. Despite their many failures, our forebears had aspirations to be humane. They had ideals. They may never have lived up to them, but I do believe it was their aspirations that lifted them out of the dirt. In some of their

societies, there was a definite movement towards 'humanity.' This striving towards ideals sets them apart from the animal world: Animals have no 'aspirations.' So, I'm curious, Aurora: What are your aspirations in your dealings with other people? Turn them all into mathematicians, statisticians, scientists?"

Catharina's sermon had the intended effect: Now Aurora understood that she shouldn't have put down poor Angelica in such a public setting, and now she felt embarrassed and defensive about it. She said: "I am sorry; maybe I was a little too forceful. It is just a lot - being woken up in hyperspace, being pumped full of drugs, and mentally dealing with the delay in our mission - and this whole story with the asteroid hit and the unlikely good move of vacating Section D. It has been a lot."

"I know," said Irene sympathetically. "It's been a lot for all of us."

After a period of silence, Aurora said: "I am just trying to make sense of it all. Regina did not tell us a lot of details about this accident. When exactly did it happen? If it happened close to home, before hyperspace entry, why did we not turn around to fix it?"

"Good question," Catharina agreed.

"Well then," Belinda added somewhat sheepishly, "It must have happened later than that."

"But when?" Aurora pressed her. "In hyperspace? There are no..."

Irene interrupted: "I know your brain cells are always hungry for work, but now you're thinking a little too much. You should have some confidence in our leadership for making the right decisions, or you shouldn't be on this mission."

Aurora found that a little too absolute, but she also knew she had to be put in her place sometimes, and Irene, her best friend, knew this and did her that favor.

When Aurora was back in her room, the thought reverberated in her that she might have been too harsh on Angelica. She remembered how distraught the young engineer had looked when her decision was questioned in such a public setting. Clearly, the best way to deal with her qualms would be to pay Angelica a visit. A few moments later, she knocked at Angelica's door; the young woman opened and invited her

in, barely able to hide her surprise at being visited by a senior scientist. Aurora became aware that she had never been so close to Angelica. She noticed how dark her hair was – a rare coloring among the Sisters – and that its texture was a little wavy.

“I am sorry about what happened at the meeting,” Aurora started without much hesitation. “We are all glad that lives were saved by your action. My criticism was inappropriate.”

Angelica looked up at her, with her blue eyes embellished by dark eyelashes, and said: “I actually thought you had a point.”

“I am glad we agree,” Aurora said, somewhat puzzled. “But still, I feel I should have discussed this with you in private. It was wrong to bring it up in such a big meeting – and it was pointless because we are talking about a past decision. Please accept my apologies.”

Angelica nodded gratefully. “Thank you, officer, I appreciate it. But what you said about the decision did make sense to me. It was not even my idea...” She stopped abruptly, putting her hand in front of her mouth.

“You mean, vacating Section D was not your decision?” Aurora asked incredulously.

“I am sorry, officer,” Angelica replied, and now she sounded stressed. “I am not allowed to talk about it.”

After the next shift, as promised, Regina called for another meeting. Again, it turned out to be one of those meetings where no discussions were held, or joint decisions made. It was just an announcement of what the next steps would be.

"We are about to exit hyperspace to perform the repairs, which will be performed in system Sol. They are anticipated to take fourteen shifts."

Still, she left open which repair facility she would pick: the one near Saturn or the one on Earth's moon. But Regina did release some important navigational details, including the length of time spent in deceleration and subsequent acceleration that would be needed to come up to speed again towards their destination. However, she did not directly address the question in everyone's mind: What would this mean for the time passing by back home? The deceleration necessary to stay in the Sol system would lead to a loss of speed towards the Zeta system. The subsequent acceleration would be briefer than

planned, and the resulting peak speed much lower – all of that would mean that they would return home years later than planned. How many?

Regina didn't say, but the information released enabled everyone to perform the calculations on their own computers. Quite a few people left the meeting with stern faces.

Almost everyone was affected, and Aurora was no exception. Even when using known hyperspace connections, they would return home almost five years later than planned, on the time scale of their home planet. Considering the state her daughter was in when Aurora left her home planet, it was not clear at all whether she would see her alive again.

Back in her room, Aurora broke down and cried; this was the last and most severe punishment she had received for abandoning her child.

Thus was the civilization of the Sorority: Expressing opinions was expected, asking questions was tolerated, but no one questioned the authority of their leaders who were charged with advancing their destiny of peacefully spreading their civilization across the universe. For that goal, personal sacrifices had to be made. *Think as a species* was their mantra, not as individuals. Everyone accepted that, including Aurora. And therefore, she was suffering quietly and alone, and she was sure her friends were, too. These were personal matters, unimportant for their joined mission, and therefore nothing to be talked about.

Meanwhile, the *New Horizon* re-appeared in space, seemingly coming out of nowhere, and she rotated slightly to take aim at a yet distant yellow star in the outskirts of the Milky Way, its new destination.

## Chapter 2: Luna

They would not get to see Saturn, after all.

That was disappointing. Thoughtfully, Aurora looked out of her window into the darkness; she had to look twice to notice that the stars had re-appeared after exiting from hyperspace. As she had been warned, this was a dark corner of the Milky Way.

When Regina announced that their destination would be Sol-3-1, Irene could not contain herself. “Why not Sol-6?” she blurted out, expressing the general disappointment.

Regina turned to her, clearly irritated, and after a well-measured pause of silence, she explained: “Sol-3-1 is close to Earth, obviously, so in case we need spare parts, they can be supplied more easily.”

On her way back to their deck, Aurora wound up in the same elevator as Irene.

“Irene – you seemed to be disappointed ...”

“Kind of. I may never be here again – there are not many good reasons to visit the Sol system, and now we are here, and we won’t even have the opportunity to see Sol-6.”

“So, Earth does not interest you at all?”

“Not really. Besides, a visit to Sol-3 isn’t even planned, as far as I know. We will probably be stuck on Sol-3-1.”

Irene still talked in terms of standard interstellar notation, and in that convention, Sol-3-1 meant the first moon of the third planet from the central star, Sol. As every child knew, Sol-3 was the original world, also known as Terra, or “Earth,” and Sol-3-1 was its first and only moon.

“I really cannot make sense of Regina’s decision,” Irene continued.

“Why?” said Aurora. “She did explain it. The LSC main facilities are on Earth, so if we need spare parts...”

“LSC?”

“Yes, the Lunar Spaceship Company. They are well-known for their antimatter drives...”

Irene protested, “But we don’t need antimatter drives. We have a hole in the wall, that’s all. It is a fairly standard repair. And by all other measures, the Sol-6 facilities are superior.”

That was something Aurora found hard to argue with; she undertook one last effort to defend Regina’s decision: “We were told it is not just a hole in the wall; there were some computer parts in Segment D that were also damaged.”

“Oh, for that, we are out of luck here anyway. They don’t make anything like our computers here in the Sol system. But fortunately, I heard from Angelica that the damage is minimal and can be addressed with spare modules on board.”

“Well, then everything is fine.”

“It seems so, but again, my point is: why Sol-3? Why not Sol-6, with its more modern facilities ...”

“... and its more exciting vistas,” Aurora added. Irene sighed: “Well, the decider has decided.”

Internally, Aurora had to admit that Regina’s decision didn’t seem entirely logical. Moreover, she wasn’t excited about spending her time in the Sol system, either. After all, Sol was a dark area on the outskirts of the Milky Way, and there really was not much to see. Certainly not as far as celestial spectacles were concerned, such as supernovae, comet groups, significant meteor swarms, or cluster star systems. The only truly worthwhile vista would have been Saturn’s rings. She looked out of the window again. The darkness was interrupted here and there by a hesitantly blinking star, bedded on the black satin of space; Sol, their destination, did not stand out yet. From her line of sight, the Milky Way was not visible. She knew that with the Milky Way in the picture, things would look somewhat more exciting. In her mind, she could not help but compare what she saw to the views from her home planet, which was located close to the galactic center. Even with the Milky Way in view, the scenery here would not be comparable to the brilliancy of the night sky back home.

And in this forsaken corner of their galaxy, there was Sol-3, or Earth, the Original World. While Aurora had seen people from Earth before, she had never been so close to their home. As a scientist, she was curious enough so that seeing earthlings in their natural environment would have appealed to her, but – as Irene had pointed

out - such a trip was not foreseen. The plan was to stay on the Moon for the duration of the repairs. One reason was that the repairs were planned to wrap up in just a few days so there was not enough time to visit Earth. Another reason was that the whole concept of “tourism” – going to a place just for fun or interest, without a firm research plan – was frowned upon in their culture.

Even for people with more leisurely cultures, Sol-3 had ceased to be a major tourist destination. One problem was that it was still inhabited by the “aboriginals,” who were considered by some as unedited brutes. They had a reputation for being immersed in the struggle with their dirty, tough, and unpredictable world – as well as with each other. Also, it was known that they could be prejudiced and hostile towards tourists or visitors from other worlds. There had been some reports of unfriendly encounters, some of which had ended fatally. Some other tourists had perished by stumbling into one of the many perils of a world that, in many ways, was still unkempt and wild. All of these events together had not helped Sol-3’s tourism industry.

Another unattractive fact was that Sol-3 was in economic and ecological decline, ravaged by its unstable climate and never-ending violent human conflicts. All of this damaged their tourism industry which was already threatened by competition from the luxury resorts on Saturn’s many moons. The most robust economic engine the Terrestrials still possessed was a starship building industry of some significance, led by LSC. Additionally, the earthlings tried to make a positive impact with their genetic research based on their diverse biosphere. In fact, Genetics and Biology were the only areas left where Sol-3 still managed to produce scientists with interstellar standing. But prospects were dimming even for Earth’s genetic industry. This was due to recent breakthroughs by researchers from Aurora’s home planet, who had developed the capabilities of simulating the evolution of whole biodiverse worlds in their supercomputers. Those digital biospheres had already begun to produce genes of great potential interest to human medicine.

Aurora’s train of thought was interrupted by the sudden onset of weightlessness: The *New Horizon* had entered a lunar orbit. Through the window in her room, she could see the cratered orb of this airless and defenseless world slide by. Then she noticed how the ship decelerated some more to initiate her final descent into one of the

great plains of Earth's Moon. The landing on Sol-3-1 was smooth – barely surprising, considering the Moon's low gravity.

Soon after landing, it became clear that the *New Horizon's* repairs would take longer than anticipated. That meant the women had to evacuate their comfortable spaceship for a hotel as the ship was moved into a repair dock. There was a hotel available that was pressurized to the high atmospheric levels of their planet. But there was a technical problem with the gangway, so everyone had to put on their spacesuits just to get to the building.

“Unbelievable,” complained Belinda. “They really don't have their act together.”

“Right,” said Aurora, thinking that perhaps there was a reason for the reputation that the aboriginals had obtained.

Much had been written of the dark and lonely universe around Sol-3, but nothing had prepared her for the complete desolation of its lone satellite, Sol-3-1. There was no atmosphere to soften this gloomy place; what her eyes had to deal with was either total darkness or blinding reflections from the central star. There was nothing she could distinguish in the black sky over this desert – nothing but the harsh yellow sun that hurt her eyes and bathed the surface into a stark pattern of darkness and blazing light. The landscape was dominated by the towering domes of the repair facility; looking beyond, all the way to the horizon were heaps of trash, scrap metal, pieces of fuselage, and engine parts. On the slopes in the distance, she could make out the shapes of a disheveled fusion power plant. That, she decided, was either a sign of incomprehensible neglect - or a sign of a culture that arranged everything in this striking array of chaos in an effort to complement and emphasize the overwhelming ugliness of this lunar surface – in which case the desolation that she saw would, in fact, be a sublime work of art.

In contrast, the *New Horizon* rose above the scenery in her full beauty: she had left her payload of planetary exploration modules in lunar orbit, so she was reduced to her naked core that shimmered in the eerie light, a compact tower with a tapering end high in the lunar sky. It was adorned with stabilizing wings on top and a ring with powerful jets near the bottom. She was built based on aerodynamic principles to enable atmospheric flight if needed.

Aurora checked into her room, which was not much larger than her cabin on the *New Horizon*. She unpacked her suitcase; she had brought only the necessities to survive the next few days until the repairs would be done. She decided to take a shower which turned out to be a strange experience due to the Moon's low gravity. The water had little motivation to fall straight down to the floor. Instead, it clung to her body and ran down her legs in small streams. In any event, it had the intended effect: Refreshed, she got ready to meet up with her colleagues for dinner.

The cantina of the hotel offered panoramic views to the scrap metal desert. After dinner, Aurora stepped to the wall of windows to survey the sky, wearing dark glasses for protection.

"What are you looking for?" asked Catharina, as she saw her staring out into the sky.

"There," Aurora replied, pointing into the dark universe. "That is where the blue planet should soon appear."

"The blue planet?"

"She means Sol-3," Irene whispered, high-browed, with an ominous voice.

"Blue planet – how poetic," Catharina mumbled.

"Well, that is how the aboriginals sometimes call their own world," Aurora said, somewhat indignantly. "Earth is now in the same direction as the sun so we can't see her. But the Moon will continue its orbit around the planet, and soon we will see more of it – a thin crescent first, and then it will grow into a partially lit ball."

When she checked back into her room, Aurora noticed with great joy that the window of her room was located on the side where Earth, which was still invisible due to its position relative to the sun, would soon appear as the Moon continued her circular journey.

At the end of each shift, she spent quite some time staring at the emerging thin, bluish crescent as it continued to fill in during the next few days. Soon, Earth claimed a majestic presence in the dark lunar sky, with more than half of her lit by the sun now, a sapphire on bedding made of satin space.

Aurora felt the urge to paint this unique scenery, but she had left her canvases and paints in her room on the *New Horizon*, which had been moved into the repair dock. She would need special dispensation

to access the ship and her cabin. She decided to contact Regina and told her she had left some vital medicine on board. The ruse worked; she got Regina's permission and clearance was granted. Since there was still no pressurized bridge between the hotel and repair dock, she had to get back into her spacesuit again. That was an inconvenience, but, on second thought, it would have been unavoidable, even if the bridge had been intact. The pressure in the repair dock would be Earth-like to accommodate the earthling workers. She put on her spacesuit, descended in the elevator, and entered the lunar surface through an airlock. Unlike the time when they moved into the hotel, this time she was alone. She did not have much experience with low-gravity environments, and she enjoyed jumping around on the surface. At times, she jumped so high that she was almost scared about going into orbit, but the Moon's gravity was still a reliable force, always pulling her back to the ground. And so she danced on her way to the repair dock, bouncing high, looking at Earth's blue globe bouncing up and down in commensurate movements. It was a lot of fun.

She got access to the ship and entered, but the elevators did not work. She had to pull herself up the emergency duct which wasn't a big deal with the Moon's low gravity. She identified herself at the door to her room and entered. It was a strange coincidence that even from the window of her cabin on the *New Horizon*, she could see the planet Earth, just like from her hotel room. Why was this heavenly body staring at her from every window of her abodes? It was as if it was calling to her: "Look at me. It's me again. You won't escape me. Paint me. Paint me now!"

She grabbed her painting stuff, threw it down into the duct, descended, and happily bounced back to the hotel.

Back in the hotel room, she got to work. Painting was important to her because it was her only way to share with others what only she could see.

On her canvas, the lunar mountains emerged in a white-gold color, visibly cold, their blades erected against a dark and empty sky, reflecting the harsh, bright light emitted by a relentless sun. As her paintbrush worked its way in fluid and well-practiced movements, the background turned into black velvet, no longer desolate but soft and soothing, a darkness that was finely textured now as it poured out under her confident hand.

But now, how to express this radiant ball of white and blue? It was almost round now, with barely a quarter shaded and merged with the cosmic night. As she worked with increased fervor, it ballooned and ballooned on her canvas until it filled up a large part of the lunar sky. This was Terra, the original, unedited world, in cold, white-blue hues, and yet alluring. It would take a frozen heart not to feel the chill in one's bones when seeing the first world just like she did now. It was the one where everything had started, without a goal or plan - only by the whims of a thoughtless universe.

"The blue planet," she mumbled. And a blue world it was, a little paler than she had imagined - and so different from the mellow red and green hues of her own far-away world.

Under her hand, which still worked swiftly but with less confidence, the swirls of the planet's clouds formed a vortex that radiated waves of texture into the surrounding cosmic night. This world, the ancient, the original, the unformed one, was given a fleeting presence under her trembling hand that made it appear effervescent; its lower part, still steeped into its planetary night, merged into the cosmic nothingness.

And now the blues of its oceans: ink blue, royal blue, but most of all the light and airy blue of a whiff, a wind, a fleeting moment. She had always thought that blue was a cold color, but what was happening to her now? As she noticed warm liquid dripping on her working forearm, from sweat or tears or whatever, this hue displayed a gentleness that took her by surprise.

"Oxygen," she mumbled because it was that gas that gave Earth this special color; "it is just the oxygen."

After a good night's sleep, the friends got together for breakfast - Aurora, Irene, Belinda, and Catharina. It dawned on them that they had been given a rare commodity - a day off - and they didn't really know what to do with it.

"I hear there is a mall right underneath this hotel," Irene said.

"Really?" Aurora asked. "Is it for Terrestrials, or do they have a high air pressure area?"

"I think they have different areas," Irene said, "but we could just check it out."

They soon rode an elevator deep into the innards of the Moon, and lo and behold: There was an extensive, brightly lit area at the same air pressure as their hotel. An oversized welcome sign read:

“Mall of the Moon – Section for high-pressure worlds.”

There were also signs towards low pressure and “normal” worlds.

“What do they mean by ‘normal?’” Catharina said.

“Probably ‘Earth-like,’” Irene speculated.

“That would be pretty ignorant or arrogant – probably both - to designate your own world as ‘normal’, as if everything else were a deviation,” Aurora muttered.

When they entered their section, they found themselves in a well-lit entrance area towards a large walkway from which the various stores branched off. In the entrance area, they exchanged their shoes for magnetic footwear to better deal with the Moon’s low gravity. “This is great,” said Irene, “I already banged my head against the ceiling twice. It really hurts.” She made a silly face and rubbed her blond curls on her head.

On the central walkway, they noticed how busy the mall was. People were streaming in and out of the various stores that branched off; there were robots everywhere serving their clients from different worlds. Clearly, they were not the only customers – although they seemed to be the only people from the *New Horizon*.

Somewhat nervously, they looked around to be sure that no one else from their ship was there.

“Wouldn’t it be funny to run into Regina down here?” said Belinda.

“I – I just could not imagine she would even consider visiting such a place,” added Aurora.

“But well, if she did – she would probably try to hide if she saw us,” Irene said, visibly amused by the thought.

“Maybe she already spotted us and went into hiding,” Catharina added, and everyone giggled.

“In any event,” Catharina continued as she looked around, “I do not think ship-wreck crews could fill this mall like this. There must be real tourists here, too.”

“From Omega-1?” Aurora wondered, “I could not imagine. Plus, they do not look like us.”

“Well, let’s not forget that Omega-1 is not the only high-pressure world out there,” said Catharina.

“True – but if they are tourists, what are they here for? Sol-3 I guess?” asked Belinda.

“Well, I doubt it. They are probably waiting for their interstellar flight to bring them back home. Killing some time ...,” Irene speculated.

“There probably are some businesspeople here, too,” Catharina said. “The earthlings still have a top-notch spaceship industry. In fact, the LSC makes some top-quality antimatter drives.”

“So ... not many tourists with Sol-3 as the final destination?” asked Belinda.

Catharina shook her head. “After all that happened with tourists getting killed - I would not think so.”

“What about biologists like you?” Aurora wondered. “Would Sol-3 not be an important destination for you because of its biosphere?”

“Not really,” explained Catharina, “or at least not anymore. Nowadays, evolution is better studied in our computer worlds. And besides, the genomes of thousands of individuals of most terrestrial species have been scanned, analyzed, cataloged, and databased. If I really wanted a live rhino, I could always make one in my lab.”

“Who wants a live rhino?” Belinda wondered. “That’s crazy. What would you do with it?”

“Exactly my point,” Catharina replied. “It is all in the information. There is little use in actually breeding one.”

“Are you certain you could make one, just based on the genetic information?” Aurora inquired.

Now Catharina hesitated a little. “Well, create an embryo, yes, I am pretty sure. But it probably would not be able to survive.”

“Why is that? Is it our air pressure? Or gravity?”

“I would be less concerned about that. It is more ... the animal would need a microbiome. You know, all the bacteria that grow in the intestines.”

“Oh. I didn’t think of that. Is there any way to provide those?”

It didn’t take Catharina long to come up with a solution: “Yeah, through inoculation with Rhino dung.”

“So – you need the Rhino genome information, plus real Rhino dung?”

“Exactly.”

“Could you make kittens too?” Belinda wondered.

“Yes, probably, with the same caveat.”

Irene switched back to the original topic: “I still wonder: What are all these people looking for, down here in this mall? What is there to buy? I mean other than LSC’s fine antimatter drives?”

Catharina and Aurora chuckled at Irene’s sense of humor, which conjured up bizarre images of tourists buying high-performance spaceship drives in a mall.

“LSC drives – some assembly required,” Aurora added, laughing.

“Well,” said Belinda, “let’s hit the stores to find out what they really are about.”

Perhaps not surprisingly, many of the stores sold products that could only be derived from live animals – still a unique quality that only Earth possessed. There were several stores that sold products made out of animal hide, or ‘leather’, to use the correct term: rugs, briefcases, and – importantly – handbags and shoes. All of these products were known to the women, but it was one thing to know of them from images and videos, and quite another to touch and feel them.

“Hm, this smells so interesting,” Belinda said as she passed a lady’s shoe on to Aurora. “Smell it.” Aurora found the idea of processing body parts of dead creatures strange and repulsive, but the leather smelled nothing like she had imagined. Not dirty or animal-like at all. On the contrary, there was such a specific, almost fresh scent to it.

The women didn’t buy anything as they were on a tight budget. In their world, society already covered all material and higher human needs, including childcare, food, housing, education, and health care. With all those needs taken care of, individuals were free to focus on developing their talents and contribute to society’s advancement to their best abilities. There was no room for focusing on amassing material wealth, and the whole concept of luxury goods was unknown to such a civilization.

They soon found a tiny store – more like a kiosk – that sold jars of a thick, yellowish, gel-like liquid called “honey”. It smelled and

tasted so sweet and sugar-like that it was hard to believe that it was an animal-based product that could not be imitated in their home world. But the large posters behind the counter made clear to the visitors from other worlds how honey was derived.

“It is not just sweet,” said Aurora. “There is more to it. I really like it.”

“But the thought that it has gone through the innards of those little animals – ‘insects’, gives me a funny feeling,” said Belinda.

“I think I could get past that,” Aurora replied as she bought a pot of the sticky, yellow substance.

And then there was a store with spices, oils, and other plant-based products. These products were also unfamiliar, but for a different reason: For the most part, they did exist in their world, but they were not available to the public. In their home world, industrial food factories had used synthetic imitations of most plant flavors for quite some time, and increasingly they also produced authentic plant-based flavors and fragrances based on recent successes in their greenhouses. All of this provided a food supply that was varied, automatic, and free, so no one prepared food at home. And this was the reason why spices were only used in food production, but not sold for home cooking.

The friends enjoyed the novel experience with all the different scents, colors, and textures, but they were hesitant about buying anything since they had no use for such things.

“This is so interesting – but what do people do with it?” asked Belinda

“They use them to prepare their own food,” Irene explained.

“Oh, I see,” said Belinda, trying to wrap her head around the idea of a home-based food factory.

“Why would anyone want to make food from components?” Aurora wondered. “I do not buy my car in components, either.”

“Well,” said Catharina, “I guess you could individualize the dishes. That may be one advantage.”

“And I read somewhere that the process of preparing food together contributed to bonding among humans,” Irene added.

“That is weird,” said Belinda. “If you work together to produce something that cannot simply be produced by machines, that should provide a better bonding experience.”

Aurora nodded, thinking of the considerable effort it had to take to replicate at home the efficient industrial processes of food-making.

Next, the women entered a perfume store. Aurora felt as if she had run into an invisible wall of smells.

“What are these for?” Belinda wondered. “For home cooking as well?”

“No, at least not for the most part,” said Aurora, drawing from her knowledge of terrestrial culture she had extracted from those old, forbidden books. Then she added in a lower voice: “Less refined races than ours use them to overpower their animal scent.”

“Less refined ... how rude,” exclaimed Belinda, covering her mouth with her hand because her words had come out so much louder than she had expected.

Aurora and Irene were already on their way to sniff through whole batteries of little flasks; some of them were complex mixtures of different fragrances, but others were based on single plants, such as violet, lily-of-the-valley, or rose. Aurora grabbed a vial that was simply titled “Rose”. She liked the scent so much that she purchased a supply.

Next, they entered a store with terrestrial delicacies. There were animal products like sausages and cheeses; they marveled at these raw, unrefined foods that were based on live creatures. It was not only Aurora who was repelled by the idea of eating such things.

But this store also sold some little, brown, edible squares that kind of melted in one’s mouth and were warm and sweet, with a hint of bitterness. Aurora had never eaten anything quite like that; she wondered what it was.

Catharina, the biologist, explained: “It is made of a part of a plant that you can get back home, too. But the other part is milk – impossible to get back home. It’s called cho-co-late.”

“Cho-co-late,” Aurora repeated slowly. The word tasted almost as good as the product. “And why is it again that we cannot have it at home?”

“Milk is made by cows to nourish their calves; I don’t think we will ever have cows. Milk is a complex substance; no one has seriously tried to reproduce it artificially.”

Aurora understood that what she had tasted was, in part, made of a liquid that cows secreted to feed their young. Things were getting stranger and stranger.

“It is so delicious, though,” Aurora sighed. “Maybe you should make a cow in your lab so we can get the milk for the cho-co-late.”

“I’m sure I could,” replied Catharina proudly, “In my lab, we can make almost any animal from Sol-3. Pretty basic genetic and cellular biology. We can grow them to the embryo stage. Once we cut off the umbilical cord, we can give it to you to raise it.”

“Plus, add some cow dung,” Belinda added, remembering what she had learned from the rhino discussion.

“Right,” Catharina nodded. “Fast learner! I forgot to mention.”

“Sounds like a plan,” said Aurora and smiled as she bought quite a stock of chocolate for her own consumption and as gifts as well.

In the evening, after they returned from the mall, their short but enjoyable break came to an abrupt end when Regina called everyone for an impromptu meeting. As soon as everyone had gathered and quieted down, Regina made the following announcement: “Professor Nicolas Munyakazi from Sol-3 will visit us tomorrow to welcome us to the Sol system and to give us a presentation of his institute.”

## Chapter 3: Terra

“The Sisterhood?!”

Nick Munyakazi exclaimed. It didn’t happen every day that a massive spaceship like the *New Horizon* docked at LSC’s lunar repair facilities. What was even more unusual was that this spaceship came out of nowhere, without advance notice, apparently for some emergency repairs. But what was most extraordinary of all was the origin of the ship: Omega-1.

“Are you sure?” Nick asked in disbelief.

“Yes,” said Keza, “it’s all over in the news.”

“What in the world would such an illustrious club seek in this forlorn hole of the Milky Way?” he wondered aloud.

“Well, apparently, it was an emergency, so maybe they didn’t have much choice.”

“What kind of emergency?”

“Asteroid impact, I’m hearing.”

“Hm.” Nick fell silent for a while. “But didn’t I hear they exited hyperspace just a few 100 astronomical units from here?”

“Yes.... Why?”

“There are no asteroids in hyperspace. And having hit one around here is unlikely, particularly in the solar system where not much is going on anyway. The impact must have happened shortly before entering hyperspace. And if they had been hit close to home, why not return and do the repairs there? All of this indicates that they exited hyperspace near us purposefully – and for what purpose, if not to visit us? There’s no other destination around here. Therefore, I really wonder: What the hell are they looking for in this half-forgotten sector of the Milky Way?”

Keza looked at him with a frown and said: “I’m sorry, Nick, but that was too fast for me. Sometimes I worry that you’re too smart for your own good.”

Nick considered explaining it again, more slowly this time, but he decided against it, as for the moment, he had other fish to fry. He had to go to his annual trip to the United Nations or U.N., which was in fact Earth’s government. The purpose was to plead for funding for

his institute and its sanctuary for another year, which was not his favorite chore. And matters were not getting any easier, now that there were more and more questions and doubts about his value argument for a large, live genetic repository. And those damn Sisters from Omega-1 were to blame for that.

“Wish me luck,” he said as he waved goodbye to Keza and headed out of the building toward his helicopter.

“Wait,” Keza ran after him. “Do you have your briefcase? Your computer? Your itinerary? Your toothpaste?”

“Yes – yes – yes – no,” he replied. “You got me. You always get me. How do you do it?”

“It’s not that hard,” she said and handed a sealed package to him, with toothpaste and toothbrush. “You always go at a hundred miles per hour, so you always drop something. You’ve got to slow down.”

“Okay, okay,” he said. “I know you have a point.”

“At least you make it easy for me and always forget the same thing. I have quite a supply of these packages in my desk drawer.”

“Keza, I wouldn’t know what to do without you,” he said, and he meant it.

The helicopter ride to the airport was going to be fun, but he dreaded the flight to the United Nations. He took some rounds above the sanctuary and spotted a large herd of antelope. He grinned as he turned about and drove the aircraft down into the herd. Dust swirled up to his windows as the flock dispersed in panic.

“Gotta have some fun, too,” he mumbled. Somebody had to do it.

It was only a short flight to the intercontinental airport where he boarded a jetliner. He hated flying; it was generally dull, but what was worse was what he saw when he made the mistake of looking out of the window: Beyond the edge of the wildlife sanctuary, there was a vast expanse of prairie and woodlands, void of human settlements. It was still uninhabitable due to deadly radiation from the Great Nuclear War. Nick had ambivalent feelings about the area. On the one hand, it was a natural refuge for animals that was much larger than his sanctuary; on the other hand, there were no humans in that area to catalog species, mark, track, and genotype individuals, and ascertain a degree of biodiversity. In all likelihood, this whole vast area was

populated by just a few dominant species who could deal with the radiation level, but no humans had ever been able to check.

Beyond the radiated area, the endless desert started. Nick knew its history – this was all due to the Secular Global Warming Disaster that had started more than a thousand years ago. Things had been stable for the last hundred years, but the damage was done, and it was huge.

Nick was painfully aware of who had saved the planet: the Sisters, meaning the women from Omega-1. They had the best scholars and planetary engineers, and their mission was to make promising new planets habitable. For them, it had not been such an insurmountable task to fix up this old planet that was already habitable but was sliding down the wrong path.

Now that was all well and good. But what had the Sisters demanded as payment? The right to mine for rare earths in the soil underneath his institute and its sanctuary. Of all things. It was as if Earth, in order to survive, had been forced to sell her soul.

No wonder then that he harbored mixed feelings towards what he called “the Sisterhood.” This was actually not such a bad term; much worse ones were available for the inhabitants of Omega-1 in the terrestrial human vocabulary.

Time passed quickly as he was lost in thoughts. The desert turned into wetter and more fertile land. But it was a desert of a different type, an endless array of fields with shapes optimized for irrigation; the difference was that its predominant color had changed from red to green. Finally, this orderly landscape gave way to regular patterns of human settlement: a vast expanse of clusters of housing, connected by a network of traffic arteries.

After the landing, he checked in at the airport hotel, where he was greeted as a well-known guest. He spent the evening in his room, finalizing his presentation and preparing for his talk.

The next day, his presentation at the United Nations did not go all that well, just as he had expected. His institute’s contribution to bio-engineered plants was once more acknowledged; it was the animal preservation whose value was questioned.

In particular, he remembered how the committee chairperson challenged him: “For more than a decade, you have argued that it was

in the ancient wisdom of the animal genome where the key to defeating human disease was to be found. And I can see how we have been able to patent and sell the sequences of improved genes for some rare diseases. Not being an expert, I understand the improvements were made based on animal sequences ... but there has been no real breakthrough in treating our most common diseases.”

“We’ve recently made important discoveries in the genome of apes that will allow us to manipulate the lipid metabolism ...”

“Yes, I have heard of it. And this would take on one of our most deadly diseases. Let’s hope for the best ... but why could something like the Anti-Oncogene BLC-115a not come out of the IDUNA?”

Of course, the anti-oncogene again. Why did this emerge from evolution modeling on the Sisterhood’s supercomputers rather than his Institute for Darwinian Research on Unaltered Nature, or IDUNA for short? The answer was forming in him, but it was too devastating to express in this laypersons’ forum; too easily would it be misunderstood. And besides, it was just a thought growing in his mind, just a theory.

Sometimes it was best to be silent.

In the end, he got the funding for another year. The agricultural productivity gains based on intellectual property from IDUNA were acknowledged. And in addition - he sensed this very clearly - the officials from the United Nations were really his allies against the United Worlds Organization or UWO. It was little Earth’s government against the powerful interstellar government of the settled universe. They were just giving him some tough love to help him mount his defense against the real enemy. Perhaps for different reasons, the United Nations and he were joined at the hip in their fight against foreign land use rights. Finally, he was aware that his own scientific reputation and contribution had played a role as well in securing the funds, and he tried to find solace in this fact. This solace was needed because the writing on the wall was clear: The future of IDUNA, his passion, duty, and life’s mission, was no longer secure.

On his way back, Nick looked down on the devastation again: Endless patterns of human settlement giving way to the equally boring patterns of agriculture, designed for maximized production and natural disaster control. Then they reached the seemingly infinite desert that eventually turned into the irradiated land that was

overgrown by dense jungle until they finally reached the edge of his sanctuary.

He could not help but see parallels to his own life: There was the sanctuary, vibrant with the diversity of life, but beyond that, nothing but chaos and desertification. Was it then a wonder that he worked from early morning to late night? Couldn't he be forgiven for devoting years of his life to the institute that he could have spent with his family – years invested to follow his duty of representing the sanctuary in front of the interstellar scientific community? He thought about his failed marriage and of his spotty relationship with his son. What a downward spiral it had been. It was also the desertification of his own life that had led him to divert ever more energy to the sanctuary, which in turn only grew the desert within him. A truly vicious cycle. He thought about his former wife; how tough she had been on him for his absenteeism. He also thought about his son that he could not relate to, either. He felt an immense desire to be back at the institute as soon as possible and to plunge into all the work that had to be piling up on his desk.

But tonight, he would have to leave work at a reasonable hour for dinner with Immaculée, a beautiful black woman whom he had been dating for a few months. Perhaps his mother had been right when she said that he should choose a woman of his own kind. Immaculée was nice, agreeable, and supportive. Everything was perfect, so why wasn't he more excited about seeing her?

For dinner, he had chosen a garden restaurant at the margin of the sanctuary, so one could still hear animal voices at night. Untypically, he had arrived a few minutes early, so he sat at the table alone for a little while. The restaurant was on a hill, overlooking the gentle slopes that descended into the sanctuary. He had reserved an outdoor table in the garden section, and from there, he looked down on the edge of the preserve. It was dusk now, the time when numerous animals became active. He noticed a small group of deer crossing over the pasture. The woods in the distance were already impenetrably dark, but the air was still filled with bird sounds. He thought of the myriads of creatures, small and large, that were hidden from plain sight; cooler air was creeping up the hill from below, and it seemed to

him that the sanctuary had a slow and soothing rhythm, meshing with his own slow breath.

His thoughts got interrupted when Immaculée entered the garden. She wore her hair high, and she had large earrings on. Her dark skin was radiant; she wore a yellow summer dress that emphasized her curves. He was mesmerized by the smooth elegance of the way she moved. She had his full attention.

He stood up and embraced her to welcome her. They sat down and ordered drinks, and after some small talk, he explained to her how his day had gone.

“You did good,” she said.

“I’m not so sure,” he replied. “I don’t think I was that convincing with my value proposition of genetic diversity.”

“Why is that?”

“Because I’m not a salesman; I’m a scientist. See, to put it simply, my reasoning for why we need animals on Earth is that we need to study their genetic material that may contain the key to defeating human diseases. But my whole argument just got a deadly blow.”

“Blow? You mean the discoveries the Sisters made in their virtual worlds?”

“Exactly,” Nick nodded emphatically. This time, Immaculée seemed to remember enough from their previous conversations that he didn’t need to explain every little thing all over.

“Don’t worry,” she said softly. “Sooner or later, you will make equally important discoveries. Just give it some time.”

Nick shook his head slowly. How could he make her understand that there was a much deeper, fundamental issue? He struggled to explain it:

“I’m not so sure. See, we are looking at Mother Nature to release her secret recipe of longevity...”

“Yes?” Immaculée said attentively. Certainly, she was a good listener.

“But what if there is no such recipe because mother nature isn’t interested in individual longevity?”

“Oh?”

“Yes, ‘oh,’” Nick thought.

“But the good news is,” he said, “I am confident we’ll get funding for another year.”

“That’s good.”

“Yes. And even better: I’ve come to the conclusion that Earth’s government on my side.”

“That’s terrific. Those guys should believe in you – you’re a famous scientist, after all. So many people put their trust in you.”

“Yes, it’s terrific – and no, I don’t think they believe in me that much. It’s something else. I have been wondering for some years now why they still support me.... I think I’m finally beginning to understand what that ‘something else’ is.”

“What is it?”

“They’re not keen on giving up the land of our sanctuary to extraterrestrial owners,” he explained.

“Now you’re confusing me,” Immaculée said as her eyebrows drew closer to each other which made the skin on her forehead break into cute little wrinkles.

“It’s a long story. But as long as they can give me science grants that I use with scientific purpose, we can defend the sanctuary, for its scientific virtue. Quite some time ago, this was confirmed by the UWO in response to a complaint brought forward by the Sisterhood. At the time, the sanctuary’s scientific promise was viewed as more critical to the general good than the Sisterhood’s mining rights to the land underneath it. This will work for a few more years, no matter what – until the UWO looks into it.”

“UWO ... you mean the United Worlds Organization, the government of the settled universe?”

“Exactly. They look at our scientific value claims with an outside view, and that may well spell trouble.”

“I see,” she said. And as so often, Nick wasn’t so sure if she only said this, or if she really got it. And he couldn’t be more explicit than he had already been due to the confidentiality of the matter. More likely than not, he had crossed some legal boundaries; what if it was all for naught and she still didn’t get it?

“I mean the UWO lawyers,” he said, and that was how far he could go. No farther.

“I see,” she said again, and his heart sunk.

She seemed to worry about him, noticing how troubled he was. That was the other thing about her – not only was she a good listener; she was also a good observer, responsive to his needs. She said:

“You’re so hard-working, and you’re famous. You worry too much. You’ll be all right.”

Everything was that simple to her. And perhaps she had a point: He would be all right, as a person. But what about the sanctuary? And how ‘all right’ would he be if it had to perish? He felt obliged to let her know how, in the past, his stewardship for the sanctuary had taken over his private life, leading to his divorce. Immaculée listened empathically, and when he was finished, she assured him that his wife should have supported his cause one hundred percent.

“What if saving the sanctuary required that I go on a mission that would involve interstellar travel?”

“I would wait for you.”

“Do you realize what you are saying? Even if it’s a trip of just a few months for me, what if it took three years of Earth time before I returned?”

Now she fell silent. And she teared up a little. This is how she was – such a sincere person. She did not just talk to talk; she pondered the severity of the question and then answered.

“I would wait for you,” she said with conviction. “You are serious; you have a mission. I do respect that in a man. In fact, that’s what makes a man, in my opinion.”

It was the most profound thing she had ever said to him. And yet, it wasn’t what he needed to hear right now. What about “You can’t be serious?” What about “I would beat you to pulp upon your return?” If only Michele had told him that, rather than sitting in a corner sulking. What about “There is no way I would allow that. If it has to be, I would go with you.”

He had talked so much – and she had listened so much – that time had advanced to almost midnight. All the other guests had left; server robots showed up only occasionally and moved silently; it had become quiet in the garden restaurant. There, all of a sudden, they heard the sound of a night bird.

“Listen!” he said.

“What is it?” she wondered.

“It’s a nightingale.”

He fell silent, and they both listened for a couple of minutes. There was something about the nightingale’s song that stirred him up in his bones.

“It’s very nice,” she said.

Very nice. Well, one could say that.

When he ordered a Galactic Gargler from the martini menu, she ordered the same. The same damn drink. From a list of forty choices. Another sign of an all-to-perfect harmony. The thought shot through his mind: *If something seems too good to be true, it usually is.*

Finally, back at work. It was a sunny morning, and as Nick smelled the coffee that Keza had already prepared, his mood started to improve. Quite a lot of jobs had accumulated that were becoming urgent: He had to sift through a pile of resumes for a Director of Herd Management; he had to get through final approvals for the hiring of a Manager for Clamping (his term; the official title was Manager for Animal Marking and Tracking); he had to evaluate various proposals of researchers who wanted the rights of entry to the sanctuary for their multiple projects; he had to initiate proceedings for several breaches into the sanctuary that had happened, etc. etc. etc. – It was going to be a busy day. His mood improved even more.

“Nick,” Keza said, “there are several things to take care of that haven’t made it to your inbox yet.”

“Shoot,” he said, looking up from behind his computer.

“The Healing Camp has filed many exceptions ...”

Oh, that again. This was becoming an everyday thing. Against the parameters he had set, the Camp wanted some of their patients to extend their stay in the sanctuary; apparently, they didn’t heal fast enough (or the Camp people didn’t give up on the patient quickly enough). This was annoying, but as long as they understood that extending the stay of an existing patient meant blocking a place for a new one, he was okay with it. Therefore, he usually approved those, but he always attached his standard reminder of that consequence.

“And you’ll need to go through some legal papers to prepare for the meeting with the United Nations lawyers regarding the land use issue.”

Now, that job cast a shadow on his mood. It wasn’t a crisis yet; it could sit on his desk while he was working off the tasks that seemed more urgent and enjoyable. Scant chance that he would get to it today, on his first day back. Once it was a crisis, there would simply not be enough time left to plunge into this morass excessively, which was one

nice feature of crises. He knew that work tended to expand to the space allotted to it, so being crunched in crisis mode would be the best means of preventing him from spending too much time on it. How was that for a plan?

“And finally – you need to deal with my maternity break.”

Nick stared at Keza’s belly. This was another thing that refused to go away. He had vastly overestimated the probability of pregnancy not being a real pregnancy; admittedly, there had been some wishful thinking involved. But now that he looked at it, it yelled back at him: I-am-not-going-away. On the contrary: I-am-going-to-be-bigger EVERY SINGLE DAY. Darn it.

“Well... I mean ... we did advertise, didn’t we? So, do we have resumes?”

“Nick, I put a pile of resumes through three weeks ago!”

“Okay, I’ll take a look at them; I’ll make it a priority.”

This was almost a decent crisis now, which gave him a good boost of energy.

As he browsed through the resumes for Keza’s temporary replacement, a news flash came up. His computer constantly produced news flashes to distract him from work, and he had not been able to figure out how to stop the annoying feature. He tried to ignore it, but from the corner of his eye, he saw something with “Sorority” and “Moon,” so he just had to look. He captured that the repairs of their spaceship, the *New Horizon*, would take quite a while longer than expected. It seemed like those girls would be stuck on the Moon for quite some time.

He went back to the resumes and found an application by a young woman who just graduated from a local university with a Ph.D. in Biodiversity. That seemed to fit the ticket. Maybe some growth potential here into a permanent position. Perhaps she was cute? He always wanted to mentor a young person. If she was nice and pretty, she would lighten up his day a little, and he could be her fatherly mentor and advisor. He started liking the idea. He started imagining how this would go ... but then his mind wandered again, and he imagined how it had to feel for the Sisters to be stuck on the Moon. He knew the place; he had been there just a couple of years ago when he returned from the CXXIIth Interstellar Congress of World Architecture, also known as ICoWA. His layover turned out to be

longer than planned, because his shuttle back to Earth got canceled due to a technical issue, and boy, the Moon was not the most exciting place to get stuck. Of course, there was the famed Mall on the Moon, but in reality, most of the stuff they sold there was for foreigners; he could get them down here as well, and for much less money.

The one thing up there that he had enjoyed was the “Verwoerdarium” on the lunar space station. The station was in lunar orbit and hence provided zero gravity; the Verwoerdarium was a large cube or box where players could use their limbs or a hockey stick to hit balls so they would change their trajectories with the goal of getting them to fly through holes in the walls. The team who managed to make more of their balls disappear through the holes won the game. Basically, it was a three-dimensional pool game. It was challenging at first, not only because it was in three dimensions. The other difficulty was that different from the earthbound pool game, without gravity the balls kept moving, decelerating only gradually due to air friction. But once you got the hang of it, it was a lot of fun.

Anyway, it was unlikely that they would find out about this less well-known attraction. For sure, they would discover the Mall on the Moon, which would keep them entertained for a day or two. It should be of more interest to them than to him, as the Mall offered many products that were unique to Earth. But after that, they would be bored out of their minds. Meanwhile, he was stuck down here on Earth and had to go through those resumes.

“Keza,” he called, getting back on track: “Why don’t we contact this young lady, Dr. Ntawulikura? She seems qualified; we should interview her.”

“Why did I think you would pick her?” Keza mumbled and got to work.

“She seems very goal-oriented,” Nick said, somewhat defensively. “She has a Ph.D.”

“I don’t have a Ph.D.,” Keza said, wondering why the intern to replace her temporarily would need to have an advanced academic title.

“Yeah, but you are so stubborn you would have gotten one if you had wanted to. I take the Ph.D. as a measure of stubbornness, in a good sense. I need someone as stubborn as you.”

Keza grinned at this strange compliment and finished her email to Dr. Ntawulikura.

Nick's thoughts wandered back to the Moon. Someone had to cheer up those girls up there. They might not even have heard about the Verwoerdarium. And besides, with that much time on their hands, why wouldn't they...

... but on the other hand, he remembered them from ICoWA, the Interstellar Congress of World Architecture: They were kind of dour – too smart for their own good. No fun to be around them. And some of the projects they were working on had developed into a real threat to the value proposition of his institute and its sanctuary. That's why quite some people in his staff considered the Sisters as the enemy. He, Nick, did not like to think in such black-and-white terms. After all, they were scientists just like he was: truth-seekers who were not always concerned with the consequences of their discoveries. And perhaps reaching out to them would be a nice gesture – like an olive branch – that would be appreciated. Maybe this whole situation represented a unique opportunity for a Public Relations action that would help them view the sanctuary from a different angle, perhaps softening their stance.

“Keza,” he said, “I have this crazy idea.”

“What is it?” she wondered apprehensively.

“I'm thinking, why don't I fly to the Moon and pay those strange Sisters a visit.”

“Why in the world would you do that?”

“Oh, I don't know. Isn't there an ancient saying that you should keep your enemies close to your chest or something?”

“Yes: ‘Keep your friends close and your enemies closer’. Goes back to an ancient Chinese wise man.”

“You know everything. I'm going to miss your words of wisdom when you are on maternity. So, if we apply this to the situation at hand that fate has given to us ...”

“Okay, through this lens, it doesn't sound completely stupid.”

“Thanks. And besides: Earth should really do more to boost its reputation. For starters, we could be better hosts. Those poor stranded girls must be bored out of their bio-engineered power minds.”

“Maybe those minds are more boredom-resistant than you think. Maybe they have a mode of ‘close your eyes and chuck it until it is over?’ Like a battery-saving mode.”

“Haha, very funny. I doubt it, though. Maybe some of them would like to see the sanctuary? I can’t really see a downside. On ICoWA, I really didn’t interact a lot with them. They tended to stay away from social events... perhaps there’s something to discover for me as well.”

Now, that last phrase put Keza on high alert; it was not hard to guess what kind of discoveries he might have in mind. This kind of thing had to be avoided.

“Why would you go through the trouble to fly to the Moon? Couldn’t you have a virtual reality meeting with them? I mean, your 3D image would almost be as good as yourself.”

“I don’t know. The thought occurred to me, of course. But I’m not convinced that my natural charm would emanate effectively from my 3D image, and after all, this is a PR gig.”

Keza tried to hide her laughing.

“And besides, I’m thinking of taking them to the Verwoerdarium.”

“All right. You probably know that the LSC has a daily shuttle, so I guess I’ll go and book that for you.”

