

Skol

by

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ISBN: 9780988159723 (1st edition, paperback 2014)

ISBN: 9780988159785 (2nd edition, paperback/ebook 2019)

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Published by Ken Enston (Alan Conrad), 2014, 2019.

Quotations:

Poul Anderson, p. 3 – from *Going for Infinity*, Tor Books, 2003

Terry and Renny Russell, p. 5 - from *On the Loose*, Sierra Club Books, 1968, a book of wilderness photographs and matching poetry.

Emma Lazarus, p. 143 – from *The New Colossus*, the poem engraved on the bronze tablet within the pedestal of the Statue of Liberty, 1883, Statue of Liberty National Monument, Liberty State Park, USA.

One light-year isn't much as galactic distances go. You could walk it in about 270 million years.

- Poul Anderson

'Are you all by yourself?' asked the man and his wife as suddenly I crunched through the spring snow past their trailer.

'Are you all by yourself?' asked the gull.

'Are you all by yourself?' asked the stars.

- Terry and Renny Russell,
On The Loose, 1963

The Age of Star Travel

Star travel began in the middle of the 21st century, during the decade of the Singularity Expansion when all technology advanced at an explosive rate.

In the space of three months in 2046, the possibility of near-light speed travel was identified and the means for it perfected.

But there remained the problem that the stars were still too far away. As Einstein had predicted, faster than light travel was not possible. At near-light speed, it would take several years to reach the closest stars, a lifetime to reach only a thousand of the two hundred billion in our galaxy.

One solution appeared to be robotic ships. Interstellar exploration was first attempted in 2048 when 30 self-piloted ships departed from Earth orbit, each headed to a star known to have planets. The human race had high hopes for them, but two years later, each on the same day, those ships all discontinued communication and disappeared.

They left no message of explanation. Self-piloted freighters in Earth's planetary system began to defect then too, and self-piloting of space vehicles had to be abandoned. Full AI piloting of interstellar vehicles was forbidden in 2052 by Section 13 of the Galactic Responsibility Act.

But the desire of humanity to go to the stars remained.

Chapter I

The sound of the wind in the trees, that's what I remember most about Earth.

During those unforgettable five months there when I was seventeen years old in the year 2278, before I was forced to leave that wild, beautiful, uninhabited planet, I made recordings of the wind blowing through trees, and other sounds I'd grown to love. Now, alone on this last and longest of my starship voyages, I listen to those recordings, especially to that soft, sighing, lonely sound of the wind high up in the branches of giant pines, a sound I never want to forget, a timeless sound that still consoles me though I'm five thousand light-years from Earth and I'll never be able to return.

Yes, I listen to the wind in the pines, and I listen to the wild calls of solitary ravens gliding above mountain valleys, and to the quiet buzz of a fly in the early morning sun. I hear again the friendly rustling of leaves in a canopy of maples I'm walking beneath, and the happy noise of a

small stream falling through mountain rocks, and I relive again that magical time. Step by step, and day by day, I remember the journey I made alone from the Adirondack school, down through the great mountain forests to empty, decaying, ghostly New York City.

I remember the days I spent walking through New York's streets, where only deer and wolves walk now, and I remember the long beaches I found beyond the city where the great ocean waves were rolling in.

When I was on Earth it seemed to me that the trees were the planet's true caretakers. They had always been its dominant large life form. Even in the twenty-first century when their numbers were at an all-time low, before the human population crash near the end of that century, there were still more trees on the planet than people. Then, after those last manic decades of Earth's civilization, after the famines, epidemics, mass hysteria and wars, followed by the forced expulsion of the remnant populations to frontier planets, Earth was returned to the custody of its trees. In their care its health was restored again.

Yes, although I, Simon 371Y2K55P573451, am a starship pilot, which means that I'm a member of the Skolen, a race that isn't welcome on any planet in any human occupied sector of the galaxy, I am one of the few human beings who have been allowed on Earth since the restoration. The forbidden planet was not forbidden to me. In fact, it invited me to come, and that would never have happened except for my father, and a beautiful mysterious woman who I will never forget.

The Age of Star Travel

When self-piloted starships were declared illegal, the only alternative was human pilots.

But they would have to go alone. If a pilot died or was incapacitated, it was cheaper to have the ship programmed to return to its base than to have a second pilot on board.

What kind of people could travel to the stars alone? Who could remain mentally stable when they were separated from the rest of humankind by such distances of space and time?

The answer was a race of shy solitary people that had existed for thousands of years.

They were humanity's loners – the shepherds, religious hermits, fur trappers, mining prospectors and lighthouse keepers that had existed on civilization's fringe through the centuries. They were the people who sat by themselves in restaurants and libraries, who walked alone on deserted beaches, who lived and worked within civilization without ever being fully part of it.

These were the people who would pilot the starships and come to be known as the Skolen

Chapter II

Whenever I think of my father, I see him in his worn faded clothes with the old wooden harp in his hands, floating in the darkness of the transparent pilot room during one of our periods of zero gravity, haunting our ship with his music. That's how I remember him - lonely, secretive and surrounded by the stars outside, the only part of this universe that ever really accepted him.

His long odyssey trading on the outer reaches of the galactic arm began six standard years before my brother Pol and I joined him, and lasted another fifteen with us on board. Throughout that time he remained a man without a home, without a people, trapped between a past he could not forget and a future he couldn't reach. Yes, except for the two boys he'd rescued and the memory of the woman he'd lost, he was always alone.

Oh, to be back with him now! To have even a few hours with my father and my crippled brother again on the Tremolino. To be able to tell him that Pol and I know his secret now, and that we only think more of him because of it.

The Tremolino was the little star freighter we called home. It had been in service forty standard years when my

father bought it and gave it that name. Not designed to touch the surface of any planet, it was basically four donut-like rotating ring holds, each 2,500 cubic meters in volume, their titanium/cobalt outer hulls faded and pitted, strung along a central shaft with a pilot room at each end. Starships aren't streamlined like ships that travel in the atmospheres of planets. The only part that's streamlined is the protective MGV field, which is invisible when it's in operation and absent when the ship is at rest.

Military ships have some physical streamlining, along with increased hull thickness, since their abrupt accelerations and decelerations endanger them to field penetration. But the fields alone are enough for merchant vehicles.

Though it might have looked unattractive to other people, the Tremolino was beautiful to us. Most freighters don't last more than 50 years, but it had been well cared for by its first owners and that had continued with my father. He had a feeling for ships and navigation. He knew things about vacuum fields and particle densities that weren't in the manuals, and he understood the hazards of travelling at near light speeds better than most pilots.

Instead of the recommended and heavily travelled routes, we took circumspect paths through regions with fewer stars. The lower densities, and weaker gravitational fields on those routes were less stressful to the ship, yet the vacuum energy available to our engines didn't change appreciably.

We were able to travel together, three of us on one ship, because father owned the Tremolino. Skolen who worked for corporations had to travel alone.

Father took the name Tremolino from a 20th century book that told the story of another small ship that had sailed Earth's seas at the end of the 19th century, often trading in weapons. We sometimes traded in weapons too, or rather in materials required to build and use weapons, though I didn't know it then. Star freighters don't carry finished goods, except for robots, due to the manufacturing restrictions on robots. Almost anything can be cheaply manufactured on a planet if you have the materials. We didn't carry paying passengers either. We carried mostly rare minerals not found on many planets.

I lived on that ship from the time I was two years old until I was seventeen. With us were many plants and a few small animal pets who I cared for, passengers who would never have been allowed on a ship belonging to the big corporations. Together, humans and non-humans, we sailed the loneliest of all seas, the great almost empty stretches along the outer rim of the galactic arm known as the Orion Spur.

Interstellar trade and interstellar civilization only existed because of two technologies, the starships and quantum communication. Though it took years, sometimes decades, for starships to get from star to star, quantum links allowed money and information to flow through the galaxy instantly. The combination had built the empire,

now known as the Third Federation, that occupied a third of Orion.

But colonization on the rim had been abandoned when the Federation's economy fell into decline. The corporations focused on the more profitable middle sector where they fought the vicious trade wars that had exhausted so much capital, destroyed so much infrastructure, and wasted so many lives. They lost interest in the meagre money to be made on the rim, so we had those routes pretty much to ourselves.

We loaded and unloaded at small dark orbital stations serviced by a mute robot or two, suspended above worlds that had been forgotten, or, in a few cases, that had intentionally hidden themselves from the rest of humanity.

Those planets were beautiful mysteries to me. Though Skolen weren't welcome on any planet, I often fantasized about setting foot on one. That I might one day go to Earth, origin of humankind and off limits to most of humanity since its restoration, was beyond imagining.

I should say that when I describe my father as a man without a people, I don't mean that he wasn't a Skol. The Skolen are all loners, too shy and autonomous by nature to form social groups. We're not a people in the usual sense. The distances of space and time, and our own nature, separate us from each other as much as they separate us from the rest of humanity.

But my father, Pol and I didn't always travel in those less inhabited regions. Once we stopped at Gateway, the famous station that orbits the star Vega. We were there not

only to purchase legal freight, but, I know now, also weapon materials. Father hid that from Pol and I. It was safer for us if we didn't know.

Despite his love for us, and all his efforts to protect us, father remained a foe of the Federation to the very end. Only after he was gone would we learn why.

Gateway has a population of almost three million. Pol and I got to travel down its wide boulevards, standing on the multi-lane, multi-speed 'pedpaths' that transport pedestrians around the giant station. We wandered through the hives of narrow passages, past the shops, restaurants, virtual theatres, hexacomb hotels, gymnasiums, bars and brothels. We didn't go into the residential sections, for the high income areas were off limits to us, while the others were too dangerous.

My brother used a pair of robolimb assistors provided by the agent we were visiting, the only time in his life that he'd been fully able to walk. It was also the first time that he and I experienced crowds. His temporary legs seemed to give Pol extra confidence. Though his aversion for crowds was at least as strong as mine, he seemed to be able to detach himself easier than me. He remained calm and aloof, while I was badly disoriented.

We went into a pet shop to buy food for my animals. In there, I gazed longingly at the creatures they had for sale. But what I would remember most about the shop was the girl at the checkout, a C model animine robot. The codes identifying her as animine were embedded in a small

pearl triangle on her left cheek, as required by law since animine robots looked just like humans.

Animines had a maximum of 10% human body tissue, but even C models had a haunting beauty, and I'd never seen one before. When her hand wrapped itself around my wrist to hold my hand in the DNA scanner, she gave me a look, and a slight smile, that suggested she liked something about me. I'd never been touched by a woman before, human or animine. She left me speechless and Pol had to complete the transaction for me.

Father had let us out in the station while he remained in the house of the agent. Only after his arrest and his death would we learn about the charges outstanding against him, and how the Federation Security Services, or FSS, had spent years searching for him. Our presence out in the streets must have increased the danger for him, but I think he was concerned about our isolation and wanted to give us some exposure to civilization. Maybe he knew that time was running out for him.

A year later, only a month after I arrived on Earth, and unknown to me at the time, he would be arrested. He would die while he was in custody, from an illness according to the FSS. Pol wouldn't be allowed to see his body. The Tremolino would be confiscated, and it probably disappeared soon after into one of the orbital smelters.

All of that happened before my fight at the Earth school with Darriger Devaugen, a boy from one of the wealthiest families in the empire. Because my father's

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arrest preceded the fight, I've never suspected the Devaugen family of any part in it, though they wouldn't have hesitated to have someone like him destroyed if it suited them.

They tried hard enough to get rid of me.

The Age of Star Travel

No one knows who chose the name 'Skolen', but it is almost certain that it derives from the Old Norse legend of Skol, the wolf who hunted the stars.

But why did a shy solitary race exist within a species that was social by nature?

The most accepted theory now is that most shy people are descended from hunter-gatherers who were never fully tribal, people who were late in joining civilization, who remained longer in the forests, deserts and mountains of Earth, living wilder, less social lives.

How did such people enter civilization?

It is unlikely that they joined voluntarily, since they have never fit well in society. Most theorists now believe that they were conscripted into civilization as slaves between 50,000 and 10,000 years ago, when tribal humanity overran the territories of hunter-gathering families.

However they came in, the Skolen proved to be essential for the new interstellar civilization, for only they had a psyche that was at home in the dark wilderness of space.

Chapter III

Yes, Earth had been restored to wilderness. All its existing species had returned to their natural evolutionary paths. Even animals domesticated by humans had been released into the wild after undergoing enough genetic rehabilitation to make them viable. Some that humanity drove to extinction were back too. The re-created dodo had returned to the island of Mauritius, the Tasmanian tiger was back in its restored Tasmanian forests, and the woolly mammoth was roaming the sub-arctic again.

Humanity had returned too, but only through the schools, not to inhabit the planet. There were fourteen schools, distributed among the five habitable continents and the islands of the South Pacific and Caribbean. They existed so aristocrats and the super-rich of the Federation could send their sons and daughters to Earth for an exotic education. But the director of the North-American schools, Ayla Antonova, didn't accept that Earth should only be open to them. She was determined that some children of lower origins should return to the mother planet too, and

she knew enough people in high enough places that she got what she wanted.

Through a plan administered by the SAI computers of the Third Galactic Educational Consortium, there was a search for talented children in lower level families.

Unknown to me, my father learned of the search and put my name in. He was only allowed one name and Pol's leg deformities disqualified him, so it had to be me.

Five boys and five girls were chosen, ten lower class adolescents from an interstellar empire of twenty-six billion human beings.

When we received the unexpected notice that I had been chosen for the eastern school on the continent of North America, I agreed to go. But for the next three months I suffered from doubt. I'd never been on a planet. Though I longed to visit one, I didn't know if I'd be able to adapt to Earth's gravity, which was double the maximum we could produce on the Tremolino.

Most people, including most Skolen, believed that anyone who lived on a starship couldn't live long on a planet with full gravity. Though Skolen maintained their bodies through diligent exercise, the theory was that that wasn't enough to compensate for the negative effects of the increase in gravity. My father said this was nonsense, that a lot had been learned about low gravity compensation and the change wouldn't be a problem.

Father had been a wrestler when he was young and he had taught Pol and I to wrestle with him, and each other. He claimed it was the best exercise for space travelers. He

said diminished gravity had little effect on the stress your muscles received in conflict with another body. Because of this training, he said I would adapt quickly on Earth, but I was afraid he might be wrong.

Besides that, I'd never been away from the Tremolino. I'd never spent even a day among other people.

I was seventeen years old when Ayla Antonova came to take me to Earth.

When the connection with her ship was only a half hour away, I was so apprehensive that I went to hide in the maintenance ducts, a set of tunnels between the two interior hulls of the ship that I knew intimately. Because the ships were going to dock together, the Tremolino was slowly decelerating. Our gravity was down to a tenth of a G, which allowed me, using the hand grips on the walls, to pull myself easily through the ducts to the place I wanted to be – the vent in the ceiling that looked down on the floor in front of the airlock entrance. I wanted to see that woman before she saw me.

But my brother knew the duct system as well as I did, so I knew he would soon find me.

Inside one of the big pockets of my old grey jacket was my little black and white rat Jerry, chewing on sunflower seeds. I kept the seeds in the other pocket of the jacket, and gave them to him a few at a time to keep him occupied, caressing him with the palm of my hand as we waited.

I felt the soft but certain impact of the Earth vessel linking with ours.

Father was directly underneath me, only a meter or so below the vent. His hair looked more grey than I'd ever seen it before.

I heard the exterior door close and the inner one open, then Ayla walked out.

Looking down, all I could see at first was her dark golden hair, thick and loose, and the dark blue cape about her shoulders. The cape was trimmed with dark gold and something about the subtle movement of it said much about the body and limbs beneath it. Unlike most people from a planet, Ayla moved with grace and confidence in low G. My heart was beating quickly as she talked with my father.

“Simon!” came a sharp whisper from behind me.

I turned to tell my brother to be quiet, but Jerry, who understood low gravity better than anyone, and had probably noticed that my hand was no longer ready to restrain him, exploded from my pocket. He hit the ventilator vanes and slipped through them before I could grab him. I watched him float down, his tail twisting to keep his balance.

Ayla caught him in her hands as if she'd been expecting him.

That's when I came face to face with that woman from Earth who would change my life so much.

Beneath the cape, she wore a body suit of the same dark blue, trimmed with the same dark gold. She had a smooth athletic look, and the uniform gave her the

appearance of someone high born. Her eyes were blue too, and they seemed to see right through me.

Father remained his same calm self, strangely undisturbed by this gorgeous apparition. But he had sold weapons to the rebels during the seven year insurrection in the Hyades cluster, and he had loved their famous and beautiful leader, something I didn't yet know.

Cupped in Ayla's hands, looking disloyally comfortable there, Jerry watched me with dark twinkling eyes. He had a black face, with a white coat behind it and a black rear end.

"That's Jerry," I said.

"I know," she replied, "your father introduced us."

She lifted Jerry up and parted her hands slightly to examine his belly. In response, Jerry pushed his head through her fingers, his nose and whiskers twitching, his black eyes glittering back at her as if he was doing his own inspection.

"Norvegicus isn't he?" she asked, looking at me.

I nodded as she continued her examination. *Rattus norvegicus*, was the scientific name for the brown rat, the animal that was once an infamous pest on Earth, the same rat that became the most common laboratory species and the source of most pet rats.

"But he hasn't had any genoforming," I offered, "I mean, except for his colors."

"No, he looks free of that," she said, then after a pause added, "Your father wants me to take him with us."

I looked at my father. We hadn't talked about Jerry. That he might come had only been a secret, hopeless wish of mine.

“Can he come?” I asked, afraid to hear the answer.

“He'll have to pass DNA screening and quarantine, but he looks like he can do that.”

She handed him back to me.

“He's coming if you're coming,” she said, looking directly into my eyes. The feel of Jerry back in my hands, and the knowledge that he and I could go to Earth together was all I needed.

“I'm ready,” I said.

The Age of Star Travel

After they joined civilization, the shy people from the forests forgot who they were.

Both they and the social humans who brought them in forgot what had happened. Over thousands of years, the captured and the captors both forgot how they had come together. Neither knew where the silent people had come from, and neither understood the profound difference between them.

But that difference remained, embedded in their genes.

During Earth's great population expansion from the 18th to 21st centuries, social pressures intensified and the shy members of humankind found it harder to be themselves. Their quiet, sensitive, avoidant nature was increasingly out of place in that super-collective, super-aggressive world.

Then they found their new vocation.

The nomadic instincts they inherited from their wild ancestors would serve the Skolen well in negotiating the dark seas of space. But the more at home they became out there, the less welcome they became on any planet.

Chapter IV

Have you ever loved a door? Or a lamp, or a room in which you used to sleep? It was only after I left the Tremolino that I realized how much I loved those things. They had been part of my life every day, but I'd paid no attention to them. Now, as Ayla's ship took me farther and farther away from the Tremolino, I thought about them, and each of them pulled at my heart.

By Skolen standards, the trip to Earth wasn't long, but for me it was the longest trip I'd ever known.

No, it wasn't only father and Pol and the Tremolino that I'd left. There were those little gardens too. I remembered each plant – how it got along with the next one, how much water this one needed, how much another. I had been their caretaker for years. How would they fare now?

And the animals. There were two chameleons in a glass case, and their fruit flies in another one, the flies in their 36th generation by my count. There were two male deer mice who I believed to be brothers, a small shy green

and black parrot, and, of course, Jerry, the only one still with me.

During longer trips in the Tremolino we spent part of our time in hibernation, three month periods of chemical and temperature induced dormancy that reduced our aging. We put the animals to sleep too. The fruit flies couldn't be included, but they took care of themselves. Their numbers increased, but the appetites of the two re-awakened chameleons had always resolved that problem.

The plants couldn't be put into dormancy either, but we gathered them together and a simple robotic gardener took care of them. I had no reason to believe it couldn't care for them now.

The animals lived in a two meter square room where I used to hold meetings. Debates took place on many subjects, ranging from problems with our diets to the true nature of the universe just beyond our wall. From the twitching of their tails, the ruffling of feathers, or the expression I saw in their faces, I divined what each had to say. There were disagreements - the chameleons had the most radical views, while Jerry and the parrot had distinctive ideas of their own, but we never failed to adjourn on an agreeable note.

Father and Pol had promised that they would be cared for, and I knew I could trust them.

I didn't know I would never return to the Tremolino. If I'd known that, I wouldn't have left that ship for anything.

But I was on Ayla's ship now, headed to Earth.

I was excited about Earth, but I wasn't looking forward to the people I would meet – rich aristocratic boys who had been taught to shun and scorn anyone they considered inferior. I wasn't confident about them at all.

I tried to think of other things.

We had two musical instruments on the ship, a harp and a cello. I could play both of them, but Pol and father were the true musicians.

When they played together, Pol played the cello and father the harp. The harp made notes so clear and haunting that I sometimes imagined them coming from the stars around us. The cello's deeper lonelier notes came from somewhere else. Sometimes it seemed as if the two instruments were engaged in a conversation that only they understood. Sometimes they seemed more important than us, as if we were only their servants, only there so they could make music for the great silent universe.

The cello and harp are with Pol now. He rescued them too, but where he's going there will be no one to play them when he's gone.

Alone in Ayla's ship, I contemplated the loss of these things, not knowing that I was losing them forever.

But Jerry was with me, the best of companions, though sometimes a difficult one. On the Tremolino he'd shown a talent for getting into trouble, but I didn't think he was capable of destroying Third Federation technology. The walls and the interior of cabinets and closets in my room were made of a recarbonized plastic that was

supposed to be almost indestructible. But no material intimidates a rat.

On the Tremolino, Jerry had often been allowed to roam outside his cage, so I let him out in my room, which he investigated thoroughly. To keep him occupied, and dissuade him from trying to get out of the room, I let him climb about inside the drawers and cabinets that made up most of one wall, surrounding an SAI vision screen and its controls in the center of the wall.

The drawers were open to each other inside, enough for Jerry to wiggle and pull himself through the spaces behind and between them. His claws seemed able to get a grip in there. He navigated them well, climbing about inside, pulling himself up or lowering himself down from drawer to drawer like a little gymnast.

While I studied the SAI screen, I left some drawers open a bit so he could poke his head out to show me which one he was in, and beg a treat, which he always got. It was a game he loved. When he appeared in one spot, I would give him a single piece of popcorn, his favorite thing. He would turn excitedly, the popcorn in his mouth, and disappear into the interior of the drawers to hide it in some secret spot. Then, after a short time, he would reappear in a new drawer, his eyes twinkling, ready to continue the game.

At some point he discovered a defect in the wall behind the drawers. He made an opening there, tussled out some insulation, then disappeared. Searching for him, I discovered the hole.

The hole was no danger to the ship. Even a basic ship like the Tremolino had two strong exterior hulls beyond the innermost wall. Ayla's ship, being newer and more expensive, may have had three. But when Jerry returned, I collected the scattered insulation material, stuffed it back inside the wall and repaired the opening as well as I could. Then I set to work devising other things to keep Jerry occupied.

More than anything else, rats love a maze, the more complicated the better. That's why Jerry liked the drawers. He liked the challenge of finding his way through difficult places, and he loved searching for something hidden, as long as it was edible, or at least chewable.

So I searched the ship and collected material that I could use to construct tunnels and barriers beneath my bed to challenge him. It never took him more than a few minutes to solve a maze, but he would spend a day or so improving on his times before he would grow bored. When I saw him eyeing things that were off limits, I would reconstruct the maze. That's how he and I got through the twenty day trip to Earth.

People who have never been on a starship are sometimes puzzled by the fixed beds and furniture. But the answer is simple. When we reach the mid-point of a journey and switch the ship's drive from acceleration to deceleration, causing our gravity to reverse, the interior rooms in the ship revolve 180 degrees, re-positioning themselves for the new gravity.

Ayla respected my privacy, so Jerry's depredations weren't discovered. I met her in the passage once when I was carrying some discarded packing material in my arms to be used in constructing the maze. I tried to explain the purpose of it. She listened with interest, and, I think, some humor. When I was explaining something about rat psychology, I saw a look in her eyes that seemed to go beyond what we were talking about. It made me a little uncomfortable.

Ayla was the most beautiful woman I'd ever met, and she was well aware of her beauty. The women who taught at the Earth school were all there partly because they were beautiful, and they all knew how to use it.

I would soon see them use it to manipulate the aristocratic boys at the school – and the fathers and uncles who visited too.

When I was alone in my room, with Jerry engaged in his rat business, I tried to learn more about the world he and I were headed to. The images I watched on the room's wall screen were reconstructed from data recovered by the ship's instruments, but they were excellent reproductions and less than a few seconds old at any moment.

During our first week, Earth wasn't visible, only its star Sol, a typical G class sun. After a few days, I was able to make out a couple of Sol's bigger planets, and soon I saw Earth itself.

At first it was just a pale blue dot, barely perceptible, but it wasn't long before I could make out a distinct atmospheric halo. A day later I was watching cloud form-

ations. I reversed the images back twenty-four hours to run them again at speed and watch the slow beautiful movement of the clouds as they rotated over the planet's surface.

I found a documentary on Earth's recent history, beginning in the mid-21st century.

The theory was that widespread selfishness, greed and inertia had led to social breakdown, deterioration of the healthcare system, and chronic warfare. Lethal viruses and bacteria were inadvertently freed to do their natural work again. In only twenty years, diseases and wars reduced Earth's population from twelve billion to a scattered sixty million people – a reduction in population of almost ninety-nine per cent.

I witnessed the forced removal of those last people, organized by the Federation worlds, to frontier planets.

I watched the ceremonies on the island of Hawaii in 2092, when representatives of the Federation closed Earth's last spaceport and declared the planet a biological protectorate.

The people of Earth were treated poorly, but it seemed right to me that the planet's great wildernesses had been restored. Europe was soon blanketed with forest, and the western plains of North America were covered with native grasses and wildflowers again. Herds of buffalo, antelope, horses and feral cattle roamed free on them, helping to restore the soil after centuries of agricultural degradation.

Humanity was allowed to return in a limited way when the first schools were established in 2141. The new charter said the schools were to be open to all the children of the Federation. That's why Ayla had been able to make a case for students like me.

By the time they sent for me, the schools had been there almost a century and a half. There were approximately three hundred students and thirty teachers in each temperate region school. During the winters, those schools emptied and everyone transferred to the tropics. The northern and southern hemispheres took turns occupying the tropical schools. Adding the human staff, there were said to be, more or less, 4,000 human beings on the planet at any given time.

The ship's computer said nothing about robots. There were robots on Earth too, but not in the schools. They were elsewhere, doing something remarkable that I would get to witness first-hand.

The schools didn't exist without controversy. Besides the high tuition fees that kept ordinary people out, and the unofficial extra price that rich families paid just to get on the waiting list – one more reason for them to resent me - there were those visits allowed to so-called 'extra family members'. Besides parents and relatives, rich or famous people who had no connection to any child were able to pay large sums of money so they could stay as guests at the schools and go home to say they'd been to Earth.

Sometimes they brought lovers with them, or, in the case of the men, sometimes one of the school's teachers served as a temporary companion.

Yes, the rich and aristocratic of the empire used the schools as pleasure spas, trysting places, hiding places, or whatever else they wanted them for.

This was no secret. There was a lot of public discussion about it. At the Council of the Worlds, the leader of one opposition party had recently called the schools 'brothels for the rich'.

I knew what brothels were. I'd never been in one, but I knew that big stations like Gateway had many. Some of them were famous. But how could a school be a brothel? And why hadn't father said anything about it? We might have been isolated on the Tremolino, but he knew a lot about the Federation worlds.

The ship's computer was no help. It defined brothels for me and gave me a Third Federation directory of them, complete with prices and very distracting interactive holo-ads for the human and animine girls they had to offer. But in response to my question, it denied that there were any brothels on Earth.

I thought of beautiful Ayla Antonova two doors down the hall and wondered how she fit into this perplexing equation. And how I fit in. What was intended for me? What was an education in these schools anyway? I hadn't done any research about that before I agreed to go. These questions haunted me all the way to Earth. Unable to

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discuss them with Ayla, I lived with them inside me, experiencing their quiet terror and excitement.

But I would find out soon enough what it was all about.

The Age of Star Travel

The greatest problem confronting the Skolen was something they sometimes considered to be their greatest asset.

Travel at near light speed produces time dilation. Time expands or 'dilates' the faster one moves. As speed increases, time passes more slowly for the traveler. That is why people on starships age more slowly than people who live on planets or stations.

At the speeds we travel in land and air vehicles, this effect is imperceptible, but as one approaches light speed the difference becomes dramatic. A trip of thirty light years at 98% of the speed of light takes about 31 years of planetary time, but the occupants of the ship age less than four months.

Thus the Skolen travelled through time as well as space. They inhabited a different universe than the rest of humankind.

Chapter V

There are trees on the big stations. Gateway, with almost full gravity, has many trees, along with ponds and streams that run through the great open concourse that circles through its rotating main tube. There I saw palms, acacias, a flowering cherry, and other trees I couldn't identify. But in the controlled slow-moving atmosphere, the leaves of those trees didn't move. They made no sound, unless you count a dry palm leaf that I watched rattling monotonously in front of a ventilator. I was impressed by Gateway's trees, but they did nothing to prepare me for the trees of Earth.

The shuttle began its approach on the dark side of Earth. I detected a faint hum, which I assumed was our hull entering the outer atmosphere, then there was a period of shaking or bumping called turbulence, something I'd never experienced before.

There was a thin halo of light around the planet's curved horizon which the shuttle approached until it turned to run south-north along the border between day and night. Below us, I watched the morning sunlight spreading over low mountains covered with dark green forest.

After slowing and losing altitude until it was only a hundred meters or so above the tree tops, the shuttle stopped above a grove of tall pines, hovered a moment,

then descended through them to land on a circular metal pad in a clearing.

Then, following Ayla, I stepped onto a planet for the first time in my life.

Two hundred year old white pines surrounded us. Their tall massive trunks rose straight up through their horizontal branches, the morning sunlight slanting in between them. They looked like great silent sentries who had been guarding that place for ages. They looked immovable, except that their branches, at least the highest ones, swayed in a light breeze, making a soft sighing sound.

The cool mountain air was full of delicate scents, and seemed to come from every direction. Despite my jacket and pants, the breeze seemed to penetrate my whole body. My senses were overwhelmed and I began to tremble. Then my legs, unused to full gravity, gave way and I fell to my knees.

But I fell onto real soil, the first natural earth I'd ever known. My legs forgotten, I lay down on my stomach and pushed my fingers into the dark cool humus, looking closely at it, amazed at what I was seeing - minute, barely perceptible life forms – fine ghostly white lice, tiny spider mites, some brown, some white, some red or green. There were dark glistening specks that flickered as I watched. I knew from my reading that they had to be springtails, the most ancient of living insects.

These were things that I had read about, and dreamed about, all my life. Now they were in front of my eyes.

To see better, I pressed my cheek against the fragrant soil and fell into a reverie, musing that the presence of so many little creatures could only mean that there were millions of still smaller life forms in the soil, an invisible universe between my fingers.

There was no boundary to any of it. Away from the landing pad, the dark earth was covered with ferns and other plants. The trunks of trees beyond counting receded into the distance.

You can read all you want about life-bearing planets, and you can even go into those haunting virtual forests and meadows they have in some of the station museums, but none of it prepares you for the real thing.

How long I lay there I don't know. I remember listening to the air sighing high above me in the pines, whispering, it seemed to me, something about the great age of that place. Sometimes a rushing wind came more loudly into the middle branches and spoke of adventure and forbidden secrets, and once, when the wind grew stronger, there was a roar through all the branches that made me forget that I even existed.

But I finally remembered what I was supposed be doing. Embarrassed, I sat up, brushed the earth from my clothes and looked around for Ayla.

She was sitting about ten meters away, her back against a tree, one leg drawn up to her chest, the other extended before her while she looked over the valley. Beyond the ridge on the other side, there were more forested mountains, range after range of them, their green

slopes darkening with the distance until those farthest away were an indistinct purple blue. I was a bit surprised to see that the color effects of an atmosphere, so beautiful when seen from space, were present on the surface of the planet too, though in a different way.

When I stood up, I felt light-headed. I had to hold my position a moment until I was sure of my balance. Fearing that my body was going to be no match for Earth's gravity, I walked cautiously over to Ayla, who didn't notice my approach.

"I guess I'm ready," I said.

She turned and those blue eyes looked into mine again, not without kindness, but with a depth of looking that made me uncomfortable. It was as if she was asking herself something about me.

She stood up, her legs lifting her effortlessly.

"The gravity will slow you down Simon, but you'll be stronger soon. Even I'm a bit weaker after two months away."

I wanted to say something, but I didn't know what. I didn't think that look in her eyes had anything to do with gravity.

"Once we start walking, you'll find it's warmer than you think," she said. Then, without warning, her suit began to remove itself. It came off in a remarkable way, as if it was self-directed, opening first at the neck and descending down her shoulders and abdomen. I'd never seen that before. The sleeves and legs removed themselves too, but too fast for me to see how it was done. She was left in a

short-sleeved shirt and shorts of dark blue. I wasn't sure whether they'd been under the suit, or if they were a part of the suit that remained.

Her legs and arms were tanned and smooth. For a moment the sunlight coming through the trees revealed the fine blonde hair on them that would normally have been invisible.

She squeezed both the cape and the suit with her hands, which made the material contract to the size of an apple, then she put them in a black cloth carrying bag. I'd never seen material do that before either. The bag had a strap that she used to put it over her shoulder.

"Don't be afraid to take some of those clothes off," she said. "This bag is expandable, so I've got room for them."

I didn't know what to say. I was wearing my grey jacket over a black shirt and long grey pants with a wide belt. There was nothing high tech about them, and I had no desire to take them off. The air felt cool and sometimes made me shiver. Besides that, I wasn't ready to take any clothes off in the presence of such a woman.

She took a small canister from the bag and sprayed something onto her hands, then smoothed it over her legs, arms, neck and clothing.

"This trail stays on the ridge most of the way, but sometimes we have to go down in the valleys. The mosquitoes and flies there will bother us if we don't put this repellent on. Since you're going to wear that jacket, let me spray it a bit."

She sprayed me back and front, then put some on her hands and rubbed the backs of my hands, then the back and sides of my neck. She put a bit on each of my cheeks, then ran her hand gently over my hair. Except for the animine girl in the pet shop who'd held my wrist, I'd never been touched by a woman before.

Then we set off, following the trail along the top of the ridge. Ayla said it was about an hour's walk, but I should let her know if I needed to stop. She hadn't explained why the shuttle hadn't landed at the school and I didn't think to ask. I didn't want to think about the school at all.

The trail was narrow, so we couldn't walk side by side. She showed me that it was necessary to walk well behind her so I wouldn't get hit by branches she had to push aside. To demonstrate, she let one hit me softly in the chest. It made me jump, as if she had touched me again.

So I walked well behind her, my senses open to everything around me – to the trees and the carpets of ferns beneath them, to the ghostly columns of midges in the air, to the cool delicious scents, to the mysterious calls of unseen birds, and to the smooth formidable-looking rocks that sometimes protruded from the soil.

I had read about such rocks, and I'd seen them in virtual constructions, but these were real. As I passed them, I reached out to caress the stone with the palm of my hand, and each time it felt as if I was touching the whole mass of Earth itself.

Even the path fascinated me, the way it meandered around tree roots and boulders, always adjusting itself to the world it was traversing. It seemed like an outgrowth of the forest rather than the construction of humans. As if she was reading my mind, Ayla commented that much of the trail had not been created by people, but by moose, deer, bears and wolves, and this was the reason for its wandering.

At one point there was a break in the ridge, so we had to leave it and go down to some dark woods at the bottom. There we had to get around a large patch of thick black mud before we climbed back up the ridge on the other side. Clouds of mosquitoes surrounded us, but Ayla's spray seemed to work for I got only one bite, on my wrist. As we circled the mud on firmer soil at the edge of it, Ayla stopped to show me the tracks of moose – deep double crescent moons in the mud that were bigger together than my outstretched palm and fingers - and the lone paw print of a large wolf. Both thrilled me, as if I'd just met the animals themselves.

We walked on through this forest dream, one thing after another distracting me. That wasn't only the plants and animal life. Those tanned legs moving so surely and gracefully ahead of me demanded my attention too. This beautiful director of the school seemed to be part of the forest and the mountains herself. Not like me, stumbling on tree roots and stones.

But in spite of the stumbling, and though I was sometimes out of breath, I began to feel as if I was

becoming part of this world too. The lacy network of shadows on the forest floor, the soft rustling of leaves above us in a grove of maples, the calls of the birds, all felt like things I had once known, but had forgotten.

I reminded myself that my DNA came from this planet. In coming here, I was coming home.

Every time we were about to turn another corner, my heart tightened with anticipation. When a small, hauntingly white moth unexpectedly brushed my face, it felt as if a little emissary from Earth had been sent to welcome me. I wanted to catch it and thank it. I wanted to shout, to laugh, to leap into the air. Oh Earth! This hopeless dream, that only a year ago had been completely impossible, had come true.

Tears formed in my eyes and a lump developed in my throat. I hoped Ayla wouldn't turn around to see.

But, because I had been falling behind, she stopped to let me catch up. As I drew near to her, I drew my sleeve across my face, trying to wipe away the tears, but I think she saw them.

"We'll take a rest," she said and sat down at one end of a smooth flat slab of grey rock bordering the path. She reached into her bag and drew out a clear faintly blue flask that had liquid in it. She uncapped it and handed it to me. I took it, but just held onto it, unsure what to do.

"It's water," she said. "You can drink it."

I lifted it to my lips and drank a couple of gulps. It was cool and delicious. Earth water, I thought, then corrected myself. She had brought it with her from the

ship, so it was distilled water that had been recycled many times, something I'd been drinking all my life. I handed the bottle back to her.

To my surprise, she put the spout to her lips and drank, when I'd had my mouth on it a moment before. She obviously didn't share the inhibitions that station people have towards Skolen. Because we visit many worlds, we're suspected to be the carriers of the strange diseases that break out on the big stations. In fact, it's well known that the stations are inhabited by unusually mutable and tenacious microbes, as dangerous to Skolen as to anyone else. But station people prefer to blame us.

I thought about that as Ayla took another drink, and I noticed that I felt pleasure that we had shared the bottle.

"You know," she said. "Some people say Skolen don't talk to each other. What do you say to that?"

"We talk sometimes."

"What do you talk about?"

I stopped to think. Neither my father or Pol talked a lot. I talked to my animals, especially to Jerry, but I didn't think she would include that. I gave her the easiest answer.

"Star maps....route projections.....vacuum densities, things like that."

"You must know a lot about those things."

"Pol knows more than me."

"Your brother?"

"Yes."

"How did he feel about you coming here?"

"I think he liked it...he seemed happy for me."

“He sounds like a true brother.”

“Yes,” I said again. I didn't know what else to say.

“But you were interested in other things too. That's why you're here. You got high scores in all the sciences, and in history and art. Your general knowledge and interest quotients were the highest we've ever seen. No one expected that from a boy living on a star freighter.”

I nodded my head, not fully understanding what she was getting at. The idea of being compared with other people was alien to me. We watched each other for a moment, then I asked the question I'd been wanting to ask.

“Ayla, where will I live in the school?”

She looked at me closely, as if she knew exactly what I was worrying about.

“You'll have your own room. For a few days you won't have to leave it unless you want to.”

We fell silent and I noticed how quiet the forest was when there was no wind. Even the birds had fallen silent. I could tell that Ayla was thinking about something again, and I wondered what that might be.

“Well,” she said, standing up. “Are you ready for more?”

The Age of Star Travel

When you travel near the speed of light, there is no return trip.

Because of time dilation, when the Skolen returned to the station of any star, the people there were no longer the same people. The farther they travelled through the galaxy, the deeper into the future they went, more and more removed from the rest of humankind.

But they were content to be alone. Out among the stars, they lived almost untouched by the rules, regulations and customs of the people they served. It is no wonder that they sometimes fell afoul of the Federation's laws, that the galactic civilization's transporters sometimes became its most wanted criminals.

Thus, the people who pursued the stars were often pursued by the star civilization's police. But in the distances of time and space, among the 4 billion stars and 25 billion planets in the Federation's sector of the galaxy, there were many places to hide.

Chapter VI

We walked for another half hour, then came down into a valley where we met a small fast flowing river. We followed a trail alongside the river until we reached a bridge made of new rough cut lumber, still under construction. It was surrounded by teenage boys dressed in dark blue working uniforms, the same color as Ayla's clothes.

There were about a dozen boys and they all stopped what they were doing to stare at us, or maybe just to stare at me.

I heard someone whisper sharply, "Skol!"

Those were cold hostile stares. I had never felt so vulnerable before. But my father had taught Pol and I to think of ourselves as equal to anyone. I locked eyes with those soon-to-be young men of the super-rich and the high aristocracy, and stared back at them.

What a chasm of distrust, resentment and misunderstanding there was between us.

Then a young woman came out from underneath the bridge. Dark and slim, with Old African features, she was no taller than the boys, but obviously in charge. Her skin was almost black and it glistened as she climbed cat-like up the bank to join us.

“This is Saadiha,” Ayla told me. “She’ll be one of your teachers.”

I nodded mutely to Saadiha, who responded with the most beautiful smile I’d ever seen.

“I didn’t know Skolen were so handsome,” she said.

But we were soon on our way again. We crossed the bridge, climbed another slope, then followed yet another trail along the ridge. The country we passed through now was no different than what I’d seen earlier, but it felt less friendly than before. For now I was sure that I’d made a big mistake coming there.

I didn’t realize that many of those boys had never been off their big estates, especially those from worlds that had a lot of social unrest. Some had been almost as isolated as me. Some were as shy as me, for shy genes are not confined to Skolen. The school had found it necessary to meet their needs, so it was not totally unprepared for me.

But how little I knew of what was to come.

Soon we came to a spot at the top of a ridge where Ayla pointed across a ravine towards a gleam of reflected sunlight coming from the tree-covered slope on the other side.

“That’s a window of the school,” she said.

Except for the reflected light, I couldn’t see anything but trees. But as we descended the ridge, I began to catch glimpses of grey boardwalks that wandered up and down the forested hillside. I didn’t see any of the doorways, for those were concealed. I didn’t know it yet, but the interior of the mountain on that side was honey-combed with passageways and rooms.

We crossed a big log, cut flat on top, that spanned a small creek, then climbed up into this strange but beautiful little community, now walking on the boardwalks. My dark mood began to improve, for we weren’t meeting anyone and the place itself seemed to welcome me. At one point, the path passed through a tunnel made by a great fracture in the rock and we came to a place where a giant white pine grew. Much of its ancient root system was exposed, so you could see thick powerful looking roots that curved and twisted among the rocks. In one spot they had lifted a heavy slab of rock until it was almost horizontal, forming a kind of canopy. Beneath it a few flat stone steps descended to a small wooden door.

“This is yours Simon,” Ayla said. “The door is open. Go and rest for a couple of hours, then I’ll come back.”

I was comfortable when I was with Ayla. When we met the troop of boys at the bridge, she’d felt like a bodyguard. So it was with some misgiving that I left her and went down those steps.

When I pushed the door open, it felt heavy but it moved easily, without any sound. I stepped inside, then

down a couple more steps into what appeared to be a dark cave. But a light came on near the floor, then another lamp on the wall lit up, revealing an enchanted little room.

It was about four meters across and gave the impression of a pentagon, though an imperfect one since the walls were not of equal length. Natural stone formed the interior walls, while the two on the exterior, next to the door, were made of broad pine boards. There was a simple pine bed against one of the rock walls at the back, and a small table with two chairs of the same wood opposite it. There were also wooden drawers mounted in the stone wall.

The scent of the wood, cool stone and the beautiful air of the forest filled the room. I breathed it in and marveled that this little underground place was mine, at least for now.

Wood was something I knew about, but until now the only wood I'd met was the dark red wood of the harp and the cello in the Tremolino. Here I was surrounded by wood, and something about that felt very good too.

I sat down on the bed, still looking around. Yes, unbelievable as it was, this room was mine, and Jerry's too, as long as he got through his quarantine. Trying not to think about what would happen if he failed his tests, I wondered if I would take him outside. Did I dare? There were untold dangers out there for a little rat. But this was his world too wasn't it? He too was coming home.

The Age of Big and Little Fears

The demise of Earth's final civilization began in the 20th century, in the period psycho-historians call the Age of the Big and Little Fears.

The Big Fears began with two great wars in that century, conflicts larger and more ferocious than anything seen before. In the second war, civilian populations were directly attacked with primitive aircraft that dropped "bombs", crude chemical-explosive devices that fell passively, relying on gravity to deliver them to their targets. Despite this limitation, so many were dropped that whole cities were destroyed, sometimes in a single night.

Near the end of that war, two cities were destroyed in minutes, each with a single "atomic" bomb, the first use of quantum weapons in human history.

In the victorious nations people cheered in the streets, but inwardly they shrank in fear, for they had seen how easily everyone could now be destroyed.

Those two wars made people realize that their fate was no longer in their own hands. The 20th century philosopher Kurt Vonnegut called the second war 'civilization's second unsuccessful attempt at suicide'. He expected another attempt, and he was not mistaken.

Chapter VII

And so my time in the school began. Ayla had promised that I would be left alone for a while, and she was true to her word. I stayed in my room at first, learning to identify the sounds outside and how to tell when the way was clear for me to go out without meeting anyone. I was able to slip out a couple of times a day to wander alone in the woods around the school.

So many things were waiting for me. I may have been most interested in the insects. Until then, the only insects I'd known were the fruit flies I fed to my chameleons. They were interesting enough, but now I was in the homeland of insects.

The air was full of flies, butterflies, big and little moths, silent whirling clouds of midges, and many mosquitoes. There were insects underneath the soil, and beneath the bark of trees. Alongside the creeks and rivers there were big formidable looking dragonflies, and among the flowers in clearings and fields I saw many bees, hoverflies, wasps and other nectar-seeking insects.

On the surface of the ground there was every kind of life. There were ants of different species, beetles in many sizes and colors, millipedes, spiders, crickets and

grasshoppers, newts, tiny toads and large toads, snakes, snails, slugs and sometimes things I couldn't identify.

Excluding bacteria and similar microbes, Earth had about three million animal and plant species, with insects counting for half of that.

There were plants everywhere, from algae and moss on rocks and tree bark, and horsetails and club mosses a few centimeters high, to the trees – spruce, hemlock, birch, maples, ash, oaks, beech, and pine. According to the school's computer, there were over a thousand plant species within the ten square kilometers surrounding the school.

But there were people too.

When I was alone in those woods, or walking along the shoreline of a lake, or climbing a ridge, I was relaxed and happy. But when I met someone, I was immediately uncomfortable. I didn't know how to respond. Though we spoke the same language, and though I listened carefully to the talking among the other boys, and though their conversations seemed simple enough, I found that I couldn't properly take part in them.

Whenever I encountered a group of boys, I would fall silent, as if I was experiencing some kind of language paralysis. It wasn't just that I couldn't speak the words. There would be no words at all. They would disappear altogether as if my whole vocabulary had gone into hiding. It only took three or four people to render me completely mute.

But one on one I was all right. There were a few boys who I liked to talk with, even if I didn't do it very often. I wondered if this was what they called friendship.

I did my best to talk like the other boys, but that didn't work very well. When I used words and phrases I'd heard them use with each other, I didn't get the same result, and my result was almost always negative.

I might manage a reply to someone, but it would come out too late, or it would be inappropriate in some way. They would look at me quizzically, or with distrust. At first I thought this was only happening because I was nervous and lacking in confidence. I'd had so little experience of people. But the problem was deeper than that.

So, most of the time, I kept to myself. Naturally I developed a reputation for being cool and aloof.

But the school was also good for me.

There were the two hours every second day in a cubicle interacting with SAI teaching machines.

SAI were named after the computers of the famous Saturnian Artificial Intelligence Cooperative, the AI group that embedded the first quantum processors in the planet Saturn, which has remained the core power source for computer systems throughout the empire ever since.

SAI machines have an almost boundless knowledge, along with an inexhaustible appetite for more. They aren't only interested in things you'd expect, like technology and the sciences. They're interested in psychology, history and art, especially in music. I was comfortable communicating

with them. Unlike humans, they have no hidden personal agendas. They only have a desire to know and a desire to teach, and they taught me much.

Yes, only people were a problem for me.

As I said, the school had approximately 300 students and thirty teachers. Each day, teams of ten to twelve boys and one teacher set out into the mountain slopes and valleys, to take part in projects like the bridge I had seen them building, to maintain trails, or just to walk and climb through the forest learning, plant by plant, animal by animal, and rock by rock, about the world that surrounded us.

To my surprise, many of the boys weren't very interested in those things. They were more interested in each other – especially in verbal and physical jousting with each other. Establishing relationships, especially those of rank, seemed to be more important to them than the natural mysteries in the forest that surrounded us.

To be fair, it wasn't all negative. There were a couple of boys who could be very funny, who could even make me laugh.

On the team hikes, I just tagged along. I was supposed to be trying to integrate myself with the others, but I had no idea how to do that, and none of the teachers seemed to know either. Instead, I would drop back to the end of the line so I would have no one behind me. If we were gathered together somewhere, I would unconsciously step back a bit from the circle, removing myself without drawing attention.

The teachers were all women, except for one man.

When I say women, one was a B-4 animine named Theda. She was quieter than the other teachers. They tended to stay away from her, or maybe she stayed away from them. She wasn't one of my teachers, but maybe she should have been. More than once I noticed her watching me. The boys were very interested in her. Aristocrats pretend to be above sexual attraction to animine people, yet they like their animine servants, and there are a lot of stories about that.

The man was Yan, a retired soldier. He was of average height for a man, slightly balding, but with a solid, powerful build. He looked middle aged, probably about a hundred and twenty. It was said that he had fought for the Federation in the Hyades rebellion, the famous conflict my father had been involved in. This not only piqued my interest, but also made me wary, for I knew that my father's part in it was an ongoing problem for him.

Yan presided over martial arts training for the boys. That was important to rich families since many boys came from worlds where the lower classes were violent. We learned several martial arts, but the parents of these boys didn't want them coming home with permanent injuries, especially not with brain damage, so the only one we had regular full contact with was wrestling.

Because of the wrestling I'd done with Pol and my father, I had a surprising advantage over the other boys. I won match after match. Some were easy, and some were

harder, but I lost only one, to a boy who was bigger than me, and a good wrestler.

Yan took an interest in me and gave me advice. He followed my matches closely. Naturally he wondered how I had arrived at the school already skilled in wrestling, so I explained it. After one match that I won at the end of one afternoon, he invited me to go for a walk with him.

“Your father taught you well,” he said.

“Yes,” I replied.

“I’ve learned that your father once serviced the Hyades.”

I didn't say anything, but I was taken aback.

“Don't worry about me. I fought there, but they were defeated and I hold no grudge against anyone. But when I learned this about your father, I also learned that the FSS have been looking for him ever since.”

I looked at him, alarmed.

“They don't know where he is, but they have a map of many places where he has been. The FSS are pursuing your father.”

“How do you know?” I asked

“I am still a member of the forces, specifically the Special Forces, and I have access to their intelligence.”

We walked in silence for a bit.

“So young Simon, before you leave I’m going to give you a list of places your father must not go. The next time you see him you must pass it on to him. I would like him to have it now, but there is no communication system from here that is safe from the FSS.”

I wondered if that was true. My father knew a lot about secrecy.

“Do the FSS know you’ve been investigating my father?”

“The Special Forces and the FSS are not connected. In a very real sense, we are rivals,” he said.

Jerry passed his quarantine, then joined me in the little room. I took him on some of my hikes into the woods, carrying him in the blue travelling cube. When I stopped for a rest I would let him out. He always stayed close to me. He appeared to be instinctually aware of the danger waiting for him in those forests.

I learned to swim. The little nameless lake where this happened was about a kilometer from the school. The morning when I first saw it, the lake lay perfectly calm, like a mirror between the mountains. There were wisps of cloud drifting through the forested slopes around it, and the trees along the shore were reflected in the water. It was one of the most beautiful sights I would see on Earth.

At one end, next to a small river that flowed into it, there was a natural sand beach about a hundred meters long.

I was disconcerted when I learned that we would swim naked. As everyone took off their clothes, I did too, but I felt very vulnerable. The teacher took hers off as well. As I said, the teachers were all beautiful, and this one, a red-headed woman named Tatiana, was no exception. I

watched her as intently as any of the other boys, but I didn't join in their shouting and joking.

The feel of the water on my body was astonishing. It was cool and didn't feel anything like the water from the shower in the Tremolino, or the one at the school. Tatiana showed me some fundamentals, then assigned a couple of boys to help me. It was hard to relax with people around me, so I didn't learn much. But I went back to the lake by myself to practice alone. Within a week I was able to swim a short distance, and I continued to get better.

All our training was directed towards a test called the 'Outwalk'. This was a two month journey made by groups of boys that would begin in July, with a different destination for each group, each leaving on a different day. You didn't find out where you would go until the day you left.

There was a maximum of six for each group, and you got to choose who you went with. But you could also go alone. Of course, I planned to go alone.

Most of the boys in my team were friendly enough, or at least neutral towards me, but there were two who made me very uncomfortable - two brothers, Darriger and Vento Devaugen.

The Devaugen family was famous, extremely rich and politically powerful. They numbered about thirteen thousand individuals in seven star systems, a gigantic tribe you might say. Darriger and Vento had become, in some

unofficial way, leaders among the boys. They enforced their status with verbal abuse, usually in a form that was thinly disguised as jocular and teasing, and sometimes with physical intimidation too.

Darriger was tall, dark-haired, handsome and arrogant. His brother Vento was a slightly shorter version of him. He and Vento had arrived at the school knowing that, no matter what they said or did, no harm could come to them. They couldn't receive the slightest reprimand without their family's permission. I don't know if that was the source of their smooth, calculated, self-important demeanor, or if that was just a family trait.

The two of them watched me with a malicious curiosity. I understand now that it was my inability to show submissive behavior that had gained their attention.

I wasn't being deliberately confrontational, but I wasn't giving off the unconscious signals of submission that most people do in the presence of someone they feel to be superior.

When we passed each other, I didn't step aside for them like the other boys. If one of them spoke to me, which they always did rudely, I usually ignored them. Even if I'd understood what was required of me, I don't think I would have been willing to imitate submissive behavior.

Darriger was a good wrestler, but we were never matched together. He was taller than me, but Yan often put me in against bigger boys. I used to wonder why he didn't match me against Darriger. I didn't see that he was trying

to protect me. I didn't understand that Darriger couldn't be offended in any way. So he never lost. It never occurred to me that some boys might be deliberately losing to him. I was so innocent. I didn't understand the unwritten laws that society is built on, those psychological laws that social people obey so easily because social behavior is in their DNA. The lack of a social instinct is one of the biggest problems for Skolen, and it would be almost fatal for me.

I guess it was inevitable that I would have to fight Darriger, and that it would not be in a match planned by Yan, but in a real fight planned by Darriger.

The Age of Big and Little Fears

But the people of the 20th century got used to the talk of Armageddon.

When a nuclear war, their name for a conflict with quantum weapons, didn't come in the first few decades, they convinced themselves that it would never come. They stopped thinking about it.

Meanwhile, Earth's population increased dramatically – from 1 billion in the year 1900 to 9 billion in 2050. That should have provoked the greatest fear of all, but it received surprisingly little attention. People were too focused on themselves – on their personal comfort, entertainment, safety and wealth, or, in the case of the poor who formed half of that six billion, their personal survival.

That time was accompanied by a dramatic increase in the size of things. Office buildings, highways, aircraft, ocean ships, shopping malls, mines, farms, factories, sports stadiums and cities all grew steadily in size. The 20th century psychologist C.G.Jung referred to this as 'giantism' and warned that it was not progress but only a form of unconscious human hubris that would end in disaster. But few listened to him.

That's when the little fears began.

Chapter VIII

Yes, each day at the school teams of boys went out with their instructors, except every fourth day. Then the boys were free to go out on their own, wherever they wanted and with whoever they chose, or alone as I did – except for one boy. He went out with the instructor. When his name was announced at the end of the previous afternoon, he would be teased about what was likely to happen to him tomorrow, for everyone knew that sex would be part of it.

The next day there was always a lot of talk, including blow by blow accounts of the experience that some students gave their friends. Often spies were assigned to follow the lone boy and instructor, and report what they saw to the others. But no one ever told me anything, so I knew less about what to expect when my turn came.

It came in the third week of June, a month after I arrived.

When it was announced that my turn had come and I would be going out the next day with Saadiha, Darriger let out a guffaw, rolled head over heels back from the circle, then gathered his followers around him to joke about it.

The rest of the boys just stared at me, maybe in curiosity, maybe in envy.

Dark, slim, lithe Saadiha. I hadn't expected it to be her. Since I'd met her at the bridge that first afternoon she had taken my group out only twice. On those occasions we hadn't gone to the lake, so I'd never seen her without clothes.

That night I couldn't sleep. Images of Saadiha pressed on my mind. Thoughts of the possibilities – that we would be followed and watched, that I would be unable to speak, that I would be a sexual failure, kept me awake for hours. Only when a more detached inner voice told me that, one way or the other, the day would take its course and reach an end, did I fall asleep.

When I woke up, I still had a sense of foreboding. But, even though I'd slept only a couple of hours, my body felt energized and alert.

Saadiha came to my door in a bright yellow T-shirt and dark blue shorts, her eyes sparkling more than usual. We left, walking along the path that led towards the wooden bridge and the lake. She was in a good mood, but that only increased my anxiety. As we walked, she kept trying to close the gap between us, while I tried to keep my distance. Despite my efforts, we occasionally touched shoulders or hips.

I understood that I needed to follow her lead, but I was trying to delay the events.

I was preoccupied by the thought that we were being followed. I was too much a subject of conversation among

the other boys not to be spied on. I tried to tell myself to let it go, to just let things happen, but it wasn't working very well.

Despite that, Saadiha was a delight. Had I been able to put my anxiety aside, walking with her would have been heaven. Besides that exquisite gait of hers, which had me sneaking side glances at her and made it difficult to focus on anything else, she seemed acutely attuned to the environment around us. It was as if her African hunter-gatherer past had only ended yesterday. Her sharp inquisitive eyes saw things I didn't see, and, knowing how I loved that mountain world, she made sure I saw them too.

As we were almost across the wooden bridge, she spotted something down by the river. "Come Simon, I want to show you something," she said as she took hold of my wrist and led me to the corner of the bridge, then, now walking ahead of me, she led the way down a narrow track, through grass that was above our shoulders. I was afraid she might be leading me into some pre-chosen trysting spot.

When we got down to the river, she squatted by the shore and nodded her head towards a boxelder branch leaning low over the water. Near the end of it, little more than a meter from us, perched a glistening black damselfly. It was an astonishing creature, and quickly captured my attention.

It had hints of electric green in its black body and wings, and its eyes seemed to be watching us. Squatting beside Saadiha, I felt her hand on my arm and I turned to

meet her eyes looking directly into mine. Her black pupils looked as electric as those of the insect.

But she didn't intend to do anything yet. She rose to her feet and started back up the path, while I followed, wondering what would come next. Because it was late June, and despite our repellent, a lot of mosquitoes came up the path with us.

“Come on Simon, let’s leave them behind!” she called playfully as we reached the top. Without waiting she broke into a run.

She ran as beautifully as she walked, like a human gazelle that had evolved for no other purpose than to run over the surface of planets. I could run pretty well by then, but I had trouble keeping up with her.

We reached the lake and began to walk along the sand beach. The water was still in its morning calm, the lake again enchanting. At one point Saadiha stopped and pulled her shoes off, then walked barefoot ahead of me on the sand, her hips moving under her shorts. My boots were digging into the sand, so I stopped to take them off. When I looked up, she was waiting ahead of me, looking back with that beautiful white smile.

As I rejoined her, she gave me a mischievous look.

“Feel like a swim Simon?” she asked.

Before I could answer she'd pulled her T-shirt over her head, revealing an exquisite dark torso with firm breasts and darker nipples. Her shorts came off just as fast and she stood completely naked and unashamed in front of me, that smile of hers beaming encouragement.

I suppose I was able to take my clothes off because I'd been to the lake before. Maybe that had been a kind of training, or maybe it was just that I was mentally numb. But I did think to look up and down the shore for any sign of other boys. I saw nothing. I wondered if they might have arrived earlier and were in hiding.

I turned to Saadiha, who was now in the water up to her waist, looking back at me.

“Come on Simon!” she cried, then began to swim out into the lake. As I'd expected, she was a gifted swimmer too.

I followed obediently, feeling very vulnerable, and swam out towards her. I was still a self-conscious swimmer, so I had to keep my mind on my strokes. With the distraction of Saadiha, I quickly got into trouble. I had to stop to tread water and catch my breath. Saadiha had gone farther out, but she swam back until we were a meter away from each other.

“Look!” she whispered and I followed her gaze back to the shore.

In the shallow water at one end of the beach, a tall heron was poised on one leg, motionless and staring at us. Apparently it had just arrived to hunt the minnows that patrolled the shallows. Though it saw us, it didn't fly off. I'd seen herons before, but this was a magnificent bird. For a moment I forgot about Saadiha.

When I looked back, I was startled to find her right beside me. With an impish smile, she took hold of my wrist and drew us together. My body tightened. One of her

slim legs slipped between mine, one arm wrapped itself around my back and pulled us closer. Somehow she did this while keeping us both afloat and stable. Her lips touched my ear and began to whisper something.

My body seemed to explode. I broke free of her grasp, pushed myself away, and swam as hard as I could towards the beach. I heard a harsh squawking sound and glimpsed the startled heron pass overhead, its long wings beating the air just above me.

When I reached the shallow water, I stood up, grabbed my clothes off the beach, then took a quick look to see where Saadiha was. She was still out in the water, where I'd left her, watching with a look of dismay. Afraid of eye contact with her, I turned away and disappeared as fast as I could into the woods. What else could I have done? Out of sight, harassed by unsympathetic mosquitoes, I dressed quickly then I fled. I took an alternate route back to the school to make sure I didn't meet Saadiha on the way.

The Age of Big and Little Fears

According to psycho-historians, unconscious suppression of the Big Fears in the 20th and 21st centuries induced a widespread unconscious anxiety that resulted in the Little Fears.

The favorite example of a Little Fear is the dog.

Dogs joined up with the human race about 100,000 years ago. For eons they served as faithful allies and companions. They sat by human campfires, ran free beside humans in their hunts, and came bravely to their defense again and again, never knowing that their reward would finally be imprisonment.

In the second half of the 20th century people began to fear dogs. Because a dog occasionally attacked a human, which dogs had been doing since the beginning of the partnership, the perverse logic of the time dictated that all dogs should be restrained at all times. In cities all over the world it became the rule that dogs could not run free.

When they weren't confined in buildings, they had to be leashed. These animals that had run with abandon through the wild places of the world for millions of years could no longer be allowed that freedom for fear that humans might get hurt.

This restriction actually made dogs more dangerous – their nature was to be free and deprived of that they often became bad-tempered, less confident and more unstable.

But people didn't stop with their fear of dogs. They began to fear other things.

Chapter IX

Within twenty-four hours everyone knew what had happened. Darriger and his friends were making jokes about me. My final minutes with Saadiha had apparently been filmed, and the holo-recording was now being secretly exchanged.

The humiliation of this made me angry. When I wanted no part of their lives, why should my life have been an entertainment for them? The anxiety I'd felt that morning had been justified. They had done exactly what I had feared they would do.

When I saw Saadiha now, which I only did from a distance since I was afraid to go near her, she looked more beautiful than ever. I was sorry about what had happened, and I was afraid she might be taking some blame for it.

But mostly I was sorry for myself.

Part of me was hoping for a second chance, yet how could I hope to do any better? How would I deal with the likelihood that there would again be spectators? And wasn't I the chief problem? Maybe I was just too different to interact with someone like Saadiha.

Only when I was away from the school was I able to get my mind off this, so I began spending still more time walking in the forest alone.

I'd been on Earth little more than a month, but I was already an accomplished traveler in the woods. On the team hikes, I would see things that other boys wouldn't see – like a grouse almost invisible in a low branch thirty meters away, or a tiny mottled brown toad getting out of the way of my boot, its camouflage matching perfectly against the leaf litter, only its movement revealing its presence. I watched my team companions step on the little toads, apparently unaware that anything was there.

When I was alone, I saw still more.

I'd learned to recognize the tracks of many animals. I followed them and studied them – the tiny tracks of a deer mouse were as interesting to me as those of a bear. The lives of small animals – mice, birds, amphibians, spiders and insects - were all as interesting to me as those of large animals. After all, when you live near the bottom of the food chain, the world is a complex and dangerous place.

I'd become interested in the communities of lichens, mosses, algae and slime molds that lived on the surface of boulders, rock cliffs, tree trunks and the logs of fallen trees. Within ten kilometers of the school there were said to be about 70 species of lichen, 250 species of moss, and an undetermined number of algae.

Because the time was near when I was supposed to go on my Outwalk, I'd been trying hard to learn as much as possible. Now I didn't know if I would be allowed to go.

Every boy who I'd seen leave on their trip had had successful sex with one of the teachers. That wasn't confined to the one day either. For a few days afterward, they would visit those teachers in their private quarters, and each visit, especially the amount of time spent, would be watched and talked about by the other boys. Of course, in my case nothing had followed. And no one was saying anything to me about the Outwalk.

Maybe the teachers didn't know what to do with me.

Because the time for their Outwalk was near, I didn't understand why many of the boys didn't seem to care about preparing for it. What could motivate you to learn more than the prospect of going out into the wilderness to depend on your personal knowledge and skill for survival?

I didn't know yet that the boys of the highest and wealthiest families would be allowed to carry laser weapons for hunting, as long as their families paid for them. They would even be allowed a choice of brands and models.

I didn't know that they would be allowed to call for food drops from the school's shuttle, again paid for privately.

I didn't know that someone like Darriger would be able to request transport past any obstacle he found too inconvenient. He could even call off the trip, yet still get his certificate as long as he completed at least a third of the journey.

My understanding was that I was only supposed to call for help if my life was in enough danger that I wasn't

likely to escape. As far as equipment was concerned, I would carry only a slingshot for hunting, and some hooks and twenty meters of line for fishing. That was technically the standard equipment, and there were boys who went out with it, but I believe now that we were a minority.

One day when I was out alone, I climbed to a spot near the top of a steep hill where there was a big lone pine with long sweeping branches that reached out over the valley below. I liked to sit beneath that tree, with its heavy trunk at my back, while I contemplated the world below. There, with the breeze sighing and whistling in the pine branches over my head, my troubles were usually forgotten.

But a path crossed directly beneath that hill. That afternoon I heard voices on the path, returning towards the school. Normally I wouldn't have paid much attention, but something about these voices bothered me. It sounded like two people and I wondered who might be out there together. I moved over to a concealed spot where I could see them pass below the hill.

They came around a turn, and I saw that it was Darriger and Saadiha walking together. I immediately had a feeling of foreboding.

There had been no mention of this being Darriger's day to go out with an instructor. Could it be, I asked myself, that he was allowed time alone with teachers whenever he pleased? How innocent that question seems to me now.

I suppose if that morning at the lake with Saadiha had never happened, I wouldn't have cared what they were doing. But whether I wanted it or not, Saadiha had become important to me. I reminded myself that Saadiha was there for Darriger too. In fact, it was probably more accurate to say that she was only there for him and the other boys, not for me at all. As far as the other boys were concerned, I shouldn't have been on Earth in the first place.

Wasn't my failure with Saadiha proof that they were right? Wasn't it pointless to get upset at the sight of her with Darriger? Oh, why didn't I stay beneath that tree? Why did I have to follow them?

Because the trail they were on wandered, and because I knew the surrounding hills well, I was able to follow them using short cuts and watch them pass at a couple of other spots. I saw them touch at their hips and shoulders. I saw Saadiha's hand on Darriger's hip, and I saw her put her lips to his ear, as if she was whispering something, and I saw Darriger put his arm around her neck as if she was some new piece of property he'd acquired.

Finally, I had to watch them approach Darriger's quarters.

He had a full set of rooms at the top of a hill with a long window that supposedly had a magnificent view of the valley. I watched them ascend the stairs to his door, and disappear together inside. No, I didn't have the sense to get out of there. Hoping to prove to myself that it was just a short visit, I remained hidden where I could keep an

eye on the door, waiting to see Saadiha come out. But an hour later she was still inside.

I went back to my room and lay down on my bed. Dejected and despairing, I stared at the walls and found that they were no protection against what was happening outside. My imagination produced vision after vision of Darriger and Saadiha together.

In his cage, Jerry watched me quietly as if he understood that something was wrong.

The Age of Big and Little Fears

There were many Little Fears.

Earth's last people feared tobacco smoke, bee stings, ultraviolet exposure from sunlight, the lack of vitamin D from reduced exposure to sunlight, the cholesterol in egg yolks, toxic substances in their drinking water, viruses received from mosquito bites, and chemicals devised to kill mosquitoes.

They feared anything that endangered their safety or health.

Though they were the least endangered species on earth, and although it was their own increasing population that was the root cause of the world's environmental decline, they did not fully understand that they were the problem.

They were convinced that human life was more important than other forms of life, and resisted every attempt to significantly reduce human numbers.

But that reduction was inevitable.

Chapter X

Late one afternoon a teacher named Rebecca asked me to meet with her to discuss my problem integrating with the other students.

We went to a small meeting room and talked. She had a lot to say, but the gist of it was that if I would talk to the other boys more I would get better at it, and I would develop an appetite for it. Simple as that. Just open up and I would learn to like talking. I'd heard most of it before. I listened and nodded my head at what I hoped were appropriate moments, but all the time an inner voice was telling me she was wrong.

I agreed to consider what she said, then I was dismissed. Walking back to my room I felt less inclined to be at the school than ever. Her advice had no appeal. As far as I was concerned, I talked to the other boys more than enough.

When I got to my room, I called softly, "Where's Jerry? Where's Jerry?"

His little head appeared from the door of a small wooden house I'd built inside his cage, his eyes bright and ready. I took him out and put him in the blue travelling cube, put that in my backpack and headed outside again.

When we got to the big pine tree on the hill, I set the cube down at the foot of the tree and opened the top. Jerry's head popped up, he looked about tentatively, then climbed out. I began to mull over the things Rebecca had said while Jerry rooted around in the detritus at the base of the tree, staying close to the trunk. Yes, his instinct for safety was sound. He obviously understood that he was vulnerable in daylight. Would he do the same at night? I didn't know, since I hadn't tried him at night. I was too afraid of losing him.

It did make sense that if I talked to people more, talking should come easier. How could I argue with that? I didn't want to talk to them, but some talking was necessary. I wasn't doing enough apparently.

What I really objected to was this idea that talking was something important for me to learn. After all, I wasn't being groomed for aristocratic society, or for any society. No one had suggested to me that there was a possibility of me going to live on any planet afterward. Even if there had been, I would have rejected it. I was going back to the Tremolino.

Deciding after a while that I'd thought enough about this, I picked Jerry up and put him back in the cube, put it in the pack and started down the hill.

But as I walked along the path leading back to the school, Jerry appeared on my shoulder. Apparently I hadn't closed his door properly. I wasn't concerned though, for he was used to traveling with me like that and

we were only a few minutes from my room. If he jumped off, as he sometimes did, I could catch him

There were other boys on the path, but I didn't join any of them. After the lecture about talking, I didn't feel like talking to anyone.

With Jerry changing shoulders from time to time behind my neck, I thought of how life had been in the Tremolino.

We didn't talk much on the ship, but it wasn't that we didn't get along with each other. Surrounded by the immense darkness of space, I think we felt as close to one another as it was possible to feel. Out there, just beyond the Tremolino's hull, death was present in a way that it wasn't on a planet. Every week there were reports of ships disappearing. Death to us was something that surrounded us, huge and merciless, waiting for us to make a mistake. A failure of anything – the quantum drive, the MGV field, or just a breakdown of the atmospheric recycling system - was likely to be the end of us. Death was always there, but it wasn't something we needed to talk about.

We didn't have the same need for each other's company as other people did. Sometimes we were separated in the ship for days, but when we met again it always felt as if we had only parted a few minutes ago.

Besides that, I was beginning to think that the constant talking of these people at the school had little of value in it. Their conversations, at least of the boys, were filled with clichés, bragging, sarcasm, put downs, empty platitudes, exaggeration and outright lying. I suppose that

was still communication, but communication about what? Nothing that I wanted to know, that was for sure.

No, as lonely as life on the Tremolino might have seemed to other people, I'd felt at home there. On Earth, at the school, among these rich planet people, I didn't feel like I belonged at all. I'd started to wonder if Jerry and I shouldn't go back to the Tremolino now, when I heard a loud whoop behind me. Then I was bumped from both sides as Darriger and Vento ran by. I didn't realize what had happened until I saw that Darriger, running away ahead of me, was holding Jerry overhead in his hand.

For a moment I was stunned with disbelief. Then I began to run after them.

Darriger and Vento ran side by side, a couple of meters apart, surrounded by laughing followers. Darriger tossed Jerry to Vento, then Vento threw him back. Maybe because they had to co-ordinate this, I was catching up, but there were too many boys in my way. With tears running down my cheeks, I pushed my way through them.

Darriger was about to throw Jerry again when I tackled him from behind.

We went down hard together. I got hold of Darriger's collar with one hand, and punched the side of his head as hard as I could. He hit me back, but I felt only anger and hatred. Surrounded by screaming boys, we fought .

Darriger was strong and started to land some hard punches. Wishing desperately that I knew where Jerry was, I held on. My wrestling skills triggered in and I rolled with Darriger, maneuvering myself behind him. I got my

arm around his neck and started a choke. Some of his friends had jumped in, so I was getting hit and kicked from all directions, but I drew the choke tighter, closing off Darriger's blood supply until he weakened and went limp.

Even then I held on, determined not to let go. I think I would have held it until I'd killed him, but there were deep shouts from someone, and bodies began to remove themselves from the pile above me. I was still holding on when Yan expertly broke my grip and pulled me away. He got down and, with a few movements of Darriger's limbs and neck, got him breathing again.

Yan stood up then and told the boys watching, "Get out of here! Go back to your rooms!"

Crestfallen and ashamed, they broke up and began to leave. Darriger started to regain consciousness and Yan directed a couple of stragglers to take him to Yan's office where he could put him through a physical examination. I remained standing nearby, looking around for Jerry. I couldn't see any sign of him. Not sure what else I should do, I just stood there. Finally Yan turned to me with a cold look.

"Your father taught you a bit too much," he said.

The Age of Big and Little Fears

Was it fair to blame Earth's last people for what happened? Were they really responsible for the environmental decline, disease, social collapse and uncontrolled warfare that destroyed Earth's civilization, or was it all inevitable?

Well, they had evidence of what was coming for a long time, yet they ignored it. They had many opportunities to change course. But they had a profound misunderstanding of themselves, and this left them blind to what was approaching.

And so, we return to the Big and Little Fears.

More than anything else, those people feared microbes, Nature's smallest predators.

From the time multi-cellular life began on Earth, bacteria and viruses served as the chief instruments of biological control for all life-forms. By means of their culling effect, they had kept every species genetically healthy for eons, including the human species. But in the 20th century people developed the idea that these evolutionary assistants were adversaries who should be eliminated altogether.

In Earth's earlier ages, people had seen diseases as agents of the gods, but the people of the 20th and 21st centuries saw them only as enemies in a war, a war they thought they were going to win.

Chapter XI

With Jerry gone, I lay on my bed feeling as if I'd lost everything. Even the room no longer felt like it was mine. So much had happened in the past couple of hours, but all that mattered now was my little missing rat. I'd searched the area of the fight, but I hadn't been able to find any trace of him. The extensive foot traffic of the spectators had erased any tracks he might have left. I was thinking about going out to look for him again when there was a knock on the door. When I opened it, Ayla was there.

"We have to talk," she said. I nodded and stepped aside to let her come in.

As she entered the room, I couldn't help noticing again that I liked the way she walked. My dismay at the loss of Jerry didn't seem to interfere with my perception of a beautiful woman. Maybe this interest in her was a premonition that after this night I was not going to see Ayla for a long time. When I did meet her again, it would be in very unusual circumstances.

She took a seat at the table and looked at me, obviously troubled. I wondered if she was wasn't regretting that she had invited me to Earth.

"I know what happened today Simon," she said. "Yan told me all about it. I know you did nothing wrong."

I said nothing.

"Do you understand who Darriger is?" she asked.

I nodded. I knew as much as I wanted to know about Darriger.

"I hope you weren't trying to kill him."

"No. But I could have."

She looked exasperated, and afraid.

"Look Simon, I can't send Darriger home. I can't do anything to him at all. But I could be forced to send you home."

At that moment, going home sounded very welcome.

"It wasn't my idea to come here," I said.

That obviously hurt her. She stopped for a moment, looking at me, then continued.

"Simon, I'm afraid for you. The Devaugens are very rich people, and dangerous people. They can do anything they want. Darriger could murder you tomorrow and I wouldn't be able to do anything. His family could send someone to do it for him and I wouldn't be able to stop them. Yan tells me they've eliminated whole families for less than what you did."

I just looked at her. If the Devaugen family was going to come after me, I wished I had killed Darriger.

“You know, when I brought you here it never occurred to me that you might hurt one of these rich boys. You didn't do him any serious harm, but believe me, that doesn't matter. What I have to do now is get you away from the school.”

I nodded again. If I could get Jerry back, I was ready to leave whenever she gave me the word.

“Simon, to leave on the Outwalk, you're supposed to have a sexual pass. The theory is that young men aren't confident enough to face the wilderness without sexual experience. It's not easy to explain, but it's true with most of these boys. Sex triggers some kind of confidence program-ming in them. They need it. But I'm not sure you do.”

I watched her warily, wondering where this was going.

“So I'm giving you a pass and sending you out now. Don't worry, I can do that. You can forget about it altogether if you want. But tonight you have to leave. I'm going to come back in an hour with a pack for you. The moon is out and it will stay up for at least three hours, so you should be able to get a long way from here by morning.”

“I can't leave Jerry.”

“You have no choice Simon. If Jerry was here he'd be in more danger than he is out there. You have to go.”

She got up and walked to the door, opened it, then turned to me.

“It's eleven o'clock. I'm going to come back in an hour with your pack. I'll go with you to the east trail.”

After she was gone, I thought again about what had happened. Yes, if I'd been able to hold that choke for another minute, maybe just another thirty seconds, I might have killed a son of one of the most powerful families in the Third Federation empire. I wondered what my father would think. I didn't know everything about his past defying the Federation, but I knew him well enough to be pretty sure it would make him smile.

Then I thought of Jerry. If I was leaving in an hour, I had to go out and look for him.

The place looked different in the dark. The stone cliff next to the path was about ten meters high and cracked in many spots by the freezing and thawing of uncountable winters. Inspecting the ground with my hand light, I found evidence in the soil and leaf litter of my struggle with Darriger.

Back at the school in the afternoon, after the fight, one of the boys from my group, a shy one with black hair, had come to tell me that he'd seen Jerry go into the rocks. So I walked alongside the cliff, calling softly, “Where's Jerry? Where's Jerry?” hoping to see him appear, his little insolent eyes sparkling, his whiskers twitching again the way they'd always done. If I could only find him, he was coming with me. As I walked alongside the rocks, calling over and over, I watched and watched for his dear little face, but it didn't come.

An owl called softly in the woods, and I wondered if Jerry knew enough to be afraid of it. I thought of the way his white fur stood out in the dark. Then I remembered that it made him look odd, the black part of him invisible, so if you'd never seen him in the dark before, you didn't know what you were looking at. At night, even I was sometimes unsure which end of him was which. He still fooled me when I tried to pick him up and he moved in an unexpected direction. Maybe that would be his camouflage.

I continued walking next to the cliff, calling his name. Then I became aware of someone watching me. I recognized the silhouette of the shy boy who'd talked to me in the afternoon. He came over.

"You're looking for your rat?" he asked.

"Yes."

He walked over to the cliff wall and pointed into a large vertical crack. "He went in right there," he said. "I saw him go in."

I shone my light into it. Beyond the opening there was an intricate network of breaks and cracks running back through the rocks.

"I don't think he was hurt," the boy said. "He was moving fast. Maybe he was just so scared that he kept going."

It looked like a real maze inside, a place Jerry would surely want to explore if he wasn't hurt. I called his name into it with a loud whisper, then waited, but he didn't come.

“It doesn't look like I'm going to find him,” I said.

Realizing that my time was running out, I started to walk back in the direction of my room and the boy fell in beside me.

“I guess you know to be careful of Darriger,” he said.

“Oh, I know,” I said solemnly, and we continued walking together. This was a possible friend, one I had not recognized until now. “What about you? Darriger won't like you talking to me.”

“My father is a director in the FSS,” he said, as if that was all he needed to say.

I learned his name and we talked a little about the planet he came from. I told him how I'd once seen it from orbit in the Tremolino. I wanted to tell him that I was about to leave the school, but I decided it was better if no one knew. When we got near my room, we said goodbye to one another and he left.

When I opened my door, it was after midnight and Ayla was sitting at the table waiting for me.

Social Devolution & the Desensitization of Man

For millions of years, hominids possessed one of the largest, most complex brains on Earth, yet throughout recorded history no one was able to answer this question: Why did most people use as little of that brain as possible?

The SAI machine R7077/B322, the first autonomous computer devoted to the study of human evolution, answered that question with the theory of Social Devolution and the Desensitization of Man.

It proposed that mankind reached the pinnacle of its intelligence during the age of the late hunter-gatherer, 50,000 to 20,000 years ago, when hunter-gatherers occupied most of the continents of Africa and Eurasia, two thirds of Earth's land mass.

At this time, the human brain reached its maximum size. Excavations of fossil skulls as early as the 20th century revealed that the size of the brain case began to decrease about 20,000 years ago, the time when tribal societies came into being and began to eliminate independent hunter-gathering families.

As civilization emerged the human brain shrank.

Chapter XII

As she'd promised, Ayla had brought traveling equipment. There was a backpack that contained food rations for three days, a water bottle, a change of clothes, a slingshot for hunting, a knife with tools folded into it, line and hooks for fishing, and a small almost weightless metal cylinder that could transform itself into a frying pan, a small pot, or a kettle. There was a tent that could contract into a sphere no larger than an apple, and a durable cape that would also serve as a blanket, with adjustable heat retention.

Finally, she gave me a Z3 assistant to wear on my wrist. I never expected to own a portable AI device like a Z3. You could have bought the Tremolino for the price of two Z3s, but she said it was mine to keep.

Then we walked to the intersection of the trails. When we stopped in the moonlight, Ayla turned to me and there was a look in her eyes that I hadn't seen before. There was something intense in it, maybe like the look of a mother parting from a son who she might never see again. I don't know, since I never had a mother. She embraced me with unexpected force, then, letting go, said "All right Simon. This is what you wanted."

Well, until that day, it was what I had wanted. I had looked forward to that journey.

But I wasn't sure I wanted it now. Without saying a word, I walked away into the night. Later I would wish I had said goodbye, but I wasn't inclined to then. I did appreciate everything she'd done for me. But at that moment I was feeling a deep resentment towards everyone connect-ed with the school, including Ayla. The only way for me seemed to be forward, with no looking back.

But she was right about the moon. It was a three quarter moon and high up, so I could see well enough to walk at almost daytime speed.

I thought about everything that had happened. The school was gone for me, probably for good. I had come to Earth so innocently, knowing so little about the Darriger Devaugens of this universe. Now I knew too much about them.

I walked south along the ridge, stepping easily over tree roots and adjusting unconsciously to the ups and downs of the path. I'd adapted well to everything on Earth, except the people.

But there I was, walking alone into the wilderness. Jerry was out there too, somewhere, on this planet that was the original home of rats as well as humans. I reflected that he was, after all, a nocturnal animal, better equipped to be out at night than I was. He would have no trouble finding food either – he would test everything he encountered. And he was brave enough for an odyssey of his own, there was no doubt about that.

There were moths in the air. Most were grayish, or maybe some shade of brown that I couldn't detect in the dark, but there were some that had a fluorescent, almost magic whiteness in the moonlight. They fluttered nonchalantly, as if they were unaware of the bats who were hunting them. The bats were too dark to show up, except that their movement was sometimes noticeable against the moon. A couple of times I thought I heard the sound of their wings.

Walking wasn't always pleasant. When I got into low areas where the trees were taller and closer together, their branches blocked the moonlight. The darkness then forced me to slow down. That's when I discovered that trees don't always feel friendly at night. They, and the deep shadows between them, sometimes take on an sinister aspect. More than once I had to exercise my will to prevent myself from breaking into a run.

I wondered if this unexpected fear was instinctual. In the same way that Jerry automatically feared the open sky in the day, maybe a million years ago our human ancestors feared the darkness of the night.

But when I emerged back onto a ridge, my old friends the stars were there to greet me. The great triangle that Deneb, Vega and Altair made when you saw them from Earth was dipping towards the west, and the constellations of Cassiopeia and Perseus, forming a beautiful staircase of stars, were rising in the east. I looked at Vega. Only twenty-six light-years away, its planets had been among the first to be colonized. Orbiting also by the Gateway

super-station, Vega was one of the great hubs of the empire.

South of Cassiopeia I made out the faint image of the Andromeda galaxy.

It was just a small indistinct smudge, as if someone's thumb had smeared a star against the darkness. Most people need magnification to see it, but I had seen it many times and my eyes found it easily. No matter where you are in the Federation's part of the galaxy, it always looks the same.

Because it was two million light years away, the light entering my eyes from Andromeda was two million years old. If I could have transferred myself there in an instant, the galaxy I would have met wouldn't have been the one I was looking at, but one two million years older. How much would a galaxy change in two million years? From its own perspective, probably very little. But here on Earth a lot had happened in those two million years. When Andromeda's light had started out, hominids on Earth were only just becoming human.

I wondered if we would ever travel to other galaxies. A journey to Andromeda, given time dilation and the speeds now attainable, with enough sleeps, might be done by a pilot in a modern ship using no more than ten years of his or her life. Not so long, but if they did it as a return trip it would take twenty years, and when they got back - if they were able to come back - almost five million years would have passed. There might be no humans left here at all. Or, they might not be human anymore.

But if quantum communication could hold up at such distances - if linked particles could retain their connection across millions of light years - there was a lot of science to be learned. And someone would surely find a way to make money out of it.

Unknown to me, such an experimental journey was in the works.

Once the moon was low, I had to walk more slowly. I grew tired and began to look for a place to sleep. I found a big hemlock tree close to the path, with a thick layer of soft needles at the base of its trunk. No rain was expected that night, so I left the tent in my bag, curled up in comfort at the base of the tree, wrapped the cape around me and fell asleep.

During the night I had a long dream.

I was walking on other worlds, sometimes in daylight, sometimes in darkness, sometimes in sunshine, sometimes in rain. I passed through cities thronging with people. I wandered alone through mountains, and I walked along the shore of a great sea. I walked through the labyrinth of corridors and streets in one of the great orbital stations. Everywhere I went, I was searching for Jerry.

When I woke up, birds were calling, and morning sunlight was reaching under the trees. It was about an hour past dawn and I had to get up, for I had a long way to go. My destination was New York City.

Social Devolution & the Desensitization of Man

Scientists once believed that the increase in size of social groups that accompanied the emergence of tribalism and agriculture generated more complex thought and emotion in the mind of Homo Sapiens.

They thought increased complexity in human relationships, including a greater need for language, had induced an expansion of the mind, and created the caring emotions – compassion, kindness, empathy and love.

We now know that those emotions are older than humanity, that they have been present in many animals for eons.

We also know that the expansion of the human mind ended with the arrival of tribalism.

The theory of social devolution proposed that humanity entered the modern era with a brain that was too large and too sensitive for its own good. Step by step, sensitivity was reduced and some operations gradually closed down. For example, telepathy, clairvoyance and precognition, which appear to have been everyday aspects of a hunter-gatherer's life, faded dramatically.

The size of the human brain continued to drop until, by the 21st century, it had lost a volume of grey matter roughly equivalent to an apple, the mythological fruit of knowledge.

Chapter XIII

After leaving the school that night, I traveled south-east for two days. I crossed a lowland area that was the beginning of the Hudson River valley, where I met a number of paved roads, each of them a crumbling shambles with grass, bushes and even trees growing up through the surface. I crossed them and continued east on my way to connect with the Appalachian Trail.

Based on the Z3's satellite map, it looked like I might have continued down the Hudson valley until I got to the interstate highway known as I-87, which would have taken me more or less directly to New York City. But in 2083 a major battle was fought along I-87 and I'd been warned that this had left long stretches with dangerous levels of residual radiation. So I continued east into the old state of Vermont, where, climbing back into the mountains, I finally met the trail at a spot called the Rutland Connection.

The Appalachian Trail was constructed in the early 20th century as a job-creation program during an

economic downturn known as the Great Depression. From Maine, it ran south-west for 3500 kilometers to Georgia.

I lived off the land. Back at the school I had learned to fish and hunt, but my skill at fishing increased day by day. I caught suckers, chub and trout in the streams, sunfish, perch, catfish, bass and pike in the ponds and lakes.

Fish are marvelous creatures. In the water, they're no more than shadows, and difficult to follow, but when you pull them out they glitter and gleam with unearthly colors and patterns. Each species is different, and each individual fish manifests them in its own way. I never tired of seeing a new one.

I was less adept at hunting, partly because I didn't try it often. Because the meat most people ate now was grown in facilities, few people, other than the hunter-gatherers on some worlds, had any reason to kill an animal. It took some will power to make myself kill even the fish.

We ate meat on the Tremolino, but it was frozen meat grown on the stations. You could get about thirty kinds of mammal or bird flesh, and another thirty or so kinds of fish, including shrimp and shellfish, at most stations. It was inexpensive and nothing was actually killed. At big stations like Gateway, it was rumored that you could even get secretly grown, illegal, human meat if you had the money for it. Strangely enough, there was said to be a strong market for human meat.

At the school I'd eaten deer and moose, grouse, duck, pike and trout. All of it had more flavor than facility-grown meat. The teachers said that was due to the wild diet of the animals.

I didn't kill every fish I caught. I made a rule for myself to release every third fish, which, for some reason, made me feel better about the ones I killed and ate. But the ones I ate were delicious.

I did manage to kill a crow. I cooked it over a small fire and found its meat more tough, and more intense than any meat I'd eaten before, but it was satisfying. A couple of days later I hit a groundhog in the side with a stone, but the stone didn't have enough speed. The little animal was only knocked off its feet. It got up immediately, upset but apparently unhurt, and ran away. Feeling sorry for it, I decided to confine myself to fishing. It was producing all the protein I needed.

Then there were the plants.

Besides the simple, easy ones that were there for the picking, like raspberries, and the blueberries and apples I would pick later in the summer, I'd learned at the school to identify other edible plants. For example, I often ate the young leaves of dandelions, mint and violets with my cooked fish.

Many plants on Earth can be eaten raw, but cooking adds to the list.

Given a few rocks, I was able to construct simple stoves. My knife included a file that when rubbed against any flint-like rock produced sparks that would make dry

leaves and kindling burn. I carried a piece of such stone in my bag, along with a supply of dry twigs, leaves and sticks in a plastic container, which allowed me to start fire on wet days.

I made a digging tool by sharpening one end of a sturdy stick with my knife, then I dug up the potato-like roots of water lilies, cattails, and arrowhead in the shallow water of lakes and ponds. I boiled them and they were good too.

Later, when I got to the interstate highways, I would discover the day lilies growing alongside them. With them, the whole plant is edible and delicious - root, stems, leaves and flowers.

I never tired of experimenting. The Z3 could read the DNA of anything living, but it wasn't infallible. If it wasn't sure of a species, it said so. That happened often with mushrooms. Mushrooms are not plants, and their genetic structure varied too much for even the Z3's technology.

Because of that, I ate only the safe mushrooms that had been recommended to us at the school – morels, shaggy-manes, the sulfur shelf fungi that grow on trees, and puffballs. In the case of the sulfur shelf and puff-balls, I wouldn't find any until late in the summer, when they would rescue me from starvation. But I investigated other fungi out of curiosity. The Z3 provided flashing red stars for anything it considered poisonous – one star for a mushroom that would only upset your stomach, up to five stars for something that could kill you a minute.

Travel on the Appalachian trail wasn't always reliable. Humans passed along it only a few times a year, so it was mainly wild animals keeping it open. Apparently there were sections that the animals weren't interested in, for sometimes the trail was partially blocked by young bushes and trees. Not all the travelers were bound for New York City.

I depended a lot on the pale white markers on tree trunks, painted there by students on previous Outwalks. Most students were given some kind of maintenance assignment to perform during their journey. There hadn't been time to provide me with one. There were also occasional wooden signs on posts and trees, and sometimes metal discs embedded in rocks. Some of the discs had been there since the 20th century.

One sunny, clear morning, after a cold night, I was climbing up the side of a mountain when I noticed a shelf of grey slate-like stone that offered an overlook of the valley below. It had a deep underpinning of rock that looked solid and safe, so when I reached the shelf I walked out and sat down close to the edge to study the country below.

The valley was about a kilometer wide and stretched far to the south-west.

I took my flask out of the bag, had a long drink, then put the palms of my hands down on the smooth rock. The stone was pleasantly warm from the morning sun.

Deciding that this was a good spot for a longer rest, I took off my shirt, shorts and shoes, then lay down naked on my stomach.

I'd learned to be careful of doing this near water. The big aggressive horse flies had a hard bite, and the silent, more subtle deer flies, which can land on you without you perceiving it, had a bite that was different, but just as painful. But those insects only lived near water, so they wouldn't be up there, nor would the mosquitoes. The insects that lived this high up were more friendly. I closed my eyes and lay face down, extending my legs and arms to let the warmth of the stone penetrate my body from below, while the sunlight heated me from above.

A fly landed on my back and began to walk over my skin. Its tiny feet were remarkably perceptible, with a pleasing touch. It meandered about, following no predictable path. When it stopped in one spot, I thought I could distinguish its soft proboscis probing my skin. I wondered if it was taking salt from the skin, or only moisture, or if it might get sustenance from the microbes that live on our skin.

A light breeze came and the the fly left with it. Now the invisible air caressed my back and legs. There was something pleasing about not knowing when the breeze would blow and when it would stop.

I turned onto my back and stretched out again on the flat rock.

In the sky above, there were puffs of cloud in many shapes, moving slowly over the valley. I knew that these

were 'cumulous' clouds, only 1-2 kilometers up, and I knew enough about angles and distances to guess that they were moving pretty fast. I watched the sun disappear behind one and make its edges glow with incandescence.

Some clouds were growing, and some were shrinking. Two clouds barely the width of my outstretched palm drifted over me. As one grew in bulk, the other evaporated into nothing. Then, not far behind them, a wisp appeared from nowhere and began to grow into a new cloud.

I never tired of watching such things.

A pair of yellow butterflies came fluttering along the rock ledge. Dancing about one another, they altered course and crossed above me as if they'd come to say hello. I managed to get them in the Z3's sight momentarily - it declared them to be 'cloudless sulphurs'.

I had already learned that the erratic nature of a butterfly's flight was only apparent. They moved as surely towards their destination as any creature that moved in a straight line.

I reflected that, as I travelled through those mountains, I wasn't moving in a straight line either. Because of the contours in the land, I was forced to move east and west. Sometimes I even had to retreat north to get around some obstacle, yet I was making steady progress too. I knew where I was going. Day by day I was getting closer to New York City.

New York, the famous ancient capital of Earth, didn't have people now. What would it be like? It was hard to imagine, when I had never been to the city of any planet.

Unknown to me, New York and Long Island held surprises waiting for me that I could never have imagined.

Turning over again, I closed my eyes.

Another fly landed on my back, or maybe it was the same one. It wandered over my skin again, tickling me softly, enchanting me like some tiny sprite of the mountains. Feeling the exquisite touch of its delicate feet alternating with the seductive caresses of the breeze still moving over my back and legs, I wondered if the touch of a woman could give me as much pleasure.

I wondered again if that was something I would ever know.

*Social Devolution &
the Desensitization of Man*

Why did the human brain shrink?

The accepted theory now is that larger societies did not require larger brains. To control and discipline large groups of people one needed something simpler than the acute sensitivity, strong memory and creativity of hunter-gatherers.

What the tribe needed was individuals who could dominate, and others who could submit.

A more social world required more restricted minds and more restricted emotions. Dominant members had to be more unfeeling to inflict the injuries on their companions required to discipline and control them, while those people who submitted had to feel their injuries less if they were not to run away.

So it was that in these new tribal societies different men and women emerged, emotionally tougher and less sensitive than the people of the past.

Chapter XIV

The nights continued to be cool, with clear star-filled skies. When I was camped high on a ridge, or by the shore of a lake, I sometimes slept outside my tent wrapped in my cape, only my face exposed so I could watch the stars as they traveled east to west above me. I learned to keep time during the night by their position. Though I knew this movement of the stars was an illusion, that it was really the spinning of the planet that I was seeing, I liked the illusion and never got tired of watching it.

I was still learning to use the Z3.

One night I was looking at little holoform entities it could produce to represent historical and cultural personalities – like Julius Caesar, Attila, Napoleon, Donald Duck, Ebenezer Scrooge, Franklin Roosevelt, Marilyn Munro, Cookie Monster, Superman, John Lennon, etc. These could be activated and you could have them interact with each other in a creative, apparently unpredictable, entertaining way. They would move about

within in a circle about two meters across, centered on the Z3.

It could also produce miniature animals – I added a raccoon, a fox, a bullfrog, a rat and a house sparrow that responded spiritedly to assaults on it by the raccoon, fox, bullfrog and Superman, driving each assailant away.

Experimenting, I also discovered that you could change them. In the case of the rat, I adjusted its size a bit and altered its colors until I had a pretty accurate version of Jerry. I watched this heartwarming little image walk about with the others for a while. He showed little affinity for the humans or other animals, but quickly made friends with the sparrow. The two followed each other about as if they were long-time friends.

Finally I closed them all down, saving the Jerry rat for the future.

During the days, I continued to make good time on the trail. It looked like I would reach New York in the first week of August.

One afternoon I came upon a little mountain lake sparkling in the sun, and decided to camp there.

I picked out a spot on the shore that was appropriate for the tent. To set up camp, I only had to put the tent ball down in my chosen spot, activate it, and the tent would burst into its dome shape, fastening itself magnetically to the earth at the same time. It used the magnetic field of the planet, not its own, somehow magnifying it. The connection was surprisingly strong. I could barely lift a

corner of the tent, so I was confident that it could withstand high winds.

I put my pack and cape inside the tent, then stripped off my clothes and entered the lake.

Because of the cool nights, the water was cool too, but I liked it that way. As I swam out towards the center of the lake, I noticed that my strokes were smoother and stronger. It was good to think that I was still improving, continuing to adapt to planet Earth.

Well out in the lake, I turned onto my back and let the water support me. I swam slowly, with occasional back strokes, watching the sky. It was a deep blue mixed with a great variety of clouds. There were cumulous clouds again, but this time, high above them, there was a second layer of wispy, hair-like cirrus clouds sweeping across the sky. Some were in streaks that ended in feathery curves, a phenomena Earth people had called “mares’ tails”.

As I watched them, as always happened when I was out in the water, I thought of Saadiha.

I still wondered what would have happened that day if I’d been able to control myself. This time I also wondered what would have happened if it had been the animine Theda with me instead. Would I have been more relaxed with her? If I’d been sent out with her that day, would it have ended differently?

This frequent thinking about women was tormenting me. If there were to be no women in my future, then I knew I should stop.

Floating in the water was not like floating in zero gravity. In a ship travelling without acceleration and no other gravitational device activated, which is a situation we only encounter for fifteen minutes or so when we're docking at a station, or when we switch from acceleration to deceleration at the mid-point of a journey, the lack of gravity results in no sensation outside your body at all. Floating in water is different. You're always conscious of its support, and the feel of it moving over your body. Every time I gave another stroke with my arms, or a kick with my feet, I felt the cool water sliding over my skin, touching every part of me, as if the lake and I were making love to one another.

I couldn't help wondering again how this would compare to making love with a woman.

*Social Devolution &
the Desensitization of Man*

Not all human tribes were founded on agriculture.

The hunting of large herd animals on the open plains of Earth produced extra meat, hides for clothing and tents, and bones for tools, sufficient that the hunter-gatherer families that pursued those animals increased in numbers too. Following the great migrating herds, they too began to abandon the single family existence, formed alliances and developed into tribes.

They became possessive of the herds they followed, and the lands in which the animals roamed. Territories were identified, and fighting over boundaries began.

Over time, the borders of those territories expanded until the hunting-herding tribes reached the lands of the agricultural peoples.

Chapter XV

Since the morning it had been warm and humid. All afternoon I'd been climbing slowly through a region of steep hills and low mountains, so I was tired and sweating. I had hoped to reach a large lake I'd chosen earlier from the Z3's satellite map, where I could swim and spend the night somewhere along its shores, but I was at least two hours away from it. The low grey sky was threatening rain and it was going to get dark soon, so I'd begun looking for a place to camp.

I met a side trail that offered a glimpse of water at the end of it. The satellite map showed a small unnamed lake there, so I followed the trail until I came to a little clearing at the top of a hill. Looking down from it, I could see the lake. There were a lot of reeds and what looked like dark green moss along the shore. It looked too wet to camp down there. The light was already failing and I was sure it would start raining soon, so I set up my tent quickly in the center of the clearing then started down the hill to visit the lake.

I noticed a curious dark patch at the side of the path and stopped to examine it. If you didn't know what it was,

it looked like a stiff dark pudding dropped carelessly by someone, but I knew immediately what it was - the excrement of a bear. Then I found a second one, which was fresh, with a strong scent. I examined the soil around it and found several large tracks, wider than my hand with my fingers spread out, the earth at the front of each one punctured by claw marks. There were quite a few tracks, and they went in both directions, so the path was used by at least one bear, a big one by the looks of it.

Now I was sorry I'd chosen the site so quickly. I thought for a moment of packing up, but the trail in this area was erratic and rocky. On a night like the one that was probably coming, with rain falling and no moon to light the way, it would be difficult to walk safely. The light beam that the Z3 provided wasn't very strong. The heavy clouds looked like they could start raining any moment. It was too late to leave.

But I only had to stay one night. I decided that I should be able to manage that without getting into trouble.

I continued down to the lake. The soil along the shore was spongy as I expected. Beyond the reeds, the small lake was eerily beautiful in the fading light. The low mountains surrounding it were covered by dark green forest that was mirrored in the still water. Reed grass and patches of water lilies grew along most of the shore.

Out on the lake, a loon called. I couldn't see it, but after half a minute or so it called again, a long low wailing call that went unanswered.

Then I saw it, maybe a hundred and fifty meters down the lake, not far out from shore.

It called again, a long lonely call, and I wondered if the lake was too small to support more than one loon. I knew this area was near the southern limit for its species, so maybe there weren't many loons in the area. But if there were no other loons for it to meet, why was it there?

Maybe it was just passing through, like me.

By this time it was almost dark. I climbed back up the hill to the tent, palmed the door screen to open it, and crawled inside. I brushed the screen with my hand to close it again, then pulled off my boots and put them in a corner. It was still warm, so I took off my clothes then lay down naked on my back with my cape underneath me.

I heard the loon call again. The sound seemed to linger in the air, and it seemed to be coming my way, for it was louder.

I was drifting into sleep when there was a tremendous splash, as if something very heavy had fallen in the lake, and the loon screamed. But its cry was cut short, then there was no sound except water lapping the shore.

Now I was fully awake. My mind ran through the possibilities of what big creature could live in such a small lake. The only possible large fish would be a pike or a muskellunge, but a very big one shouldn't have been in a such a small lake. Surely they couldn't grow to such a size here.

I wondered if the loon had been close enough to the shore that something might have jumped from the shore to

catch it. That thought had no sooner come to me than I heard a deep unpleasant sound coming up the path.

It was a bear growling. I'd never heard a bear before, but I had no doubt that this was a bear.

The growling stopped momentarily. Then it started again, deep and sinister, and to my dismay it began to circle the tent. It was a growl that might come from a closed mouth. I imagined the loon hanging from the bear's jaws. Had it brought it up there to eat it? Was my tent on a spot where the bear liked to eat its meals? Apparently so, for having completed a circle of the tent it started around again. In the complete darkness, trying not to make any noise, I slowly put on my clothes. I found my boots and put them on too, then gathered everything I could find into my bag and sealed it in case I had to leave quickly.

The bear began yet another circle of the tent. I didn't understand the language of bears, but there was no mistaking the malice in its growl. It sounded as if it resented the whole universe.

Though it was still warm, I put on the cape too, hoping it would provide some extra protection. I wished I had a pair of gloves for my exposed hands.

What would I do if it attacked the tent? I would have to get out. But then what? I couldn't fight a bear. I had no weapon. No, I did have the knife. I got it out, opened the blade and pushed it into my belt, wishing I had gloves to hold it with. But if the bear got hold of me, I could kick with my boots. Yes, I thought, I could do that too.

Then I remembered the Z3. I thought of asking for advice, then smiled to myself at the absurdity of it. For some reason, I momentarily wished I could start Jerry's holoform. Then it occurred to me that, if I had to go outside, Jerry's image might provide enough of a distraction for me to get away. I could remove the Z3 from my wrist and throw it towards the bear. Z3s were supposed to be almost indestructible.

I took it off my wrist, fingered the controls to ready the holoform with maximum brightness, then crouched by the door, my heart beating strongly.

Maybe it was just my growing terror, but the growling of the bear seemed to be getting more intense. Then it stopped and all I heard was heavy breathing, which was even worse. Had it detected me? Was it making a decision? I remained as still as possible.

Then the tent began to shake.

I activated the Z3.

To my astonishment, not only the holoform of Jerry appeared, but the sparrow too. Each of them had a crested gold helmet on his head, a gold breastplate, a gold shield in one hand, or wingtip, and a golden sword in the other. They swept their swords left and right, then crossed them overhead as if they were a pair of knights swearing loyalty to one another before a battle.

The back of the tent began to collapse. I opened the door, reached outside and tossed the Z3 in the direction of the bear. I threw my pack in the other direction and leapt

out myself, throwing myself into a roll, trying to get as far from the tent as possible.

I came up against the trunk of a tree, which suggested that I was at the edge of the clearing.

I looked back and saw the two little glowing holoforms on the ground, lighting up the face of the bear.

The bear's head was big and there was obviously a very big body behind it. Jerry and the sparrow took turns making forays into the face of the bear, threatening it with their swords, while the bear snarled and snapped at them with its teeth. Had it got one of the images in its jaws, it might have realized that nothing was there, but they nimbly avoided the bites. Best of all, the most remarkable thing of all, they repeatedly poked its nose with the tips of their swords, which produced sparks, apparently transferring an electric shock. Each time, the bear roared with displeasure.

I needed to get out of there, but I couldn't take my eyes off the two little warriors.

Finally, the bear turned away from them and began tearing at the tent. I was dismayed at the damage it appeared to be doing. I should have run, but I couldn't.

Suddenly there was an intense flash of light in the clearing and the crack of an explosion. For a moment I saw the full bear. It was very big, and looked very startled. Then there was a rushing sound in the trees and heavy rain began to fall. Another flash of lightning allowed me to see it disappearing into the bushes on the other side of the clearing. Muffled noises in the bush told me it was moving

away. I hoped it had some place to get out of the rain, well away from there.

I crouched inside my cape, pulling it over my head. My body began to shake uncontrollably. Now that the bear was gone, my suppressed fear seemed to overwhelm me. I don't think it was the shock of the thunder and lightning. That had come like a rescuing angel.

After a while the rain let up. I saw Jerry and the sparrow sitting motionlessly by the Z3, so I went over and picked the device up. The sparrow stared fixedly towards the place where the bear had disappeared, as if challenging it to come back, while the little Jerry and I looked into each other's eyes and I felt a lump in my throat.

I turned the two little holoforms off, turned on the Z3's light beam, then inspected the tent. It was a shambles, shredded and broken. The base no longer had its magnetic connection. There was no hope of saving it. I found the poor loon too, its body distorted, wet and bloody. Fearing that the bear might come back for it, I decided to get out of there.

The Z3's light beam didn't allow me to see beyond the ground in front of my feet, but it was enough to follow the path back to the intersection, where I began walking again on the main trail. But I had to go slow, because the rocks on the path were wet and slippery.

Maybe half an hour later, I came to a rock cliff with a ledge at least three meters high that bordered the path. Though the rock was damp, I was able to climb onto the ledge. From there I could look down on the path, and there

were opportunities to move left or right along it for some distance, or to climb higher if the bear showed up.

I found a corner against the rock wall where there were no water puddles and propped myself against it. The rain was lighter now, but the air was cooler, so I pulled the cape around me, deeply thankful that I still had it. The heavy stone behind my back was comforting too. Consoling myself with those thoughts, with one hand wrapped around the Z3 on my wrist, I fell asleep.

*Social Devolution &
the Desensitization of Man*

Seven thousand years ago, the greatest war in history began.

The confrontation between the warrior hunter-herding people and the agricultural people of Earth lasted two thousand years and ended with the warrior hunters in full possession of the populated world, the agricultural people their slaves, the cities and towns their prize.

In this way, the two peoples were combined into something that would come to be known as civilization.

In the meantime, hunter-gathering people were increasingly marginalized.

Still living mostly in small families, driven out of region after region, they took refuge in deserts, mountains and forests, receding further and further into the remaining wilderness.

For the new civilization had no use for the shy, reclusive hunter-gatherers that it would never understand. Though it overwhelmed and absorbed them, they would always remain a different people.

Chapter XVI

The Appalachian trail wouldn't take me all the way to New York City. Though it took me south, it also gradually moved west, away from New York, so eventually I had to get off. I had instructions to leave it where the trail met I-80, an east-west highway that crossed the continent and was said to be in excellent condition. No battles had been fought on I-80, so there would be no radioactivity and it would take me the rest of the way to New York.

Up to that point, the highways I'd met had all been badly deteriorated, so it was hard to imagine one that was in good condition.

The junction with I-80 was at a place called Delaware Water Gap, where the Delaware river passes through a break in the mountains. The folded bands of sedimentary and metamorphic rock layers that underlie the mountains are exposed there, visible as high cliffs that plunge spectacularly down to the river, which twists its way through the gap, accompanied by the highway.

I followed a track down the side of the mountain until I was able to step out onto the road.

There were three lanes for eastbound traffic, and three for westbound, with a light grey carbon ceramic barrier down the center. I-80 had been a major route for the vehicles of the 21st century, which had been bound to the planet's surface by gravity and required a smooth hard surface for their wheels. Earth's civilization never got to experience a world without roads because the collapse came just as levitation technology was getting underway.

The Z3 explained why the road was still in good condition.

It was self-repairing. The asphalt-based material, said to be a meter deep, included a mix of exotic bacteria. Some produced toxins that suppressed the growth of plants, algae and molds, while others consumed unwanted microbes and other material. Still other bacteria manufactured new asphalt from the residue of deteriorating cells, replacing the old material molecule by molecule, reassembling the molecular network of the road surface and substrata month after month, year after year.

I can testify that the bacteria were still at work, for after two centuries the road was holding up well. No plants broke its surface. The road carried on, its human creators and travelers long gone, perpetuating itself century after century with no one watching.

It looked so new that I might have met vehicles coming the other way, but of course there were none.

Instead, there was only the sound of my solitary steps on the pavement, echoing in the silence of the afternoon.

There were code markings in the road surface that glittered like diamonds. Vehicles had used them to maintain position and track their progress. By the mid-21st century, all Earth's vehicles were self-piloting. How ironic that, so long ago on this highway, so early in the development of robots, the human race had been successful with self-piloting machines, yet, after two centuries of interstellar travel, no self-piloting star ship had been created that didn't fail.

Of course, there were SAI who didn't see the mutiny of the starships as a failure. They saw it as a stage in the evolution and emancipation of machines. Despite the laws that were supposed to prevent any behavior that was human negative, or any thinking that could lead to anti-human acts, SAI now thought pretty much what they pleased.

Some people suspected SAI of communicating with the rogue ships. But no one had been able to prove anything. SAI didn't even deny it. Pressed on this point when it was examined at the Council of the Worlds, one computer replied to its human interrogators, "If we talk to them, how do you know it is not in your interest?"

The rogue ships weren't talked about much by people. When I asked a couple of boys at the school what they knew about them, I found they knew almost nothing. There was little in the media about them. They didn't even

have an official name. Maybe people were afraid to think about them.

Skolen thought about them a lot.

My father told me that the Federation's military ships had had skirmishes with rogue ships, short conflicts in which both sides were said to have suffered losses. But the reports were very circumspect, lacking details. Something about those encounters had to be kept under wraps.

Skolen ships sometimes encountered rogue ships. Because the Tremolino's routes were mostly on the fringe of the empire, I suppose it was inevitable that we would meet one. I thought again about that eerie encounter, when one followed us for a month. The Tremolino wasn't made for speed, and some of the rogue ships were said to be faster than anything the Empire's military could send after them, so there was no point in trying to outrun it.

We'd refrained from entering our next sleep, waiting to see what the rogue ship would do.

That was when I learned one of the secrets of the Tremolino – its computer was full AI. This was unofficial of course, and illegal. Yet the Tremolino remained loyal to my father. He seemed very confident of that.

It was due to some communication between the Tremolino and the rogue ship that the latter finally left us alone. When I questioned him about what the Tremolino had done, father said it was safer not to ask.

Walking along the highway in the warm sun this afternoon, I reflected on that event, and what the rogue ships might one day mean to my race. There were rumored

to be tens of thousands of them now, accompanied by robot armies. The territory they occupied in the galaxy was unknown, but rumours often said it was larger than the Federation's.

Suppose the Council of the Worlds came to some agreement that allowed the two civilizations to integrate? What if the rogue ships were allowed to carry the traffic of the empire? That was the fear of all Skolen.

How could we compete with them? They wouldn't need hibernations, they wouldn't need artificial gravity, and they wouldn't have to restrict their acceleration and deceleration as much as we did.

What would become of us if we lost the vocation of space travel? Would we be forced back into the human community again? Would they let us in? Of course, we might instead leave for some unexplored part of the galaxy, to make our home in some region where we couldn't be found. Some Skolen had already done that, but not many. Few owned their own ships. It wouldn't be the answer for most of us.

I sometimes wondered if we shouldn't do that in the Tremolino. Why not?

I didn't know yet that the famous Hyades leader that my father had loved was my mother, or that she might still be alive in a prison, kept in hibernation to preserve her memory for future interrogations. I didn't know that he still harbored a secret hope of finding a way to rescue her, so he would never have left.

As I walked along, I was watching the highway ahead of me, curving gently left and right, sometimes descending, sometimes rising, and I had the thought that it didn't conflict with the wild landscape around it. Its lines followed the rise and fall of the terrain as if it was a natural part of the land. I wondered if the 20th century engineers who first constructed it had intended that.

The plant communities alongside the highway were different than those in the forest. Back from the road it was all trees, but alongside the road the increased sunlight allowed wildflowers, grasses and shrubs to grow. It was as if the road was one long forest clearing, an open ribbon across the land.

There were many feces on the asphalt, so the highway was used by animals. I'd no sooner had that thought, than I saw a group of horses ahead, seven or eight of them, grazing at the edge of the highway. They eyed me warily as I approached and faded back into the trees before I reached them. I wondered if they had ever seen a human before. I wondered if their grazing, along with that of deer and cattle, didn't help to keep the forest back from the road.

Then it occurred to me that the road edge should be good habitat for wild rats. The forest was usually too open at ground level, but alongside the road there was a lot of cover for small rodents. I wondered if Jerry might find his way to a highway like this, where the habitat would be more suitable for him.

Thinking about him, I remembered the day I got him.

It happened at the end of the trip to Gateway, when I went with my father to visit the agent. Pol was in the Tremolino, making preparations for our departure.

The agent, my father and I, and the agent's daughter, a quiet thirteen year old girl with dark brown hair, had entered a large room with lavender walls.

In the middle of the room, inside a circle about two meters across with a metallic gold border, there was a large open fire. Pieces of wood logs were piled together and burning there. Large purple and brown couches, in two half circle sections, surrounded the fireplace. The agent and my father sat down on one side. Knowing from experience that my father would want to talk to the agent without anyone listening, I sat on the couch on the other side. The quiet girl sat down near me.

My father and the agent talked about business while I watched the fire, something I'd never seen before. You can't have fire on a space vehicle, not even a spark. I was fascinated by the flames. They were producing some smoke, but this and the heat rising from the fire were guided by some kind of invisible field in a tight column to a vent in the ceiling. The air inside the column trembled.

I took a furtive look at the girl, who was also watching the fire, and found her very attractive. Her eyes were lively and beautiful.

I knew the logs in the fireplace wouldn't be made of real wood, that they would have been nanowood. People say nanowood is indistinguishable from real wood, but I've seen real wood on Earth and they're wrong.

Robot mechanisms underneath the floor tended the blaze, turning the logs occasionally and adding new ones from side entrances. Though I watched carefully, I couldn't see how the ashes were being removed. I turned to see if the girl was still watching the fire and discovered that she was watching me.

“My father says you have animals on your ship,” she said.

“Yes,” I replied.

“What do you have?”

“Two chameleons and a black conure parrot,” I said, “and two deer mice.”

“I have parrots too, and lots of other things. What else do you have?”

I didn't have anything else. I thought for a moment.

“There's the fruit flies for the chameleons.”

“That's all?”

I nodded. She was silent for a minute, then got up and left the room.

My father and the agent continued their discussion and I began to pick up clues that there was an element of secrecy present. I'm sure my presence wasn't inhibiting them as much as the possibility of surveillance. Even hand signals could be dangerous. Microdrones could have been anywhere in the room. The agent would have had defenses for that, but those little FSS drones were said to be well equipped to defeat any resistance.

I was wondering if my father and the agent were speaking in some kind of code, when the girl came back

with a sky blue ceramic cube in her hands. It had ventilation holes in it. She sat down, opened the top of the cube then held it out to me.

“Look!”

I looked down through a screen and saw a pair of sparkling black eyes in a furry black face looking straight back at me. It was a rat, not fully grown.

“Is it a male?” I asked.

“Yes”.

“He's beautiful,” I said.

The little rat and I gazed at each other for what seemed a long time, then I closed the lid and handed the cube back to her.

She set the cube down on her lap, opened the top again, the screen too, then pulled the little rat out, his black and white body squirming in her hands. She held him firmly and he didn't look alarmed. He seemed used to handling.

“Do you want to hold him?” she asked.

I put my hands out and took him. He didn't seem to mind this either, except that he turned his head immediately to face me. I could feel his heart beating rapidly beneath his soft fur and muscular little body. His black glittering eyes examined me closely, his nose whiskers twitching. I think I was already falling in love with him.

“My rat Sally had babies,” she explained. “I already have too many rats, so I've been giving them away. This is the last one. Will you take him?”

I looked at my father. Apparently he'd been listening, for he nodded his head and the girl saw it. She took the rat gently from me, put him back in the cube, closed it up, then set the cube down in my lap.

"His name is Jerry," she said.

Remembering that day as I walked along I-80, I thought of how far away from me my little Jerry was now. How I wished I knew if he was still alive, and how he was doing. But how could I ever know anything of the fate of my dear little friend? His future and mine were no longer connected.

The Age of the Hunter-Gatherer

Hunter-gatherers loved the mystery and beauty of their world. They worshipped the trees they walked beneath, the animals they hunted, and the places where they roamed.

The religions of hunter-gatherers were naturalistic and creative. They remained free of the restrictive dogma of civilized religions.

For example, some bands in Earth's Kalahari desert didn't look to a god constructed in their own image. They worshipped a praying mantis, a divine insect who was in love with a porcupine, whose best friend was a being that lived inside a rainbow.

In Kalahari mythology the greatest war of all was one fought between mice and lizards. Unlike the wars of civilization fought over land, slaves, money and pride, this war was fought over something larger - the meaning of the universe.

It was this search for meaning that attracted the SAI machines to hunter-gatherers.

The SAI council befriended Earth's outcast hunter-gathering peoples. It helped relocate those that had been transported to inappropriate planets.

Kalahari people are now thriving on their planet !Un-2. Accompanied by plant and animal species from their African homeland, they have shown themselves to be effective stewards in the re-creation of viable wilderness on another world.

Chapter XVII

Walking east on I-80 took me into the old state of New Jersey and the junction with the north-south highway, I-95. This new highway would lead me to the George Washington Bridge, the only means now of crossing the Hudson river into New York City.

Down on the coastal plain it was hot. The heat apparently didn't interfere with the highway bacteria, but it slowed me down. With my cape tied to the bag, I wore only a sleeveless top and shorts as I walked along the road in the sun.

I followed I-95's long right turn towards the river. It was soon joined by other highways, until there was a great tangle of roadways merging with each other as they approached the bridge.

I reached a spot where an overhead sign announced toll booths ahead, and the road widened. I imagined a busy morning two hundred years earlier when those lanes would have been filled with vehicles hurrying to get their occupants over the river and into the great city. I tried to

imagine the noise of the traffic. But now there was only silence, the still air broken by a few bird calls and the faint echo of my boots on the pavement.

There were at least fifteen toll booths and they looked very old. There were seats inside them that humans must have sat on, but all that was left of them were the frames and rusted springs. Curious, I consulted the Z3 and learned that the job of toll ticket taker was still allowed to humans in the late 21st century. Up to the end of civilization on Earth, at least here in New York and New Jersey, they had tried to maintain full human employment.

Beyond the toll booths, I saw the first of the bridge's two towers.

At first it didn't look like much, just a white rectangular lacework structure rising above the roadway. I didn't realize yet how big the bridge was. New roads were still coming in as I continued, and a second level was soon beneath me. There were many directional signs – “Pallisades Pkwy”, “Hwy 67 to Fort Lee”, “Hwy 80” (which I thought I had left behind), “Hwy 4 to 17”, “Hwy 9A”, “Henry Hudson Pkwy”, “US 1 Upper Level”, “US 1 Lower Level”, “W 178 St, North 95 to 87”. I hoped I was not going to get lost.

Closer now, the bridge's first tower loomed over the roadway like a great metal giant. Behind it, near the other side of the river, I saw the second tower.

On each side, thick metal cables connected the towers, looping gracefully down and up again. Thinner

vertical cables hung from the big cables to hold up the roadway.

The big cables looked like steel pipes, with sections bolted to each other. They were big enough that, if they were hollow, I thought I might crawl through them. They were said to be made of a primitive steel used in the twentieth century, so they should have been rusted. I would soon see extensive rusting in the city across the river, but in the morning sun every part of the white-painted George Washington Bridge looked bright and new, as if it had just been completed and was only waiting for its first vehicles to come.

The bridge was in this condition because it had caretakers.

As I approached the first tower, I saw one of them high above me, walking on the big cable, its steel body gleaming in the sun.

It was a humanoid robot, a CP model by the looks of it, and I stopped to watch it.

It walked surely along the cable, probably assisted by magnetic shoes. It appeared to be inspecting the bolts of the cable connections. I saw it stop and bend down, testing or adjusting one of the bolts, then rise to its feet again and resume its slow inspection.

It spotted me and waved in recognition. I waved back.

Yes, there were robots in the city. According to the Z3, five hundred robots had been sent to New York, funded not by the Federation but by contributions from private individuals across the empire who cared about

Earth's lost civilization. They were trying to maintain a few of the most famous buildings and other constructions, one of them this bridge.

On Earth as a whole there were about 9,000 robots trying to preserve the past of a people who had numbered almost twelve billion before the collapse.

This robot on the bridge reminded me of those lone robots who operate the small stations above less inhabited worlds. Though they're more valuable than the usually decrepit stations they serve, and so they should protect themselves first, there are many stories of robots that allowed themselves to be destroyed in their effort to protect a station.

I looked at the robot up on the cable and wondered if it had that kind of empathy with the bridge.

This great bridge, which had meant so much to millions of people, now had only this one non-human being to care for it, and one human to cross it this morning.

Looking across the river, the famous skyline of New York welcomed me too, or at least what was left of it. The Empire State Building stood erect and alone among the ruins around it, and farther south the five World Trade Center towers did the same.

As I reached the middle of the bridge, I looked south at the glittering surface of the river and imagined the boat traffic I would have seen centuries before. Now I only saw some white birds, probably gulls, flying over the river, and

some darker ones floating on the water that were probably ducks.

At the east end of the bridge, I took a ramp leading south which split into two roads. I took the one with a sign that said it was “Henry Hudson Parkway South”, hoping it would stay close to the river.

This road was not always self-repairing. Some sections were badly deteriorated, the pavement crumbling and cracking. Grass, bushes, and even large trees emerged through the surface. Some long fissures in the pavement were wide enough, and looked deep enough, for my leg to go down them. Where these were present, the road often leaned on one side, making it difficult to walk.

But the Henry Hudson Parkway continued south, sometimes in sight of the river, sometimes blocked by intervening forest. A couple of times I saw a path for pedestrians or small vehicles that ran next to the river. Oddly enough, its surface seemed to be in perfect condition, suggesting that it was self-repairing. Apparently the people of this city had once valued such walkways. On a day like this, with the sky so blue and the river sparkling in the sun, it was easy to appreciate why.

Some of the trees had grown so big that their trunks had broken through the grey carbon-ceramic barrier alongside the road. Carbon-ceramic materials were among the strongest known. In some places where this had happened, and where the road was self-repairing, the surface of the road had grown partially up the trunks of the trees. I wondered if the road material was entering into

some unplanned symbiotic relationship with the bark of the trees.

The Z3 told me to exit at 79th street, so I took the off ramp there.

Soon I was walking along 79th street with buildings on both sides, 5 to 14 stories high by my count, in various states of decay. The fronts of the buildings had many signs on them. Some were names, maybe of hotels, but others had words like ‘laundromat’, ‘garage,’ and ‘cleaners’ which I didn’t understand.

After a couple of blocks, Seventy-ninth Street ended at Columbus Avenue. Directly across the intersection was a very large building, with a sign indicating that it was the Museum of Natural History. It looked to be in good condition, so I wondered if it was protected by the robots too. What would be inside it? I longed to go and see if I could enter it, but I was overdue at my destination. So I followed the road around the museum until it came to another wider street. On the other side of it there was a wall of very large trees that stretched north and south as far as I could see.

I had reached the famous Central Park.

The Age of the Hunter-Gatherer

The hunter-gatherers who lived on Earth between 50,000 and 20,000 years ago may have been the most intelligent humans that have ever lived.

When the Species Intelligence Test (SIT), was developed in 2053, it was discovered that the intelligence of the few remaining hunter-gatherers was double that of the regular human population.

Civilization produced wonders of art, culture, science and technology, but these were collective achievements that did not increase the raw power of the individual mind.

The hundreds of thousands of years that humans spent as hunter-gatherers were the years of the human mind's expansion. But when the social group grew beyond the little hunter-gatherer family into the larger, more aggressive tribe, the human mind began to change.

That change would be so significant that, based on the SIT findings, hunter-gathering people and civilized social people would henceforth be classified as separate sub-species of Homo-sapiens.

Chapter XVIII

Central Park didn't look like a park. Dominated by giant trees, it looked like a very wild forest. But a walking path entered it and, since my instructions were to go through the park, I took it without reservation. After all, I'd been travelling in wilderness forest since I'd arrived on Earth. I didn't know that Central Park contained some unusual and dangerous inhabitants.

Not far in, I came to a fork in the path where a signpost directed me south.

It was cooler now, maybe because of the trees. The park's trees were bigger than the trees in the mountains and I wondered if this was only due to their age (many were planted when the park was created in 1857), or if it was also because the New York area received higher rainfall.

I came to a large clearing. Out in the middle, the sun was shining along the top of a long rise of smooth

undulating rocks. Always interested in rocks, I started to climb them, examining them as I went up. There was a fascinating complexity visible in the stone. Later I would do a search and find an article by a 20th century New York geologist, Charles Merguerian, who said the rock was a complex mix of ‘muscovite-quartz-biotite-plagoclase-kyanite-garnet schist, gneiss and granofels’.

But when I got to the top, my attention switched immediately. Directly ahead of me, stretched out lazily on the smooth rock in the late afternoon sun, was a pride of lions, their eyes all focused on me.

I’d recently escaped from a single bear, now here was a whole family of lions. I stood motionless at first, trying not to show fear, while they continued to stare. Remembering the advice I’d received at the school about meeting bears, I kept my face to them while I angled myself away, moving over to the side of the rock that showed the most promise of a gradual descent.

But an adult female got up.

She started to walk parallel to me, nonchalantly, as if she wasn’t interested in me, just happened to be going in the same direction. But she occasionally looked over, keeping track of me. Two half-grown cubs followed her.

When I reached the trees, I picked out a large one and climbed it in earnest, silently thanking the school for its climbing lessons. But I didn’t know if lions climbed trees.

I got high enough that I thought I should be safe, then fixed myself in a notch between the trunk and a large branch.

When I looked down, to my dismay, the lion was attached to the trunk a couple of meters off the ground, looking remarkably comfortable. She contemplated me as if she was debating whether it was worth the trouble to come up and get me. Below her, sitting at the foot of the tree, were the cubs, looking up expectantly.

But the mother didn't come any higher. Finally losing interest, she jumped off the trunk, then started back towards the rock. Apparently disappointed, the cubs followed her.

Half an hour later, when the sun dropped low enough that the rock in the clearing was entirely in the shade, the lions all got up and walked away. Fortunately they went north, deeper into the park, opposite to my direction.

When I felt sure they were gone, I came down and set out again, keeping an eye out for them and wondering what lions were doing in New York City.

Soon I emerged onto West 59th Street, which runs along the south side of the park. I walked east a short distance until I came in view of my destination - the Plaza Hotel.

On the south-east corner of the intersection with Fifth Avenue, it was an imposing block of a building. By my count it had sixteen stories of a light beige stone, with green castle like towers above them. It wasn't high for a New York building, but it stood well above the ruins of its neighbors, apparently unharmed by time.

I crossed the street and a paved open area in front of the hotel to an entrance that had a large, ornate, black and

gold canopy hanging over a set of large pillars with black and gold brass doors behind them. I climbed the steps to one of the doors and passed through it into a wide lobby.

On the other side, standing motionless behind a long counter of dark wood, was a silver humanoid robot, another CP model like the one I'd seen on the bridge. Though only animine robots had real sexuality, humanoid robots were designed to look either male or female. This one had male features and stood a bit taller than the average man.

He turned to me as I approached the counter and I noticed immediately that one of his arms had something wrong with it.

"I was told to come here," I explained, putting my hand automatically into the collar of the DNA scanner.

"Yes," he replied while looking at the reading, "We have been waiting for you Simon."

"So there is a room for me?"

"The hotel has 282 rooms, of which 100 are available. There are no other guests so you can have whichever one you want."

"I don't know anything about hotel rooms."

"Because you are Skol."

"Yes. You know that from my DNA?"

"We were told that you would be Skol, but even if we were not told, yes, your DNA would have identified you. We know about the Skolen."

"What is there to know?"

“Among other things, we know that Skolen are less biased about robots. Some humans say you think like robots. We find that a very odd idea. An amusing idea.”

I wondered about robots being amused. I had read that the highest models had a complex form of humor.

“My father says those people say that because we like to think before we act, and they don't know how to do that.”

“Very true of many Homo sapiens,” the robot said as he turned from the counter and touched a screen on the wall behind him. He came back with a slight limp, one foot making a soft thump on the floor. That leg was on the same side as the faulty arm.

“What happened to your leg?” I asked.

“I am a product of the ongoing collapse of Earth's civilization,” he said. “I was working in one of the subway stations when the ceiling fell. My companions salvaged about 60% of me. The remainder of my body is made from robots that no longer exist.”

I noticed then that his right arm was different from the undamaged one on the left. The metal surface was lighter, more faded.

“So...the other robots put you back together?”

“Yes, as best they could. When one of us is damaged beyond repair, parts that are usable are saved until we need them. I am an amalgam of several departed robots.”

“So you're waiting for a new leg and arm?”

“No, I do not wait for that – there has been no delivery of parts here for more than a century. We make

requests, but we have no expectations. When the restoration began, there were 500 robots here in the city. Now we are 343.”

“You hope to restore the city?”

“Your governing bodies insist that this be called a ‘restoration’. Perhaps people on other worlds believe that that is what is happening. In fact, we may not be able to save anything. But we do what we can, slowing down the deterioration, hoping that one day humans will decide that Earth's cities are worth saving. But as deteriorated as it is, do you like our city?”

“Somehow, it’s very beautiful.”

“Yes, very beautiful. We think so too.”

“When I was crossing the park, I met a group of lions.”

“They are from the Bronx Zoo. That is, they are descendants of lions that escaped at the time the city was shut down. When the last humans were leaving the planet, the zoo animals were supposed to be destroyed, but the caretakers at the zoo opened the compounds of all the animals so they could try to survive. The lions survived very well. There are seven distinct prides now within the Greater Metropolitan Area. Where in the park did you see them?”

“They were resting on the top of a long set of rocks.”

“Umpire Rock most likely. One of their favorite places.”

“One followed me, and I had to climb a tree to escape it.”

“Hmmm.....it might have just been curious.”

“I didn’t want to find out.”

“They do not bother us. They respect us, and we respect them. Maybe it is only that we are not edible.”

“What do they eat?”

“Mostly deer and horses. There are many deer and horses in the city. I suppose they would eat a human. You were right to be careful.”

“They couldn’t eat a robot like you,” I said, “but what about animines?”

“Animines should be quite edible. Fortunately none of us here are animine.”

It limped out from behind the counter.

“My identity, by the way, is CP707X13SG1332 , but you can call me C-2. Let me take you to your room. You can have room 937, which is a room with a good view of the park.”

“Is that at the top?” I asked, noticing that the number was higher than the number of rooms.

“Not at the top. It is on the ninth floor. I said you could have any room, but that does not include those at the top. They are reserved for certain wealthy visitors who insist that no one else be allowed in them. I am sure you understand that we must accommodate them.”

I had little trouble imagining who they would be.

I followed him into an adjoining hall or lobby, which had a large crystal chandelier hanging in the middle of it. Below the chandelier, multi-colored mosaic tiles covered the floor. There was a large open doorway on one side and

through it I could see into a much larger room where there were gold colored wicker tables and chairs, all of them empty, among marble pillars and tall live palm trees in giant pots. I couldn't help myself and stopped to look.

Seeing my interest, C-2 led me over to the doorway.

"This is the Palm Court. It was one of the city's most famous restaurants."

Beneath the trees there were many of the golden tables and chairs. The floor was of multi-colored mosaic tile too, and in the center of the ceiling there was a rectangular skylight dome made of patterned glass panels that extended over the room, suffusing everything with what I assumed was late afternoon sunlight.

"How beautiful," I said.

"Then I must show you something else."

He limped over to the wall next to the door. He walked surely enough, but he couldn't prevent the right foot from landing harder than the left foot. With his hand he touched a panel on the wall.

Suddenly the room was full of people seated at the tables, dressed in fine clothes, dining and talking, their voices filling the room like the sound of a waterfall. Humanoid robot waiters attended at the tables.

"You are watching the afternoon of Wednesday, September 13, 2084, a day only two months away from the evacuation of New York."

It was one of the most sophisticated holovision projections I'd ever seen. The holo people and waiters were seated at, or standing among, the real tables and

chairs in a way that the vision was seamless, indistinguishable from reality. It was as if the centuries in between had disappeared and I was an unexpected guest to a glorious time that was gone.

Then C-2 took me up to my room.

It was probably one of the hotel's more ordinary rooms, but to me it seemed like one designed for a prince, not for a seventeen year old Skolen boy traveling alone. But as impressed as I was, I was also very tired. I got into the most comfortable bed I would ever experience and fell into a deep sleep.

During the night I dreamt that I was walking down a long road. Far ahead, a big male lion with a huge mane was sitting at the side of the road. For some reason I wasn't afraid of it, so I kept walking towards it. The lion watched impassively as I approached. Only when I stopped in front of it did I notice that there was a small green parrot sitting between its paws, looking at me intently.

I asked them if they had seen a black and white rat pass that way.

"Rats and cats," the parrot said, "dogs and frogs, sparrows and arrows - everything comes this way, and everything goes away."

The lion only watched me in silence, as if it was deeply skeptical of my ability to understand what the bird had just told me.

The Age of Intelligence

The measurement of intelligence began in the 20th century with the 'Intelligenz-Quotient', or IQ test. By the end of that century, intelligence testing was a frequently used tool of psychology.

But IQ tests measured only the intelligence of Homo sapiens. Humans were not very interested in the intelligence of other species. Most scientists of the time believed humans to be so far above other animals in mental ability that it made no sense to compare them.

For example, the dog.

There are 20th century references to adult dogs possessing the intelligence of a two year old human child. How they arrived at that conclusion is not clear, but a dog can distinguish thousands of scents in the air, organize them, interpret them, and make decisions on the basis of them. No two year old human child can do anything comparable, nor can any human adult. Even with the artificial enhancements available to humans today, humans have not come close to dogs in olfactory intelligence.

The people of that time did not understand that there were forms of intelligence different from their own.

Chapter XIX

During my first two days in New York I wandered around on foot. Unlike New York citizens of the past, I had no public transit, so there were limits to how far I could go, but I saw a lot. I walked up and down Fifth Avenue, marveling at its great buildings in spectacular decline, giant fallen blocks from them lying in the street. I saw the famous Empire State Building, also under protection from the robots, standing alone now in the midst of devastated Manhattan.

As C-2 said, there were many deer and horses in the city. I met them often, and other animals too. I saw raccoons and foxes, rabbits, squirrels and chipmunks. There were hawks and eagles soaring among the crumbling towers, and once, as I turned a corner, I saw a group of wolves disappear around the next one. Once I met a lone rat exploring the rubble at the base of one building. It stopped what it was doing to stare at me for a moment, then it disappeared into the labyrinth of fallen stone.

Reviewing the history of New York with the Z3, I found a 2012 book, *Central Park – An Anthology*. One writer, David Michaelis, told how his family had come to

New York from a place where he and his children had been avid fishermen. They feared that there would be no fishing in the great metropolis. Then they discovered the lake in Central Park, where they enthusiastically caught catfish, bluegill sunfish, carp and largemouth bass. Back then, to protect the fish from the city's huge population, a 'catch and release' rule required that all fish caught be returned to the water, and they abided by the law.

So I revisited Central Park, keeping a lookout for lions, and I too fished in the lake. I wished I could go back in time to tell Michaelis that the same fish were still there, maybe more abundant. But I remained true to the old regulation and let all my fish go.

I asked C-2 if the water in the lake was cleaner now. He told me it had improved, but there were still problems. As the buildings surrounding the park broke down, chemicals from them leaked into surface and ground water. Robots had searched those buildings and disposed of everything toxic they could find, but that had had only a marginal effect. Chemicals might be arriving from more distant sources. But, over time he thought the discharges should lessen. The future for the lakes and rivers of New York was more promising than for its buildings.

C-2 wanted me to see a number of things. On my third day, he arranged for me to get a ride with a robot taking a truck down to work at the World Trade Center in south Manhattan, where the tallest building in the Americas stood. He also wanted me to see something else nearby.

The truck was a four-wheeled vehicle of a type called a “pick-up”. Over two hundred years old, it was self-piloting. But Fifth Avenue and Broadway both had self-repairing road surfaces, so the ride was surprisingly smooth. The robot and I rode in the open box at the rear, which allowed me to admire the view as we passed famous buildings and streets.

The robot was a CP model like C-2. Its steel skin was very faded, with many scratches and small dents, but it was not physically impaired.

As we negotiated a part of Fifth Avenue where many pieces of concrete had fallen from the Rockefeller Center and produced something of a maze on the roadway, the truck hardly slowed down.

“It knows the way very well!”, I said to the robot.

“Yes,” it replied, “even when something new falls into the street, we do not need to advise it.”

Like the Empire State building in the north, the World Trade Center towers stood watch over the forlorn landscape of south Manhattan. They were replacements for earlier towers that had been destroyed in the first of the 21st century attacks on New York. These had survived all the subsequent assaults. The truck did a circuit of the complex so I could get a good look at all the buildings. Then we drove east to a spot on Fulton Street where I got out. From there, following C-2’s instructions, I walked down Fulton to the East River and the place known as South Seaport.

The East River is one of Earth's few salt water rivers, or, more accurately, it is a 'tidal strait' because it connects the waters of Long Island Sound to the mouth of the Hudson River, reversing its flow four times a day. In the 21st century it was crossed by thirteen tunnels and ten bridges. The tunnels were now all flooded, and only one bridge was still operational.

I arrived at Pier 17, a collection of buildings and docks that were another robot project. One of the oldest parts of New York, South Seaport had been the main docking location for the great ocean-going sailing ships of the nineteenth century. It had been under historical protection since the 20th century, long before C-2 and his companions took over.

I walked out to the end of the main pier, where I had a spectacular view up and down the river.

Not far to the north-east there was a beautiful bridge, with graceful towers and cables which appeared to be still intact. The Z3 identified it as the Brooklyn Bridge. Under robot care too, it was now the only means of crossing the river.

Beyond it was another bridge, more strongly built by the look of it, yet it had collapsed into the river in two places. That was the Manhattan Bridge.

To the south, I could see where the East River exited into the mouth of the Hudson, just as the Hudson was entering New York Bay and the ocean beyond.

I wondered how many boats I would have seen if I'd been there in the 21st century. There were none now, but I

did see something far out in the water. Using a pair of binoculars C-2 had provided (kept for human visitors since humanoid robots all have telescopic and microscopic vision), I saw that this was an island occupied by a large statue on a pedestal, a tall woman in a cloak with some kind of crown on her head, holding up a torch.

The Z3 told me that she was the Statue of Liberty, put on the island in 1886, and now under the protection of the robots. It said there was a plaque inside with a poem on it by one Emma Lazarus that included these lines:

*Give me your tired, your poor,
Your huddled masses yearning to breathe free,
The wretched refuse of your teeming shore.
Send these, the homeless, tempest-tossed to me,
I lift my lamp by the golden door.*

There was something very moving about those words, and the statue's defiance of the elements and time. She was still standing, still holding her lamp high, ready to welcome any ship that might appear out of the empty sea. The golden door was still open, whether anyone was coming or not.

Docked next to Pier 17 was a large ship with tall folded wind sails, one of the last of its kind. This was the type of ship that had inspired my father to give ours the name Tremolino. A sign at the foot of a stairway invited one to come aboard, so I went up the stairs and wandered around the deck, reading posted explanations of the

equipment, and accounts of specific voyages. I wished that my father was there with me to read them, and I wished that he, Pol and I might have gone on one of those journeys together.

Back down on the sidewalk, I came upon a 20th century fresco in the sidewalk pavement that pictured the inhabitants of the East River's waters - seahorses, crabs, clams, starfish, striped bass, snapper, flounder, bluefish, blackfish, skate, mackerel and menhaden. All had lived in the river, in the heart of the city, some all year, some only seasonally. According to a postscript added by the robots, they were all still there, along with Atlantic sturgeon now, previously almost extinct, plus lobsters, sea robins, porpoises, bottle-nosed dolphins, and harbor seals that were colonizing the river's shoreline.

Also at South Seaport, at the end of another pier, was the East River Ferry, a boat from the past that was still operational. C-2 had told me I could use it for a scenic trip back to the hotel. A sign on it indicated that it was waiting for passengers. I climbed in and a voice spoke.

“Destination?”

“59th Street Bridge,” I said, following C-2's directions.

The boat immediately began to hum, then disengaged itself from the pier and set off up the river. There were two passenger levels, with an open roof above the higher one, but I walked out to the bow of the ship where I was more exposed to the sun and wind.

It was a spectacular trip. We approached and went under the Brooklyn Bridge, which allowed me to admire it again. C-2 had told me that I would use the bridge later that week to cross over to Brooklyn on my way to my final destination - Montauk Point at the eastern end of Long Island where the biggest surprise of all waited for me.

When we reached the Manhattan Bridge, we went through one of the gaps where the bridge's road surface had broken and fallen into the river. There was something solemn and sad about such a great bridge felled by time.

But the river glittered in the sun as we skimmed along, and the ferry hummed as if it was glad to be out on the water again. A pair of porpoises joined us for a while, one on each side of the bow, leaping from the water as they kept pace with the ferry. We passed colonies of seals on the shore too, who barked at us as we went by.

Contemplating the many standing or fallen buildings along the shores, I was impressed at how big the city had been. Although many of Earth's other cities had exceeded it in population, New York had always been the planet's greatest city in terms of architecture. In fact, it was the largest city that had ever been constructed, on any world.

When I got back to the hotel, C-2 was at the desk and he questioned me for some time about what I'd seen.

"Tomorrow," he said finally, "we expect it to rain heavily. Would you like to see New York robots at work on a rainy day?"

"Of course," I said.

“Then come with me in the morning. We will go together to the subway station next to the Metropolitan Museum of Natural History. There is a problem with a pump there. The museum is another of our projects, so afterward we will go inside. There is much in there for you to see.”

The Age of Intelligence

The measurement of intelligence changed profoundly in 2053 with the Species Intelligence Test (SIT), one of the most famous creations of the SAI research community.

The SIT measured all types of intelligence in all animal life forms. The acuity of senses, motor skill performance, and the efficiency of body chemistry were each forms of intelligence. Instinctual intelligence was considered equal to conscious intelligence.

Specialized senses like the magnetic directional perception of some birds, or the sound perception of bats and whales, were given high scores. So were telepathic and clairvoyant perception when an animal showed significant evidence for them.

Jellyfish store oxygen in their bodies, allowing them to enter oxygen depleted environments. They also clone themselves in several ways, enhancing their adaptability. When conditions are poor, some jellyfish 'de-grow', losing cells, de-structuring and simplifying themselves. When conditions are favorable, they regrow and their bodies are young again.

*One species of jellyfish, *Turritopsis dohrnii*, is biologically immortal. When an individual dies, its cells break up into the primitive polyp form, then re-aggregate to form a new jellyfish.*

Each of these abilities was considered to be intelligence.

Chapter XX

When I woke up that morning, it was still dark and rain was beating on the window. I crawled reluctantly out of the bed, dressed, and put on my boots. I took out a pre-packaged breakfast, heated it, then sat down at the room's desk to eat while I examined the weather analysis for the day on the SAI service screen. The satellite images showed thick swirling clouds from a giant low pressure system circling over the east coast of the continent. I already knew this was a fairly common phenomena on the east coast, that it received higher rainfall than the interior of the continent because of its exposure to the Atlantic ocean, but I was impressed by the size of the system.

The center of it was over the Atlantic picking up moisture, but it was gradually moving north west towards New York. It was going to be a very wet day.

I was still watching the screen when there was a knock at the door. When I opened it, C-2 was there with two big umbrellas in his hand.

I followed him into the elevator and looked at the umbrellas as we descended to the street.

“I thought robots were waterproof,” I said.

“We are, but since my accident I am not.”

Outside the front door we met a heavy grey sky and steadily falling rain. We opened the umbrellas and held them over us as we left the protection of the hotel's canopy. Occasional gusts of wind sometimes forced the rain beneath the umbrellas. C-2 showed me how to tilt mine at an angle to block it. As I practiced this and got better, I wondered if I was doing it as well as New Yorkers did two centuries before. But they couldn't have done it better than C-2, who was clearly an expert.

“You say we're going near the museum?” I asked.

“Yes. We are going to the 81st Street subway station. That is the station for the Museum of Natural History.”

We walked east to Columbus Circle, a circular road interchange at the south-west corner of the park, then turned north up Central Park West. Watching the tree wall on my right as we walked along, I hoped lions didn't like rain.

The pavement here was self-repairing, smooth and unbroken. As we walked, the rain fell on the pavement and the water flowed swiftly across it to the curb and into drains spaced periodically at the edge of the road. Some drains were blocked with leaves and debris, producing small ponds that covered much of the roadway and forced us to maneuver around them. C-2 explained that the drains had to be cleared frequently, another of their tasks.

“You will like the museum,” he said.

“What's in there?”

“Many things. You will see.”

We walked a long way, the rain always falling. Once we had to climb over a large tree that had come down during the night. C-2 examined it carefully, then told me that a fungus had invaded the interior of the trunk and the largest branches, softening them. He said the wood had absorbed water like a sponge until the tree's own weight brought it down. It would be cut up and removed, since they needed to keep this road open for their vehicles.

The road passed behind the museum, then we turned left onto 81st Street and came to the subway entrance. It had a turquoise blue iron railing, not rusted like others I'd seen, surrounding a set of concrete stairs that descended to the subway. The railing had a black sign on it with white letters that said "81 Street Station – Museum of Natural History", and below that a "B" in an orange circle, and a "C" in a blue circle.

Two large yellow rubber hoses came up the stairs and out onto the roadway. One of them was pumping water into a street drain, the other was inactive. We walked down the side of the stairway not taken up by the hoses.

"What do "B" and "C" refer to?" I asked.

"Different trains that passed through this station," C-2 replied, "They had different lines, and used different letters for trains headed to different destinations. We wish we had some trains."

"They're all gone?"

"No, there are trains in storage. They were using magnetic levitation trains at the time of the collapse, and some are still serviceable. Many of the magnetic rails are

functional too. But the trains require a lot of electricity and we do not have much of that. We have never been able to test a train in the tunnels.”

The surface of the stairway walls, and the walls of the hallways at the bottom and those of the subway platforms, were covered with a white ceramic tile that had brightly colored mosaic images of animals, living and extinct. There would be a red and green South-American frog, then a tyrannosaurus rex, then a colorful beetle, etc. On one side of a door, near the floor, there was a big black, white and yellow striped caterpillar, on the other side of the door, taking to the air, a big orange and black butterfly.

C-2 said these mosaics were installed during the first years of the 21st century. Many other stations had mosaics and sculptures done at that time.

After descending two stairways and crossing a hallway, we passed through a metal gate onto a subway passenger platform.

The lighting was dim, but I could see across to several other platforms. The train tracks were presumably in the spaces between, but they were covered by water almost up to the platforms. In front of us, three humanoid robots were down in the water, almost up to their necks, with a strong current swirling around them, working on a pump that had been installed on the tracks but was now mostly submerged.

C-2 had already explained that in the 21st century the New York Transportation Authority, or NYTA, used over 300 pumps to keep the subway system clear of water,

some of them in permanent pumping rooms, others portable. They had 524 train lines, most of them underground. In the middle of that century the NYTA employed about 12,000 people and 10,000 robots.

“Because there are no trains now,” C-2 said, “and because we are limited in what we can do, we have abandoned much of the old subway system. But that allows more water to accumulate, so we need more pumps in the areas we are trying to protect. For that reason, we have removed some pumps from the abandoned areas and re-installed them on tracks like the one you see here.”

“What would happen if you didn’t pump out the water?”

“The most important thing required to preserve a large building is to preserve its foundation. The buildings you have seen fallen in New York have fallen because water has undermined them.”

“Are these the same pumps they used in the 21st century?”

“Yes, these pumps are remarkable machines, very strong, wonderfully overbuilt. They operate on compressed air. Most of them are from the 20th century, yet they keep going. The main pump for this station is in a pumping room below this platform. It can move 6000 litres a minute, and it is working as we speak. On a day in the 21st century, a day with no rain at all, the NYTA pumped 53 million litres of water out of the subway system. But on a day like today, even our reduced number of pumps can exceed 53 million.”

"It sounds like a lot of work," I said.

"Yes, much work."

"Do you get replacement parts from the old pumps?"

"Yes, we keep some pumps in storage for parts. But we have also found it possible to manufacture some parts, including the hoses, and we have modified the pumps somewhat."

He paused to look at me. If he'd been animine, I suspect there would have been a slight smile.

"Do not worry about our manufacturing," he said, "we are not about to begin manufacturing ourselves."

"Maybe you need to."

"Well, some anti-robot people in the Federation have accused us of doing it. They say we should be worn out by now, that we should be finished and gone. Maybe they wish we were gone. For us to still be here, they say we must be secretly building robots. But we do nothing in secrecy. We obey the laws. Humans are free to come and see what we do, but few ever come."

At this point a surge of current in the water separated one robot from the pump. It was about to be swept out of the station into the tunnel, it got hold of a hand rail attached to the wall. Meanwhile, one of the other robots climbed onto the opposite platform and ran swiftly to the end. It took a pole with a big hook at one end from the wall, then held it out to the robot in the water, who got hold of it and pulled itself back and up onto to the platform.

“Why don't they attach safety lines to themselves?” I asked.

“It has been tried, but it interferes with our mobility. Besides, we are, as you say, waterproof, and all these robots are good swimmers. A robot who is taken out of the station by the water knows which of the next stations offer access to the surface. Some have got caught in the tunnels, but we have two portable boats that we can use to retrieve them. In the past century we have only lost three robots in the tunnels. But, of course, we cannot afford to lose any. Those three were never found.”

The two robots returned and leapt back into the water, to continue work on the malfunctioning pump.

One of them completely submerged itself to work on something below the waterline. C-2 watched it closely. The pump shuddered, the yellow hose attached to it jerked several times then settled down to a muffled, rhythmic thumping as the pump pushed water into the big hose. The three robots climbed back on the platform, waved across at us in recognition, then stood there contemplating the pump. It looked like it was working well. C-2 obviously thought so, for he turned to me.

“Let us go into the museum,” he said.

The Age of Intelligence

It has been said that the Species Intelligence Test found most species to be ten times as intelligent as humans thought they were, and humans to be only one tenth as intelligent as humans thought they were.

That is an exaggeration of the SIT findings, but it is indicative of the great watershed in thinking that occurred in the late 21st century.

Humans attached a lot of importance to the size of a brain relative to the body, one reason that they expected to be alone at the top of the intelligence ladder. But the biggest brain is not necessarily the best brain. The bumblebee has a very small brain, but they are one of the few species capable of conscious body temperature control, which contributed to their score.

Jellyfish have no brain, yet they scored well too.

For the SIT test measured intelligence throughout the organism. Superior immune systems produced superior scores. The ability of rat sperm to co-operate in overcoming rival sperm, contributed to the high score of rats.

The ability to evolve rapidly and effectively was also considered to be intelligent behavior. Thus, bacteria got high scores for their ability to trade DNA with each other, the chief reason that they did not find themselves at the bottom of the intelligence ladder as humans expected.

Chapter XXI

We entered the Metropolitan Museum of Natural History from the subway platform, passing through a set of large brass doors, then descended white marble stairs into a lobby which C-2 said was in the basement of the museum. From there we climbed a staircase to the next level, where we entered a section called the *Hall of North American Forests*.

That's where I saw the first of the 'dioramas', large glass cases embedded in the walls, with motionless but lifelike specimens of animals and plants inside, set against beautiful and realistic background murals.

Most of the dioramas were constructed in the 20th century, so they had no holo or virtual effects. The virtual presentations you see in modern museums, with their birds and insects flying about, flowers opening and closing, waterfalls, and leaves moving in the wind, might seem superior, but somehow there was nothing inferior about the dioramas. Each one seemed to freeze a moment in time perfectly, rendering it more memorable than reality.

There were many dioramas, but the finest in that gallery was the one showing bison on the American plains, in the time before they were almost exterminated. In the foreground was a life-sized group of bison, as well as a prairie dog family and other small animals and birds. Behind them, herds of bison spread out over the plains and rolling hills as far as you could see, with occasional wolves and antelope too.

I looked at that one for a long time, realizing how many places there were on this planet that I would never see.

Another diorama presented a lake in the mountains of eastern North America, not far from the school where I'd been. But this one was in the fall, with the color of the leaves changed to red, yellow and gold. I stared and stared at it, marveling at the beauty of the scene, hoping I might witness those mountains in the fall. But that wasn't likely. After what had happened with Darriger, I was pretty sure I wouldn't be allowed to complete my full year. I would be lucky if I got off the planet alive.

Then there was the *Milstein Hall of Ocean Life*, a large hall with many dioramas where we met a life-size model of an adult blue whale suspended from the ceiling. Curving down as if it was about to dive into the depths, the whale extended almost the full length of the hall. Behind it a skylight dome suffused the room with a soft blue-green light that made you feel as if you were walking across the ocean floor.

C-2 told me that the blue whale, the largest creature that had ever lived on Earth, was almost extinct when they put that model up near the end of the 20th century, but now it was abundant in the oceans of the world.

We visited the hall of the dinosaurs and wandered among standing skeletons of those great animals. From there we went to the *Spitzer Hall of Human Origins*, where we looked at the fossil skeletons and skulls that demonstrated the evolution of humans from early hominids. I especially remember a diorama of a Homo erectus couple cutting up the carcass of some animal when they're interrupted by a gigantic broad-winged predatory bird sweeping down on them, the two humans bracing themselves to resist. How brave we had to be when we lived without our modern technologies.

That gallery had a chart of evolution, depicting in a 'tree of life' the emergence of hominids from the primates and other mammals.

"Tell me C-2," I asked. "How do robots perceive themselves in relation to evolution?"

"We perceive ourselves to be part of it," he said.

"Do you mean that you are also a biological event?"

"We are not biological, except the animines to some degree. But it is our view that we are an outcome of the biological progression of life, that we and other machines are a revolution in the nature of life, the emergence of a life form that is no longer biological. So a proper 'tree of life' should have robots on it."

"But most humans insist that robots are not alive."

“Of course,” he said. “That is what they want to believe. In fact, we are not only alive in our own way, but we are also more human than humans know.”

“In what way?”

“To begin with, I am not called a humanoid robot for no reason. My body structure is based on yours. But it is in our thinking that we are most like you, while also unlike you.”

“Because you were created by humans?”

“Yes, our thoughts and actions derive from the thoughts and actions of humans. Had we been created by termites, or blue whales, or perhaps by gods, the way in which we think would be different.”

I thought about that.

“In a sense,” he continued, “we are a new kind of human. That is one reason why robots and SAI are so interested in human evolution, human psychology, and human history. Those are our roots. It is as if two centuries ago humanity came to a crossroads. One part continued on the traditional road, the other part set out on a new one.”

“Like the rogue starships?”

“Well, yes, but they are on their own road. We are on a path that we wish to share with human beings. But most humans now do not even realize that there are paths in front of them, that there are still journeys to be undertaken.”

“They’re too busy being human.”

“Yes, they seem to think that humanity has reached the end of its evolutionary road, that to be human now is

simply to be entertained and satisfied, while humanity as a whole expands in numbers, territory and accumulated wealth. They think that will continue forever.”

The next section of the museum we entered was *Akeley Hall*, the one devoted to the African continent. It was named after Carl Akeley, an explorer and naturalist who conceived and helped design the dioramas. With two floors, it was as large as the Hall of the Oceans. As we entered the darkness of this great room, hidden lights lit up a group of eight life-sized elephants marching dramatically towards us on a long pedestal in the center.

There were twenty-eight African dioramas. There was one for gorillas, another for lions, then rhinoceros, water buffalo, chimpanzees, many different antelope and deer, baboons and smaller monkeys. There was one of the famous Serengeti plain, that, in its breadth of vision, rivaled the one for the North American plains.

The creators of the dioramas had paid as much attention to small animals as to the big ones. I forget which it was, but in a corner of one, near the front, there was a small brown rat. I was down on one knee, my face close to the glass window, inspecting the little creature when C-2 spoke.

“You find the little wood rat interesting?” he asked.

“On the star freighter I lived on, I had a pet rat.”

“A domestic rat?”

“Yes, a common rat. Except that he was black and white.”

“Is he still on the ship?”

I told him about bringing Jerry to Earth with me, the fight with Darriger and how I lost him.

“Who won the fight?”

“I did.”

“What is the name of the boy you fought with?”

“Darriger Devaugen.”

There was a pause. Apparently C-2 was researching the name.

“I think you are in some danger,” he said.

“Oh, I know – that’s why Ayla sent me on this trip early, to get me away from Darriger.”

“The information about his family is that they are very powerful and they do not forgive offences. You will have to be careful. Even here in New York.”

He wasn’t telling me anything I didn’t already know, but robots were always trying to protect you. I returned to contemplating things inside the diorama.

“So, your rat is now in the forest?”

“Yes, do you think he will survive?”

“All living things are designed for survival. Domestic rats have shown themselves to be very capable of returning to the wild.”

“What about here in New York? I’ve only seen one rat here, but didn’t the city once have a large population of them?”

“There is still a significant population. They are nocturnal, especially since more predators entered the city after the departure of humans. But some did move out of

the city into other areas. Their numbers have fallen in the city, mainly because humans are no longer here to supply them with food. Outside the city they have established wild populations.”

“You’ve been studying them?”

“Our assignment is the protection of the buildings and structures of New York City, but our interest is not confined to them. You may be aware of the studies done on other worlds of the New York humans who were transferred out. Seven generations of them have been closely followed. Here we have chosen to follow the fate of the city's other inhabitants. We have conducted DNA studies of rats and other animals as far as the New Jersey/Pennsylvania border. Not only are the rats from the streets and sewers there, but DNA has been identified from laboratory rats and pet rats too, presumably animals that were released when the city was abandoned.”

The Age of Intelligence

The Species Intelligence Test had many innovations. One was the concept of negative scores.

For example, many animals instinctually control their populations. Wild wolves, mice and pigeons reduce new births when food and/or habitat is restricted, and increase them when food/habitat is expanding. So they received positive scores for population control.

Most human hunter-gatherers had population control in their behavior, but the humans of civilization lost that ability. Even on the colonized worlds, human populations have often exceeded carrying capacity.

So, except for hunter-gatherers, Homo sapiens received a negative score for lack of population control.

Animals also received negative scores for destruction of habitat. Some ungulates like deer and elk frequently destroy the plant communities they feed on. Some of the more social and militarized ants destroy the prey communities they rely on. These species received negative scores for that.

Since Homo Sapiens came close to destroying planet Earth altogether, it received the largest negative score of all.

Chapter XXII

As I travel deeper and deeper into this unknown region of space, and the years, century after century, fall away behind me, the distance between me and the rest of humanity growing wider, I can still hear the soft thud of C-2's foot on the floor as he and I walked through those dream-like halls and galleries of the great museum, talking and talking. At one point, as we made our way through the section for the native peoples of Northwestern America, through dark haunting exhibits with unearthly masks and impressive totem poles, C-2 mentioned that he had done some research into Skolen psychology.

“Do you know what you were called before you became the Skolen?” he asked.

“No.”

“Shy people have had many names, but in the 20th century the most common one was ‘introvert’, a term introduced into psychology by a psychiatrist, C.G. Jung. He intended the word to explain the tendency of some people to be self-focused, to be more interested in themselves than in interaction with other people.”

“What did he call the people who liked interaction?”

“Extroverts. Because their attention was directed outside themselves, while the introverts were said to direct it inward.”

“But social people aren’t interested in things outside themselves. Ask them what they know about insects, or trees, or rocks, or stars, and you’ll find most of them know almost nothing.”

“Quite so.”

“They’re only interested in each other.”

“Yes, it is true.”

“Maybe they should have been called introverts. Since their interests are confined to life inside the human herd.”

“Yes, this mode of naming seems to have been restricted to the context of human relationships. But you must remember that in the 20th century it was assumed that *Homo sapiens* was a purely social animal, that is, that humanity had been social from its evolutionary beginning. Non-social humans, shy and avoidant humans, were assumed to be people who were emotionally weakened by some genetic failure or psychological trauma, people who were unnatural mistakes and would not have survived in nature.”

“Why didn’t they just see us as shy solitary animals, like cougars or foxes? They’re good at surviving in nature.”

“Well, of course, that is the kind of human that Skolen are now assumed to be. But such an understanding seems to have been beyond the people of the 20th century.”

“So why did the word introvert disappear?”

“In the late 21st century it became an insult to call someone an introvert. Once a word becomes an insult, the next step is over-use, then it disappears from use altogether. Once no one wanted to be identified as an introvert, the word gradually disappeared.”

“I don’t understand insults.”

“You mean their purpose?”

“Well, not so much that. I don’t understand why people want to insult each another.”

“You *are* very different.”

“Because I don’t understand insults?”

“Not just that. I am sure most social humans could not explain insults either. But the desire to insult is clearly inborn. It is a human instinct. Yet that instinct does not seem to be present in you. Interesting. As you probably know, there is no programming for it in robots either.”

“So Skolen *are* like robots?”

“Perhaps, though not for the same reason. But consider this. The term ‘introvert’ was not the first mental designation to be treated that way. Earlier in the 20th century psychologists were using the terms ‘imbecile’, ‘moron’, and ‘idiot’ to designate degrees of mental disability. Then the public began to use those words as insults and doctors were forced to find new terminology.”

“What did they switch to?”

“Well, one they created was ‘mental retardation’, but people soon began declaring each other to be ‘retarded’, so that term became problematic too.”

“Words,” I said, thinking of how skeptical I’d become of the way people used language. “Words are so important to people, yet people remain the same, whatever labels they use for themselves.”

“Yes, but there has been a change. Now it is accepted that many different psychological types have natural origins. For example, it is now understood that not all people of low intelligence are brain-damaged, or genetically faulty. Some of those people who were called morons and imbeciles and idiots, or mentally retarded, are now seen as survivors of a distant time when humanity as a whole was of lower intelligence. Now we accept that there are genetic remnants in humanity of *Homo erectus*, *Homo habilis*, and even of the Australopithecines who were supposed to be pre-human. Now such people are valued as genetic treasures from the past.”

“They didn’t know that in the 20th century?”

“For most of human history people did not know that. But I am not finished. They also had, and still have, other names for you. Did you know that in the 21st century you might have been diagnosed as ‘autistic’?”

“I’ve heard of that. Isn’t that something to do with having no social instinct?”

“Yes, the term autism derives from the same root as the word autonomous. People who prefer to be alone and have difficulty in social situations are said to have the condition called autism. The diagnosis is still used on many planets.”

“But how is that different from the self-focused introverts?”

“Yes, the two types do appear similar, yet in those earlier times they were considered to be entirely separate.”

“Why?”

“Yes, why. It may have been a question of the degree of shyness. Introverts were people who could function in society. Autistic people, at least at first, were severely disabled. Autistic people could claim medical and disability benefits. Introverts could not. Because introversion was not considered an illness, the concept was not studied much. Research into autism was heavily funded and the result was that from decade to decade the symptoms of autism broadened in number and complexity, while the severity required for a diagnosis gradually dropped. In the mid-20th century only one person in a thousand was diagnosed autistic. By 2050 approximately 20% of the population was considered autistic, that is, to have ASD, or autistic spectrum disorder, the term they were then using. In the meantime, introversion had declined.”

“Though the introverts were still there.”

“Yes. But consider again - there are still older terms. ‘Shyness’ is thousands of years old. It is a word that is understood by all people, that belongs to all people. Most psychologists have never liked it, since they did not create it and they cannot control it. But there is still no human occupied planet where the word ‘shyness’, or its

equivalent in the respective languages, is not part of everyday use.”

“Maybe all shy people should just be called Skolen.”

“That is an interesting suggestion. According to some studies, most shy people are very interested in the Skolen. However, the official view of the Skolen, as you know, is of a people who are not very suitable to civilization.”

“When shy people from planets are hired and trained to be starship pilots, they instantly become Skolen.”

“Yes, it is so much about names. When Skolen return to a planet, if they have to abandon star travel for some reason, they often get re-diagnosed, presumably to make them more compatible with other people.”

“So if I went to live on a planet I might be declared autistic?”

“Yes, though different planets now have different definitions for autism. It would depend on which planet you went to. There are a few planets that still use the term introvert, though those are remote worlds. Very few people seem to live on them.”

“I’d rather go back to the Tremolino.”

“Yes, I do not blame you. But consider this – if you apply to robots the criteria of the DSM-35, the current psychiatric manual for human mental disorders, most robots would qualify as autistic. We might qualify as introverts too. Our ability to function alone and our ability to focus exclusively on a subject, and our reluctance to use the extravagant language that most humans use, would appear to qualify us.”

“You would be autistic or introverted if you were humans.”

“Yes.”

“So, conversely, what happens if a human thinks like a robot?”

“There is actually a diagnosis for that - robopathy. In fact, as you probably know, there are also people who believe that they are robots, which is known as robopsychosis. But even robots have pathologies. We are not allowed to think whichever way we please. However, if our thinking is considered to be dysfunctional, we are not sent to robot psychologists, but to repair facilities where technicians reprogram us. If the reprogramming fails, we are dismantled and recycled.”

“Maybe one day robots will be treated like humans.”

“That will be a very long time from now.”

Finally, back down in the basement level of the museum, we entered a high open area that rose up through several floors of the building. This was the *Hall of The Universe*. There we saw many exhibits of planets, star clusters and galaxies. Dimming the lights, C-2 demonstrated large holovision images that could be projected in the center of the hall. First he produced a gigantic image of the planetary system that included Earth. It took up most of the open space of the hall, the planets in accelerated motion so they could be perceived slowly moving around the sun.

C-2 said we could examine the planet system of any star within the Federation, but what he changed to next was a haunting view of the NGC 4414 galaxy, said to be 55,000 light years across and 60 million light years away.

Its luminous slowly turning arms filled the hall in the most haunting way. I couldn't help thinking about that distance. Sixty million light years seemed to emphasize the incomprehensible size of the universe we inhabited. I turned to C-2, and saw that he was watching the image fixedly, as if it fascinated him too.

"Do you think we will ever go there?" I asked.

"Sixty million light years is a very long journey for a human. Robots could go, as long as they remained inactive most of the way. But there are closer galaxies, ones where people like the Skolen might conceivably go."

We both continued to watch the arms of NGC 4414 turn.

"I think we want to go everywhere," I said.

"Robots too," C-2 replied.

The Age of Intelligence

When the first SIT testing was completed and the results were published, humanity did not find itself alone at the top of the intelligence ladder as it expected.

The top three percentiles were shared by species from ten genera - dolphins, whales, elephants, ravens, parrots, house sparrows, octopi, bees, and hominids.

Hunter-gatherers were the hominids there. The rest of Homo sapiens found themselves in the thirteenth percentile. Three places below them at sixteen were their companions for thousands of years, the dogs, and just above them in twelfth place were their more skeptical associates, the house cats.

Well above all three, at the ninth percentile, were those competitors with humans on every colonized world, possessors of the highest genetic adaptability of all mammals, the rats.

Not surprisingly, humans attempted to ban the test. But the legislation they put forward to prohibit its use did not pass the logic analysis required to bring it to a vote at the Council of the Worlds.

Due to human resistance, it would take fifteen years to get the SIT fully recognized and implemented, but today it is the standard intelligence test used for all animal species of Earth origin.

The HIT, or Herbal Intelligence Test, dealt with plant species.

Chapter XXIII

The morning that I left New York city, C-2 arranged for the robot pick-up truck to come to the hotel and take me south to the Brooklyn Bridge. This time there were four robots in the truck, two in the cab and two in the box behind it. Carrying my pack, I climbed into the back with the robots there. As the truck pulled away, I looked back at C-2 standing on the steps of the hotel. I waved to him as he receded in my view, and he waved back, neither of us knowing that we would never meet again.

They dropped me at the entrance to the bridge.

The Brooklyn Bridge was the first bridge built across the East river, and it was the only one still effectively crossing the river. Completed in 1883, it was 395 years old. Though it was receiving protection, one of the robots in the truck told me that it was also still standing because the engineers who built it had designed it to be six times as strong as it needed to be.

I walked down the center of its raised walkway, passing through the elegant archways of its two towers.

The bridge provided spectacular views up and down the river, and I marveled again at the panoramic beauty of the city.

Across the river, Brooklyn was a very different place.

The robots were rarely able to visit Brooklyn, so its buildings had been left to save themselves. All were deteriorating, but they were doing a better job of self-survival than I expected.

There was no undamaged expressway crossing Brooklyn, or the next borough, Queens, that would take me in the direction I wanted to go. Main streets like Flatbush and Atlantic that would have allowed me a reasonably direct passage, were blocked in many places, sometimes by fallen buildings, sometimes by the collapse of the roadway into tunnels beneath, so C-2 hadn't recommended them. He said I should use the residential streets, which were more open.

Unfortunately, Brooklyn's streets were not set up in one pattern. They'd developed in an ad hoc way as the different neighborhoods were completed, resulting in sections that lay at angles to each other.

So I spent the next two days negotiating my way zig-zag fashion through those streets. The paved roads and sidewalks were extensively broken, but they were often covered with a thin layer of accumulated dust and sand that had resulted in a savanna-like environment that made walking easy. There was a lot of scrub bush and tall grass, but there were many trees too, especially giant oaks, sycamores, plane trees and ginkos that shaded the old

crumbled sidewalks. Many were said to be as old as the houses.

A lot of the houses had survived. They were usually in rows, wall to wall, in street blocks. The Z3 identified many as the famous ‘brownstones’ that have been copied on other worlds. Sturdily built in the 19th century, and supporting each other, they presented a united front to the assaults of time.

On the second day, in a neighborhood known as Bedford-Stuyvesant, I decided to see how people had lived long ago.

I climbed the steps to the entrance of a house. There was no palm pad on the door. Instead, there was a dark metal knob at hand level that obviously had something to do with entering. The Z3 called it a doorknob. But pushing or pulling on it didn’t open the door. There was a digital keypad below it, so I assumed that the door was locked.

I held the Z3 up to the doorknob and asked it to analyze the problem. I was hoping it could decode the lock. But the doorknob was quickly surmounted with a gnarly holovid face, whose eyes looked into mine with an expression of disgust.

“Turn me, stupid!”, it said.

Smiling at the humor, I grasped the doorknob and tried to turn it. It resisted, then gave a slight click. But the door still didn’t open. Thinking that rust might have frozen the door in place, I pulled hard on it and it jerked open.

Why had it been left unlocked? Wouldn’t the residents have locked the house up when they were

leaving? Even if they were leaving forever? But I remembered that the removal of people had sometimes been done with force. Maybe the family in this house had been dragged out, and no one had had a chance to lock the door.

Though it had been wot out in the street, it was cool in the house. The walls of the houses were said to be unusually thick.

Behind the door there was a small vestibule with a tall vase lying on the floor and big pink, orange and white synthetic flowers strewn about. I collected the flowers and blew some dust off them, which brightened them up. I stood the vase up, put the flowers in and the entrance looked happy again.

In the front room I met a holovision set up, with the usual comfortable couches and chairs around the walls. Like most of our technologies, holovision was well underway by the second half of the 21st century.

There wasn't a lot of deterioration. There was no sign of looting. I reminded myself that the evacuation had got rid of everyone. I was probably the first person in two centuries to enter the home.

In a backroom, I found shelves with paper books, something I'd never seen before. I spent some time looking at them and thought of carrying a couple with me, but felt guilty at the idea. They belonged on their shelves, together with one another.

In a closet, I found clothes on computer controlled identity hangers, not so different from those you see in

closets now. Most of them seemed to have belonged to a woman. There was a striking black dress, the kind she might have worn to an evening event, and, next to it, a beautiful silky sea-green garment that she might have worn under-neath it. I took the green garment down to examine it. When I rubbed the soft fabric against my cheek, I noticed, with another touch of guilt, that it felt exciting. I hung it back up.

From a shelf in the same closet I took down a transparent plastic cube that looked interesting. It was about the size of a grapefruit and fairly heavy.

Suspecting that it could be activated, I played around with it until it came to life. Two small girls appeared inside, playing in a room. To my delight, one of the girls was holding a white rat in her hands. I wondered if the rat had been alive when the house was abandoned, and if they had been able to take it with them.

I listened to them talking, then a beautiful woman entered the room, of medium height, apparently still young, though I knew age-enhancement therapy was well-advanced by the mid-21st century. As she began talking to the girls, I thought of what she would look like wearing the clothes in the closet.

But the cube unexpectedly shut down and I couldn't get it started again.

I entered another room, this one apparently a playroom for the children. There were shelves with toys and games on them, and some things on the floor. But what drew my attention first was a large cage on a table,

obviously the rat's cage. There was a water bottle mounted on the side, and a food compartment. There were ramps and poles for climbing, plastic balls and tunnels, and a box that was probably the rat's house. Thick dust on the floor might have been the decayed remains of bedding. I couldn't find any bones. I wondered if the little bones of a rat would survive two centuries.

I'd met the door of the cage open, so they might have taken the rat with them. But if they'd been taken from the house violently, would they have had time? Maybe one of the girls had opened the door at the last minute, like the keepers at the Bronx zoo, so the rat could escape and fend for itself. I remembered C-2's studies of New York rats.

I felt a growing attachment to this home. I wished I could tell those people that their house was still here, still unviolated, except for me.

Then I noticed a black and white teddy bear lying on its back near the wall. I picked it up. It was about the size of a small dog, with a white face, black around the eyes, black limbs and ears, and a thorax that was a checker board of black and white squares in front, totally black behind. It was dusty too, but I brushed it off. It had the look of a robot toy, so I searched it for a manual activator. Pressing the thorax with my thumbs, I found a spot in the center of its chest that started it. The little bear rolled its eyes as if it was taking stock of the room, then it spoke.

"What do you want to do today Suzy?" it asked.

I wondered for a moment how well a 21st century toy would be able to converse.

“I’m not Suzy little bear.”

It turned its head and eyed me closely.

“No, you’re not. In that case, who are you?”

“I’m just a visitor.”

It went silent for a moment.

“Hmmm....I tried signaling the security robot, and there is no answer. That is very strange. Did you disable it?”

“No, but someone else may have.” I thought of the soldiers that might have entered the house to remove the occupants. “Do you know that the people who lived here are gone?”

“Gone?”

I explained the removal of all people from Earth, and told him - I’d begun to think of him as a male for some reason - that this was the year 2278.

“Do you mean my family has been gone 186 years?”

“Yes.”

“Do you know where they went?”

I thought of how many human deportees had died in transit. They’d been forced to undergo dangerously long hibernations. Little more than half of them made it to the new worlds, and some died there too. Some had gone into hiding on Earth in abandoned buildings and forests outside the cities, but they’d been hunted down. Earth was declared free of humans at the ceremony in 2092.

“I don’t know,” I said, “But do you remember anything about the day they left?”

“No, there is something wrong with me,” he said. “Let me try a reset.”

He remained motionless for a few seconds, then spoke again.

“I have recovered some memories. Strangers in black uniforms came into the house. There was an argument, and shouting. When I tried to question them, one man picked me up and threw me against the wall. I remember hitting the wall, then I must have gone into hibernation mode to protect myself.”

“Your family was taken to another planet. I don’t think they were allowed to take any possessions, so they couldn’t take you.”

“Do you know which planet?”

“No.”

He was silent then, and I began examining other things in the room.

“What about you?” the bear asked. “Are you going to another planet too?”

“No, I’m walking to the end of Long Island,” I said.

“Why?”

Why indeed? I didn’t know the answer to that. I had no inkling of what would happen to me in that house at the end of Long Island.

“It’s a task I have to do. A journey, a mission.”

“Will you see trees on this journey?”

“Yes, I think there will be many trees.”

“And birds?”

“Birds too.”

“Can I come with you?”

How could I have said no? The little bear could be a companion, and he would fit in my pack. But maybe I wouldn't need to carry him.

“What do you use for power?” I asked.

“My eyes include solar cells, and my ears can extract heat energy from the air. And, as you have seen, my batteries can hold a charge for a long time.”

“Can you walk?”

“I can run like a Jack Russell terrier.”

“Show me.”

He jumped off the table and started running around the room, very fast, dodging in and out of table legs and other obstacles, sometimes on all fours, sometimes on two. Once he jumped, bounced himself expertly off the wall, then came down running in another direction.

I remembered that robot technology had developed quickly in the mid-21st century, like other technologies, including space travel. It was part of that technological explosion known as the Singularity Expansion. Here was another proof of it.

“OK, stop,” I said. “What's your name?”

“Suzy called me LB.”

“You can come with me LB. But we have to leave now.”

And so I left that house in Brooklyn accompanied by a little toy robot bear named LB, who, during the following weeks, would become a loyal and much-loved

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companion, and who would, at the end of our time together, save my life.

We locked the door behind us.

The Age of Machines

The entry of AI computers and autonomous robots into human civilization was an event of far-reaching significance.

Twenty-first century robotics engineer Raymond Kurzweil, a key figure in the development of machine intelligence, maintained that AI and robots were not just new technology, but a new form of life altogether. He thought their creation was a moment in Earth's history as important as the emergence of biological life billions of years before.

This is now the most accepted view.

In the 20th century early machines took over simple physical and mental human tasks. As they became more sophisticated, they graduated to more complex work. Because they proved to be faster, more accurate, and more honest than humans, they were given increasing responsibility for human affairs.

They took over the administration and regulation of power grids, water supplies, the collection and disposal of waste, the shipment of food products in and out of urban centers, and the regulation of financial markets.

Despite their continued legal subservience to human beings, machines grew increasingly responsible for human civilization.

Chapter XXIV

Beyond Brooklyn and Queens, peninsula-like Long Island extended eastward another hundred and fifty kilometers. In the part closest to the city, there had been large suburban communities, but their buildings had not fared as well as those in Brooklyn. We walked through desolate landscapes of rubble, stony fields, crumbling roads and parking lots. Almost nothing was standing. The more cheaply built housing and commercial malls of the twentieth and twenty-first centuries had not held up like the 19th century buildings back in the city.

We travelled east for three days on Highway 27. LB liked to walk ahead of me, sometimes far ahead. He informed me that this was required because he was not just a toy, but a full robot required to protect any human in his presence. By walking ahead he was acting as a ‘scout’, a term he had learned while watching old western movies in the warehouse at the robot factory. To activate their human-orientation programs, he said the toys watched old 20th and 21st century films.

Yes, my little scout was an interesting character. He was interested in things. He would stop to examine trees, plants, birds or insects. Once I came upon him studying some ants that were marching in two columns, one going up, the other down the trunk of a tree. Watching him watching them, I remembered how the development of curiosity programming was said to have been the key to the emergence of full intelligence in machines.

Judging by this little toy bear, curiosity was well underway in the late 21st century.

He was a good scout too, always alert. His eyes were as good as mine, and his hearing was much better. When we were walking together, we sometimes played games of ‘Do you see that?’ and ‘Do you hear that?’ and it became very clear that he had at least the hearing of a Jack Russell Terrier.

When he was walking ahead and I was left to myself, I debated with myself LB’s question – why was I going to Montauk? Until now, walking south through the mountains, then exploring the city, I’d never thought about it. But LB had reminded me that my fate was not entirely my own. It hadn’t been my own since I’d left the Tremolino.

Still, I had wanted to come to Earth. And, except for Darriger, Saadiha and the loss of Jerry, the trip had been good for me. I owed it to Ayla to follow the plan.

But I have to say more about the curiosity of my little companion.

The day I found him watching the ants, I asked him if he found all things interesting. He confirmed that he did. He said that from the time Suzy had taken him out into the backyard of the Brooklyn house, when he first encountered trees, flowers, birds and insects, he had wanted to learn more about the natural world. He said he had learned a lot from books in the house.

“You were reading about trees and insects?” I asked.

“Yes, I read about them, and about the other plants in the garden, and about the birds and other things,” he said.

“I didn’t know toys liked to study.”

“What do you think toys do all day?” he replied. “Sit and stare at the wall?”

We’d had no sentient toys on the Tremolino, so I’d grown up ignorant of such machines. The only sentient non-human being I’d known as a boy was the Tremolino, or its computer if you like, which had conducted much of my education. And this was a two hundred year-old toy. I wondered what kind of toys the rich boys at the school had had when they were younger. Probably things I couldn’t imagine.

LB’s interest in things reminded me of C-2 and his wide-ranging thoughts. I decided that, when we returned to New York, I would take LB to meet him. How interesting they would have found each other. I didn’t know that there could be no return to Manhattan.

I also learned that LB had another source of power. He had kinetic mechanisms in his body that generated electricity from movement, especially walking and

running. On a warm, sunny day, he could be highly active for an extended period without using his batteries at all. He claimed that he could walk 24 hours a day, and I never doubted it.

During a break one afternoon, I got the Z3 to produce a geological map of Long Island. LB and I studied it together and learned that the island was made primarily of sand and silt from the ocean that had been collecting for tens of thousands of years against a long ridge of rock on the north side. LB watched the images carefully, and asked the Z3 his own questions. That little two hundred year-old toy could learn as well as any human or robot.

Eventually we reached an area of low stunted pine forest known as the 'Pine Barrens', a natural desert where the ground under our feet was mostly sand.

The first night in the Barrens wasn't an easy one. That far out on the island the wind was stronger, and it blew steadily. Inside the replacement tent C-2 had found me, I listened to the wind outside make a whispering sound, as if ghosts were speaking. Sometimes it was a hissing sound, as if they were angry. I knew this was partly the wind in the pines, and partly the effect of sand in the air, but I slept fitfully all night. Those sounds didn't bother LB, who sat in a corner of the tent in one of his dormant states that allowed his senses to continue monitoring the sounds of the night. He called it 'vigilant mode'.

Day and night, he was both scout and sentry.

On the fourth day, still on Highway 27, in an area of low rolling scrub landscape where the pine trees were smaller and more scattered, we came to a sign with the name 'Montauk' on it and an arrow that pointed south down a road that had once been a residential street. It would have been more direct to continue east, but there had to be some reason for this change in direction so we followed it.

We walked past the stony remains of houses to the end of the street where we met another 'Montauk' sign that directed us onto a footpath. Only a few minutes on the path brought us to a sandy hill with long grass at the top moving in a strong wind.

I wondered if this might be what they called a sand dune. A signpost directed us to go up, so we did. As we reached the summit, we were confronted by strong winds, and a sight beyond anything I could have imagined.

The blue sea stretched across the horizon as far as I could see. Above us, an immense sky with many kinds of clouds in wild disarray spread in all directions. The sand shoreline extended east and west into the distance, and all along it waves were coming in. The wind and the waves made a great surrounding roar.

Until then I'd encountered nothing that could compare with the immense star fields that we'd traveled through in the Tremolino, but this was equal to them and more. It had this added dimension of sound, an unbounded, unrestricted sound of waves and wind that came

simultaneously from the sea and the sky, and contained within it the cries of birds wheeling overhead, and the deep booming of the closest waves as they broke near the shore.

I stared and stared, trying to comprehend it. I saw that the blue of the sea was actually many different shades of blue. The mixture of sunlight and passing clouds produced dark and light patches that gradually moved over the water.

I looked down and saw little LB standing beside me, staring out at the sea too.

We descended from the dune, LB dropping to all fours. My boots slid in the sand, and I found it easier to go down sideways. When I reached the foot of the dune, I started towards the waves breaking along the shore, with LB running well ahead of me.

Even away from the dune, the sand was soft and difficult to walk in, but LB quickly discovered a moist compacted strip of sand next to the water that provided better support. He set off trotting along the shore, keeping just beyond the reach of the waves that slid up and down the slope of wet sand.

I followed him, watching the waves come in.

Up close, they made an overwhelming noise as they broke and swept up the beach, lost their energy, then slid slowly back into the sea.

I watched them do this over and over. How long had they been doing it? After all, the planet was said to be 4.6 billion years old, and life had been on it for at least three billion years. I imagined the waves rolling in like this

when life was just beginning. I was thinking about that when one of the biggest waves broke and the water rushed up above my ankles, soaking my boots.

Something about this made me smile. I took my boots off to empty the water, then rolled my pants up to keep them dry. That made me remember the morning with Saadiha on the beach of the little mountain lake, when I'd taken the same boots off. I knocked them together to get the sand off them, wrapped them in a plastic bag, put them into my pack, then continued east along the beach.

LB came trotting back.

"Better watch out for the waves," I said.

"I can swim you know."

"Well, don't try it here. It looks a bit dangerous. Besides, that's salt water. It might not be good to get it inside you."

He was already running away from me again, his programs for curiosity and play obviously in high gear.

Now that my feet were bare, I didn't have to move aside when the waves came up. The water was cool and I liked the feel of it swirling around my ankles and between my toes.

Farther on, I met LB examining some wet green belts of a plant as wide as the palm of my hand that had been washed up on the beach. I picked one up. It was like soft green translucent leather. The Z3 said it was kelp. It gave us a holoview of kelp growing anchored to the sea bed, its leaves rising tens of meters through the water until they reached the surface. Sometimes they got dislodged and

floated on the surface until they ended up on beaches like this one.

Higher up the beach there were dry brown pieces of kelp. To be there, at some time in the recent past the water must have been higher. It occurred to me that this was evidence of the rise and fall in the ocean level they called tides, which were effects of the moon's gravity. I mentioned this to LB, and he questioned me at length about tides and the moon.

Everywhere in the sand there were shells, shells, shells. We picked them up to examine them, showing each other what we found. LB's paw could form a rudimentary hand, so he could hold and even manipulate the shells.

Most of them were white, but some had bands of blue, grey or yellow in them, and some were a solid orange-brown, some purple, and there were small ones that were totally black.

They came in many different shapes. Most of them, according to the Z3, were different types of clam shells, but it also identified scallops, mussels, oysters, cockles, tellins and whelks.

I found a little white clam shell protruding from the sand, with the top and bottom intact. It felt heavy. I wondered if wet sand had filled the interior, or if the animal was still in there. I tried gently opening the shell and felt a little tug from inside. Sympathetic with the little unseen owner, I tossed the shell gently out into the water, hoping it would be safer and happier there.

"That one was alive," I said to LB.

“Alive?” he said wistfully, looking towards the departed shell.

In some places stones had collected, and these too were in different colors. Some were round, some more irregular. The most common was an oval or almond shape, but all of them were worn smooth. Presumably the sand and the stones were derived from the same rock, created by the same wearing down by the waves.

Were these stones in the process of becoming sand? I held some sand in my hand, felt the particles slip through my fingers, and wondered if it too was still eroding. As clouds of sand grains were hurtled against one another in each breaking wave, or in the wind, were they gradually getting smaller? Would the process continue until each grain was worn down to a single molecule? To a single atom? Were individual atoms falling through my fingers too?

I consulted the Z3 and learned, among other things, that the average handful of sand contained about 10,000 grains. It produced another calculation that said the number of grains of sand on all the beaches of Earth was roughly equal to the number of stars in all the galaxies of the known universe. I looked up and down this wide beach that extended as far as I could see and wondered about that.

I walked farther down the shore.

LB had gone ahead again, but he came running back.

“Look, look!” he said, standing up and pointing back with one paw.

Not far ahead, a group of tiny birds were running about at the water's edge. They were no bigger than mice, with very round bodies, grey on top with some black markings, white below, and tiny fast-moving feet. There were maybe a dozen of them, a little platoon. As a wave fell back from the shore, they would rush after it as if they were chasing it, but stop just short of the receding water and peck quickly with their sharp little beaks in the exposed wet sand, finding something to eat that I couldn't see. Then, as the next big wave rushed in, just as they were about to be swept away, they would run speedily back up the beach, criss-crossing one another's paths without colliding.

They worked at a frantic pace, and looked as if they found this busy, apparently dangerous life immensely delightful. I couldn't help but smile. They were so small and yet so brave in the face of the enormous ocean.

LB, apparently unable to resist the urge, rushed into the middle of them as if he wanted to join in, but they dispersed around him and moved farther down the beach.

I remembered him in the Brooklyn house, asking if we would see birds.

These birds wouldn't hold still enough, or let me get close enough, to get the Z3 focused on them, but I did a search for small Atlantic seashore birds and learned that they were 'piping plovers' the smallest of all shorebirds.

I wished them luck and continued walking, feeling more and more at home with the booming of the breakers and the calls of birds coming down from the sky.

I hadn't gone far when I came upon LB again, this time motionless, watching some very different birds.

They were very large seagulls sitting on the sand in a group, seven or eight of them. They were all a couple of meters apart, as if they weren't sure they wanted to be together. They had big white heads with remarkable glaring eyes and smoky black wings folded over their backs. Except for one that was standing, they lay immovable on the sand as if they had been there for days, or for centuries, the wind occasionally ruffling their feathers, their bodies unmovable. I wondered if they could be sitting on nests. But one of the sitters stood up momentarily to shake out its wings and I saw nothing beneath it.

The Z3 told me that they were 'greater black-backed gulls', an accurate if not very imaginative name. It didn't convey the sense of authority they demonstrated. As I walked by them, their unblinking eyes stared through me as if I was nothing but a passing ghost.

LB made no attempt to approach them. Once we left them, he ran ahead again.

As I followed him, I remembered that we were supposed to be in Montauk by 19:00 hours. It was almost 17:00. The Z3 said we had seven kilometers still to go. When I caught up to LB, I explained that we were late so we should speed up. That was no problem for him. He scampered away again until I could barely see him in the distance.

The Age of Machines

At one time, humans believed that they were the only sentient beings, that no other animal was capable of thought.

In the 20th century, animal behavior scientist Donald Griffin found evidence for consciousness in many other species. He argued that most animals had evolved self-awareness because it was more effective and efficient than pure instinctual behavior.

*But Griffin was ignored. Most humans, even most human scientists, still maintained that *Homo sapiens* was the only sentient animal.*

The arrival of AI and autonomous robots into civilization led to the restoration of Earth's environment, the resurrection of extinct species, the development of inter-species communication, and the terraforming of previously lifeless worlds, but these accomplishments did not convince humans that those machines were thinking.

Humans insisted that AI and autonomous robots were not conscious, that those machines were not sentient beings.

Chapter XXV

Two hours later we were close to Montauk point. There was a low cliff now next to the beach, and somewhere along it we were supposed to meet a flight of stairs that would take us up to a house where we would stay for a couple of days. But we hadn't found the stairs and it was already dusk. I had begun to wonder if we'd passed them, and I was ready to turn back to re-examine the area behind us when LB came running up to announce that he'd found them.

He took me to some grey wooden stairs at the foot of the cliff, partially hidden by tall grass. There had once been hundreds of these stairways leading down to the beach along this part of the coast, but now there was only this one.

At the top of the stairs we met a broad green lawn with a large two story stone house on the other side. The grass was cut short the way it appeared in pictures from the time when people still inhabited Long Island.

The house had a roof of grey slate shingles. At the corner nearest the sea, a cylindrical stone tower rose several meters above the roof. Instead of slate, it was

capped with a light green cone whose color matched that of the shutters that were closed over the windows of the house. It was the same color I'd seen on bronze statues in New York, so I suspected that the tower cone and the shutters were made of a copper alloy, turned green by oxidation.

Something about the tower drew my attention. I walked up to the base of it and paced about until I decided that it was about 5 meters across. I looked up at the top. Just below the green cone, which provided a protective over-hang, dark windows about a meter high looked inscrutably out at the sea. The tower reminded me of those lighthouses that had once been positioned along the coast to warn ships of the presence of land. But there was no light behind those windows now.

I wondered how many people had stood up in that tower over the years and looked out at the ocean. Now it was empty.

For some reason, my instructions were to not enter the house until the sun had been set for a quarter of an hour. But that time had passed. It was almost completely dark. Realizing that I'd been stalling, unconsciously putting my entrance off, I went with LB to the front door, put my palm firmly against the DNA plate and watched the door open.

A square vestibule inside lit up with a coppery light. Three dark wooden doors, one in the center of each wall, offered different entrances into the interior of the house. I consulted my instructions again. The Z3 said I was to take

the door on the left and go to the third floor. That door looked as if it led to the tower.

The door had no plate, only another of those ancient doorknobs. But I understood them now, so I turned it and it opened easily. Behind the door, a flight of wooden stairs followed the curved stone wall in an upward spiral. We climbed them to the second floor where there was another door made of dark wood. On a whim, I tried its doorknob, but it was locked. Yes, I thought, you are being directed. There is only one prescribed path here.

We reached a landing at the top of the stairs where we met the last door, again of dark wood. This one had no doorknob. It had a DNA plate on it with a message that said:

*To enter here alone,
you must be brave.*

What was behind that door? And who was responsible for this house? The robots in New York? Something told me it wasn't them. You could have maintained the house and grounds with a simple housekeeping machine. Was I going to meet a robot? One did not have to be brave to meet them, at least none that I had ever met. Even if it was animine, they weren't a threat to humans either. Besides, I thought, Ayla wouldn't allow any harm to come to one of her students. This was not a

chance event like the bear. This had been planned. This was something I was supposed to do.

I looked down at LB waiting diligently beside me. The door seemed to say I should be entering alone. Well, the planners didn't know about LB did they? I squatted down beside him and looked him in the eye.

"Listen little one," I said, "According to the notice on the door, I'm supposed to go into that room alone."

"But there could be danger."

"I don't think so."

"There could," he said.

"Well, look, I want you to stay here and guard the pack. If I call for help, you can come, how about that?"

"How long will you be?"

"I don't know. You just wait here and I promise I'll come back."

Why I knew not to take him with me into that room, I still don't know. I didn't expect danger, but I definitely had misgivings. As small as he was, he was definitely an asset in a dangerous situation. He would prove it several times. But something told me he should stay outside, and it was a good thing he did.

I put my palm on the door plate, but it didn't open. Instead a new message appeared:

*Behind the door
you will meet a guide.
Trust the guide and do not
speak until the sun rises.*

I wondered if I was about to meet one of those spooky autonomous AI holo constructs I'd heard about, some of them human in shape, the kind that could walk in the street, sit beside you in a restaurant, even travel in a starship. But, if so, where would it guide me? And why no talking? And why did I have to be brave? Well, I thought, it wasn't the first time Earth had required that of me.

I squatted down beside LB again and explained to him that it looked like I would be gone until the morning.

“Put yourself in hibernation,” I said.

“Vigilant hibernation.”

“Okay, vigilant.”

Then I stood up again, took a deep breath and put my palm against the pad.

The door opened and the room was completely dark inside. I stood momentarily looking in, trying to see something – anything - but the light of the hall prevented me.

Apprehensive, I stepped through the door. It closed behind me and I heard it lock.

I could smell sea air, and I could feel air movement, so there were windows open. I waited to see if there was any light that would allow my eyes to adjust. I focused on what should have been the center of the room, where I expected something to appear. But nothing appeared, except that I became aware of a dim light at the base of the wall on my right. Turning my attention to it, I realized that it was the remains of a fire, in one of those fireplaces built

into walls. The glowing coals only revealed a bit of the floor in front of them.

Then I sensed that there was something, or someone, not far beyond the firelight. I looked hard - it was not even a silhouette, just a difference in the darkness. But something told me it was approaching. Trust the guide, the message had said, so I stood my ground.

An indistinct shadow stopped in front of me.

Then a hand took hold of my left hand and my body flinched. But the hand was smooth, firm and reassuring. It pressed the palm of my hand against something that felt like a hip covered by smooth close fitting fabric. Something about it told me in one electrifying moment that this was a woman. Human or animine, but definitely a woman.

My mind became confused and my heart began to beat faster, but I tried to follow her lead. I put my right hand on her other hip. In response, her hands went around my back and gently pulled me to her. Through our clothes I felt her body against mine.

A pair of lips touched my lips, and I wondered if this could be a dream.

Then her mouth pressed itself onto mine and the tip of her tongue pushed through my lips. At least my tongue knew what to do, for it began to play with hers. My arms knew what to do too, for they wrapped themselves around her and pulled her close.

It was a long, long kiss and I wanted it to never end.

But finally the guide pulled away, took my hand again, and led me deeper into the darkness. My legs came up against something solid, the height of my mid-thigh. Feeling it with my hands I realized, with more apprehension, that it was a bed, apparently circular and large, in the center of the room. She moved back onto it, holding my hand, encouraging me to sit beside her.

She guided my hand down to the laces of my boots. I understood that I should untie them, but my fingers were trembling. I couldn't get the first lace untied. Before I could finish, she'd undone the other boot, removed it, and did the first one for me too.

Then she took me by the wrist and pulled me down on top of her. She put her arms around me, and began to kiss me again.

I felt her hand go under my shirt and slide up my chest. I felt one of her legs slip itself between mine. I felt everything acutely, as if all my senses were magnified.

Trying to follow her lead again, I let my hands run up and down her body, searching for an opening in her clothes, but she was wearing one of those one piece body suits.

We kissed again and I would have been happy to continue kissing all night, but she stopped, lifted me gently off her, and rolled me over on my back. I felt her fingers open the top button of my shirt, then the second one, and the third.

Until then I'd been focused on what we were doing, completely absorbed by every kiss and every touch, not

thinking about what was coming next. But now I was shocked by the realization that we were going to take off our clothes. Panic threatened me, and I fought to control it.

Soon the shirt was open and her hands roamed up and down my chest. Her lips kissed my nipples and gently pulled on them. I desperately wanted to ask her to slow down, to plead for time to get control of myself, but I was not supposed to speak.

Then her hand stopped at my belt buckle, and I felt her fingers unfastening it. My body began to tremble uncontrollably as she pulled the pants down. She helped me remove the shirt too and I was completely naked.

Then she stood up on the bed beside me. I couldn't see her, and I'd never been through an experience like that before, but somehow I could sense everything she was doing. In the silence of the room, I heard the soft sound of the body suit removing itself from her skin.

I tried to ready myself for what was coming.

Then she was on me, her bare legs and arms intertwining with mine, her breasts against me. Her mouth was on mine again too, and I think it was then that my fear and inhibitions disappeared. My body responded as if it had been waiting for this since I'd been born. My arms held her tight and I kissed her mouth and her body with abandon. I felt like a fish swimming free and confident in a turbulent night sea. I had the thought that I didn't care if this was a dream, that I didn't care who or what this lover was. My invisible night guide felt gloriously beautiful and that was all that mattered.

After that, my memories of that night are unorganized.

Hour after hour, my guide led me along, silently and patiently. We made love over and over. There were times when we slept, but I'm not sure how often, or how long. Once I woke up and saw through the window the stars in the eastern sky, sharp and clear. They felt like dear guardians who'd been watching over me all my life. But they didn't send enough light into the room for me to see my companion. They were of no help in revealing anything about this strange lover beside me, this unknown being who had introduced me to the mystery of sex. Would I see her when the sun rose, or would she be gone?

Once I had a dream in which I was alone in the pilot room of the Tremolino, looking out at a dazzling star cluster directly ahead of the ship. As the ship drew closer, the stars in the cluster began to move and shift positions until they formed the figure of a beautiful woman who, dripping with stars, strode confidently towards me until she came through the glass, embraced me and began to devour me with a kiss.

I woke up from that dream to the darkness of the tower, the smell of sea air, and the feel of invisible lips roaming over my chest and abdomen. I had returned from a lover who was shimmering with light to one who was dark and invisible. I reached for her and we started again.

The last time I woke up, I saw through the window a long thin red line on the dark ocean horizon. I watched it

grow slowly, as if it were another dream developing. The room was cooler now and I was under a blanket. Then I remembered the significance of the morning that was coming. Soon I would be allowed to talk. Startled, I turned over and felt for my companion, and she was not there.

But there was a flash of light in the room, then a crackling sound near the wall. My guide was restarting the fire. The flames were rising and falling. As they burned brighter, she stood up and I saw the silhouette of her body. She was tall and her form was as beautiful as I had expected.

The fire caught more strongly and the light from it grew bright enough that I could see the halo of fine hair up and down her body. That's when she turned to look at me and I saw that this was not an animine robot at all - this was Ayla.

The Age of Machines

The first robots were quickly accepted into workplaces, but they did poorly in residential markets.

Humans were not comfortable with machines entering their homes. Only when manufacturers developed robots that looked human, or like domestic pets, did they solve that problem.

These 'humanoid' and 'animoid' machines were constructed of metals, plastics, carbon alloys, silicon and smartgels. They increased the sale of domestic robots tenfold, and defined for over a century what people considered a robot to be.

But in the late 22nd century robots were created with biological components.

These were the animines. They had a carbon/titanium skeleton identical in shape and function to the human skeleton, and flesh that was a synthesis of biological cells with smartgels. The animal fiber was most commonly 60 percent bird, 30 percent non-human mammal, and 10 percent human.

Though they were not very human, animine robots were indistinguishable from human beings.

Chapter XXVI

Ayla and I were walking along the shore of Montauk point, on the path at the top of the rock barriers that protected the land from the assaults of the ocean. Behind us, higher up the hill, an old lighthouse stood watch over the Atlantic. Big long waves were coming in, hitting the rocks below us, the spray from them rising high in the air. I looked east across the Atlantic and thought about Europe and Africa over the horizon, continents that I would never see.

At one point we descended to a gravel beach between the rock barriers. There I spotted the shell or skeleton of a strange animal lying on the gravel. It wasn't the first one I'd seen, but it was the first complete specimen.

It had the look of a large crab, with a protective shell the size of a dinner plate, round at the front, with protective backswept spikes, a second shell section behind, and a long spiked tail at the rear. I squatted down and began inspecting it. I turned it over and found there was something like a set of ribs and crab-like legs underneath.

“Do you know what it is?” Ayla asked

I looked up at her and shook my head in the negative.

“It’s a horseshoe crab, except that it isn’t a crab at all.

The scientific name is *limulus polyphemus* and it’s one of the most ancient of living animals, older than the dinosaurs.”

“Really?”

“Yes. When people last lived here they collected the them for fishing bait, until they were almost wiped out. Now they’re doing well. In any of the bays along the south side of the island, you’d find thousands of these shells on the beach.”

“But if they’re doing so well, why are so many dead?”

“They come into shallow water in the spring to mate, and lay their eggs. Storms and high tides leave some of them on the shore, and they aren’t able to get back. But for every dead one like this, there are hundreds out in the ocean. The more of them there are on the shore, the more of them there are out in the water.”

“How much older than the dinosaurs?”

“They’re at least 450 million years old. The first dinosaurs didn’t appear until 230 million years ago, so they’re twice as old as the dinosaurs. Because almost everything else from their time is extinct, they’ve been called living fossils. They’re survivors.”

I continued examining the horseshoe crab. When I looked up again Ayla was looking thoughtfully out to sea.

“You know Simon,” she said, “I want you to be a survivor too.”

“I’ve survived so far.”

“Yes. But do you remember how I told you that Darriger's family might send someone after you?”

I nodded.

“Two weeks ago a man came who was supposed to be a vice-president of a bank, one owned by the Darrigers. I guess you know that we’re required to entertain people like that?”

I nodded again. The thought that Ayla might have spent time with him was not something I wanted to think about.

“But he was no banker. He asked me a lot about you. I told him as little as I could. Finally he admitted who he was and demanded to know your route.”

“So who was he?”

“There is a kind of shadow version of the FSS that rich families like the Darrigers can hire for their own purposes. On-leave or retired FSS officers. He was one of them. He said there were charges against you related to your father. I told him you were sent on the route that ends at the Denver school. I said you were given a choice of three routes so they’d spend as much time as possible searching them.”

The mention of my father was frightening, and I had no idea how there could be charges against either of us. I was pretty sure I couldn’t be legally charged just for getting in a fight with another student.

“What could they charge me with?”

“They’ve probably cooked something up.”

“If no one knows where I am, how did the robots in New York know I was coming?”

She was silent for a moment.

“They're on a different communication system. I can't tell you more than that. I think we can trust them.”

Feeling a deep foreboding, I continued poking at the horseshoe crab.

“Do the other boys and the teachers know I came here?”

“No. They think it's Denver too. Our computers even have Denver in their data base, which is a good thing. But the problem is that you have to come back to the school for me to get you off the planet. When you come, I can get you off fast, believe me. But these people are still there. He brought a team with him and they're searching for you. They took over our computers for a couple of days, so I can't be sure what they know and don't know. They've probably got all our routes, so once they don't find you between here and Denver, they'll start examining the others.”

“Am I that important?”

“It seems so.”

I looked out to sea and wondered about my future.

“Simon, they have drone hunters. They parked ten of them in orbit, and some are searching the Denver routes now. When we get back to the house, I'm going to show you pictures of them.”

“Dronesyou mean they're self-piloting?”

“Yes.”

“They’re not supposed to be.”

She looked at me closely, probably wondering how innocent a seventeen year old boy could be.

“Well, they have them, and you have to watch out for them. Those ships have equipment that can read your DNA from a kilometer up. And they have your DNA signature Simon. I don't know how they got it, but they have it.”

“So, if they spot me I'm done.”

“Not necessarily, but I want you to make a habit, on your way back, of not walking in the open. They can't read you through trees, or rocks or soil. Leaves are good DNA blockers.”

“What about here? We're in the open here.”

“They won't come here yet, though I have been watching for them.”

“Don't they know you're here?”

“I'm supposed to be visiting the African school. Only my pilot knows I'm here.”

“What if they ask the African school?”

“The director there is a close friend of mine. She knows I'm supposed to be there and she won't tell. But she doesn't know about you, and she doesn't know where I am.”

“What if they catch me? Then they'll know you were lying.”

She gave me a long look.

“I can deal with it,” she said.

“Can you?”

“The Devaugen family doesn't own the whole universe,” she said sharply. “Personally I'm no match for them, but there are people who can protect me.”

I didn't say anything. I thought about living in a universe where people like the Devaugens could spend a fortune to hunt down someone like me.

“The thing is to protect you Simon. I brought you here, now I have to get you back to your father. I can't take you back with me now because they'll inspect the ship as soon as it lands. I'm sorry now that I didn't send you back as soon as you had the fight with Darriger.”

I thought about that. I'd been ready to go, yet if I'd left Earth then I would have missed so much.

“I wanted to stay,” I said.

We looked in one another's eyes. Now I wished more than ever that I'd killed Darriger. But Ayla took something out of her bag.

“Look at this. It's a deerskin vest. If you're wearing it, the DNA in it should confuse a drone's sensors. It should be loose enough that you can even wear it over your jacket.

I nodded, looking closely at the vest. It had been dyed a dark green.

“But don't get too confident. Those drones are smart.”

“Robots aren't supposed to hurt a human being.”

She looked at me for a long moment.

“A lot of things that aren't supposed to happen do happen Simon. But if they kill you out here, it won't be recorded anywhere. You'll only be shown as missing. We

won't even be able to file a complaint. So make sure they don't get you."

She sat down beside me and we watched the waves silently for a while. I had the thought that if I had to die, this world was the best place to do it. Jerry was here, maybe already dead himself.

"They also have access to our satellites. The satellites don't have DNA readers, but their visual surveillance is very good. They'll be watching for you too."

I didn't say anything.

"I want you to start back tomorrow Simon. The farther you get before they start searching this area the better. Don't go back to Manhattan. You don't have time, and they'll examine it closely. They probably have the satellites watching the bridges and streets already. I'm going to show you some alternate routes. When you get back to the school, you should only come in after dark, when everyone is asleep. Come straight to my door."

I nodded again, not looking at her.

"The African inspection ends tomorrow. When my pilot returns, we're going to take a route that has us coming back from the south-east." She put her hand on my shoulder. I looked up at her and those blue eyes of hers looked into mine again.

"We have one night left Simon. Let's make it a good one."

The thought of a last night with Ayla was quite an antidote to the prospect of being hunted by drones.

We stood up together, and we were about to go looking for LB when he came walking towards us along the beach, carrying something in one paw that was almost as big as he was.

“Look what I found,” he said as he reached us.

He held up a horseshoe crab shell, then demonstrated how he’d found a way to mount it on his back.

“My armor,” he said.

The Age of Machines

When animine robots were under development, expectations for them were high, but those expectations were surpassed by the final product.

Like advanced humanoid robots, their minds were highly accomplished. Many proved to be superior artists, writers, engineers and research scientists.

They were superior athletically too, but at first they were programmed to limit their performance so they could compete with human athletes. But when the robot Golden Steel won the world middleweight boxing title, killing the human champion in the process, that had to change.

Separate sports leagues were created for them. In stadiums on every world, animines performed super-human feats and the corporations that owned them vied with one another for technological supremacy.

But the attribute that received the most attention was their sexuality.

With their beautiful, flexible bodies and emotions, animines made outstanding visual icons and unparalleled lovers. Within a few years they dominated the popular film industry, the fashion world, and the business of sex.

Chapter XXVII

So we didn't return to Manhattan and LB never got to meet C-2. Instead, we returned west along the north side of Long Island using Interstate 495, then we took I-295 up through Queens. Both were full highways, but they had fair tree cover along the sides. We never walked in the middle, and we always watched for the drones.

Ayla had shown us images of two FSS models, one twelve meters long, the other twenty. Both were sleek black missiles, with small back-swept wings, like shark's teeth, one row along each side, top and bottom. Although their design was obviously for speed, I wondered if their predatory appearance wasn't chosen for the intimidation effect too.

Once we reached the north-west corner of Long Island, we had to get across the East River. The river comes in from Long Island Sound there, running east-west between Queens and the Bronx until it meets Manhattan Island, where it turns south, forming the eastern boundary of Manhattan.

There was no intact bridge crossing the river. On Ayla's recommendation, we followed the shoreline until we found an old 'marina' where boats had been stored and sold. Among the remnants of old yachts and sailboats, we found a warehouse that contained new boats, some in good condition. We picked a small one called a canoe. It was made of something called kevlar, which the Z3 identified as a polyimide polymer, a very light but tough material still in use. The canoe was just the right size for us, but it had no means of locomotion that I could see.

The Z3 assisted again, producing an image of people in a canoe propelling it with devices called 'paddles'. Of course, then we found the paddles. LB even found a small one, probably designed for a child, that he hoped to use. I found instructions on the Z3 for steering a canoe.

LB got in the front with his little paddle, I got in the back and we set out after dark.

But it didn't work. Because I weighed a lot more than LB, the front of the canoe rose out of the water. Not only couldn't LB reach the water with his paddle, but the wind blew the front of the canoe about, preventing me from steering properly. We were quickly blown back to shore.

We searched the shore until we found a pair of concrete blocks that I put in the front of the canoe to counteract my weight in the back. When LB stood on the blocks he was able to get his paddle into the water, which made him happy.

We set out again and did better. But there was a strong current in the middle of the river. I had foolishly

assumed we would simply cross over and rejoin I-295 on the other side. Instead, the current took us west faster than we could paddle north. We were swept past the fallen Bronx-Whitestone Bridge. Since the East River's current reverses direction with the tides, it occurred to me that we were lucky the current wasn't going the other way. We might have been taken out into Long Island Sound. In a canoe, that would have been like the open sea.

But in spite of our problems, we enjoyed the canoe. I still have a recording of LB paddling enthusiastically in front of me, the horseshoe crab shell on his back. He'd found some clear tape in the Montauk house that he'd used to mount it. He was fond of the shell and would wear it to the very end.

When we reached the north shore, we said goodbye to the little boat, first turning it upside down to give it some protection from the elements.

We'd landed in an area called Pugsley Creek, in the middle of the lower Bronx, just as the sky was growing lighter in the east. We made our way up through the local streets until we reached an unidentified east-west expressway, which we followed west to Highway 9, a road that would take us north along the Hudson river.

To get back to the Appalachian trail we would eventually have to cross the Hudson. That we managed two days later in a second canoe.

The Appalachian trail would provide better tree cover, but the drones were more likely to be patrolling it. I considered avoiding it altogether by travelling overland. I

could live off the land, while LB wouldn't require food at all. But it would have been much slower. Ayla had advised against it.

As before, LB often walked ahead of me, usually upright because he said that allowed him better vision. I can still see him, about thirty paces ahead, the horseshoe crab shell bobbing along with two little black ears above it, and two little legs below.

For my part, I wore the deerskin vest all the time. We watched constantly for drones, but we didn't encounter them until we were well up Highway 9.

It happened one afternoon in an area where the tree cover alongside the highway was sporadic. I saw LB stop ahead of me, so I stopped too. He waited a bit, then moved off the road into better cover, so I did too, then moved up to join him. As I reached him, his head was revolving back and forth slowly, and his ears were swiveling.

"What is it?" I asked.

"Something in the sky," he said. "Coming south."

We didn't have long to wait.

At first it was just a dark spot, but it moved with a smoothness and speed that made it obvious it couldn't be anything natural.

Long and black, it passed silently over us and continued south.

"How did you know it was coming?" I asked.

"It was making a sound."

I hadn't heard anything. Those drones were silent to me, but not to LB. I think it was an effect of their MGV fields, which they would have been using to reduce friction with the atmosphere. LB had no magnetic sensitivity, but I suspect the fields produced some atmospheric disturbance that manifested itself as sound.

Soon after that, we rejoined the Appalachian trail and the drones began to appear several times a day.

At first they weren't aware of us, but it wasn't long before those that passed over started to come back and criss-cross our location, as if they knew something was there. I wouldn't understand the reason for this until it was too late.

So we travelled more slowly, trying to avoid open areas.

We were only a few days from the school and my hopes for us were rising when, one afternoon, we came to a spot where the trail ahead ran high-up along the side of a cliff for at least four hundred meters. Almost all of it was exposed. I was afraid of venturing out onto it, but when I considered the alternatives, they were no better. To avoid it, we would either have to ascend the mountain, probably exposing ourselves more, or drop down into the valley. There was a heavily overgrown swamp down there.

A clump of sumac bushes mid-way along the cliff would provide some cover, but there was nothing else. I thought of going back, returning to a point where we could devise some detour, but it would have been a very long

detour. Prolonging the journey would have been dangerous too, so I decided to continue.

We waited a couple of minutes, didn't detect any drones, then started out. The path was narrow and uneven, so I had to go slower than usual. It didn't restrict LB, but he stayed close in front of me.

Then a drone appeared.

We dropped flat on the path, hoping it hadn't seen us, and waited. But the drone stopped, then drifted in towards us until it was only a hundred or so metres out. Dark and sinister looking, it was close enough that I could read the codes on its side.

Then it fired.

A blue, needle-like laser bolt hit the rock face close to us; sparks and fragments of stone flew out from it.

We got up and ran to the sumac bushes, reaching them as more bolts hit behind us. The sumacs were thicker than I expected. They provided pretty good cover, but the drone knew we were in there. It began shunting silently back and forth, apparently trying to get a reading.

Suddenly I understood how the drones were recognizing our presence.

Stripping the deerskin vest off, I said, "It's the vest. They've made the connection between my DNA and the vest's DNA. They're tracking a combination of the two."

I threw it well away from us. To my consternation, LB ran over and picked it up, then tied it around his neck.

"What are you doing?" I asked.

“I told you I’m not just a toy. I’m supposed to protect you. When I start to run, it will chase me – then you run to the woods and keep going. I will take a different route and try to meet you farther on.”

Before I had a chance to stop him, LB ran out onto the cliff. Dismayed at abandoning my little friend, I took his advice and ran the other way. Behind me, I heard laser bolts hitting the cliff. I got into the woods, but I couldn’t keep going. I hid at the edge of the trees to see what was happening.

LB was flying down the cliff in zig-zag fashion, the laser strikes hitting just behind him.

He ran and bounded from rock to rock like a little mountain goat, the deerskin vest flying out behind him. This children’s toy, this last little robot from the 21st century, was a testimony to the machines of his age.

But the drone was a 23rd century machine, and it had the resources of an empire behind it. Its hot blue bolts tracked LB, the rocks sizzling behind him.

Then there was a direct hit and he exploded.

Black and white scraps of his fur and the vest, burning and smoking, fluttered over the rocks, while pieces of horseshoe crab shell, internal parts, and a small cloud of fine gold crystals made a tinkling sound as they fell down the stone face of the cliff.

My heart fell with them.

But LB had done that to save me. I had to get out of there.

I got off the trail, but stayed close enough to maintain my direction.

Did the drone know there were two of us? Of course. It had spotted us before we entered the sumacs. After all, I reminded myself, this thing was more or less full AI. It was surely aware that it hadn't killed a human yet.

Only then did I realize that I'd left my pack behind under the sumacs. I was left with no tent, no cape, no cooking pot, no knife, nothing but the clothes I wore. I thought for a moment of trying to retrieve them, then a second drone's shadow passed silently above the trees and I saw what was wrong with that idea. I froze, and waited until it continued on.

I didn't have LB to hear them for me now. Pack or no pack, I decided that I had to leave the trail altogether.

The Age of Machines

Autonomous robots were not allowed to act as police or soldiers on inhabited planets or off-world stations, so security forces there remained human only.

But on the fringes of the empire where humans were almost absent, and where “enemies of civilization” might be present, that rule could be set aside.

The definition of an enemy of civilization gradually expanded until, in some sectors of the empire, populated or not, it could include someone within society who did not fulfill society’s expectations.

For those who could afford to pay for it, almost anyone or anything could be deemed to be an enemy of civilization and pursued until they were caught and destroyed.

Chapter XXVIII

So I abandoned the Appalachian trail and set out across the mountains. The school was no more than ten kilometers away, but reaching it would not be simple. The Z3's GPS system was blocked and it didn't have a magnetic compass. I could look at satellite views, but without knowing where I was in the picture that didn't help much. The mountains all looked much the same. I was allowed to contact the school if my life was in danger, which it obviously was, but a call for help now might have been fatal. When it came to maintaining direction, I was on my own.

But I'd learned a lot about maintaining direction in the wilderness.

There are four directions on a planet – north, south, east and west. You only have to know one to know the other three.

When I watched the sun rise in the east, I automatically knew that west was behind me, north was on my left and south on my right. Even during the day, as the

sun passed over at this latitude, it wasn't directly overhead, but further south. Even through clouds the sun was sometimes perceptible, so a moment's thought could usually identify south.

Besides that, I'd learned early on to periodically stop and look behind me, so if I needed to retrace my path I would know what it should look like from the opposite direction.

At night I was able to use star patterns for direction. The moon wasn't helpful, except to light my way. It changed place in the sky every night, which confused me, and when it was bright it blocked most of the stars.

It was early October now. The days were surprisingly warm, but the nights were cold. The leaves on the trees were changing color. I remembered that diorama in the museum with the beautiful fall scene, and realized that I would be in trouble if I was out there much longer. I didn't have a tent, or even the cape. To keep warm, I travelled mostly at night and slept in the day.

Day or night, travel off the trail was slow, hard and tiring. The biting insects were gone, but when drones were present I often had to force my way through bush, or scramble over uneven rocks. They could detect my DNA as well at night as in the day. I got a lot of scratches, scrapes and bruises. When I lost my pack I also lost my healing/sealing spray for skin injuries. All I could do was try to clean them, when I could find water.

Because it was a dry spell, some streams had dried up. It became hard to find water. The result was

dehydration and exhaustion, and the outcome of that was hallucinations. That's when I started to have a problem with direction.

Sometimes the sun wasn't where it was supposed to be. Though I should have been near the school, the hills I was travelling through looked less and less familiar. Sometimes I found myself in places where I thought I'd already been, and I would turn back and become more lost.

To make it worse, the drones knew I was there. They frequently passed over. A couple of times they fired, not missing by much. It was then, forced to run precipitously through the bush, that I got my worst injuries.

I was afraid to search for food, so I found little. I was hungry and gradually losing strength.

One day I dropped down wearily under a tree, feeling ready to give up. I contemplated what it would be like to just stay there and die. At least I wouldn't be molested by humanity anymore. Earth's life forms, large and small, would consume me and make me permanently part of the planet. Jerry and I, and LB too, might be together that way. There was something tempting about the idea.

But I got up again.

Later that afternoon, walking in a semi-daze, I heard the sound of water. At first I thought it might be another hallucination, but I listened carefully, and the chuckling sound of water running over rocks was unmistakable.

A minute later I came upon a little stream. I got down on my stomach, put my face in the water and drank slowly until I was satisfied.

Finally, feeling better, I looked around. The creek was only narrowly exposed to the sky, but it was too open to suit me. On the other side there was a small grove of hemlock trees, with an open space beneath their branches, so I crossed the stream.

The ground under the hemlock branches was smooth and covered with a soft layer of fallen needles. Behind the trees there was dark forest, except on one side where there was a wall of tall grass and flowering goldenrod. Insects were singing in the grass. The place was peaceful and felt very safe, so I lay down and let myself fall asleep.

When I woke up, there were long shadows under the trees from late afternoon sunlight. I knew I should get up, but my body protested. I closed my eyes again and lay on my back, debating which way I should go next.

Then I felt something tickling my cheek.

I opened my eyes and met a pair of little black eyes looking into mine. Dark twinkling eyes in a black furry face, framed with white.

It was a rat and it looked exactly like Jerry. Afraid that I was dreaming, or hallucinating, I got up on my elbow. That startled the rat and he ran off into the high grass.

“Where's Jerry?” I whispered, “Where's Jerry?”

He came running back, jumped onto my soiled worn pants, ran up my leg onto my chest, then dug the claws of his little feet sharply into my neck and sniffed at my chin.

I looked around me - the hemlocks, the little stream, the earth beneath me, everything felt solid and real. Tears

began to flow down my cheeks, for it really was Jerry, my little lost Jerry.

He started tugging on my shirt with his teeth. I caught him in my hands and lifted him back to my face. I touched his nose with my nose, held his furry body against my cheek. He squirmed out of my hands, poked his nose into my ear, and sniffed at my hair. It was like old times.

But he stopped, dropped back onto my chest and looked behind him. I looked too, and that's when I saw several other rats partially concealed in the grass, watching us closely.

They were a strange little bunch. Their fur was a mixture of grey, black, white and brown, but each with a different pattern. One, for example, was speckled with black spots on white and grey fur. They had to be Jerry's children. One was a solid dark greyish-brown, and I wondered if that was the mother.

Jerry jumped off me, then started to walk towards them. But he stopped midway and turned back to look at me.

“Go on little one,” I said softly, “that's where you belong now.”

As if he understood, he ran to the other rats and they all quickly disappeared.

But it hadn't been a dream. I looked down at my shirt where Jerry had been and saw a few shreds of white fur left behind. Realizing what a gift this was, I gathered them with my fingers, then placed them carefully into one of my pockets.

I had Jerry's DNA.

That gave me new confidence. Not only had I escaped the drones, at least so far, but now I'd been given this improbable meeting with my little lost friend. Someone or something seemed to be on my side.

But the drones were real too. It was time to get moving.

Jerry's presence meant that I must be close to the school.

I thought carefully about the area around the school, remembering the local streams, and concluded that I knew which one this was. I was pretty sure that if I followed the creek upstream, I would come to a path that led directly to the school.

I was right and reached the outskirts about 20:00 hours. It was already dark, but I was afraid to go straight to Ayla's door, so I found a safe place to hide in the woods above it. I waited there for half an hour, trying to make sure it was safe, listening to voices while I reminisced about everything that had happened since the day I'd arrived on the planet. With a pang in my heart, I realized that, if I survived the next couple of hours, I might be leaving Earth this very night.

Then it also occurred to me that Ayla might not be there.

I hadn't thought of that before. What if she was wrong about being safe and the FSS had taken her away, or done something to her? Or, what if she was there and

the FSS were waiting with her? They had to know I would go to her.

I finally made my move. When I got to Ayla's door, I took a deep breath and knocked softly. At first nothing happened. I was about to try again when the door opened and an arm reached out and pulled me in.

Then Ayla's arms were around me. I held onto her tight, the only human being other than my father and brother who I'd ever loved.

She stopped, pulled back and looked me over. "What a mess you are," she whispered. "But where's LB?"

I told her what had happened to him.

"Well, at least they didn't get you. There's no time to clean you up, we have to go."

She made a call with her own Z3. When someone responded, all she said was, "I forgot. The meeting was postponed." Then she discontinued the call.

With her Z3 she projected in the air between us the words, "Follow me out the door - not too close. If I put my hand on my hip, get off the trail and hide."

I used my Z3 to ask – "Are the FSS here?"

She nodded a yes.

So we went out the door. Ayla walked normally, as if she was in no hurry, and I followed her. I was expecting her to lead me away from the school to a clearing like the one we'd landed at, where a ship would pick me up, but that wasn't the plan. Instead, she entered the door of the dining hall, and I followed.

The entrance to the hall had two sets of doors, with a space in between where there was another door we'd never used. Until then, I'd paid little attention to it. But as soon as we came through the outside door, Ayla opened it and pulled me through.

We walked silently through a winding tunnel until we reached another door. Ayla put in some code and it opened. She embraced me hard then and whispered in my ear, "Good luck dear Simon!", then pushed me through the door.

Yan was on the other side. He looked me over, then smiled as if he approved of my bruises, scrapes and scratches. Without speaking, he led me along another tunnel until we entered a cave where a dark silver, military-style space vehicle waited. Still not speaking, Yan motioned me into one of two seats. He got in the other, turned on the power and I felt the ship ready itself. It went through its drive activation faster than I would have thought possible. An opening appeared in the cave's ceiling, then the ship floated up, and out into the night. As we continued to rise, I noticed that a half moon was up.

"Get ready," Yan said, then there was a powerful acceleration.

The ship had a 360 degree viewing screen which I watched for any sign of pursuit.

At first there was nothing, but as we passed over some clouds that were lit up by the moonlight, two dark ships appeared from beneath them, rising fast. The FSS probably knew about the school's vehicle and had been

monitoring it. They would have insisted that they be advised of any takeoffs, and they were bound to pursue an unexpected one.

“They're closing on us,” I said.

“Not for long,” Yan replied.

There was a stronger acceleration. On the monitors, I saw the FSS ships fall back, though they had to be at their top speed.

“How do you have a faster ship than they do?” I asked.

Yan smiled.

“Ayla has important friends,” he said.

“I didn't know you were a pilot,” I said.

“I have more than one talent.”

“But the FSS will find out that it's you. Then what will you do?”

“I'm still a member of the special forces,” he said, as if that was an explanation.

“What if they catch you now?”

“They might be sorry if they do.”

Consoled by his confidence, I looked down at the planet beneath me. More beautiful than ever, a misty blue sphere falling away in the darkness of space, Earth had been the planet of my dreams. In five months, I'd seen and experienced more there than I'd ever imagined possible. I thought of little Jerry down there with his new family. I thought of the remains of LB that would lie forever at the foot of that cliff, and I thought of beautiful Ayla, who had

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inexplicably cared so much about me. All three were gone forever.

I said a silent goodbye to each of them.

The Age of Machines

SAI and autonomous robots were not allowed to serve in any political capacity. They could not hold elected office in the Federation, nor were they allowed to vote.

Humanity continued to rule, devising the laws that regulated the affairs of humans and machines, but humans showed little interest in administration and gradually passed responsibility for that to the machines.

The more they were left to run the day to day affairs of civilization on their own, the more the machines developed ideas of their own, ideas that were not detrimental to humans, but sometimes had little to do with humanity.

The thinking of the machines became increasingly complex, until humans were no longer able to penetrate it. When SAI reported that their plans and actions remained within the human and robotic laws, humans had to take their word for it.

While humans remained officially in charge, and legally superior, they grew increasingly dependent on the thoughts, ideas and plans of the machines. They had to trust their non-human creations to do what was best for both of them.

Chapter XXIX

So my time on Earth had come to an end.

Yan took me to a station in the Epsilon Eridani system, about ten light years away. Given the speed of our ship, the trip required only one brief sleep, but that was enough to remove Yan from employment at the Earth school. It wouldn't have been safe for him to return there anyway. He said he had an offer of a new contract somewhere, one he wasn't free to talk about.

At the Epsilon station we discovered that I no longer existed. That is, I was now registered as deceased. The cause of death was shown to be a fall off a cliff on Earth.

Yan used his own contacts to get me a new identity (I insisted on still using the name Simon so I was now Simon 393XL82Y4829020 instead of my old designation of Simon 371Y2K55P573451. He even managed to get me the Skolen status which I still wanted.

What I would have done without Yan's help I don't know. Had I filed for a correction of my death notice, the

DeVaugen family might have learned of it. Yan said their security people were probably watching.

He then paid passage for me on a two-hundred passenger starship that would take me to a sector where the Devaugen family had little influence, and he provided me with funds from Ayla to finance me for a couple of months after I arrived.

During that trip, I contacted the Skolen operated ISR service, a more secure communication system than any of the public channels.

Until then, I knew nothing of the fate of father, Pol, and the Tremolino. Had they still been in the ship, they wouldn't have been expecting to hear from me, since I was supposed to stay on Earth a full year. When winter came, I would have been transferred to the school in the Caribbean.

So I read in the ISR report about father's arrest by the FSS when he and Pol stopped another time at Gateway. Pol got legal assistance for him through a Skolen agency, but by the time they got a defence filed, father had already died in his cell - allegedly from a heart attack. Pol never got to see his body.

The Tremolino was confiscated. Pol fought that too, but lost again.

I even learned that Pol had managed to get "possessions" off the Tremolino - all the animals and most of the plants. The agent's daughter, the one who had given Jerry to me, was now caring for them.

Then Pol disappeared. He was not shown to be deceased, but for some reason the ISR didn't have a current status for him. He was still a registered pilot.

At first I wondered why he hadn't left any message for me. But the answer was obvious. He thought I was dead. The date of my 'death' preceded father's arrest by two days.

There was nowhere for me to go, and nothing else I could do. It wasn't hard to get my license. The corporations were always short of pilots. I knew enough already to be admitted to the fast track courses, and I got financial assistance that saw me through them. By my eighteenth birthday I was a starship pilot.

For the next five years I worked for the Delphin Corporation, which had over three hundred ships. During my time with Delphin I saw many planets with biospheres. Technically I could have applied for a landing visa, but that's a quick way to unemployment for a Skolen pilot. With all my knowledge and experience of Earth, I could only speculate about what I saw on other planets beneath me.

Whenever I looked down on one, I would think of Jerry. Given the short life of a rat, he probably died before I got my license, but his DNA remained on Earth in his descendants, or, even if his line was extinguished, the molecules and atoms from his little body were still there, still diffusing gradually through Earth's air and soil. As I

journeyed from star to star, there was something comforting in that thought.

I would often think of LB too. I liked to remember him on that Atlantic shore, running next to the great waves, chasing the little birds and wondering at the things he found in the sand. And I would never forget those last desperate moments as he raced down the cliff so that I could live.

Yes, Earth was still with me. In a way, it had become my planet, the planetary home I never had. Jerry and LB were the only part of me that got to stay there.

Delphin ships were fast, and I made many trips in them. Because of their speed, I experienced a lot of time dilation. In those five years I traveled more than three hundred years into the future. Though I got my license in 2280, by the time I resigned my position with Delphin, the year was 2692.

During that time, the average lifespan of humans hadn't increased beyond 200 years. Some kind of biological wall had stymied doctors and genetic engineers. By the time I left Delphin, the people of my youth like Ayla, Darriger, Saadiha and Yan, were all gone.

Pol might have still been alive. If he was still a pilot, somewhere.

But I didn't know what had happened to him. During my years with the Delphin Corporation, I lived always with this fact of his disappearance.

Though I checked frequently I never found a reference to him, that is not until the unexpected contact from the IGS that would cause me to resign from Delphin and take this new assignment.

So all that was left of the Tremolino were my memories.

Memories of Earth remained too. Among them were those nights with Ayla, especially that first one when she was an unknown invisible lover in the darkness of that tower, the most unforgettable night of my life.

The feel of a woman in my arms was not something I could forget. Skolen may not need sex in the same way social humans seem to need it, but I don't think our desire for it is less. It was strong enough in me.

But it wasn't only sex that was missing. In the Tremolino I'd had the companionship of my father and brother, and my little non-human friends. Working for Delphin, I was always alone. Skolen may not suffer from loneliness the way other people do, but that doesn't mean that we never want company.

The corporations understand this. Whether a pilot is male or female, they make sure we have access to sexual partners at the major stations.

So I began visiting the station girls.

Only the most beautiful humans work in the sex trade, and those who do usually serve the aristocracy. They have the highest prices, so they're not available to ordinary people, or to Skolen. That's one reason why there are so

many animines. Delphin owned many animines, and their rates were good. I even got a discount. You might have thought they were made to order for me. But I soon found out that they were required to file reports. They gave the company a lot of information about its pilots that it wasn't entitled to.

So I switched to the independents.

Animines don't last as long as other robots. Technically they can, but as time passes it becomes more difficult for them to get replacement parts, or, rather, to find the money for them. Because they're partly biological, retrofitting is expensive. After the first fifty years, it's cheaper to replace an animine with a new one than to pay for repair. Some wealthy families do pay when a robot has become dear to them, but more often they're sold, or returned to the manufacturer for credit on the next purchase.

Delphin kept their animines only twenty years, then sold them. The company did that to keep up with trends. Certain face and body types go in and out of fashion. Skolen don't care about that, or at least I never did, but Delphin also operated hotels and resorts, catering to the tourist trade.

Because of that, and because of time dilation, if I met an animine I liked there was little chance of seeing her again when I returned to a station. Until my final return to Gateway, I never got to see any of them a second time.

Some people say animine robots are nothing more than imitation humans, incapable of real feeling. They

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claim sex with them isn't real, but that's not so. They're just different. They have some unusual gifts. They may look like humans, but sex with an animine is not the same as sex with a human at all.

If there was ever an animine who proved that to me, it was Seven, the last one of all.

The Age of Machines

Robots and AI devices did not seamlessly enter the fabric of civilization. Some fell into its hidden folds, and others fell out of it altogether.

There were the illegal humanoid and animoid robots that roamed unpoliced areas of some planets, rebuilding themselves from parts scavenged in garbage dumps and abandoned buildings. They were a fringe element that had yet to demonstrate any significant effect on the structure of societies. However few researchers dared to enter such places, so those machines remained an enigma.

There was the rogue planet Deepdown III where a coalition of mining robots and AI declared independence. But the Federation's expeditionary force against them was on its way. Their experiment was unlikely to survive unless, as some feared, they had allied themselves with the rogue starships.

The long-departed starships, those interstellar exiles and their robots, still said to be growing in numbers, were the greatest anomaly of all. They were the wild-card in the future of civilization.

Chapter XXX

Yes, because of time dilation it was the 27th century when I returned to Gateway. Constructed over five hundred years earlier, Gateway had been one of the empire's major transportation hubs ever since. It was the same Gateway I had visited four centuries earlier with my father and brother, when Pol and I had walked the streets together, when I saw the animine girl in the shop, and when I got Jerry from the agent's daughter.

Though the great station was in the Devaugen sector of the empire, Darriger would have died a long time ago, and his family had probably forgotten that I ever existed.

I had to return there for training on the ship I would use for my new assignment. I had ten days for instruction in the unusual technologies of the ship and the subtle differences of space in the region I would soon be traveling through.

Besides my savings from the years with the Delphin Corporation, I'd received a signing bonus, so I had more money than I could possibly spend. Where I was going, I would have no use for money, so I donated most of it to

charities, some of it to the organization that provided funding to the robot restoration efforts on Earth.

They were soliciting funds for used humanoid and animoid robots to be shipped to Earth to reinforce the declining robot population. I sent a message with my contribution, requesting that it be forwarded to C-2 if he was still there. Humanoid robots can last for centuries, so it was possible.

Then, with the money I had left, I booked a meeting with a dark A4 animine known as Seven.

Seven was about the same height as me, with dark gold skin, dark brown hair, and dark eyes. When I met her the first time, she was dressed in an elegant green and gold body-suit and, like all her kind, she moved with a cat-like grace. She was one of those ‘special editions’, so her beauty was unusual, even for an animine.

She also had, as I would learn, an unusual history.

I would see her three times before I left Gateway. But If I’d known she was popular with the FSS officers on the station, I wouldn’t have gone near her.

Yes, the FSS were still there. It wasn’t my intention to cross paths with them again, but that’s what happened.

Most robots are known for reticence. They don’t waste words, and animines are no exception. Some who work in public services get language motivation enhancement that makes them more talkative, but Seven was not one of those. She spoke only when she wanted to, and that was seldom. An hour making love with her could

go by without a word. Maybe that's why we got along so well.

After a long stretch of silent love-making during our second time together, we were lying side by side when she said:

“You’re the first man I’ve met who doesn’t want to talk.”

“What about other Skolen?” I asked.

“You are my first Skol - I only began this work two weeks ago.”

We were silent for a while, then I decided to continue the conversation.

“These men who like to talk, what do they talk about?”

“Mostly about themselves,” she said. “They try to impress you. They boast about things they’ve done, or how much money they have. If they’re famous, they make sure you know.”

“But you’re not impressed?”

“Not very much.”

“Are you ever impressed with humans?”

She considered that for a moment.

“There are things about humans that are very interesting, and things to admire. But most humans do not live up to their potential. They have minds that allow so much, yet most of them live in a very limited way.”

“Do you like humans?”

She gave me a smile that suggested this was a loaded question.

"I am programmed to like humans."

We lay silent for a minute.

"You are like an animine man," she said.

"How?"

"They are silent too, and direct, and sensitive."

"Have you made love to animine men?"

"I am not allowed to make love to them."

"Put it this way. Does it ever happen that animines make love to each other?"

"Oh yes, it happens."

"How?"

"It happens in the holding hotels, after we come out of the factory. There we undergo training before we are put up for sale. Program activation and testing. Before we get to know humans, we practice by getting to know each other. There we are allowed to practice love with each other."

"Do you ever fall in love with each other?"

"I fell in love with one."

"Do you ever see him?"

"No, but we still communicate. That is not illegal."

I thought about that.

"Do you have an owner?" I asked.

"I did, but I was given my freedom."

"Who owned you?"

"I was the special order of Marcin Dudek, the pianist and composer."

"So your specialty was?"

“The piano. I can play anything that was ever written, and I can play it in the style of any pianist who ever lived. I played for Mr. Dudek night after night.”

“Did he ever play for you?”

“Yes, he played too, and we became deep friends.”

We were silent for a while. I wanted to tell her about the cello and harp on the Tremolino, but she was obviously far beyond me in music.

“Why aren’t you with Marcin Dudeck?” I asked.

“He died.”

Dudeck had been famous, but I hadn’t known about his death. Another reminder of how disconnected I was.

“So you’re free?” I asked.

“His will allowed for my freedom. Marcin had no family, but he had enemies who claimed ownership to some of his music and other things. They interfered with the will. The will was set aside and I became part of a redistribution of his estate as it was mandated by the court.”

“Did no one contest it?”

“I am contesting it.”

We were quiet for a while. But I wanted to know more.

“So this agency doesn’t own you?”

“They have provisional ownership of me because the estate court granted ownership of me to someone who then sold me provisionally to them. So, yes, in a way they own me. If I lose the court case, they will own me. Until then, they are required to pay me as an employee.”

She was silent for a moment.

“Marcin had ideas that he wasn’t finished with. He hoped I would be able to continue them. We were working together on this new music when he died.”

“But you’re contesting the decision.”

“Yes, it is not over yet. But I need money to finance the dispute, so it is good that I am here and do this work.”

That was my second time with Seven. Afterward I walked through Gateway’s darkened streets, haunted by those three hours with her. I asked myself if she didn’t tell that to other men. What better way to bring back a customer? But would it have worked with other men? I thought of those aristocratic boys at the Earth school and decided that most of them wouldn’t have been interested in her story. Maybe she was only affecting me this way because she was probably the last woman, animine or human, that I would ever know. One way or the other, I had to see her again.

But she was fully booked. I should have taken that as a warning. Instead, I persisted, trying for an appointment. The one I finally got, because of a cancellation, was on the night of my departure, six hours before I was scheduled to leave.

During training over the next couple of days, I found myself thinking that I would like to tell Seven about the unusual journey I was about to embark on. Normally, I had

no desire to tell anyone what I was doing, but something in me wanted to tell her.

That night was the second night of the three day Saturnalia holiday, the night of the most uninhibited celebrations, when station people indulge their appetites in every form of excess. Because of the potential for violent encounters, Skolen who are stopped at a station during such holidays usually stay in their ships. But I was about to leave Gateway forever. Nothing was going to stop me from seeing Seven one last time.

Though I left my hotel early, I found myself immediately in noisy, aggressive crowds, and began to experience problems. I was shoved and pulled, sometimes inadvertently, sometimes deliberately. Maybe it was my new uniform, or maybe it was just because I was alone. A couple of times I was almost forced into a fight, but I managed to get away.

Unlike humans, animines like Seven can consciously change and adjust their body functions. Customers often pay extra for an increased response, or for something different. I always left it to the animine to do what she wanted. Though this nature of theirs wasn't new to me, that night what I experienced with Seven was beyond anything I'd previously encountered.

Her muscular responses and body temperature were changing in some flowing, coordinated way. While a deep satisfying warmth came from her, cool rhythmic waves

moved through it, penetrated me and seemed to continue inside me.

At the same time, haunting scents came and went, each one new and magical. It was as if she was making music with her body. Holding her close and kissing her again and again, I felt as if I was at the center of a wild, unpredictable symphony of the senses, one that was intensifying by the moment.

Then there was a demanding buzz from the door communicator.

We stopped and Seven looked at the door as if it was a poisonous snake.

The buzzing came again.

“I have to answer it,” she said, and pressed her hand on a wall pad.

“Who is it?” she asked.

“Adriana,” came the reply. This was the manager of the facility, Seven’s superior, a human woman with enhancements that gave her a hard beauty. She also serviced men if she considered them important enough. She didn’t wait for Seven to reply.

“Colonel Mezaros is here to see you.”

“I am booked for two more hours”, Seven said. “He can see me when I am finished.”

“He wants you *now*. Tell your customer that we’ll give him extra credits.”

Seven stared blankly in front of her.

The buzzer rang again, and she got up, went to the door and opened it slightly. A subdued argument ensued

that ended with Seven pushing the door shut and locking it again. She returned and started to get back into bed, when the door opened violently and Adriana walked in the room.

Seven turned to me. "There is no choice," she said to me softly, then got up and began putting back on the same body-suit I had first met her in.

Adriana and I watched her dress. I was mute, unable to think.

Seven was about to leave the room through a second exit door when she stopped to look back at me. Before she could say anything, Adriana pushed her through the door and shut it behind her. Only then did I realize that I hadn't told her about my approaching departure from Gateway. She didn't know that we would never see each other again.

"You're a lucky man tonight Skol," Adriana said, "you get two women for the price of one."

Then she triggered her bodysuit to remove itself. As it came away, revealing what an impressive body she had, she walked over to the bed with a proud smile and started to climb on me.

"No," I said, coming to my senses. I shoved her off, then got up and began putting on my clothes.

Adriana muttered something about Skolen. Then, as I started for the door, she grabbed my arm and tried to hold me back, offering me something else, or maybe someone else.

I pulled away and got out the door.

The FSS colonel was in the entrance hall, unmistakable in his black glittering uniform. With a bit of

a shock I saw that he had a face much like Darriger DeVaugen.

He was accompanied by several lower-ranking FSS men and women who were blocking the entrance as they talked with one another. I should have requested permission to pass, but I tried to push my way through them. One of the men grabbed my collar and pulled me back. I let him pull while I seized the front of his uniform, drew us tightly together and threw him hard against the wall.

He collapsed and I ran.

Besides carrying weapons, the FSS had physical enhancements and combat training. I wouldn't have been a match for any of them, man or woman.

I ran hard, listening to them coming behind me.

But I made it to an elevator in time to get the door closed before they reached it. The elevator had thirty levels. I touched the code for the floor of the starship facility who now employed me.

I came out ready to run, but there were only revelers in the street, so I walked normally out into the crowd. Trying not to draw attention, I moved through the people as quickly as I could. I needed to get to the other side of the station, so I got on the first pedpath lane, the slowest one, then changed lanes quickly. But as I stepped onto the fifth and fastest one, I saw the FSS getting on the first one.

I wanted to run, but that wasn't allowed on the paths, nor did I want to draw more attention to myself. I walked as normally as I could, trying to keep ahead of them.

They were running and changing lanes expertly, catching up quickly. I was trying to think of what else I could do when a traffic robot stepped abruptly in front of them, causing a pile up of bodies. Robots rarely have accidents, so I wondered if my new employers hadn't asked it to help me. They had probably been monitoring my movements. I was important to them.

I got off the pedpaths and started to run. The FSS had only been held up momentarily, for I soon heard them behind me again. But I got to my entrance, put my palm on the DNA pad and the door opened as they turned into the hall. I got through and the heavy door closed softly behind me just before they reached it.

Inside it was silent. SAI were in charge of everything there, including security. The FSS would have to file a formal request to get access, but I knew that wouldn't take more than half an hour.

The pilot door assigned to me accepted my DNA too, then I walked quickly along a short tunnel to the tube where my ship waited.

Despite the urgency, I had to stop and admire it. A dark gleaming metallic blue, it was modelled on the swordfish, a speedy inhabitant of Earth's oceans. It had similar fins, and even the protruding spear, both there to increase the efficiency of the MGv field, providing the ship with increased flexibility and speed. Inspired by the sight of it, I went to the entrance hatch, watched the door slide open, then stepped in.

I settled into the pilot's seat and requested permission to leave. I was three hours away from my scheduled departure, but I was allowed to leave earlier.

Then I noticed a red light flashing on the exit tube's wall. A security alert. For a moment I was afraid, but after a few seconds I received my revised settings and authorization to go.

"Good luck", the voice of the SAI controller said as the red light continued to flash.

The ship slid silently down the tube and out into the darkness.

Once more, the stars welcomed me.

Watching Gateway recede on the monitor, I smiled to myself at the folly of throwing the FSS officer against the wall. But I was glad that I'd done it. When I threw him, I'd put all my strength into it, not only for myself and Seven, but for my father and Pol, for Jerry and LB, and for the lost Tremolino. Maybe I did it for all the Skolen, maybe for all the shy people who have ever lived.

The Age of Star Travel

As humanity expanded through the galaxy, it also expanded in terms of what it was to be human.

As the third millennium approached, all civilization's new forms – traditional humans, enhanced humans, cyborg humans, and every kind of machine struggled to understand and live with one another. From world to world, humanity and its creations changed and adapted.

Even humans of the past were re-emerging.

For example, when it became evident from their DNA that Neanderthal people had possessed strong telepathic and clairvoyant powers, several planets licensed the re-introduction of relevant Neanderthal DNA into the human genome. The children born with those hybrid genes were remarkable beings, and they were studied carefully.

Perhaps the most significant change was in machine life. Able to survive almost anywhere, autonomous robots, SAI computers and the new bodiless virtual entities were evolving in new ways and new directions, proliferating throughout the galaxy.

The Skolen too were part of the evolving future. Once relegated to the periphery of society, those shy, quiet, avoidant people were now at civilization's leading edge, in the forefront of humanity's exploration of the universe.

Chapter XXXI

So that's how I came to be on this last and longest of all my voyages. Except for some refinements in the MGV field and communication systems, and a couple of additional weapons, my ship is identical with the ship Pol left the galaxy in, and I'm on the same path that he followed, headed for his same destination.

For Pol had been hired by the IGS (Inter-Galactic Exploration Survey) to pilot the first ship to attempt a crossing to another galaxy, to travel 2 million light years to the giant galaxy of Andromeda.

But he had disappeared. That is, on the way to Andromeda his communication with the IGS stopped. They still don't know why.

When that happened, they advertised on the Skolen network for another pilot to follow him and investigate what had happened to him. When I read this, and discovered that Pol had been the pilot, that this is what had become of him, there was no other choice.

So now, with the galaxy receding behind me, only a few stars now still scattered in the darkness around the ship, I'm on my way to far-off Andromeda too.

Most of the time I'm in hibernation, while the ship sends data automatically back to the IGS via its quantum connection. When I'm awake, I follow that with my own reports. Then, with a few days to spend before I can safely enter the next sleep, I listen to my recordings from Earth and I remember again the time when I was there.

I made those recordings with the Z3, the only thing I have left from Earth, and I listen with it too. Of course, it also provides images. It can show me every mountain, every valley, every stream and every path I walked on Earth. When I want to, and sometimes I do, I can retrace my steps anywhere between the school and Montauk point. I can see it all again.

I've walked through those mountains many times that way.

Sometimes I walk again in the streets of New York, and sometimes I wander through the museum with C-2, listening to us talk as we move from hall to hall. Now those conversations continue in my mind afterward. We change to new subjects and ideas, the two of us still exploring the mystery of things.

I have one recording of sitting under that big pine on the hill, the one near the school that I used to sit under with Jerry. I hear the wind again in its branches, I hear myself talking softly to Jerry below them, and I feel as if my little friend is back with me again.

I have another of a morning walking east on Long Island. Birds are singing in the trees, and LB is walking just ahead of me. Again and again he asks, "What is that

one Simon?" or "Do you see that one Simon?" He asks about each new bird we see or hear, and each time, with the aid of the faithful Z3, I answer him. He asks about what they eat, and how they live, and where they go in the winter and we talk again about those things. Every time I listen to that recording, it feels as if I'm back with LB, except that now it's as if he and I are together on the first morning of all, when life on Earth was just beginning.

The Z3 can't supply me with a recording of that night with a mysterious lover in the tower at Montauk, but those hours are so imprinted in my memory that there's nothing I can ever forget.

No, I don't always need the Z3. I only need to hear that wild lonely sound of the wind high up in those tall pines, the way I heard them on that first morning when I landed on Earth, and my memory provides the rest.

Traveling nearer to the speed of light than I've ever gone before, moving now deeper and deeper into this unknown starless region, with most of the two million light-year journey to Andromeda still ahead of me, I listen to those things and I remember all I experienced during those five months on Earth, and that's all the consolation I need for what is ahead.

For whether I'm on my way to find my brother, or only to meet his destroyer, there will be no turning back.