



the

Wandering Earth

Liu Cixin

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The Wandering Earth

Author: Liu Cixin

Translator: Holger Nahm
Editor: Kim Fout, Verbena C.W.

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Website: www.hotinchina.net

Contact: hotinchina@126.com

CHAPTER

1 The Reining Age

I've never seen the night, nor seen a star; I've seen neither spring, nor fall, nor winter. I was born at the end of the Reining Age, just as the Earth's rotation was coming to a final halt.

The Reining lasted for 42 years, three years longer than the Unity Government had projected. My mother once told me about the time our family witnessed the last sunset. The Sun had ever so slowly crept toward the horizon, almost as if it had stopped moving altogether. In the end, it took three days and three nights to finally set. Naturally, that was the end of all "days" and all "nights". The Eastern Hemisphere was shrouded in perpetual twilight for a long time then, perhaps for a dozen years or so — with the Sun hiding just beyond the horizon — its rays reflected by half of the sky. It was during that long sunset that I was born.

Dusk did not mean darkness. The Northern Hemisphere was brightly illuminated by the Earth Engines. These giant generators had been raised all across Asia and North America; only the solid and stout tectonic plates beneath those two continents could withstand the enormous thrust forces they exerted. There were about 12,000 Earth Engines built and distributed across the Asian and American plains.

From my home I could see the bright plasma plumes of several hundred Earth Engines. Just imagine a gigantic palace, one as large as the Parthenon on the Acropolis. Now imagine countless colossal pillars raising from that palace, reaching to the heavens, each emitting brilliant, bluish-white light like a titanic fluorescent tube. And then there is you; you are a microbe on the palace's floor. This only begins to paint the picture of the world we lived in.

This picture, however, is not yet complete. Only the forces acting tangentially to the Earth's rotation could slow it, so the Earth Engines' jets had to be aligned to a specific angle. Those gigantic pillars of light were slanted to that angle. Now imagine what that meant for our palace, with its pillars all leaning on the very verge of toppling down! Many who came from the Southern Hemisphere were mad when suddenly confronted with this awesome vista.

Worse than the view was the scorching heat emitted by the Earth Engines. Outdoors the temperature was stuck at around 160 to 180 degrees, forcing us to wear thermal suits just to leave the house. The extreme, nearly suffocating temperatures often brought torrential rains. It was always a nightmarish scene when the beam of an Earth Engine cut through dark clouds. The clouds scattered the brilliant, bluish-white light of the beam, erupting it into countless frenzied, surging halos of rainbow light that covered the entire sky like white-hot magma. One time my senile grandfather — tormented by the unrelenting heat — couldn't take it anymore; when a heavy downpour arrived, he was so elated that he ran outside, bare to the waist. We couldn't stop him in time and the top of his skin was scalded off by the raindrops which were heated to a boil by the Earth Engines' plasma beams.

To my generation, born in the Northern Hemisphere, all of this was perfectly normal and natural, just like the Sun, stars and Moon had been to generations before the Reining Age. We called the entire history of the human race that had come before us the Pre-Solar Age; what an enthralling and golden era that had truly been!

When I started primary school, my curriculum included a journey around the world. I went on that journey with my teachers and a class of thirty. At the time, the Earth's rotation had already come to a complete halt. The Earth Engines were only being used to maintain the planet's equilibrium and

make a few minor adjustments. Because of this, the beams were significantly throttled during the three years from when I was three until I turned six. It was due to this throttling that we were able to take our trip, giving us a chance to get to know our world better.

First, we visited an Earth Engine up close. The engine was in Shijiazhuang, near the foot of the Taihang Mountains. The engine was a towering metallic mountain, looming over us, filling half the sky. To the west of it the Taihang Mountains seemed to be no more than a ridge of small hills. Some of us children exclaimed in wonder that it must be as tall as Mount Everest. Our beautiful teacher, Ms. Xing, smiled as she told us that it was in fact 36,000 feet tall, a good 6,000 feet taller than Mount Everest.

“People call it ‘God’s Blowtorch’,” she said.

We stood in its enormous shadow, feeling its tremors shake the very Earth.

There were two major types of Earth Engines. The larger ones were dubbed “Mountains”, while the smaller ones were called “Summits”. We ascended North China Mountain 794. Let me tell you, it took a lot longer to scale a “Mountain” than to ascend a “Summit”. The top of a Summit could be reached via a giant elevator, while you could only go up a Mountain in a car, snaking your way up a coiled road. Our bus weaved into the endless procession of other vehicles, following the smooth steel road up the outer side of the Mountain. To our left, there was only a blank face of azure metal; to our right, yawning abyss.

The traffic mostly consisted of 50-ton dump trucks, fully loaded with rocks from the Taihang Mountains. Our bus quickly ascended to 16,000 feet as the Earth below almost completely disappeared, obscured by the reflection of the Earth Engine's greenish blue light. Ms. Xing then told us to put on our oxygen masks. As we approached the plasma plume, the light and heat increased immensely, causing the visors we wore to gradually dim and the mini-compressors in our thermal suits to whirl along with all their might. At 20,000 feet we came upon the material intake. Truckload after truckload of large rocks was dumped into the faint, red sparkling light of its giant maw, devoured the rocks without sound.

Fascinated, I asked my teacher about it. “How is the Earth Engine able to turn those rocks into fuel?”

“Heavy element fusion is a very arcane field of study,” she told me, “too difficult to understand for your age. You can content yourself to understand that the Earth Engines are the most powerful machines mankind has ever built. The one we are standing on, North China 794, operating at full power has the capability of exerting 15 billion tons of thrust on the Earth.”

Finally, our bus reached the very top of the engine. Here the mouth of the plasma jet was directed above us. The beam emanating from it was so enormous that, when we tilted our heads up, all we could see was a gargantuan wall of blue plasma reaching into infinity above us. Looking far up at the blue, I then recalled a riddle posed to us in philosophy class:

“You are walking along on a plain when you suddenly come across a wall,” I told my teacher. “The wall stretches endlessly upward, endlessly downward, endlessly to your left and endlessly to your right. What is this wall?” Our haggard teacher had asked our class that riddle. I now asked Ms. Xing, curious at her answer. Even the memory of that question made me shudder as we stood atop the engine.

Ms. Xing stood next to me, thinking of the answer. After a perplexed moment, she shook her head as she contemplated my query.

Leaning close, I whispered the riddle’s terrible answer into her ear. “Death.”

For a few seconds she stared at me in silence, and then she suddenly embraced me. As she held me tight, I gazed over her shoulder into the distance. Rising from the hazy Earth below, I could see a range of gigantic metal peaks. The range stretched in all directions as far as the eyes could see, each peak shooting forth a beam of bright plasma. It looked just like a gigantic, slanting cosmic forest.

puncturing our teetering sky.

~~After a while, we made our way to the ocean. Standing on the seashore we could see the pinnacles of submerged skyscrapers reaching up out of the waves with the ebb of the tide. We beheld the gleaming whitewash of water rush out of their windows, forming cascades of waterfalls.~~

Back then the Reining Age had only just come to an end, leaving the Earth with the horrifying aftermath of its passing. The tides, quickened by the Earth Engines, had swallowed two out of every three cities in the Northern Hemisphere; then the global increase in temperatures melted the polar icecap, turning the ensuing floods into a deluge that spread to the Southern Hemisphere. Thirty years earlier my grandfather had witnessed giant 300-foot waves that had engulfed Shanghai. Even now, I could never tell us about it without his gaze slipping into a thousand-mile stare.

Our planet had already changed beyond recognition before it even set out on its journey. Who knew what hardships awaited us on our long travels through outer space?

At the seashore we boarded an archaic vessel called "ship". As we departed the coast, the Earth Engines grew ever more distant. Within a day's travel, they had disappeared altogether behind us. Before us the ocean was bifurcated by light; in the west, the azure glow of the Earth Engines' jets; to the east, the shimmering pink water, illuminated by the Sun's rays. We sailed straight down the glittering seam where the two glows met on the ocean's surface. It was a truly marvelous sight to witness. As our voyage continued, the azure glow slowly waned, while the pink light gradually waxed. With its waxing, unease began to spread across the ship. We children could no longer be seen on deck. Seeking shelter in the belly of the ship, we even drew the porthole blinds tight.

One day later, the moment we dreaded most finally arrived. We all gathered in the large cabin that we used as our classroom to hear Ms. Xing's announcement.

"Children," she said, "we will now go and watch the Sun rise."

None of us moved a muscle; we all stared at her in blank disbelief. She attempted several times to get us going, but we refused to move.

Seeing our fear, another teacher pointed out the problem to Ms. Xing. "It's just as I said," the teacher told her. "The world-trip should be scheduled before we teach them modern history. It would make it easier for the students to adapt."

"It's not that simple," Ms. Xing retorted. "They learn it all from their surroundings, long before we teach them any modern history." She then turned to some of the class monitors. "You children go first and don't be afraid. When I was a little girl, I was very nervous before seeing my first sunrise, just like you are now. But it was all good."

Finally, we got up and one by one made our way to the cabin door. As we shuffled along, I felt a small, clammy hand grip my own. I looked down and saw it was Ling.

"I'm scared," she whispered, her voice trembling.

"We've seen the Sun on TV. It will be just like that," I told her consolingly.

"Just like what?" she countered. "Is a snake on TV like seeing a real snake?"

For a second I searched for the right words, but then decided not to give an answer. "... Anyway, we should get a move on or we'll get marked down for the course!"

Ling and I grasped each other's hands tightly as we made our way onto the deck with the other children. Shaken by fear and full of trepidation, we faced our first sunrise.

"Consider this," Ms. Xing told us. "We only began fearing the Sun three or four centuries ago. Before that, humanity was not afraid of the Sun. In fact, on the contrary; in their eyes the Sun was both dignified and magnificent. Back then, the Earth still turned and people saw the Sun rise and set every single day, cheering the dawn and praising the beauty of sundown."

Ms. Xing stood with us as we watched at the ship's bow. Her long hair was caught by a gust as the

first rays of light shot over the horizon, and for a moment I could not shake the thought of some monstrous sea creature breathing up the front of the ship.

Then, finally we beheld that soul-chilling blaze. At first it was only a point of light on the horizon but it quickly grew into an expanding arc. My breath caught in my throat as I felt myself falling into the clutches of terror. It felt as if the deck below my feet had disappeared. I imagined myself plummeting into the watery abyss below; and I fell ... Ling fell with me, her wispy frame clinging to my shaking body. The other children, everyone else — the entire world — all fell.

And then I remembered the riddle.

When I first heard it, I had asked my philosophy teacher what color that wall was.

He had told me: “It must be black.”

The answer had seemed off to me. I always thought that a wall of death ought to shine. That was why I had remembered it when I saw the wall of plasma. In that era, death was no longer black; it was the glare of a flash, for it would be a final flash that would vaporize the world.

Three centuries ago, astrophysicists discovered that the fusion of hydrogen to helium inside the Sun had abruptly accelerated. In response, they launched more than 10,000 probes straight into the Sun. Ultimately they managed to establish a precise mathematical model describing the celestial body. Using this model, supercomputers calculated that the Sun was already on the verge of evolving away from the main sequence, ending its hydrostatic equilibrium and with it, its life-giving heat and light. It was projected that there was only a short time before the fusion of helium would spread through the entire Sun, causing a runaway explosion, the so-called helium flash. After the flash, the Sun would transform into a huge but dim red giant. It would grow so large that the Earth would be inside the Sun as if swallowed into the Sun!

In fact, that could never happen; never happen because the preceding helium flash would have already vaporized the Earth.

It was all to occur in 400 years; since then, 380 years had passed.

This stellar disaster would not only annihilate and consume every inhabitable telluric planet in the solar system, but it would also forever change the nature and orbits of the Jovian planets. After the primary helium flash, the heavy elements would re-accumulate in the core of the Sun and further helium flashes would repeatedly occur for a period of time. This was a “period” in the stellar sense lasting many, many thousands of human lifetimes.

All of this made it impossible for humanity to continue living in the solar system, leaving only one last resort: The migration to another star. The technology of the time allowed for only one destination for this migration. That destination was Proxima Centauri, the star closest to ours, a mere 4.3 light years away. But while it was easy to reach a consensus on the goal of the migration, the means were far more controversial.

To enrich the learning experience, our ship was turned back twice on the Pacific, giving us two sunrises. By then we had become accustomed to the sight and we started to believe that the children of the Southern Hemisphere, who were constantly exposed to the Sun, could actually exist and live. We continued our journey into the dawn, watching the Sun rise higher and higher in the sky. With it the temperatures too began to rise.

One day, as I was drowsily resting in my cabin, I was suddenly disturbed by the sound of a quarrel coming from outside. Moments later the door opened and Ling popped her head in.

“Hey, the Spaceship Faction and the Earth Faction are at it again!” she shouted excitedly.

I could not have cared less; after all, they had been fighting for almost 400 hundred years now. Nonetheless, I went outside with her for a quick look and saw a group of boys fighting. It was immediately obvious that Tung was up to his usual games again. His father was an incorrigible

member of the Spaceship Faction, and was in fact still in prison for joining an insurgency against the Unity Government. Seeing Tung, I guessed that the apple hadn't fallen far from the tree.

Ms. Xing and some of the burly sailors had managed to separate the fighting children, but it was no easy feat.

Even as he was being dragged away with a bloodied nose, Tung shouted, "Throw the Earth Faction overboard!" He pumped his fist in to emphasize his point.

"I am Earth Faction, too," Ms. Xing said with exasperation. "Do you want to throw me overboard, too?"

"We'll throw every last one of the Earth Faction overboard!" Tung shouted, utterly unwilling to back down.

In those days, the Spaceship Faction was losing in public popularity and they had grown even more unruly as a result.

"Why do you hate us so much?" Ms. Xing asked.

"We don't want to wait for death together with you Earth Faction fool!" a couple of the Spaceship Faction kids immediately shouted in response.

"We will build the spaceships! All hail the spaceships!" they chanted.

Ms. Xing pressed the holographic emitter on her wrist. Immediately, a holographic image appeared in the air in front of us. We children stared at it in rapt attention and, at least for a moment, peace returned. Floating in front of us was the image of a glittering and translucent glass sphere. The hermetically sealed sphere was about four inches in diameter. Two-thirds of it was filled with water. Small shrimp, a small sprig of coral and a bit of green algae swam in the water. The shrimp languidly moved about inside the sphere.

Ms. Xing said, "This is something Tung came up with for natural science class. There is more inside this small ball than meets the eye; it is also full of microscopic bacteria. All things inside interact with and support one another. The shrimp eats the algae and draws oxygen from the water. It then discharges organic matter in its feces and it breathes out gaseous carbon dioxide. The bacteria further breakdown the discharge into inorganic matter and carbon dioxide. With the inorganic matter the algae then use artificial sunlight to perform photosynthesis."

We all gazed in awe as she explained to us the process.

"They thereby can manufacture nutrients, grow and reproduce, all while exuding oxygen for the shrimp to breathe," she told us. "With nothing but sunlight, this ecological cycle should be infinite and self-perpetuating. It was the best class work I had ever seen and I was well aware that it encapsulated Tung's dreams, as well as the dreams of every other child of the Spaceship Faction," she said fairly. "In essence, it is a miniature of the spaceship they so desire! Tung told me that he had designed it according to computations based on rigorous mathematical models and that he modified the genes of every life form in the sphere, ensuring that their metabolisms would achieve a perfect balance. He firmly believed that life within the sphere would endure, right down to the natural end of the shrimp's life. All of us teachers loved the project and we provided it with artificial sunlight at the required intensity. Convinced by Tung's calculations, we quietly wished that his little world would succeed. But today, just about a dozen days later ..."

With great care, Ms Xing produced the real glass sphere from a small box. The shrimp floated on the water's surface, dead. The water itself had gone a dismal shade of cloudy and the rotting algae inside had lost their green, and had now turned into a dead, woolly substance covering the coral.

"This small world is dead. Children, who can tell me why?" Ms. Xing asked, showing us the lifeless sphere.

Someone quickly called out an answer. "It is too small!"

Ms. Xing smiled and nodded. "You are right; it is too small. A small biosphere, no matter how

precisely designed, can never withstand the test of time. It is no different with the vessel that the Spaceship Faction imagines.”

“We could build a spaceship the size of Shanghai or New York,” Tung retorted, his voice subdued as he cast his eyes on the sphere.

“That is true, but that would be the limit of our current technology and compared to the Earth, such a biosphere would still be very small,” Ms. Xing replied gently. “Too small, in fact.”

“We can find a new planet,” Tung countered.

“Even your faction does not really believe that,” Ms. Xing said. “There are no available planets in the Centaurus constellation. The nearest fixed star with an available planet is eight-hundred-fifty light-years away. Even the fastest ship we can build can travel no more than zero-point-five percent of the speed of light. At that speed it would take us one-hundred seventy-thousand years just to get there. The spaceship's biosphere would not even be able to last a tenth of that. Children, only an ecological system the size of Earth, with its vigorous and all-encompassing biosphere, can exist in perpetuity. Should humanity leave Earth to travel across the universe,” she said, concluding her impassioned explanation, “it would be no different from an infant leaving its mother in the middle of a desert!”

“But,” Tung said, pausing before he continued in an almost pleading tone, “teacher, it's too late for us and too late for Earth. It is too late for it to reach sufficient speed and to make it far enough away. The Sun is about to explode!”

Ms. Xing would have none of that sort of talk. “It is not too late,” she told him, and us as we all listened in. “We must trust the Unity Government! How many times have I told you? Even if you don't believe, even if worst comes to worst, ‘At least humanity died with pride, fighting to the end!’ ”

Humanity's exodus would proceed in five steps: First, the Earth Engines' jets would be used to counteract the Earth's movement, stopping its rotation. Second, the engines' entire power would be used to set the Earth on a new path, accelerating the Earth into escape velocity, taking it away from the Sun. Third, in outer space, the Earth would continue to accelerate as it traveled to Proxima Centauri. Fourth, in transit, the Earth Engines would be re-aligned, the Earth's rotation would be restarted and the deceleration process initiated. And then fifth, the Earth would be moored in an orbit around Proxima Centauri, becoming its planet. People also called these five steps the “Reining Age”, the “Exodial Age”, the “First Wandering Age” (during acceleration), the “Second Wandering Age” (during deceleration), and the “New Sun Age”.

The entire exodus would last 2,500 years, about 100 generations.

Our ship continued its voyage, making its way into the Earth's night. Neither the light of the Sun nor the glow of the Earth Engines could be seen here. As we stood in the cool Atlantic breeze, the children saw our first starry sky.

God, the beauty of it was heartbreaking!

Ms. Xing arched her arm around the nearest few of us, as if to embrace us all with one hand. “Look children,” she said as she pointed to the heavens with her other hand. “There is Centaurus and that is Proxima Centauri, our new home!” Tears began trickling down her face as she spoke those words leading her to weep.

It was an emotionally infectious moment, seeing her tears. By the time she finished, we were all sobbing. All around us — even the sailors and the captain, hardened seafarers one and all — no one could stop the tears from welling up in their eyes. Through our tears we all looked in the direction that Ms. Xing was pointing, the stars in the sky twinkling as we cried. Only one point of light did not waver; a heavenly lighthouse on the distant shores of the wild sea of the night, a faint beacon for lonely travelers freezing in the cold desolation: The star of our hearts, Proxima Centauri. It was the

only hope and support for a hundred future generations, set on a course through a sea of woes.

On our return voyage, we saw the first sign that Earth had begun its journey. A gigantic comet had appeared in the night sky. It was the Moon, abandoned by humanity. The comet's tail was, in fact, the jet of Lunar Engines, pushing the Moon out of its orbit to ensure that there would be no catastrophic collision as the Earth began its acceleration. The Lunar Engines' trail covered the ocean in a blue glow and drowned out the stars. As it moved, the gravitational tide of the Moon riled up the ocean, raising towering waves. We quickly transferred to a plane to continue our journey to our destination in the Southern Hemisphere.

The day of departure had finally arrived!

When we deplaned, we were immediately blinded by the brilliant jets of the Earth Engines. The plasma plumes were several magnitudes stronger than when we had last seen them. Even through closed eyes we could see that the beams had been righted and were now shooting straight toward the sky. The Earth Engines were running at full power.

The acceleration gave rise to 300-foot rolling, thunderous waves that assaulted every continent. Scorching hurricanes howled through the boiling froth, screaming through the countless towering beams of plasma with unbridled fury, uprooting almost every tree on Earth. Our planet had also become a gigantic comet, its blue tail piercing the dark of space.

Earth was on its way, and with it, all of humanity.

Just as we began our journey, my grandfather passed away, his burnt body ravaged by infection.

In his final moments, he repeated over and over, "Oh, Earth, my wandering Earth..."

CHAPTER

2 The Exodial Age

After we de-boarded, our school prepared to relocate us to a subterranean city; we would be among the first group of inhabitants. Our descent began when our school bus entered a massive tunnel which soon became a smaller corridor deep below, always sloping downward. After traveling for about half an hour, we were told that we had entered the city; but as I looked out of the bus' window as we drove on, I could only ask myself, 'What city?'

All I could see was an endless parade of labyrinthine, branching cave passages and countless sealed metal doors. A row of floodlights hung from the cave's high ceiling, bathing everything in a dull metallic blue. I could not help but feel disheartened at the realization that, for most of the remainder of my life, this would be my world.

"Early humans lived in caves and so will we," Ling said quietly, but not quietly enough for Mr. Xing not to hear.

Turning to us all, she intoned, "There is nothing we can do about it, children. The surface will soon become a very, very terrible place. It will be so bad, that your spit won't even make it to the ground. When the cold comes, it will freeze in mid-fall and when it is hot, it will evaporate even as it leaves your mouth!"

Our teacher had barely finished her admonishment when a younger child turned to me and asked, "The cold part I understand; it's 'cause the Earth will move further and further away from the Sun, but why will it get hot?"

"Idiot, didn't you learn about orbital acceleration?" I snapped back.

"No," he responded, shirking.

It was Ling who took it upon herself to patiently explain the situation to the child, almost as if she wanted to dispel her erstwhile melancholy. "Things are different than you think. It's like this: The Earth Engines are not that powerful. They can only accelerate the Earth a bit and certainly not enough to launch the Earth out of its solar orbit in one fell swoop. In fact, the Earth will circle the Sun fifteen orbits before it can escape! During these fifteen orbits, the Earth will slowly pick up speed. Right now the Earth's orbital path is still pretty much circular, but as the Earth accelerates, its orbit will become increasingly elliptical. The faster it moves, the flatter the ellipse will become, and the more the Sun will be shifted toward one end of the orbit. When the Earth is at its farthest point away from the Sun it will naturally be very cold."

"Right, but it still doesn't make sense! When the Earth is furthest from the Sun, it will be very cold and when it is at the other end of the ellipse, its distance from the Sun will ... hmm, let me think." He thought for a moment. "No, the orbital dynamics states that we'll not get closer than we are now... So why should it get hotter?"

The child truly was a little genius. It was a real blessing that genetic memory engineering had brought such a child the memories of his father, making him the norm. Without them, even in 400 years we could not have realized the god-eclipsing miracle such as the Earth Engines.

Even so, I gave a snarky answer. "But there are still the Earth Engines, you dolt. Right now, more than ten-thousand of those giant blow-torches are being switched to full power. The Earth itself is basically just the ring that holds those rocket nozzles." I shook my head in mock disgust. "Now just be quiet. You're annoying me!"

~~Thus we began our life underground. The subterranean cities spread across the continents. They were built one-third of a mile below the surface and each one had enough space for over a million inhabitants. Under the Earth's surface, I finished primary school and entered middle school.~~

Most of my schooling concentrated on the physical sciences and engineering; the arts and philosophical subjects, on the other hand, were condensed to a bare minimum. The human race had no time for such distractions now. All in all, humanity was then probably the busiest it had ever been. The work never ceased and there was always more to do. Interestingly enough, the religions of the surface world vanished without a trace overnight. We still had history lessons, but our history books portrayed humanity's history under the Sun as life in a mythical paradise.

My father was an astronaut serving in the space fleet's Low Earth Orbit Wing. He was on the job almost constantly and I rarely saw him at home. I remember that in the fifth year of the Earth's acceleration, our entire family visited the seaside as the planet reached its aphelion. For us Aphelion Day was a holiday much like New Year or Christmas. At the furthest point from the Sun, we could indulge in a false sense of security.

We still needed to wear thermal suits to go to the surface. To keep us warm, these suits were fully sealed and powered by nuclear batteries. Once outside, the blinding light of Earth Engines' plasma jets was almost all that we could see. The brilliant glow of this forest of energy beams seemed to swallow the entire world. We had to travel for many hours in our flying car before we managed to escape the glow and we were actually able to see the sunlit seashore. The Sun itself had become tiny, no larger than a baseball. It hung in the sky, utterly unmoving, its distant rays only illuminating that one area with dawn-like light. Around us, the sky was the deepest blue we had ever seen and in it the stars were clearly visible. Looking into the distance, I for a moment wondered where the ocean had gone. Not long before my eyes there was only a vast white, icy plain stretching to the horizon.

A large group of revelers had gathered on the frozen ocean, shooting fireworks into the dark blue sky. The mood of the celebration was truly extraordinary. All around I could see drunken party-goers rolling on the ice as my ears were assaulted by songs being belted out. It seemed that no one could agree on which song would be appropriate, leading to a cacophony of voices, all trying to outdo each other at the top of their lungs.

"Despite it all, they all want to live their own life and there's nothing wrong with that," my father said. He paused, suddenly remembering something he had not yet shared. "Oh, I forgot to tell you about I've fallen in love with Li Xing. I want to move out to live with her."

"Who is she?" my mother asked tranquilly.

"My primary school teacher," I answered in my father's stead. Having started middle school two years ago, I had no idea how my father had come to know Ms. Xing. Maybe he had met her at my graduation.

"Well, then go," my mother said.

My father continued his thought. "I'm sure to tire of it after a while. I'll come back then. Does that sound all right?"

"If you want to, certainly," my mother answered, calm as the frozen ocean all around. But then, a few moments later, her emotions were at last stirred. "Ah, look at how beautiful that one is!" she shouted, pointing at an exploding firework in the sky, genuinely moved by its spectacular display. "I bet it had a holo-projector inside!"

Back then we were baffled when we watched films and read stories from the Pre-Solar Age. We just could not understand why people should invest so much emotion into matters that had nothing to do with survival. Watching a protagonist despair or cry over love was strange beyond words to us. In those days, the imminent threat of death and the desire to escape alive overwhelmed all else. The dai

updates on the condition of the Sun and position of the Earth all but devoured our attention and ruled our emotions. This all-consuming focus gradually changed the essence of human psychology and spirituality. Love and all its foibles became mere distractions, just like a quick swig of a drink was for a gambler who cannot take his eyes off the spinning wheel.

Two months later, my father really did come back home, done living with Ms. Xing. My mother was neither happy, nor sad.

“Li Xing was very impressed with you. She told me you were a very creative student,” my father told me.

My mother, who had overheard our conversation, was genuinely puzzled. She asked, “Who was impressed with him?”

“Ms. Xing, my primary school teacher. Father just spent two months living with her,” I answered just as perplexed as she.

“Oh, now I remember!” My mother laughed, shaking her head. “I am not even forty and my memory is already shot.” Looking up at the holographic starry sky that covered the ceiling of our house and then to the holographic forest on our walls, she continued. “You picked a good time to come back. You need to change these images. The kid and I are tired of seeing them and we don't know how to program the damn thing.”

When the Earth again began its long fall toward the Sun, all of us had entirely forgotten this episode.

One day, the news reported that the ocean was thawing. When we heard it, our family again made its way to the seashore. At that time Earth was just crossing Mars' orbit and with its approach, the strength of the Sun had again increased. It still should not have been enough to thaw the Earth on its own, but the Earth Engines ensured that the surface temperatures had reached rather pleasant heights. People everywhere were delighted that for once they did not need to wear their thermal suits.

Earth Engines still filled the sky of our hemisphere, but on the other half of the planet people could truly feel the Sun draw closer. Their sky was bright blue and the Sun was as brilliant as it had been before our exodus began.

We took our flying car and as we flew over the ocean, we could not spot any signs of thaw, instead seeing only a white expanse of ice. Disappointed, we got out of our car. Just as we closed the door we were shocked by an almighty rumble that seemed to rise from the very depths of the Earth. It sounded as if the entire planet was about to explode.

“That is the sound of the ocean!” my father shouted over the noise. “The rising temperatures are heating the thick sheets of ice unevenly, causing something very much like an earthquake.”

Suddenly, a sharp, discordant thunderclap pierced the low rumble and the people watching the ocean behind us began to cheer. I looked and saw a long crack appear, shooting across the frozen ocean like a vast, black lightning bolt; then, in the midst of the ongoing thunder, crack after crack appeared in the frozen ocean. Sea water erupted from these cracks, quickly forming torrents that spread across the icy plain.

On the way home, we looked out over the vast, long-barren land below. Weeds had begun to drive their way out of the soil, and all manner of flowers had sprung into full bloom, and tender leaves draped withered trees in green. Life had wasted no time, flourishing everywhere with vibrancy.

Every day that the Earth drew closer to the Sun tightened the hold of anxiety gripping humankind, making ever fewer choose to emerge to admire the now spring-like surface. Most of us remained hidden within the subterranean cities. We did so not to avoid the imminent heat, torrential rain, and hurricanes, but to elude the dread of the approaching Sun.

One day after I had already gone to bed, I overheard my mother quietly telling my father, "Maybe really is too late."

My father replied in equally hushed tones. "There were rumors like that at the first foerihelions."

"But this time it's true. I heard it myself from Professor Qian Dele's wife," came my mother's quiet and soft response. "He is an astronomer of the Navigation Commission. You all know him. Anyway, he himself told her that they have observed a further acceleration in the concentration of helium."

"Listen, my dear, we must hold on to hope," my father calmly but insistently replied. "Not because hope is real, but because we have to live up to nobility. In the Pre-Solar Age nobility meant money, power or talent, but now one must only hold to hope. Hope is the gold and the jewels of this age. No matter how long we live, we must hold fast to it!" He then added, "Tomorrow, please tell our child the same."

Like everyone else, I felt ill at ease as the perihelion approached. One day, as I was going home from school I — without really knowing why — ended up in the city's central plaza. I stood by the round fountain in its middle, in turn looking down at its sparkling blue water and up to the ethereal ripples of light reflected by the gushing water below that played across the dome above me. After a while I noticed a familiar face. It was Ling, holding a little bottle in one hand and a small tube in the other. She was blowing soap bubbles, her eyes blankly following each string of bubbles as they floated away. She watched them until they vanished, only to blow another string.

"Aren't you a bit too old to find that amusing?" I asked her as I approached.

Ling looked at me in surprise and with a warm smile said, "Let's go on a journey!"

"A journey?" I asked, now the one surprised. "Where to?"

Her smile beamed brighter. "The surface, of course!" She waved her hand through the air, using her wrist computer to project a hologram. The translucent image revealed a beach sunset. A breeze gently swayed the palm trees, while white waves washed ashore. A couple lay on the golden beach, black silhouettes against the backdrop of the glittering sea.

"Mengna and Dagang just sent me this. They're already on the other side. They said that it's not too hot out there and being in the open air would really be nice about now, so let's go!" she told me, her enthusiasm showing.

"They've just been expelled for missing school," I objected.

Ling frowned. "Hmm, that's not what you're really afraid of. You're afraid of the Sun!"

"And you aren't scared? Have you forgotten that you had therapy to treat your heliophobia?" I retorted.

She smiled again. "But I am no longer that person. I've finally seen the light. Look," she said using the small tube to blow another string of soap bubbles. "Watch them closely!" She pointed at the bubbles.

I stared at the bubbles, watching the raging waves of color and light play over their surfaces, the twisting turbulences far too complex and intricate for the human mind to take in. I could not shake the thought that the bubbles knew how short their lives would be and were frenziedly revealing their countless dreams and legends of their vast memories to the world. Seconds later, the raging waves of color and light disappeared in a nearly soundless explosion, leaving behind only the tiniest wisp. The bubbles remained for less than a second before disappearing; and then there was no trace that anything had ever existed.

"Did you see? The Earth is a cosmic soap bubble; with a pop, it will be nothing. So what is there to be afraid of?" Ling asked.

It was my turn to frown. "It's not really like that; the calculations show that after the helium flash it will take about a hundred hours before the Earth is fully vaporized."

“That's the absolutely terrible part!” she shouted. “We are a third of a mile underground, just like the meat stuffing in a pie. First we'll be roasted and then we'll be vaporized!”

For a moment a cold shiver ran down my entire body.

Ling continued. “But it won't be like that on the surface. There everything will evaporate in the blink of an eye. The people on the surface will be like soap bubbles, gone in a pop.” She smiled again. “And because of that, I think it would be better to be on the surface when the helium flash hits.”

I couldn't say why, but I did not go with her. Instead, she left with Tung and I never saw them again.

The helium flash did not happen. The Earth rushed past the perihelion and began its sixth journey toward the aphelion, allowing humankind's taut nerves to relax. Once we passed the perihelion, the Asia's Earth Engines faced in the direction of Earth's orbit. With the Earth no longer in rotation, this meant that, save for the occasional minor positional adjustments, Asia's Earth Engines were shutdown completely. We sailed into a quiet and very long night.

The American Earth Engines, on the other hand, were operating at full capacity with the continental plate now acting as the superstructure for the jets of our planet-rocket. Because the Western Hemisphere also faced the Sun, the temperatures there were truly horrific; horrific enough to burn all their vegetation to ash.

The Earth's orbitally-assisted acceleration carried on like this, year after year. Every time the Earth sped toward the aphelion, humanity's collective nerves relaxed in tune with the Earth's increasing distance from the Sun; every new year, with the Earth falling toward the Sun, they would grow taut with each passing day. And, every time the Earth came to the perihelion, rumors would begin to fly, proclaiming that this time the helium flash would happen. The rumors would persist until the Earth again sped toward the aphelion; then the people's fears would begin to gradually diminish, together with the shrinking of the Sun in the sky.

But the next wave of fear would already be brewing.

It was as if humanity's spirits were caught in a cosmic swing. Or perhaps it would be better to say that we were playing a cosmic game of Russian Roulette; the journey to the aphelion and back to the perihelion was like the turning of the chamber, and passing the perihelion was just like pulling the trigger! Every time the trigger was pulled our nerves would be more frayed than the last. We passed our youth under the shadow of this oscillating terror.

Actually, when one really thought about it, the Earth never left the blast radius of the helium flash. Even at the aphelion, the only difference would have been that the Earth would have been slowly liquefied instead of being vaporized by the explosion; and that end would have been worse than what would have happened at the perihelion.

The Exodial Age soon became an age of catastrophes.

The first came when the acceleration produced by the Earth Engines and the change of orbital trajectory disturbed the equilibrium of Earth's iron-nickel core. The effect crossed the Gutenberg Discontinuity and spread into the planet's mantle. All across the world, geothermal energy escaped and a cataclysmic rampage of volcanic eruptions followed in its wake. From the sixth orbit on, the subterranean cities were thrown into mortal peril as magma seepage became all too frequent and catastrophic events.

On the day it happened, I was just on my way home from school when I heard the blare of the municipality's emergency broadcast.

“Alert! All citizens of City F112! The city's northern protective barrier has been breached by crustal stress and magma has entered the city! Magma has entered the city! At this moment magma is flowing into Block Four! The Underway exits are blocked off. All citizens are to gather in the center

plaza and evacuate from there via elevator. Attention, the evacuation will commence according to Article Five of the Exigency Law! I repeat: The evacuation will commence according to Article Five of the Exigency Law!"

Looking around the labyrinth of passages, our subterranean city seemed eerily normal. But I was aware of the immediate danger; there were only two Underways to the outside and one was blocked since last year due to necessary reinforcement work on the protective barrier. If the other way was also blocked, we could only escape by elevator through the vertical shafts and the carrying capacity of the elevators was very limited. It would take very long indeed to evacuate all 360,000 inhabitants that way. There was no need, however, for it to turn into a struggle for survival; the Exigency Laws of the Unity Government ensured a well-ordered escape.

It brought to mind an ethical question in the olden days; it had gone, 'You are in a flood and you can only save one person. Do you rescue your father or your son?' In the eyes of our age, that question made absolutely no sense.

When I arrived in the central plaza, I saw the other inhabitants already lining up in long rows according to their age. Closest to the elevator doors stood the robot nurses holding the infants, then came the kindergarteners, followed by the children in primary school and so on; my place in the ranks was still rather close to the front.

At the time my father was on duty in Low-Earth-Orbit, leaving only my mother and myself in the city, and I could not find her. Running along the crowded ranks, I looked for her, but was soon stopped by soldiers. I knew that she would be in the last group, all the way at the end. Our city was first and foremost a school city, with only a few families, and she had already calculated where her age peers would be.

The queue moved at an exasperatingly slow pace. It took three long hours before it was my turn, but I felt no relief as I boarded the elevator. I knew that there were still 20,000 college students between my mother and her survival; I could already smell the strong odor of sulfur.

Two and a half hours after I had made it to the surface, magma swallowed the entire subterranean city a third of a mile below me. Imagining my mother's final moments felt like twisting a knife in my heart. She, along with 18,000 others that could not be pulled out, must have seen the magma surge in the central plaza. The power had already failed then, leaving the horrible crimson glow of the magma as the only remaining light. The white dome high over the square would have slowly blackened under the heat and those trapped would have surely perished. They must have never felt the magma actually engulf them; the scorching air, hotter than 2,000-degrees, would have taken their lives long before.

But life had to go on, and even in our cruel and terrible reality, the enticing sparks of love could flash at any moment. During the twelfth journey to the aphelion, the Unity Government, in an attempt to ease humanity's anxiety, unexpectedly revived the Olympic Games 200 years after they had been suspended. I was going to participate, having been selected for the motorized sled rally team. The competition would involve racing my motorized sled from Shanghai, across the frozen Pacific, and then on to New York.

As soon as the starting shot rang out, more than a hundred sleds shot off across the frozen ocean blazing across the ice at 120 miles per hour. During the first leg there was always a competitor in my sights. Two days later, however, all others, whether they were ahead or behind me, had disappeared over the horizon.

The light of the Earth Engines had disappeared together with my fellow racers. By this time I had come upon Earth's darkest corner. Here all things stretched into infinity; above, the starlit sky, and below, the frozen ocean. It almost seemed as if they reached the ends of the universe; or perhaps I had reached the ends of the universe itself.

I felt as if I was the only human in this cosmos of infinite stars and endless ice, and I was overwhelmed by an avalanche of loneliness. At the edge of tears, I sped on, racing as if my life depended on it. My race was no longer for a spot on the podium; it was to rid myself of this terrible loneliness before it killed me. In my mind there was no longer a far shore for me to reach.

Just as these thoughts raced through my head, I saw the silhouette of a person against the horizon. As I closed in, I realized that it was a woman. She was standing next to her sled, her long hair fluttering in the icy wind. You may already have guessed that it was this chance encounter that would shape the second half of both of our lives.

Her name was Koriyama Kayoko and she was Japanese. The women's group had set out from the starting line 12 hours before us, but her sled had been caught in an ice crack, breaking one of its runners. As I helped her with the repairs, I could not help but share the bleakness that had just overcome me.

Nodding in acknowledgment, Kayoko said, "Oh, absolutely. It was exactly the same for me! It really feels just like being the only person in the universe!" She smiled as she continued. "You know when I saw you appear in the distance, it was just like what seeing the dawn must have been like in the Pre-Solar Age."

After a moment I had to ask, "Why didn't you call for the rescue plane?"

She raised her small fist and, with the perseverance so characteristic of the Japanese, declared, "This competition embodies the spirit of the human race and we all need to realize that the Earth, wandering through the universe, cannot call for help!"

I nodded, but replied, "Nonetheless, we now have to call; we don't have a replacement runner. Your sled is broken for good."

She grimaced and then said, "How about I hitch a ride with you? That is, if you really don't care about your ranking."

I really did not care, and so Kayoko and I completed the remainder of our long journey over the Pacific.

As we passed Hawaii, we saw the first light of dawn on the horizon. On this endless field of ice illuminated by a tiny Sun, we sent our application for a marriage license to the Ministry of Civil Affairs of the Unity Government.

In New York, the race judges had — having impatiently waited for us — already wrapped up the competition and left. But there was one official waiting for us. A worker from the municipal Bureau of Civil Affairs was more than pleased to congratulate us on our marriage. He then carried out his duties. With a wave of his hand, he projected a hologram into the air, revealing neat rows of thousands upon thousands of dots; one dot for every couple that had registered for marriage in the past few days.

Due to the harsh conditions, the law stipulated that only one of every three newly married couples would be given the right to procreate as determined by the luck of the draw. Faced with the many thousand dots, Kayoko hesitated for a long while before choosing one.

When the dot turned green, she leapt with joy. I, on the other hand, did not really know what to feel. Would it be fortune or folly to bring a child into this miserable age? The official, at least was jubilant. He told us that it always made him a little happier when he got to see a newlywed couple get the "green dot". He retrieved a bottle of vodka and poured each of us a drink. We slammed it down, toasting to humanity's survival.

Behind us the feeble light of the distant Sun bathed the Statue of Liberty in a golden glow. Before us stood the long abandoned skyscrapers of Manhattan, the Sun's weak light casting their long shadows across the quiet ice of the New York Harbor. In my tipsy haze, tears began to gush down my cheeks.

Earth, oh, my wandering Earth!

Before we parted, the official gave us a key ring. In a drunken drawl he said, "These are for your newly allotted home in Asia. Go home; oh, your wonderful home!"

"Why is it wonderful?" I asked coldly. "Asia's subterranean cities are full of dangers; but you in the Western Hemisphere wouldn't know that."

"We are about to experience a danger that you have never known," he shot back. "The Earth will soon make its pass through the asteroid belt and this time the Western Hemisphere is facing right toward it."

This somewhat sobered me. "We passed through the asteroid belts a couple of times in the past few orbits; isn't it a non-issue?"

The official shook his head as he responded. "We just scraped the edges of the asteroid belt. Of course, the space fleet could handle that. They have the lasers and nukes to get rid of all the small rocks in the Earth's path. But this time..." He choked. "Haven't you seen the news? This time the Earth will pass directly through the asteroid belt! The fleet can only deal with those big rocks; but the small one..."

As we were flying back to Asia, Kayoko asked me, "Are those asteroids very big?"

My father was in orbit then, tasked with securing Earth's journey. Therefore, despite the government's news blackout aimed at avoiding a panic, I had some idea what we were facing. I told Kayoko some of that. "The Earth is heading towards asteroids the size of large mountains; even a five megaton nuclear bomb would do no more than leave a small scar on their surface. They will have to use humanity's most powerful weapon!" I added in an enigmatic tone.

"Are you talking about anti-matter bombs?" she asked.

"What else could it be?" I replied.

"What is the fleet's operating range?" she asked.

"Currently it is limited. My father told me it's about a million miles away," I answered.

"Oh, then we will be able to see it!" she said excitedly.

I gave her a look of warning. "But it would be best not to look."

But Kayoko did look, and did so without protective goggles. The first flash of an anti-matter bomb arrived from outer space shortly after our plane had taken off. Kayoko was looking out a window admiring the stars at the exact moment it happened. The flash blinded her for more than an hour. Even a month later her eyes were still red, swollen, and teary.

It shook every one of us to our core. The anti-matter shells continued to bombard the asteroid. Over and over again, the brilliant, destructive flashes seared the black heavens as if a crazed horde of titan paparazzi surrounded the Earth and was snapping away with abandon.

Half an hour later, we saw the first meteors, their long, blazing tails cutting across the sky, entralling us all with their terrible beauty. Ever more followed in their wake, each streaking farther than the last.

Then, the sky suddenly shook behind us with a loud boom, immediately followed by continuing rumbling and more shaking. Kayoko, under the impression that a meteor had hit the plane, screamed in fear and jumped almost right into my arms.

Just then the captain's voice came through the speakers. "To all passengers; please do not panic. That was the sonic boom of a meteor breaking the sound barrier. I do ask everyone to use the headphones in order to avoid permanent hearing loss. Because the flight's continued safety cannot be guaranteed, we will make an emergency landing in Hawaii."

As the captain spoke, I saw a meteor much larger than the others fall. As I watched the fireball plummet, I became convinced that it would not burn up in the sky like the ones before it. Sure enough it sped across half the sky and while it shrunk smaller and smaller, it struck the frozen ocean in the

end. Looking at it from 30,000 feet, the point of impact was just a small white dot. But that white dot immediately spread into a white circle, rapidly expanding across the ocean's surface.

"Is that a wave?" Kayoko asked me, her voice quivering.

"It is a wave, a hundreds of feet high wave," I answered. "But the ocean is frozen. The ice cover will soon weaken it." I had concluded with the last part, trying to calm myself, no longer looking down.

We soon landed in Honolulu, where the local government had already arranged to take us to the subterranean city. Our bus traveled along the shore, giving us a glimpse at a sky covered in meteor dust. From here it looked as if a legion of fiery-haired demons had all at once burst from a single point in space.

One meteor hit the ocean not far from the shore. There was no column of water; instead we saw a steam rise to form a giant white mushroom cloud above the impact site. The swell of it surged to the shore under the frozen surface as thick layers of ice shattered with loud thunder. The ice rolled like waves, as if a school of giant, sinuous sea monsters was swimming under the surface toward the shore.

"How big was that one?" I asked the official who had come to pick us up.

"Less than a dozen pounds, no bigger than your head," he told us. "But I have just been informed that a twenty-ton one is going down over the ocean five hundred miles north of us." His wrist communicator began beeping. He glimpsed at it and then immediately told the driver, "We won't make it to Gate 244; just head for the closest entrance!"

The bus turned a corner and stopped in front of an entrance to the subterranean city. As we got out, we saw a group of soldiers at the entrance. They stood motionless, staring into the distance, their eyes filled with dread. We followed their gaze to the horizon where the ocean joined the sky. There we saw a black barrier. At first glance, it looked like a low layer of clouds on the horizon, but its height was far too even for it to be a "layer of clouds". It was more like a long wall lying across the horizon. On longer inspection, we could make out a gleam of white on top of that wall.

"What is that?" Kayoko asked an officer, a soft fear in her voice.

His answer made every hair on my body stand on end. "A wave."

The tall metal gates of the subterranean city were shut with a rumble. About ten minutes later we felt and heard a low rumble emanate from the surface, as if a titan was rolling about on the ground far above. We looked at each other, our faces blank with dismay, for we all knew that a 300-foot wave was now rolling over Hawaii. Before long it would impact every continent; but the shocks that followed provided for an even greater terror. It was as if a giant fist had reached from the heavens and had begun pounding the Earth. Underground these shocks were faint, hardly noticeable, but each tremor shook our very souls. It was meteors, unceasingly striking the Earth without mercy.

This brutal bombardment of our planet continued intermittently for an entire week. When we finally left the subterranean city, Kayoko shouted, "Heavens, what happened to the sky?"

All above us was gray; gray because the upper atmosphere was filled with the dust that had been kicked up as the asteroids impacted the dry land. Sun and stars had disappeared behind this endless gray, as if the entire universe had been covered with a dense fog. On the surface, the water left behind by the billowing waves had frozen solid, covering those lonely buildings fortunate enough to survive with long veils of ice. The falling impact dust had also covered the frozen ocean, leaving a monochrome world. A world of gray.

Kayoko and I continued our return to Asia with the very next flight. As the plane crossed the now long meaningless international dateline, we witnessed humanity's darkest night. It was as if the planet had dived into inky depths. Not a single ray of light could be seen in the world outside the window. And with this world, our moods turned pitch black.

“When will it end?” Kayoko mumbled into the dark.

~~I did not know whether she meant our journey or our miserable and adversity-ridden life.~~ wouldn't have mattered anyway; at that moment, both seemed equally everlasting. Even if the Earth made it beyond the reach of the helium flash and we escaped with our lives, so what? We would just have made it onto the first rung of an unfathomably tall ladder. Even if, in a hundred generations, our descendants should see the light of new life, our bones would have long turned to dust. I could not even dare think of all our future suffering and deprivations, much less dare consider that I would be dragging my wife and child along that endless, muddy road with me.

I was tired, too tired to go on ...

Just as despair and sorrow threatened to suffocate me, I heard a woman cry out: “Ah! No! You can't, love!”

As I turned to look, I saw a woman a few rows away from us. She held a gun that she had wrestled from the hands of the man next to her. It was apparent that he had just attempted to put the gun barrel to his temple. The man looked wane and emaciated, his dull and lifeless eyes staring out into infinity. The woman buried her head in his lap and began to sob.

“Quiet,” the man said, devoid of all emotion.

The sobbing stopped, leaving only the sound of the engine softly humming a funeral dirge. In my mind the plane was stuck in the vast blackness surrounding us. We seemed absolutely motionless. All that was left in the entire universe was the darkness and us, nothing else. Kayoko pressed herself tightly into my embrace, her entire body ice-cold.

Suddenly, a commotion started in the front of the cabin and people began whispering excitedly. I looked out the window to see a dim light emerge from the darkness in front of the plane. The light was blue and formless, spreading uniformly through the impact dust suffused sky.

It was the glow of the Earth Engines.

A third of the Western Hemisphere's Earth Engines had been destroyed by the meteorite strikes – fewer losses than the calculations projected at the start of our journey. The Earth Engines of the Eastern Hemisphere had suffered no losses, being on the reverse side of the impacts. In terms of power, there was nothing stopping the Earth from completing its escape.

The dim light before us left me feeling like a deep sea diver finally seeing the light of the surface after a long ascent from the abyss. I began to breathe easy again. Behind me, I heard the woman's voice.

“My dear, we can only feel fear and pain while we are alive,” she said. “Death...death leaves nothing. On the other side there is only darkness. It is better to be alive, wouldn't you say?”

The thin man did not reply. He was staring at the blue glow, tears welling in his eyes. I knew that he would be able to hold on; we would all be able to hold on, just as long as that promising blue light remained. Watching him and the glow, I remembered my father's words of hope.

After we landed, Kayoko and I did not go directly to our new home in the subterranean city. Instead, we went to visit my father at his surface-side space fleet base. When we arrived, however, all that remained of him was a posthumously awarded medal, cold as ice. I was given the medal by a rear admiral of the fleet. He told me that it happened during the operation to clear the asteroids in Earth's path. An anti-matter explosion had blasted an asteroid fragment straight into my father's single-seater.

“When it happened, the relative speed of rock and spaceship had been sixty miles per second,” the officer told me. “The collision instantly vaporized his micro spaceship. He did not experience any pain; I can assure you, there was no pain.”

When the Earth again began its descent toward the Sun, Kayoko and I ascended to the surface to see the spring. But there was none.

The world was still a vista of gray below the gloomy sky. On the surface, frozen lakes had formed from the residual ocean water, but nowhere was there even a speck of green. The impact dust in the atmosphere blocked the Sun's rays, preventing the temperature from rising. The surface and oceans did not even thaw at the perihelion. All throughout, the Sun remained a faint, dim glow, a ghost looming beyond the impact dust.

Three years later, the impact dust had at last begun to dissipate and humanity was finally approaching its ultimate perihelion. As we reached it, those living on the Eastern Hemisphere had the joy of seeing our world's fastest sunrise and sunset. The Sun leapt from the horizon, only to streak across the sky. The angle of all of Earth's shadows changed so quickly that they looked like the sweeping hands of countless clocks, racing around their imaginary chapter rings with manly determination. It was Earth's shortest day, over in less than an hour.

After that hour, the Sun plummeted back below the horizon and darkness fell across the Earth. I was left with a feeling of sadness. This fleeting day had been like an all too brief synopsis of Earth's 4 billion year history in the solar system. And until the end of the universe, Earth would not return.

"The dark has fallen," Kayoko said then, stricken with grief.

"The longest night," I replied. We had entered a night that would last 2,500 years. Not until a hundred generations later would the first light of Proxima Centauri again illuminate our hemisphere. The other side of the world was facing the longest day. Even so, it would last just a moment when compared to the age-long night. The Sun would quickly rise to its zenith, where it would remain motionless, slowly shrinking. Half a century later, it would be difficult to pick out from among the surrounding stars.

The Earth's intended path led it straight to a rendezvous with Jupiter. The Navigation Committee's plan was as follows: The Earth's fifteenth orbit would be so elliptical that the aphelion would reach Jupiter's orbit. There Earth would brush past Jupiter, nearly colliding with the giant planet. Using Jupiter's enormous gravity to assist its acceleration, Earth would finally achieve escape velocity.

We first caught sight of Jupiter two months after passing the perihelion. At first the naked eye could only see it as a dim point of light. Soon however, it grew into a small disk. Another month passed and Jupiter had grown to the size of Earth's lost Moon, but it was a sphere of dark crimson, not glowing silver. Already, one could faintly make out its bands. Then some of the Earth Engines beamed all of which had been perpendicular to the Earth for 15 years, began to tilt. Final adjustments were made to the Earth's angle as we approached our cosmic rendezvous.

Jupiter slowly sank below the horizon and three months later it vanished altogether. Now it was visible only to the Western Hemisphere and we knew that two planets had just met.

It almost came as a surprise, when one day we heard that Jupiter would again be visible from the Eastern Hemisphere. Throng upon throng made their way to the surface to witness the cosmic display. When I passed through the gates of the subterranean city and reached the surface, I saw that the Earth Engines that had driven our planet for 15 long years had all fallen completely silent.

Once again, we could see the starlit sky. Our final rendezvous with Jupiter was already in progress.

Everyone nervously stared toward the west as a dim red glow began to appear beyond the horizon. This glow slowly grew, stretching across the entire width of the horizon. Only then did I realize that a neat border had formed between the dim red light and the starry sky. The border was curved, its arc so massive that it spanned from one end of the horizon to the other. Ever so slowly it rose, and as it did everything below the arc turned dim red. It was as if a theater curtain the size of the night sky was being raised to separate the Earth from the rest of the universe. I could not help but gasp as that occurred to me; that dim red curtain was Jupiter! Of course I knew that Jupiter was 1,300 times the volume of Earth, but only when I saw its immense splendor did I truly take in its incredible size. It

almost impossible to express the horrible feeling of oppression that this cosmic monster engendered as it rose across the entire horizon.

One reporter later wrote, "I could not help but wonder if I had woken in my own nightmare or if the entire universe is but a nightmare in the gigantic mind of that god!" As Jupiter continued its terrible rise, it gradually occupied half of the sky. We could then clearly see the tempests raging in its cloud layers; chaotic, swirling lines of those storms dazed all who beheld their maddening dance. As I stared, I recalled the boiling oceans of liquid hydrogen and liquid helium that lay beneath those thick cloud layers.

Then the famous great red spot of Jupiter rose, the cyclopean maelstrom that had raged for hundreds of thousands of years. It was large enough to swallow our insignificant planet three times over.

Jupiter now filled the entire sky. Earth seemed to be no more than a balloon, bobbing on Jupiter's boiling ocean of dim red clouds! Even worse, Jupiter's giant red spot had come to occupy the middle of our new heaven, like a titanic red eye staring at our world. All of Earth was shrouded in its ghastly red light; in that moment it was impossible for anyone to believe that our tiny Earth could escape the gravitational pull of that enormous monster. For us, it was not even imaginable that Earth could become Jupiter's satellite; we would certainly plummet straight into the inferno concealed beneath that boundless ocean of clouds!

But the navigator's calculations were exact. That bewildering, dim red heaven slowly began to move and, after some indeterminable time, the western sky began to reveal a black crescent. The black quickly grew in size and within it stars began to twinkle; Earth was rushing out of Jupiter's gravitational clutches.

As Earth escaped, sirens began to wail. The gravitational tide that Jupiter had drawn toward itself was rushing back to land. Later I learned that great waves reaching higher than 300 feet had again swept across the continents. As the waters rushed toward the sealed gates of the subterranean cities, they stole one last glimpse at Jupiter, now filling but half of the sky. As I did, I could clearly see streaks of light marring the planet's cloud oceans. Subsequently, I came to realize, that they had been the result of Earth's own gravitational pull; our planet, too, had caused massive waves on the Jupiter's liquid hydrogen and helium oceans.

Then the Earth, accelerated by Jupiter's gravitational forces, was hurled into deep space.

As we left Jupiter, the Earth reached escape velocity. It no longer needed to return, to lurk within the grasp of the doomed Sun. It was flying toward the vastness of outer space, to begin its long Wandering Age.

It was under the dark red shadow of Jupiter that my son was born, deep beneath the Earth.

CHAPTER

3 Rebellion

After leaving Jupiter behind, the more than 10,000 Asian Earth Engines again began firing at full power, and this time they would not stop for 500 years as they perpetually accelerated Earth toward its destination. In these 500 years, half of Asia's mountains would be consumed, burnt in the Earth Engine's nuclear fire.

Humanity was free, free from the dread of death that had been our constant companion for more than 400 years. What followed was one long, deep, and collective sigh of relief. But the revelry that everyone had expected never materialized. What in fact followed was beyond anything what anyone could have ever imagined.

After our subterranean city's celebratory rally had ended, I donned my thermal suit and ascended to the surface, alone. The mountains of my childhood had already been leveled by the super-excavators, leaving only bare rock face and frozen Earth. The bleak emptiness was broken by splotches of stark white that covered the land as far as the eye could see; the salt marshes left behind by the great ocean tide. Before me loomed the city of my father and my grandfather. What had once been a home to 1 million now lay in a pile of ruins. The Earth Engines' blue glow dragged long shadows from the exposed steel skeletons of the city's skyscrapers as they reached from the Earth like the fossil remains of prehistoric beasts.

The repeated floods and meteorite strikes had destroyed virtually everything that had once stood on the Earth's surface. All that humankind and nature had wrought over millennia lay in ruins. Our world had been reduced to a Mars-like desolation.

Shortly thereafter I noticed that Kayoko had become restless. She would often leave our son to fend off in the car on her own. When she returned, she would only say that she had been to the Western Hemisphere. Then finally, one day she dragged me along.

We traveled for two hours at Mach 4 in our flying car until we could finally see the Sun rising over the Pacific, barely the size of a baseball. It illuminated the frozen ocean below with its faint, cool light.

Kayoko put the car into hover at an elevation of three miles. She then produced a long tube from behind our backs. As she removed its cover, I saw that it was an astronomical telescope, the type that hobbyists use. Kayoko opened the car's window and pointed the telescope at the Sun. Then she asked me to look.

Through the telescope's colored lens I could see the Sun, magnified by several hundred magnitudes. I could clearly see even the Sun's faint halo and the sunspots ever so slowly moving across its surface.

Kayoko connected the telescope to a computer that she had also brought along and captured an image of the Sun. She then opened another image of the Sun on the screen and said, "This is an image of the Sun from four hundred years ago." As she spoke, the computer began comparing the two images.

"Do you see that?" she asked, pointing at the screen. "All the parameters, the luminosity, the pixel arrays, the pixel probability, the layer statistics — they are all exactly the same!"

I shook my head. "And what does that show? A toy telescope, a basic image processing program, and you, an ignorant amateur." I paused, but then continued. "Just forget about it; don't believe the rumors!"

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