

Lessons from Pluto

A [possibly] fiction novel



Gibraltar Station

1:52 hours

The old fluorescents reflected greenish light off the monitor. The windowless room was the only thing Victor Robles saw for 8 hours a day from 2300 to 700 hours in the morning. His chair gave a protesting squeak as he sipped from the constantly refilled coffee mug. A row of blank metal cabinets filled with backup hard drives were his only company as he stared at the antique flatscreen with breathless anticipation. Normally the job was so uneventful that he would regularly sneak in some time playing fútbol on his phone. But now, as the imagery from the New Horizon probe came in there was nothing that would tear his eyes away from the screen. The blurry crescents sent from thousands of kilometers out were already enough to get scientists from all over the world salivating. But these new images would be humanity's first ever close in views of the Pluto/Churon system. Everyone who remembered the heady days of the Voyager flybys or the Cassini mission, was crowding the bloggosphere, even those in Owen's camp who'd tried to demote Pluto back in '06.

But none of that mattered now. What mattered was that after years of waiting and budget negotiations, they were finally going to get results. This was the final frontier in local planetary science.

“Are you getting anything yet on your monitor?”

The text was from Maria, his boss. She was as excited as a prom girl when they found out that the Gibraltar station would be the first point on Earth to get the signal. He sent back a quick text telling her that it would still be a bit longer.

Roger hadn't even been employed at the Iberian Space Agency when the probe had been launched back in '06. He'd only managed to work up to this position 9 months back. It had taken a lot of late nights doing calculations and staring at seemingly endless streams of data before he'd gotten the promotion. But now as he became the first human to watch the telemetry arrive, he knew beyond the shadow of a doubt that it was worth it.

The first image was still blurry, but even so the sight was one that changed the course of everything humanity knew about the universe. The shock momentarily numbed him, then he literally jumped out of his seat as his coffee cup, which he was sipping from, fell to the floor.

The next instant he was smashing his fingers on the keypad of his phone as if by sheer force he could subdue the satellite network to run faster. Feeling like he would die of old age before the woman answered, he finally got her on the third ring and felt all of the words which he'd been rehearsing tumble across his tongue randomly. “Senora! Senora Robles! The imagery! It's in...and...I don't know how. Have you seen it?!”

If Maria Robles was famous for anything, it was keeping a cool head under both extreme pressure as well as endless drudgery. Since astronomy tended towards the latter, she had a little less practice

in this case. Nonetheless she'd spent most of her life in administration and knew Victor as well as anyone else in the department. She carefully helped him calm down to the point where he could finally speak in complete sentences. "Now Victor. I know that you're very excited. We've all been waiting for the better part of a decade to see these images. So can you please now tell me what has you so flabbergasted?"

Her measured tone and calm voice did its work as well as any therapist could. After a few deep breaths, Victor managed to weave together his jumbled thoughts into one mind-boggling sentence. "Senora. The imagery from Pluto shows a huge structure near the equator that is unmistakably artificial."

There was a long silence and Victor couldn't tell what was going on at the other end. But having been through several moments of deep breathing, he was now just a bit less agitated than the voice at the other end.

"Um. Victor. You...you're certain of this? I mean, you're just getting the data in now, aren't you?"

"Senora. It is not possible to mistake this. I am looking right now at the sunlit side of Pluto and I am seeing a large cylindrical shape. Comparing it to the overall size of the planet, I would guess that it's 300 meters in diameter, and it's nearly long enough to jut above the meager atmosphere."

"Santa Maria! This is the most incredible discovery since ice on Europa!" There was another long pause and he heard her whispering to someone else. "Victor, now listen carefully. I need you to get this data to Madrid right away. We're going to make this announcement ourselves, and to hell with NASA."

Victor knew she was taking a big risk with that. It was their satellite, after all. But sadly, they were beyond the curvature of the Earth, and wouldn't get the signal for another 18 hours or so. Victor sent commands to the craft to take more photos at the highest magnification and sent the whole zipped file off to Maria. But even after that was done, he continued staring at the image. That structure, it was so huge. Even with Pluto's meager gravity, it would have taken a small army to build it. An army of what though?

Chapter Two

As expected there was a huge firestorm over the discovery. Not only the structure itself and what it implied, but the fact that it was so very far away. It seemed impossible that any kind of life could exist at temperatures that would freeze methane. What kind of creature could exist in a place like this?

Not surprisingly, Victor found that he had a new boss once things had calmed down a little. NASA apparently didn't appreciate Spain taking over the limelight, and sadly they had a lot more influence in the scientific community. The images flashed around the globe at the speed of light and everyone from military officials to UFO believers became an instant reporter with opinions, blogs, podcasts, and youtube videos.

The images overshadowed everything else at the time, and theories were as widespread as the

people who developed them. He would turn on the news one day to hear some scientist claim that the Neanderthals had developed space travel. Or someone would send him a link from a blogger who believed that aliens built an outpost to monitor the Earth.

Needless to say, his fame (not to mention his paycheck) grew noticeably. Maria's fiery career plunge, had only fueled the intrigue of the news itself. Victor found himself catapulted to celebrity status as the first human to witness irrefutable proof of extraterrestrial life. And in our own astronomical backyard, so to speak. There were book deals, interviews, promotions, even a cameo on Hollywood's latest Star Wars sequel.

Thus he found himself at a social hosted by some rich Cantelonean businessman. Victor felt enormously out of place in his rented tuxedo and spent more time than he would've liked to admit admiring the rich wall tapestries and avoid trying to fit in with such an alien crowd. As the wine began flowing more liberally and tongues were loosened, people peppered him with many of the same outrageous theories that he was hearing on the internet.

Finally near the balcony, he spotted Natasha, a colleague who did contract work for the Jet Propulsion Laboratory. She was about a decade younger than his mom, and one of the brightest people he knew (at least personally).

"You'd be amazed at some of the crackpot theories floating around over there." He watched her balancing a plate of cheese and pecking at it absentmindedly.

"Oh I believe it" she said after a bite. "Some of those eggheads are actually trying to devise a way to land the probe." She laughed genially. "Maybe shoot it straight down that chimney."

Victor thought about that for a moment. "Well, of course it would be a suicide fall, but the gravity is miniscule..."

"Yes but Victor my dear boy. You realize that thing is speeding along at over 50,000 kilometers per hour. There's no way in the world, any world for that matter, you could slow it enough to descend as anything short of a missile."

He struggled to not feel embarrassed by her comment. "Of course I do realize that, but JPL has designed spacecraft to do the impossible before. I mean just think of the old Voyager probe, and the..."

"I'm sorry Victor. I don't mean to make you feel bad. But those probes had much more powerful engines. They had the fuel to slow down, plus they were going about half the speed of New Horizons." She paused while taking a small bite of cheese. "I mean, it's just *so far out*. Over 5 billion kilometers, that they had to push it as fast as possible."

"Yes of course."

"Victor. I realize that you got lucky, being the first person to see this...chimney thing. And you really do have a good head on your shoulders..." She glanced over at someone walking towards them and lowered her voice. "Certainly more so than many of these yokels."

The man smiled widely as he approached. He was shorter and very well dressed, probably a bureaucrat. "Ah Natasha and Senor Robles." He shook hands with both of them. "I don't mean to

interrupt. I just want to thank you both for being here. Natasha, we truly lost a brilliant comrade to the capitalists. And Senor Robles, if you ever tire of the bickering in the Iberian Space Agency, you can be sure that the Russian Space Agency would be happy to take you.”

Victor took half a second to choose a tactful reply. “Thank you. I am honored. But I must say that I seem to have an allergy to sub-arctic temperatures.”

The man chuckled. “And yet you study the coldest spot in the solar system.”

“Well at least he knows basic astronomy.” he thought to himself.

Chapter Three

Victor and his colleagues around the world watched and studied the video footage night and day looking for any more clues. As New Horizons reached it's closest approach, there were a great many more discoveries to be had. Along with the chimney were a huge number of barely recognizable rectangles dotted all over the surface. These were much smaller than the chimney and seemed to follow irregular lines in random patterns. Based on the shadow angle it was believed that they were no more than 15cm tall. But with so little to work with, it was mainly conjecture. On the opposite side of the planet from the 'chimney' was a small mountain range with a clearly defined gash carved entirely across it. Even some credible scientists agreed that this could have been a road of some sort. One thing that everyone agreed on though, whoever had created all of this had vanished long before the rise of humanity. Like everything else in astronomy, every question that was answered brought new and more complex puzzles. The biggest one, aside from the builders themselves, was what the enormous chimney was built of to have survived so long, and what could have been it's purpose. There'd been so much political wrangling and budget cuts when the probe was being built, that there wasn't much instrumentation for this. After all, who could've expected to find something artificial at the outer edge of the solar system? As such, the community had to be satisfied with the chimney images and maps of the various surface features.

Chapter Four

It was almost a decade later and Victor was at a NASA press conference announcing the proposed launch of a second mission to send a rover to the Pluto/Churon system. The schedule was rushed because the dwarf planet was still heading out of it's perigee and would soon be too far from the sun to reach with any certainty. Victor spotted Antonio, one of his old colleagues from those first heady days.

“Antonio, hey.”

The man clearly hadn't aged well and looked closer to retirement age than Roger would have expected. But his gate was strong as he made his way over and his face was bright and smiling. He stood only a couple of centimeters taller than Victor did and wore his usual button shirt and vest.

“Victor you old dog. The Americans actually let you in? I thought they had better security around here.” He laughed, and Victor joined him and slapped the man on the back.

“Well they'd better. I'm helping to design the transmission dish on this bucket.”

Antonio made a big 'O' and pushed air through it. “Really? They let you on the project after Maria's fiery fall from grace?”

“Didn't have a choice. The Chinese are calling the shots now, these guys are just holding onto the twilight of their influence now.”

“True true. So are you still raking in the pesos from your book?” Victor detected a note of envy in the older man's voice. The book deal had been a no-brainer. His publisher assured him it would be on the best-sellers list, and it stayed there for two years running.

Doing his best to be convincingly humble, he waved his hand. “Oh you know how it is with these cinco minutos of fame. People get all fired up about someone, and then it goes away. It's not me who's important, I'm just the lucky stiff who happened to be at the screen. It's the MIBs that are the real prize.” It was a term that came out just a couple of days after the original announcement. Some blogger called them the Most Improbable Beings, and the term MIB stuck.

“Did you know that a Chinese scientist confirmed that the line cutting through the Wendaleze range really was a road of some sort? The woman theorizes it based on the faint square and rectangular outlines that appear alongside it on both sides. She says that it looks just like an urban map in Beijing.”

Antonio looked thoughtful, trying to grab at the scraps of memory. “Yes, I did hear about that. About three or four years ago I think. They were hoping to find some kind of vehicle, but it's hard to imagine anything surviving these millions of years.”

Chapter Five

Victor was nearing retirement when the rover finally reached Pluto. Since then space-faring technology had advanced by leaps and bounds, mainly driven by the discovery. There was an infrared telescope on the far side of the moon, a manned mission soon to enter the Martian atmosphere, and yes, a much anticipated manned mission planned for Pluto. Of course the latter wouldn't be seen in his lifetime. Even the rover would be trapped on Pluto for another 200 years as it drifted out beyond Neptune's orbit to the Kuiper Belt. But for now Victor was able to watch the rover trundle towards that now-famous cylindrical cone which dwarfed every other feature around. Everyone watched excitedly as the cameras panned back and forth, taking in every possible detail. The images were all black and white, the sun being too weak to provide any color contrast worth noting. There were three large monitors displaying images from each of the cameras. The two forward cameras providing a binocular scene in the visual range, and one rear-facing camera showing an x ray feed in the hopes that some clues could be teased out from below. The scene looked like horror movie images of a post-apocalyptic land. The ground was nearly barren in every direction with bits of artificial clues here and there. One looked like the twisted truss-like boom of a crane, another was a long flattened cylinder that almost resembled a submarine without a conning tower. But most peculiar of all were the huge rectangular spaces of pure utmost

black. Van Nyen, the rover operator, carefully teased the vehicle to the edge, keeping the speed slower than a snail's pace. It took almost nine hours for signals to travel from the rover to Earth and back. So with almost a billion Yen riding on the mission, everyone was taking it with utmost care. Finally it reached the edge and she directed it to flash a laser rangefinder into it. The cavern was the size of a small island and over 100 meters deep.

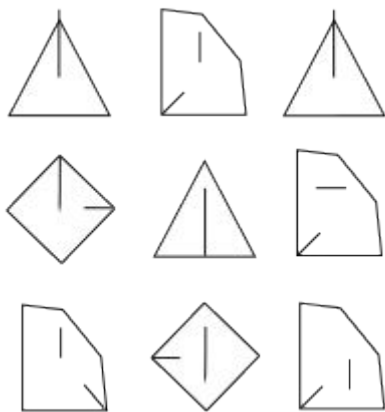
Finally Nyen was ordered to direct the vehicle towards the biggest prize, the chimney itself, as it was dubbed. The cameras panned left, right and up looking at detail on all sides. The surface was perfectly smooth from the ground to as far up as they could see. It was also exactly cylindrical to within a few millimeters. The closest analogy anyone could come up with was the turret of an immense warship. With the same painstaking stoicism, the rover crawled along the perimeter in a wide arc, looking for anything else of note.

It was only after it had traveled almost a complete circle around that Roger heard Li Tang, the director call out "Stop! Pan down." His voice was pregnant with emotion and excitement which was completely out of character for the man. "Right there. Zoom in please."

Then they all saw it. Just above the Plutonian soil was a rectangular shape projecting a few centimeters from the surface.

"Can you remove some of that dust please?"

The operator moved some controls while everyone watched with baited breath. The anticipation in the dead silent room was palpable. As the millimeters of soil fell away, the shape began to grow. It took a long while for people to breathe again after the shock of processing what they were looking



at. There, a billion kilometers from Earth were a series of shapes etched into the surface in three rows of perfectly straight lines.

The shapes were arranged seemingly at random, but all remained precisely within those three rows.

Like Victor's original discovery decades earlier, this new element brought another firestorm of chatter as the first ever extra-terrestrial language was announced. Li Tang was a much more skilled bureaucrat, and gave specific credit both to the rover team, NASA, and Victor's team who had made this mission possible. The news brought a whole new eruption of

podcasts, speculative theories, and experts.

Chapter Six

Na'ima's eyes traced a seemingly endless visual path between the image on the screen and her books. Each book had been published in the hurried days after those first penultimate shots reached Earth. She gave an exasperated sigh and brushed her hand through her tightly curled black hair for the thousandth time.

“No one ever told us this would be easy.” Kwassi patted her shoulder. He was half a head taller than her with a gentle smile, strong arms, and a receding hairline. They'd been friends for a few years, even dated awhile back. But dating co-workers just never seemed to work out in her profession. There were just too many late nights like this, banging on her head to try and tease out some meaning.

“Kwassi, I just don't get the whole trimary thing. But there's no possible way they could have a language this simple and build such grand creations.”

He stared at her again with his kind eyes. “Well sure, there are plenty of people who think that. The question is...what does it translate into?”

Like dozens of other linguists around the world, their team at the University of Accra were going over the images from that plaque with a fine-tooth comb. Most people had theorized in the early days that the writing was a trimary, a language based on three symbols much like the binary code used by early computers. The problem was that binary represented other words in English, Spanish, or Chinese. Whereas this code was, to pardon the pun, totally alien.

Na'ima gave out another exasperated sigh. “They haven't come up with any other examples, have they?”

“Na-di girl, you know they would send us the feed straight from the rover if they could. All we got is the plaque and that snippet from the castle.”

The castle had been so-named because it was the only remains which were non-rectangular. Instead of an exact quadrilateral, the lines terminated at four perfectly equal triangles. By now there was little doubt that the shapes were the remains of buildings worn away over the millenia so that only a dozen centimeters or so could be seen above the surface. It was believed that whoever these aliens were, they couldn't have been very large because the shapes ranged from those as large as an average room, to a half dozen meters across at most. The predominant theories were that the MIBs were less than half a meter tall, based on the size of the writing.

“So what do you think about the talk of sending people out there to explore in real time?” She gave Kwassi a look that said she needed a change of subject to rest her weary brain.

“Well I wish we could see it, but sadly they won't be able to send people out there for well over a century. We'll just have to be satisfied with this junk.” He waved half-heartedly at the monitor.

“What'ya mean?”

“Girl? You do' know 'bout the orbit? That place is almost a comet, goes out to over seven billion kilometers and takes another 100 of our years to go back inside the orbit of Neptune.” His look was almost insultingly superior and she was tempted to get mad, if she didn't know him better.

“Of course I know that, you digrosso, but the Taiwanese have the Ion engine now. They can send somethin out to Neptune in a couple weeks. Shouldn't be that hard to reach Pluto even if it IS at it's Apogee.”

“Yeah, but maybe you forgot that Pluto's atmosphere freezes to the surface when it gets out that far. Everything we're lookin at here,” he waved triumphantly at the books and computer screen, “is

buried under three meters of frozen nitrogen and methane. Honestly girl, for an exo-linguist I thought those teachers of yours back in Camaroon would give you a real education.”

She threw an etching pen at him and he dodged it easily. The game was an old one between them and offered just the kind of mental break that Na'ima had been looking for. She got up and threw half-hearted punches at his shoulder. They wrestled for awhile and she finished it off by giving him a hug.

“Wha's that for?” he asked with mild surprise.

“For being just the friend I need in dis.”

As she glanced at the screen over Kwassi's shoulder, something teased her brain and she slowly edged around him to look closer at the screen.

There it was. Staring at her in plain sight. “I can't believe it! I just can't.”

Kwassi moved to look over her shoulder. “Wha's that Na'di?”

“It's been staring us in the face this whold damn time. How could we all have been so stupid?” she rapped her knuckles against her head.

“Girl. Will you tell me wha' got you so rilled up already?”

Now she was the one to speak with an air of superiority. “Kwassi look at the lines. Not the shapes..... the LINES!” They're not the same!”

“Well I'll be.” He barely whispered as he looked closer.

“The shapes themselves might be a trimary, but the small lines within are slightly different. They must mean something to those...MIBs.”

Chapter Seven

Na'ima's grandchildren were already reaching retirement age when the planet-web sent the news of the Earths' first human mission to Pluto.

Humanity had been waiting over a hundred years for the icy world to be close enough and [relatively] warm enough for the mission. It was so momentous that there was an actual antique ticker-tape parade through Fort Lee (which was the closest available dry land to the old New York city).

Wu Chen had gotten the news only a week before that he'd been selected to take command of the mission. This due to the fact that he'd been the only one to come back alive from Titan. Despite the disastrousness of that trip, he often allowed himself a few minutes of daydreaming for the old days of monkeying around near Saturn. Back then being an astronaut was still a big thing. You had to be brave enough to risk your life separated from cold vacuum by a few inches of metal and foam, but not so brave as to be a psych risk. He remembered wondering at how enormous Saturn looked through the viewport and how much it had humbled him.

With a sigh he yanked himself back to the present evaluation forms. Instead of gazing at the great rings now, he had a slightly larger viewport showing Alpha Centuri. The base under the surface of Montes Agricola at Far Side ran much like the ancient submarines of Earth's oceans. The quarters

were cramped, the colors drab, and the food mediocre. The only good thing about it was the mandatory skylight that he got to enjoy as a lunar resident. He took a few minutes away from the screen to rest his brain. Letting his eyes loose focus, he calmly gazed at the wall screen image of the great stupa at Sanchi. This was the only part of his day that brought him a sense of deep relaxation.

Chen had always been a serious and hard-working pilot, but he still wondered for the thousandth time, what the United Worlds Space Agency saw in him. Sure he was a good pilot, but now he'd be the sole person responsible for a whole crew, and with even more risk involved than the Titan mission. Despite the lunar gravity, he felt the weight of this mission bear as heavily as the gravity pads that he kept stored in the rec space.

Chapter Eight

Chen turned his eyes back to yet another resume and realized with a sigh that the easy part of the screening was long past now. He'd narrowed the list from several thousand to a few dozen files. The final push was going much more slowly than he would have expected. Everyone's file now showed psychological stability, physical training, and a breadth of experience in one or more critical fields. He could tell that the week ahead would be a tough one.

His thoughts were interrupted by a light chime from the door.

“Jinlái.” he threw out absentmindedly

The man who entered was tall for a Ugandan and well proportioned. His coffee colored skin shone in the light and his uniform was crisp and well-maintained. He bowed respectfully and smiled warmly.

Knowing everything about the man already, Chen switched to French and greeted him professionally. “Welcome Muogo. I trust that your quarters are acceptable?”

Being a linguist, the man replied in perfect Manderin. “Yes Captain Chen. I'm afraid that the conditions are equally as cramped on a ship as they are here.”

Chen gave some halfhearted sympathy and motioned the man into a chair. “I'm afraid that we cannot mimic the wide open spaces of Uganda any more than we can mimic Kunming.”

“I understand sir.”

“Muogo, your resume shows great promise both for your experience at the ISS-IV as well as your extensive linguistic skills. I would like to know in all full honesty (it was well known that Chen could read the subtle clues on peoples' faces like he was reading a smartpad) if you believe that you could decipher the Plutonian language given a more complete sample.”

Muogo knew not to leap to an answer. He thought about all the other obscure languages he'd studied and what his colleagues considered a minimum base to work from. “Sir, I can't be certain, but I believe that with four or five times as many symbols to pull from, we could at least have a rudimentary understanding.”

With that, Chen knew he'd picked the right person. Muogo was not too impulsive, but skilled

enough to offer a reasonable guess. He peppered the man with a few dozen more questions about his experience on the International Space Station, his years teaching at MIT, and his latest book. Still analyzing him, Chen noticed that the man's eyes stayed bright and calm. The man had enough confidence from the beginning to believe that he could be selected.

Once Chen was satisfied that there was nothing about the man to raise any alarms, he kindly informed the Ugandan that he would provide the news either way within 48 hours.

The other interviews followed the same pattern. Chen learned more about a person from *HOW* they answered questions, then from the answers themselves. When he finally reached a core group of 3 finalists, he sent them to Mrs. Fu, the director. Mrs. Fu was a well seasoned bureaucrat and understood people on a very deep level. She had given Chen first choice of crew members, but it was still her job to give final approval. She would confirm that among the whole team, there was enough skill in geology, linguistics, astronomy, xenobiology, and astrophysics for the mission to be a success.

Chapter Nine

Yolanda had never struggled so much with meditation in her whole life. But this mission was a dream come true in every way. It was an adventure, it was uncharted territory, and it held the potential to answer thousands of questions brought up by the Robles discovery. She continued to keep pushing the distracting thoughts aside as there was nothing she could do now to change her status. She listened to the calm melody of the flute playing on the rec room speakers as she sat calmly on the mat. The interviewer, a Chinese man named Chen, had showed a poker face during the interview and she wouldn't know if she would be chosen for another day or two. In the meantime, she spent her time either studying mission specs, exercising, or practicing Tai Chi. After a relaxing meditation session, she gave into the urge, and turned on her PDM. The personal data manager downloaded her messages and showed one from a Mrs. Fu. The cryptic message said only that she was invited to join her crewmates for a lunch meeting at 1500 hours. Checking the time she cursed silently and threw on her nicest oversuit.

She nearly collided with Chen as she entered the 'cave-teria' as it was lovingly dubbed. He quickly sidestepped in his usual impassive way and they both half-heartedly pulled a nutrient package from the slots and sat down with the only other people in the room. She saw a tall man with the darkest skin she'd ever seen, another shorter man with an olive complexion and large nose, and an older Chinese matriarch.

“Thank you for joining us Ms. Delgado and Mr. Chen.” The woman smiled warmly at them, a good sign Yolanda told herself.

“As you must know by now, all of you have been selected as finalists for the United Planets Space Administration's first peopled mission to the dwarf-planet Pluto...” For several moments it was impossible for her to continue as the cheers and back-slapping overwhelmed the group. Yolanda herself nearly jumped up and hugged the woman.

“You have all worked incredibly hard to be chosen for this historic mission. But the hard work is in fact just now beginning. You will all be expected to stay in top physical and mental shape as well as becoming intimately familiar with the ship, the latest rover discoveries, and the various equipment which you will be using. During the training, you will be expected to be both student, and teacher to each other. I want to ensure that you know as much as possible about each others' skillset. If any of you become unable to complete your tasks once you leave Ganymede station, it will be important for the rest of your crew to fill in. You have been selected not only for your intelligence, and background, but also for your innovative thinking. Ms. Delgado, I understand that you are a highly credited author of astrophysics, astronomy, and astral-navigation. Isfaheem Al-Jezrai is a well respected professor of extra-terrestrial geology, and archeology. Muogo Ningape has years of experience with the UN as a linguist and has published several scientific journals on ancient languages. Finally Mr. Chen is a decorated pilot and has an extensive background in rocketry, mechanical engineering and emergency medical procedures.

Mr. Chen, I appreciate your request for a fifth addition to the team, but with the enormous risk of this mission and the tight budget we could not in good conscience support it. The whole board has reviewed your files ladies and gentlemen, and we feel completely confident in your skill and experience. Congratulations.” She smiled broadly and looked at each of them directly before shaking their hands.

Despite her years of emotional training, Yolanda lost it and began weeping openly with pure joy. There was nothing on any of the inhabited planets to match this one amazing moment.

After making her announcement, Mrs. Fu took her leave and Yolanda sat with the group learning as much as she could about them all. She felt a stronger sense of comfort with the Ugandan then with the other two. Chen seemed to be rigid and impassive and Al-Jezrai talked about nothing but rocks through the whole conversation. Still, they were all intelligent people and she respected each of them for their devotion to their respective fields.

Chapter Ten

Chen pulled up the ships specifications one more time, determined to understand it backwards and forwards before departure. He especially studied the Taiwanese Hsinchu engine, as he never trusted the rebel islanders, as they were still considered. He was still reviewing the data when his PDA beeped that the crew were going to have lunch.

He grudgingly put the pad down and made his way down the hall to the canteen. He immediately spotted Muogo, Yolanda and Isfaheem at a table. Yolanda was an Argentinian woman with a sturdy build and tightly knotted black hair. He found her to be an enormously capable woman. She likely would've been captain if it wasn't for the preferential treatment Chinese people on the mission.

But for Chen, it was especially interesting for him to be teamed up with Isfaheem. The Egyptian man had been the keynote speaker at the Martian Geological Forum last year and Chen was looking forward to picking his brain on theoretical xenobiology.

“Well hello Mr. Chen.” They all greeted him kindly and he bowed to each of them in turn. Yolanda more than anyone felt the increasing tension as they all began to recognize the gravity of the mission. Like every meal, the food itself was an afterthought to the never-ending work of studying and memorizing each and every piece of machinery that they would be shuttling out with them. Today's discussion centered around the suits they planned to use for the few moments of EVA. The suits would be as bulky and uncomfortable as those of the old moon landing. They would be so heavily insulated that it was, in essence like a miniature spacecraft itself. The environment was so unforgiving that the designers couldn't develop any way for them to use their hands at all. So the suits had extra-long arms with robotic fingers controlled by hands that remained well within the thick arms. The design borrowed from early examples prosthetic technology. But it was assumed that most of the time they would travel in 'the limo' as it was dubbed. This was a squat cylinder connected to six balloon wheels which would take them on longer trips away from the ship.

Chapter Eleven

The final few months were spent at Ganymede station practicing with the actual ship and rover as they underwent final construction. By now the spacecraft were downright luxurious compared to the old 'tin cans' of the twenty-first century. With the Hsinchu engine allowing access to the various moons, mineral resources were once again plentiful. The ship kept a minimal gravity by rotating around it's axis and the length was divided into a pilot's cockpit, a common room, and a small private cabin for each of them.

They went through thousands of drills and mock disasters encompassing anything that the design team could imagine going wrong. The preparations were sobering enough that Isfaheem wondered if he hadn't made a grave mistake in leaving the comparative safety of the university.

Chapter Twelve

As the giant countdown clock ran ever closer to climactic day, tensions continued to mount. Sharp words rang out when a technician found a critical part missing, or if the fiber reinforcement struts were tensioned poorly. For Yolanda, her daily meditation and Tai Chi were more essential than ever. Her brain felt like it was going to explode from the constant barrage of information being repeated with seemingly endless patience by Chen, Mrs. Fu, or any of the dozen mission specialists who were helping to ensure their success.

She was getting a final fitting check on her suit and practicing trying to move in it when she decided to test it out on the surface. She operated the controls that moved the 'fingers' and opened the airlock. The sight as she left was like nothing she had ever experienced. Up till then, she had always been unlucky enough that her surface excursions had occurred when Ganymede was facing away from Jupiter. Now the enormous orb of the planet dominated the sky with a brightly banded

half-circle. It took several minutes before she could even tear her eyes away. It was as clear to her as the red spot itself that this was and would be the most beautiful scene she would ever behold. But of course there was a mission to prepare for and a suit to test out. She spent a few minutes moving on the surface, climbing up the more gradual craters, and doing little jumps in the light gravity. Then out of the corner of her eye she noticed on the heads up display that her O2 levels were draining faster than the specs called for. She left the frozen surface and headed back into the airlock. One of the biggest advantages of the suits, over anything she'd used before, were the dexterity of the external 'fingers' which she was slowly learning to operate efficiently. Though it gave each of them an apelike appearance, the long metal fingers were immune to the cold vacuum and allowed them to operate controls with ease.

Before she checked in with her team, Yolanda spent half an hour looking carefully over her suit. If she could troubleshoot the problem herself, it would give her more confidence that she could do so out on Pluto.

Finally she noticed that the O2 cylinder was the wrong size. This one was likely the one used by astronauts here on Ganymede. The connecting tubes were probably drawing oxygen out faster due to the lower pressure. She brought the issue up with Martin, the lead suit technician who was visibly impressed by her discovery.

Chapter Thirteen

The departure was calmly anti-climatic after the endless preparations and disaster drills up till then. Once they broke orbit, Yolanda set the ship spinning fast enough to mimic a perceptible gravity and she worked out their speed, velocity and trajectory with the captain.

The rapidly spinning cylinder offered enough private space that all four of them could enjoy a respite from each other and avoid the 'cabin fever' of the old days. Chen watched the VR screen with his typical seriousness while Yolanda kept tabs on their position. Isfaheem and Muogo both had little to do during the trip except study, which they both did extensively. Muogo became especially interested in the astral-positioning that Yolanda worked on, and often tried her patience with his endless questions.

True to form, the Hsinchu engine sped them at fantastic velocity towards the icy world shortly after it crossed inside Neptune's orbit. In the olden days, they would likely have stared in wonder at the vacuum of space and the sights of the few planets along their path. By now though, the solar system was becoming as familiar to them as Antarctica for most Earth residents. The ride out now was just a long journey to a much greater adventure.

In a time that would've astounded Yuri Gagarin, they flew above Neptune's orbit and towards the edge of the Kuiper belt. The anticipation was beginning to reach a feverish pitch as they rose high above the ecliptic towards Pluto. The cheers were loud and sincere when Yolanda announced that they would arrive within the next 24 hours.

Despite being intimately familiar with the tiny system, they all watched open-mouthed as the twin

worlds grew steadily larger on the screen. Soon they were able to discern the chimney, and eventually they could even make out the faint rectangles on the surface.

Yolanda worked closely with Chen to put them in a stable orbit while they looked for an appropriate landing spot. This wasn't difficult as there were few craters and the surface bore more resemblance to an Oklahoma plain than to a lunar expanse. The landing was surprisingly smooth given how much energy had been poured into reaching this moment.

The minute their ship was stabilized and the outriggers secured, Chen began delegating tasks for everyone starting with the assembly of the limo. The squat cylinder would be their main defense against the near-zero kelvin temperatures outside. All three of them felt more than a little put off by the constantly repeated safety warnings. Yolanda dealt with it by repeating the mantra 'coldest spot in the inhabited solar system' which in itself awed her.

"I know that everyone feels as excited as me to get out there and see what we can learn from these structures. But I need to insist that nobody remain outside for more than 70 minutes. The suits may have two hours of oxygen, but the insulating systems aren't guaranteed for more than 90 minutes and your lungs will freeze long before you run out of air. Most importantly, I insist that none of you...and I repeat *not one person* leaves this ship alone. If you don't have someone to accompany you, let me know and I'll watch your back. Once the limo is assembled, we'll put together the IEVs and you'll be able to go play.

Of course everyone wanted to go see the plaque in person and take more detailed pictures of it, even though humanity had been poring over the symbols for over a century. Isfaheem and Chen took an ion digger and excavated around the base of the chimney. He found that the perfectly smooth material extended well below the surface, which was to be expected, but the plaque yielded no new information. It was formed out of a material totally unknown and impervious to any impact. This was obviously how such a structure could have survived the countless meteorite impacts and vast temperature changes of the Plutonian surface.

Once the limo was ready, Muogo went out with Yolanda to look for any other linguistic clues. They spent 15 hours exploring before coming back with nothing more than a few samples from the castle and a piece from what had resembled a girder. Isfaheem's analysis of the latter showed that it was made of an iron alloy, though one as yet undiscovered. The material of which the castle and the other rectangles were made of was exactly the same as that used for the chimney. After the cursory look at the girder, Isfaheem's hours of testing on the unknown rock bordered on the obsessive.

Yolanda watched as he and the captain stared at it like children examining a bug.

"Mr. Chen this is without question, the most monumental discovery in the history of geology. This stuff is at least twice as hard as diamond but with a structure more like shale. I cannot for the life of me imagine how they carved something like this."

"Isfaheem, were you able to find any marks on it which could be considered artificial?"

The man turned away briefly from his magnifying lamp. "I'm sorry to say that there isn't a single mark or scratch that I could say is definitively artificial."

“Amazing. And yet they manipulated this strange rock into the largest structure on the whole planet.”

Chapter Fourteen

Chen was in his quarters waiting for a line of site to one of the Jovian relay stations. As soon as it was possible, he sent out a compressed data stream of their findings so far. He'd barely finished typing commands when there was a light knock on his cabin wall. He gave a command to the door to form a porthole and looked out at Muogo.

“Yes Mister Ningape?” His face was always composed and spoke of the comparative strictness of Chinese culture.

Captain Chen. Permission to put together the IEV and take a look in one of the holes.” His face looked hopeful and the captain didn't disappoint.

“Permission granted. See if Yolanda has time to help you, and if not then I'll give you a hand.”

“Very well.” His face disappeared from the window almost before he finished speaking.

It only took another five minutes before there was another knock on the wall. He opened a porthole to again see Muogo's face looking in.

“Captain, Yolanda is busy mapping nearby asteroids with the ships telescope and doesn't want to be disturbed for another three hours. She's worried about the possibility of something big flying our way. Would you be available before that time?”

“It would be my pleasure, to use an English term. Give me 10 minutes to finish the ship's diagnostic and I'll be right with you.”

Though his main duty was to keep tabs of all of the ship's systems and the health of the crew, once planetside his duties took little time outside of verifying the proper functioning of heating and life support systems. His secondary role therefore was to act as a fill-in for any tasks that the rest of the crew needed him for. This was especially true for any excursions outside.

The two of them spent the morning assembling the two IEVs or Independent Exploration Vehicles. These were mainly composed of a triangular lattice supporting a tiny semi-enclosed cabin. At each vertice were three standard rocket motors, ion engines being unsafe at such close proximity. Even though the craft could easily carry a 500 kilo equivalent, they were required to travel in separate vehicles to add an extra margin of safety in case one of the IEVs malfunctioned.

Though Muogo was itching to go and see what the holes were all about, he had to wait until after lunch before everything was ready. They took off and headed out from the plain to the closest hole. It was a huge rectangular cut with what must have been perfectly straight sides before time, erosion, and micrometeorite impacts weathered the edges. Chen and Muogo slowly flew over the edge and descended below the surface.

The rock glowed under the bright exploration lamps and showed precise vertical cuts all the way down. Muogo took measurements and used a manipulator arm to cut out a piece halfway down.

While they descended, he did some superficial analysis but found it to be ordinary rock with layers

of frozen water, and traces of iron, silica, and magnesium.

They reached the bottom and found an even more strange environment. For as far as they could see, which wasn't far despite the immensely bright lamps, the space was perfectly flat and rectilinear. Muogo set a laser tape to measure the angle and found that it was exactly perpendicular to within a fraction of a degree.

“Muogo!” He heard Chen's voice over the radio and for the first time since he'd known the man, there was an element of excitement.

“Yes captain?”

“Please come here at your first convenience.” His voice still crackled with subtle excitement.

“I'll be there momentarily.” He quickly collapsed the laser tape and rocketed over to where the man's lights were shining.

Chapter Fifteen

As he got closer, it was clear what was causing the normally pensive man to be excited. There in the lights of Chen's IEV was a machine of unmistakably alien design. It rode on a dozen tiny wheels and measured no more than three meters long by two meters wide. The body was fully enclosed, with strange protrusions rising out in odd places. At the front was a large pair what looked like manipulator arms and a cylindrical turret-like structure rising above the middle. On the back was a clearly visible row of the same symbols as the plaque.

“Captain. This is amazing. Our first MIB machine! How much do you think it weighs, do you think we could lift it to the surface, I wonder what it's use was.”

With the same barely perceptible excitement he replied. “I have no idea how much it weighs, but it would have to be at least 900 terrestrial kilos. I would guess that it was a machine used in the creation of this cavern though. I'll head back up to the surface, and have Isfaheem prepare to bring the limo up to the edge and we'll use a winch to haul the vehicle up.”

They both took detailed pictures and a 3D scan of it before returning to the surface and back to the ship. When they arrived Isfaheem was ready to explode out of the hatch, though he knew better than to actually go outside. “By the hand of Mohommed! You really found an alien machine?!”

Yolanda was right behind, having temporarily abandoned her survey of asteroids. “Captain, I'd like to look at those images as soon as possible.”

Chen put up his hands and, with smiling eyes replied. “Easy easy now. I'm going to send a compressed stream of these pictures to whichever Jovian base is in line of sight first, then we'll put them on the monitor and we can all oggle them together.

While he was doing that, Muobo and Isfaheem worked to attach a winch motor to the front of the limo. “Isfaheem, you'd be interested to see the geology down in those holes. They must extend fifty to seventy meters below the surface. You can see the whole crust laid out as nicely as Olduvai Gorge.”

“I look forward to it good sir.” he replied flamboyantly.

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