THE DAEDALUS TRANSFER

By HUW LANGRIDGE

CHAPTER ONE: LAUNCH PHASE
14 March 2056 AD

A shiver ran down Samuel Jennings's spine during the final stages of the dock. The space shuttle he was riding in fired a web of reinforced nylon tethers, which clamped to the Near Earth Orbit Rig. The two spacecraft embraced each other four hundred and twenty miles above the Sirte Basin, North Africa.

There was a loud metallic clang followed by a pressurised hiss. The shuttle had connected. Samuel was soon to be a crewmember on the Rig. He was one of the many who would soon be involved in the big launch scheduled for the next day.

It had been a long day for him. His shuttle had launched from Cape Canaveral seventeen hours earlier and had fallen past the Rig three times already whilst ascending to its altitude. He had not slept the night before. Rivers of anticipation had been coursing through his veins. Now, he found his excitement unbearable as he looked out at the grand spacecraft that was nestled in the construction platform on the Rig. Even during their flybys, Samuel and his shuttle crewmates could see how incredibly majestic the spacecraft was. With it's cylindrical Accommodation Module, the huge Command Module at the front, and the Cryogenics Module tucked away at the back.

Now they could see the tiny workmen crawling over the ship attending to the last minute checks. The Automated Maintenance Clamps followed behind them. Cleaning, checking and sealing. A well-calculated set of tasks, carried out with utmost precision.

It was a colossal operation, one that could be observed from the surface of Earth by anyone and everyone who had access to a telescope or a good pair of enhanced binoculars.

Larry - the capcom on the launch scheduled for the next day - tapped Samuel on the shoulder, snapping him out of his dreamlike awe.

'Beautiful isn't it?'

Samuel turned away from the view-port. He felt a strong sense of contentment, and he struggled to convert his feelings into words. Fixing Larry with a wide-eyed stare he said, 'All my life, I've never seen anything like it. The Daedalus docked inside the Rig. Like mother and child. It's so incredible. Has Mankind really come this far?'

'Yes, and you and I are going to be the ones to launch that thing. We're the ones the Foundation chose to send the Daedalus on its way. It's going to be a ground breaking three months.' Larry said with a smile.

The integrity of the connecting corridor between the shuttle and the Rig had now been established, and one by one the crewmembers of the shuttle began to pull themselves through to the Rig. It was to be their new temporary home.

Samuel decreased the compression filter to reduce the muffled hum that permeated his earthbound transmission. Now, he could hear her more clearly.

He lay back on the cabin bed, attached his suit tether to a hook at his side to prevent himself from floating away, and looked up at the camera.

‘How are the kids, Marie? I’m so sorry I didn’t get a proper chance to say goodbye to them on Thursday.’

On the screen, Marie smiled back at the camera. Her wavy brown hair was tied up in a bunch, stuck through with a small stick to hold it in place. Her green eyes possessed a radiant shine. She looked so alive. She was still in her bathrobe, and Samuel felt more than a little aroused by the combination of the sight of her and the knowledge that she was so very far away from him right now.

The time delay on her return signal from Earth’s surface was almost two seconds.

‘Marcus is playing tennis with some of the boys from school. The teacher is dropping him home later. Katie has detention. She put a whole bunch of sanitary towels into the sink in the girl’s bathroom and flooded the place. Oh Sam, I don’t know what to do with that girl sometimes.’

Samuel laughed, and adjusted the brightness on the monitor so that he could see Marie more clearly, ‘I wouldn’t worry about it too much. All kids go through a rebellious phase at some point in their lives. And besides, it’s going to get worse before it gets better - I’m sure.’

Marie let out a sigh, ‘I don’t know how you can be so casual about it Sam, when you know deep down that you are the reason she’s acting so strangely.’

‘Marie, that’s not-‘

‘Honestly Sam. All that time you spent in astronaut training. If you were around more then things would be much more – normal. Promise me when you get back we'll take a vacation.’

Samuel stared at the monitor for a few moments. He had often followed Marie’s intuition when it came to discussing the children. She seemed so much better at the parent thing than he was.

‘Okay, I promise.’ He said, ‘I’ll be home in time for the summer. Why don’t you get some travel brochures and find something good for us. Involve the kids in the decision. I’ll go along with whatever you three decide.’

Marie was smiling, ‘Really? That sounds great. I’ll do that.’

Sam was silent for a moment. He found his mind wandering back to the overwhelming sense of wonder that he had felt as the shuttle had approached the NEO Rig.

‘Marie?’ he said.

‘Yes Sam.’

‘I’m in space. Tomorrow will be the biggest day of my career. I can look out of my view-port and see the whole world below me. It makes me feel like a King, or an angel. And I realise more with every passing moment how much I love you.’

15 March 2056 AD

‘Ignition on module rotation is go in five, four, three, two, one. Ignition’

The pressure jets fired, and the Accommodation Module began to turn slowly inside the NEO Rig. It looked like a giant beating heart inside an enormous steel ribcage.

Twenty-four large robotic arms retracted slowly away from the module as the Rig released its motherly grip. Each arm was the size of a double-decker bus. It was a grand synchronised dance. The module now hung in space, no longer attached to the Rig, which had cradled it for so many years during its construction.

In Control Room Two, nestled in the upper part of the Rig, angled slightly forward, overlooking the module, Samuel loosened one of the straps that held him to his chair. It was stopping him from floating away from his desk, but the strap was tight around his shoulder, causing a dull aching cramp.

He could hear chatter over his headphones, asking for status updates, and he reported back to Control Room One that all systems were functioning normally.

The comforting voices of the pre-flight checks continued in his ears.

‘Increase the module’s rotation to one-point-five RPM.’ said the Flight Controller in his calm, easy Southern accent.

The module’s rotation speed increased. Samuel could feel faint vibrations in his chair, and as he looked out of the control room window, he could see the huge module easing lazily past.

He looked along the bank of computers. Further down the aisle he could see Larry, who was undertaking capcom duties today. As capcom he would be the single point of contact for the crew of the Daedalus. All messages and information intended for the crew had to be spoken by Larry. Larry was also harnessed into his chair, and was chatting to the ship’s Commander right now. Beyond Larry, further along the bank of computers was Frederick - the Systems officer - correlating a palm device log file against the readings on his monitor. Over his headphones, Samuel could hear Larry reassuring the ship’s commander that the module’s rotation was well within the accepted vibration levels.

Something on one of the screens caught Samuel’s eye, and he leaned toward the monitor for a closer look.

He cursed under his breath when he realised what he saw and quickly patched through on a secure channel to the other control room.

‘Control One, I need you to look at Camera 71-Alpha.’

From across the gantry, three hundred metres away, the response from the Flight Director came back over the speaker.

‘Roger that. Camera 71-Alpha. I’m looking at it. What am I supposed to be looking at?’

‘There’s an Automated Maintenance Clamp still attached to the Accommodation Module. Did someone forget to remove it?’

For a moment the Flight Director was silent, and all Samuel could hear were

the other members of the team talking.

‘Okay, I have a visual on the AMC. Aren’t those things supposed to remove themselves?’

‘It looks like this one didn’t. It must have malfunctioned.’

‘It doesn’t look like it’s still attached to the Rig, only the module It’s not going to be a problem. We can do a manual jettison from the module when the ship clears the Rig, maybe use the onboard EVA unit to-’

‘No!’ interrupted Samuel, bunching his hand into a tight fist, ‘the module hasn’t completed a full rotation yet. If we leave it attached it won’t clear the Rig. It’s sticking out a full 3 metres. That’s a lot more than we have clearance for.’ He glanced again at Camera 71-A.

‘That’s a negative. We have all arms retracted now.’ Flight said calmly.

‘No, you’re wrong. Shit! I can see it. It’s going to hit one of the xenon transfer cranes. Order a stop on the rotation now!’

Through the window in front and below him, Samuel could see the AMC unit bolted to the side of the large rotating module. It was bigger than he thought, and it was steadily moving closer.

‘Okay, okay,’ muttered Flight. Samuel heard a click as Flight opened the channel, ‘Systems in Control Room Two? I have an order from…’

His voice was cut short. There was an almighty crash as the AMC unit slammed violently into the xenon transfer crane below them, shattering the calm and drowning out Flight’s voice. The jolt caused the entire control room to lurch upwards. There was a deafening screech of twisting metal as the room tore free of it’s own mounting within the Rig, severing their power cables and oxygen pipes and rupturing the entry corridor to their room.

Everything went dark.

The three men were thrown upwards out of their seats with the force of the impact, ripping their restraining harnesses, slamming into the ceiling, hard and fast. Larry smashed his head against one of the ceiling mounted units. It knocked him unconscious.

Red emergency lights on the gantry arced round to shine through the window of the control room.

Stillness, and silence, broken only by the fizzle-pop of a computer short-circuiting.

Frederick started to climb over to Larry, but he found that his foot was wrapped in a cluster of cables that had come loose from the wall. He fumbled at the wires, trying to shake himself free, but he couldn’t. Looking across at Samuel, he started to scream.

Once the AMC unit had hit the xenon transfer crane, it snapped free of it’s clamping and broke away from the module, momentum flipping it over and over as it flew upwards toward the control room. The module continued to rotate, the massive cylinder occupying the whole window as it surged upwards past them.

For a few seconds, there was silence. Then Samuel could hear sharp metallic clangs and bangs as the AMC bounced upwards, glancing off the mounting pillars

and girders which held the fuel crane and the control room in place, spinning this way and that as it's momentum was absorbed bit by bit into the Rig frame.

Samuel closed his eyes and prayed that the AMC would not hit them. He hoped that it would get deflected out of the way or become trapped between two pillars somewhere.

But his prayers went unanswered, and a second impact rocked the control room as the AMC smashed into it, ripping a massive hole in the floor.

The control room started to depressurise rapidly. There was a heavy popping sound as some of the control units caught fire, and a high pitched squeal as rushing air escaped through the hole into the vacuum of space.

Above the hissing noise, Samuel could hear the incessant beeping of the Class One Emergency Tone ringing out from one of the terminals. He knew what it meant. The pressure was falling. If they didn't seal the hole or get the hell out of there they would be dead within minutes, or seconds.

Samuel knew he couldn't save the others, they would have to save themselves. Working quickly he climbed hand-over-hand along the ceiling towards the spacesuit rack. Bracing himself against the wall, he wrestled one of the suits free of its mounting and began to fight with the rubber seal on the collar. As he tried to get it over his head, an explosion rocked the control room as the AMC that was wedged underneath them started to burn up.

The room bucked again, knocking Samuel - and an unconscious Larry - across to the opposite wall, and swinging Frederick in his cable harness downwards to smash his head against the floor. His screams were cut short.

The Emergency Tone shut off. The pressure reduction started to cause severe barotrauma in Samuel's inner ears. He screamed in pain as the pressure imbalance increased to excruciating levels. He struggled to breathe, trying in vain to clamber into the suit. He could feel his eyes widening in tight fear. This was it. This would be the last thing he'd know.

I'm going to die. In a few seconds I'll be dead. There's no escape now.

Marie…

A second explosion ripped through the room, sending a searing hot fireball along its entire length, burning fast in the artificially enriched oxygen environment. Incinerating everything in its path.

Just before the flames consumed him, he caught a glimpse out of the window. He could see the fragile Earth below. He could see the straight, clean edge of the north coast of Libya. The sun scorched browns of the Sahara, contrasted against the rich blues of the Mediterranean Sea. The planet looked so tranquil and serene from up here.

He knew why he was here. He was part of the bigger picture. Part of the big investigation. And maybe that was worth a few lives.

The men and women in Control Room One could only sit and stare in disbelief and horror as the events unfolded before them. They had seen the AMC unit also, just as Systems had called a halt on the rotation.

'The module never would have stopped in time.'

‘Good God in Heaven!’

‘At least the xenon tanks didn’t blow.’

‘Even if we’d halted rotation when they asked us to. It still takes time for the reverse jets to counter the spin. It doesn’t happen instantly!’

‘Sir we need a go or no-go on the launch sequence.’

‘Shit!’

‘Sir we need to stay in the launch window. Do we have a go on the launch?’

‘Sys…Systems, Flight. Give me a report on the integrity of the module.’

A moment later, ‘The module is fine. The AMC snapped clean off, but it didn’t take anything with it.’

‘Did the Daedalus sustain any internal damage?’

‘Negative sir.’

‘Then we cannot allow them to die for nothing.’

‘Sir, I repeat. Do we have a go or no-go on the launch?’

He took a deep breath, ‘Yes. Proceed with the launch.’

16 March 2056 AD

‘This is Commander Frank Chambers on board the spacecraft Daedalus. Mission Day Two.

‘I know I speak for all the members of the crew here when I express my deep regret and profound sadness at the loss of three fine astronauts. Samuel Jennings, Larry Barnes and Frederick Beresford, who lost their lives during the unfortunate and dreadful accident which took place yesterday during the launch of our ship. They were a credit to the Space Foundation, and gave their lives to support its ideals. Frederick was a close personal friend of mine, who applied for this mission also. And I know that Samuel left behind a son, a daughter and a loving wife. And Larry, a wife and two sons. My heart - and those of all my crew – goes out to those families today, as we share in our thoughts, the sacrifices those astronauts made for the progress of mankind.

‘In the quest for truth, we are all required to take a leap in the dark. This mission is one such leap, and we will carry their memories with us forever’

As the Earth swung past the view-port of the accommodation module, Frank could see the South Island of New Zealand creep slowly round to the dark side. The island was surrounded on all sides by the expanse of the South Pacific, and to the south he could make out scattered storm clouds, which churned up over the Antarctic’s ice fields.

On many of his previous missions, Frank had often spent his recreation time staring out of the view-port at the world below. The view of the Earth from

up here was so mesmerising and radiantly beautiful that he could hardly take his eyes away. It was often the case with Earth orbital flights. He always started the missions fully intending to get some serious reading done, or perhaps begin writing his autobiography. But it always came back to the same thing. Recreation time was nearly always spent playing cards or staring out of the window. It was as though all the intense work he had done during his shift had left him with only enough energy for passive entertainment. Certainly nothing that challenged the grey matter too much.

As he stared at his home planet, it occurred to him that this could well be his last view of home, and he fought hard to prevent the tears from welling up behind his eyes. He had known this before the mission, but the idea became more poignant now that he could see the wondrous place from this hugely elevated position.

When the module's rotation carried the Earth out of sight, the deep star field came into view. He pushed his face close to the view-port. Without the glare of his home planet to obscure the light of the stars, he could see the infinite expanse spread out before him. It was a beautiful sight, a clearer version of the image that populated the summer nights of his childhood. Except this time he was not seeing those tiny distant points of light though a telescope hampered by orange city lights and localised pollution. Now he was able to look directly into the past life of the universe, and see everything it had to offer.

Somewhere below him, a controlled thrust burst altered the trajectory of the Daedalus. The ship was beginning to break away from Earth's orbit and would soon be out of its gravitational free fall, on a transfer orbit to Mars.

But that was only the first step on a much grander journey. Mankind had already set foot on Mars. The Daedalus would take them so much further.

Commander Frank Chambers and Captain Ian Byrne were the only crewmembers left awake when the Daedalus undocked from the NEO Rig in Near Earth Orbit thirty-six hours earlier. The remaining five members of the crew slept in cryogenic hibernation in the dedicated module at the back of the ship.

None of them would be aware of the accident that had taken place as they were leaving until they awoke from their sleep, many years from now.

There had been some talk of aborting the mission, but that idea had been buried quickly, especially after the families of the three astronauts had expressed their desire to see the mission go ahead. Many people maintained that Larry, Samuel and Frederick would have also wanted the Daedalus to continue flying.

So here they were. Going ahead as planned. Trying to forget about the disaster that literally shook the Rig. Continuing on as though nothing had happened, but always aware that indeed, something had.

Frank turned his thoughts to the mission.

The Daedalus was to be their new home for the next one hundred and fifteen years on the outward journey. His job for the next eleven months (along with Captain Ian Byrne) would be to monitor the systems up until the final abort window in Mars's orbit. After that, Ian and Frank would join the other five members of the crew in cryogenic hibernation for the remainder of the trip to Proxima Centauri. On arrival in the new system, the onboard computers would then wake the crew in preparation for a further two years of intensive studies. Then they would fall into a geo-synchronous orbit around the

destination planet.

Frank sighed at the thought of how much planning, effort, blood, sweat and tears had gone into getting them even this far, with so much further to go. He was in no doubt that the Daedalus was going to go down in history as one of the great pioneering ships of this and the next century. Even if the voyage was unsuccessful and they all ended up dead in a floating metallic tomb, tumbling forever through the void, they would still represent the height of human engineering. They would be the furthest travelling humans ever, as it would take a minor miracle to plan, authorise and build a ship that would catch them up using current propulsion methods, given that there wasn't another Hohmann Transfer window on a trajectory to Mars for another twenty-five months.

That's why they had to just leave. Escape the burning wreckage, catch the transfer window, and leave everyone else to clean up the mess back at the Rig.

Frank had once described the Hohmann Transfer concept to a group of hungry journalists in Washington DC. In fact it was only six weeks prior to the launch, and the question of how the Daedalus would get to its destination was raised.

'To correctly understand a Hohmann Transfer trajectory,' Frank said into the cluster of microphones in front of his face, 'one has to imagine that the Daedalus is already in solar orbit before it has launched from the Rig. Therefore, to send it on it's way to Mars, it merely has to be given a push in the right direction at the right time. The ship will then glide around it's solar orbit to intercept Mars when Mars is passing by, or rather just miss it so that we can slingshot past, using it's gravity to send us on to the next planet, Jupiter. It's simple physics. If you can understand how planets revolve around the sun, just think of our ship as another planet. The whole process saves us a lot of fuel. If we're lucky we can get to Proxima almost for free.'

That press conference had lasted over an hour, and had won him a standing ovation. It had been his moment in the spotlight.

Frank moved away from the view-port and settled onto the bed. He was light-headed from staring out the window. He kicked off his rubber shoes and swung his legs up onto the bed. He had spent most of the day with Ian testing uplink frequencies with NEO Rig Control (what was left of it), and helping out with the accident investigation, sharing his knowledge of AMC's with the other members of Control.

But now it was time to get a few hours sleep.

The centrifugal force of the spinning accommodation module created a light gravitational effect that enabled basic tasks such as going to the toilet and sleeping to be performed much more easily. So although he felt light on the bed, the sensation was not so far removed from what he was used to on Earth.

He struggled for a while to ignore the incessant noise of the internal systems on the Daedalus. He remembered one of the trainers on the ground telling him that people tolerated noise more if they knew it was necessary. Before long his mind would learn to forget that the noise was there, but he had not reached that stage yet.

As he closed his eyes in the darkness, he saw occasional streaks of light dancing on the insides of his eyelids as tiny interstellar radiation particles penetrated his retina.

Frank let out a deep breath. He was a spaceman again, on a voyage full of new things. He knew nothing would ever be the same again.

Only a few minutes later, spinning in the Daedalus accommodation module, hurtling though local space on a trajectory for the stars, he temporarily joined his colleagues in their slumber.

Frank grabbed onto the swing bar above the door, enabling him to hook his legs through the gap into the central axis corridor of the spinning module. Ian Byrne was floating five metres in front of him. He was holding a palm device, and was using it to check the backup routines on the emergency electrics monitoring software.

‘Good Morning Ian, how’s it going?’ Frank shouted over the machinery hum.

‘Fine Frank. I’ve just been checking the ISOE and we’re due for the final Trajectory Correction Manoeuvre in about two hours.’

The ISOE (Integrated Sequence of Events) list was created in advance of the mission by the spacecraft team on the ground. Its purpose was to plot anticipated events in the mission so that they can be correlated against real-time events. This assures the flight crew that all aspects of the mission on the ground and in the Daedalus are happening according to plan.

‘Will the TCM be the final burn to set our course to Mars?’

‘Yes, to steal a little of its angular momentum’

‘Then straight onto Jupiter for another gravity assist,’ Frank added. ‘We don’t have the power to turn back now even if we wanted to.’

Ian laughed nervously, ‘We have another abort window in eleven months when we hit Mars proximity, and that will take up nearly three-quarters of our fuel to break back into an Earthbound orbit. But once we pass Mars, we can’t get back until we perform the photovoltaic scoop at Proxima Centauri in a hundred and fifteen years time.’

‘I’m still wondering if that’s going to work.’

‘Whether we’ll ever wake up?’

‘That also, but I’m talking about the scoop.’

‘Don’t go having doubts now, Frank. We’ve practised the procedure over fifty times in the simulator. The real thing won’t be any harder. Most of it’s automated anyway. All we have to do is extend the panel arms and make sure the software is running smoothly. In fact we’ll have frustratingly little to do. The only thing I can think of that will possibly go wrong with the procedure is if micrometeorites knock out all eight solar panels while we’re scooping. The probability of that is about ten thousand to one.’

‘Thanks Ian, you’re scientific probabilities always put me at ease. Will we even remember who we are after a hundred years in a cryogenic pod?’ Frank said laughing, ‘More importantly, have you got time for some breakfast before the burn?’

‘Let me finish these checks and I’ll follow you down.’

‘Are we going to have another beard contest this time Frank?’

‘You know that competitive pastimes are not encouraged in space.’ Frank said as he attached the hook on his suit to the door of the pantry, ‘It encourages inter-personal conflict. Besides, you won last time.’

‘Come on, it won’t be competitive. Whoever feels the need to shave first loses. Simple as that.’

‘Okay, but what does the winner get.’

‘The loser has to run the cryo pod checks for six months.’ Ian said, beaming his broad Scottish smile.

‘Six months! I think we should let the computers do it. After all, we’re expecting them to keep us alive after we put ourselves to sleep.’

‘But we can’t be sure they’re completely fail safe yet. Besides, you might win the contest Frank.’

‘I guess these pods aren’t as simple as in the “Cryo Dude” movies.’

‘Oh yes, Cryo Dude. What was it again? “Chuck Flame is Cryo Dude III: He’s Cool”.’ Frank laughed.

‘Something like that.’

‘Chuck Flame. What a terrible actor.’

‘Alright, you’re on,’ said Frank, grinning, ‘a beard contest it is.’

‘Okay,’ said Ian, then his smile faded slightly. ‘Are the cryo pods your biggest concern about this mission?’

‘Not my biggest concern, no.’ Frank said as he sipped fruit juice out of a foil pouch through a clear tube, ‘The possibility of problems with the interstellar winds when we hit Proxima’s heliosphere concerns me greatly though.’

Ian considered this for a moment, ‘I’m not so sure about that,’ he said finally, ‘We’ll have the solar panels docked prior to that. Besides, Pioneer survived it.’

‘Yes, but Voyager didn’t. We have no idea what effects the termination shock will have on the ship.’

‘We don’t know that Voyager didn’t make it. Earth just lost contact with it. If the antennae on the Voyager probe were knocked out of line by even the smallest fraction of a degree then the downlink would have been disrupted. That’s probably all that happened. Voyager wasn’t designed to take the enormous buffeting it would have experienced when it hit the remote heliosphere, but I doubt it broke up. The Daedalus has been designed with that in mind.’

‘I always get nerves at the start of a mission.’

‘On a mission like this there are so many ifs and buts. So many variables

that we can never be expected to cover every eventuality.' Ian said, 'We knew the risks when we entered into the program. The chances of us returning to Earth are pretty small. Even though we've covered so many aspects of the mission in the preparation, we knew deep down that the risks were immense. But you-'

'-I know, Ian. You can't let it hinder your professional conduct. Welcome to the edge of human endeavour.'

'My concern lies more with the crew.' Ian said, 'We are dealing with the longest crew confinement exercise known to man. I realise that extensive studies into astronaut behaviour over extended periods in confinement have been undertaken, and that although there were a few relational problems on the manned Mars mission, there was nothing that couldn't be ironed out. I think there's so much more to learn about lengthy confinement. Man was never meant to be in space. Our bodies didn't evolve in a confined weightless environment. Not enough zeitgebers'

'Zeitgebers?'

'Aspects of human evolution on Earth. Little reminders that enable our biological clocks to stick to a twenty-four hour rotation. Like day and night for example.' Ian explained.

Frank thought about this for a moment, 'I was under the impression that most of the animosity on board the Mars mission was directed towards the ground crew.'

'The crew switched off the communications computer for several days because they resented the ground crew for monitoring all their conversations. They were severely reprimanded for it though. It could have jeopardised the mission,' Ian said 'But it was far healthier for the morale of the crew that their discomfort over being confined was directed at the ground rather than manifest itself as internal disagreements.'

'Ian, when we get to Proxima Centauri, we won't have the ability to communicate with the ground crew. It will take years for them to even receive a downlink message from us. Any problems will have to be resolved internally'

'That's my concern, Frank. That's exactly what I'm worried about,' Ian let out a deep breath, 'Your leadership skills precede you Frank. But this will be your biggest challenge yet.'

'Please explain to us Mr Chambers, exactly what the heliopause is?' asked a beautiful young reporter in a shapely burgundy trouser suit.

'Well, without going into too much detail,' smiled Frank, blinking against the camera flashes at the press conference, 'the heliopause is one of the many things the Daedalus will be investigating on its journey. I'm sure many of you already know what solar wind is. It's what gives comets their trails. Invisible solar flares, thrown out from the sun. Ionised particles that shoot out across the solar system, bombarding everything in their path. The Aurora Borealis - or Northern Lights - is a visible case in point. The winds travel very far very fast, but even they have an outside influence. Places where they cannot escape the gravitational pull of the solar system. So we are encased almost in an invisible sphere, the heliosphere. Beyond the heliosphere is the heliopause. Part of the interstellar medium where no solar

winds exist, because there are no stars. The Daedalus will travel beyond the heliosphere, through the heliopause, and into the heliosphere at Proxima Centauri. It's unprecedented, unless of course you talk about Voyager and Pioneer, the manmade probes which ventured beyond our solar system many years ago.'

'Mission Control has uploaded some photographs of the damage to the NEO Rig. Would you like to see them?'

Frank sighed, 'Not really. The whole incident fills me with a profound sense of guilt.'

'I know it's not what you want to hear, Frank, but this mission is bigger than any one person, or even three. You of all people should know that. What else could we do? We had to continue with the mission.'

'I know. You're right. But all this death. In my mind, the module, it's tainted with the blood of three men.'

'I'm only emulating the opinions of the Foundation when I say this, but we couldn't shelve the whole mission just because of a faulty AMC unit that, miraculously, didn't even jeopardise the integrity of the Daedalus when it broke off.'

'Maybe we're jinxed.'

'Maybe we're lucky. What better way to humble us and make us realise that these things are not to be taken lightly. That mankind is not the master of all he surveys.'

Frank stared at him, 'I think, if anything is going to teach us that, it will be this mission.'

20 July 2057 AD

Frank floated past each of the cryogenic pods. Using a small palmtop computer, he initiated a routine that queried the pods for information about the vital signs of each sleeping member of the crew. He also ran a diagnostic program on the pods themselves to ensure that they were still in perfect working order.

Monitoring the cryogenic status of the crew was a necessary part of the mission up until Mars orbit. Storage of humans on ice was still a pioneering science, and it wasn't very often a set of subjects could be studied for a long period of time. So the vital statistics of the sleeping crew were downlinked to Earth on a regular basis, to aid the progress of cryogenic science.

After Mars transfer, Frank and Ian would be asleep, and the onboard computer - after a series of dry runs - would automatically downlink all information to Earth. But after they crossed Neptune's orbital path, even that would stop. Then they would be truly alone, for the journey to the edge of the solar system was but a mere fraction of the journey to Proxima.

Frank arrived at Harold Gunther's pod. His vital signs were perfectly normal, as always. The science officer lay peacefully in his icy bed.

Harold was born in Munich in 2009. He lost his parents at an early age.

His father died during the factory strike riots of 2017 and his mother died of cancer in 2021. Harold was taken into a childcare facility at the age of twelve. His circumstances forced him to become a very introverted child and he soon retreated into books. Eventually he won a scholarship to the Berlin University of Astronomical Science, and joined the space program in 2040. To Frank, Harold was the embodiment of triumph over adversity.

Harold would be responsible for carrying out all the chemical, biological and physical experiments in Proxima Centauri. His theoretical viewpoint on all matters of natures laws would no doubt prove invaluable throughout the course of the mission.

The second pod in the line belonged to the Canadian born Norwegian named Jake Harding. Jake was thirty-four years old. Though by the time he woke up he would be one hundred and forty-nine.

Jake was a child prodigy. By the age of eleven he won his PhD at Toronto University, and by fifteen he owned a pilots licence. He turned his attention to the field of low to zero gravity medical facilities and entered the astronauts training program at the age of eighteen.

Prior to his acceptance on the Daedalus mission, Jake's most famous contribution to the space program was his invention of the 'Freefall Doctor' which he designed and – quite literally - rolled out during his year-long stint as medical supervisor on the NEO Rig. The Freefall Doctor was a small spherical artificial intelligence unit that was a perfect aid to a medical officer in a weightless environment. Jake had made a lot of money from the invention, which was now used on eighty percent of all space missions, including the Daedalus.

Harold and Jake would be the first two men to wake and see the dawn of a new solar system. A new dawn in Proxima Centauri.

The three other pods belonged to Navigation Officer Loretta Pearce, Medical Officer James Clarke and Bio Monitor Janice Taylor.

Frank traced his fingers lightly over one of the pod's frosted glass surface, and thought to himself how lucky he was to have such a talented and special crew on his mission. In fact, he was travelling with some of the best scientific minds in the world.

CHAPTER TWO: LINCOLN'S TRIGGER

Mankind's exploration of space took several dramatic leaps in the first half of the twenty-first century. The first major contribution being in the year 2037, when the first habitable base on the moon became operational, supporting a permanent crew of twenty people. It was named Lincoln's Reach.

Three years later, on the lunar surface, the Lincoln Outpost was set up. The outpost consisted of a small array of radio telescopes and had been constructed to provide one of the clearest views of space ever achieved by man. Lincoln's Reach and the Lincoln Outpost were later connected by a pioneering low-gravity tram system, which transported science officers to and from the telescope array over a distance of seventy kilometres.

Astronomy therefore, also came in leaps and bounds. Ever since the twentieth century, evidence of planets outside our solar system had been pretty conclusive. It was even thought that some of the Saturn sized planets found in the Sagittarius constellation could harbour life. This was considered

especially so with the Alpha Centauri system, given that the star was in fact very similar to our sun.

With the aid of the Hubble-NextGenST4 telescope, it became evident to us that our solar system's closest neighbour Proxima Centauri (also in the Centauri system) possessed a multitude of planets in orbit around the dim red dwarf star at its centre.

The Proxima Centauri system lay just over four light years from Earth.

The first indication that there were planets in Proxima Centauri came about in 2042 when astronomers detected a gravitational wobble in the star. This fluctuation indicated that a large planet was orbiting the star and exerting its gravitational influence upon it. The planet was later estimated to be roughly nine times the size of Jupiter, our solar system's largest planet.

The Hubble-NextGenST4 was turned to the system for a closer look, and more complicated mathematical assumptions led scientists to believe that there were at least seven planets swinging around the red dwarf.

As the planets were spotted, they were catalogued with the prefix PMC (an abbreviation of Proxima Centauri) followed by a numeric value relevant to the order of discovery. The first planet to be spotted was marked 01. Any satellites of those planets were given a further suffix as they were found. 'A' was the first.

16 July 2048 AD

Mike Taylor reached over to the coffee machine and hit the espresso button.

He rubbed his eyes. He was reaching the end of his ten-hour shift and was having trouble keeping his eyes open long enough to complete the final spectroscopy sweep. Soon he would hand over to Phil Johns, who would sit at this desk for a further ten hours, twiddling his thumbs waiting for more grainy images of space to download into the Lincoln Outpost data banks.

It was a boring job, but one which had to be endured. Even with so many budding astronauts applying to the Space Foundation nowadays, it was still necessary to 'do time' in a mundane service job. Pushing buttons and logging data on the moon or in Earth Orbit prior to winning a position on one of the more pioneering missions like the second Mars Lander or the Venus Descent Team.

The flight Mike wanted to join was the upcoming Europa seismic project. It looked exciting. To have a chance to do the Nav work on board that mission would be the highlight of his career, even if the mission would take over twelve years to complete. It was a very exciting prospect.

The mission plan was to insert a five-man crew into a low orbit over Europa, and drop a remote seismic probe down to the icy surface. Then they would spend three years driving the thing about, guiding it over as many shot-points as possible, to find out what was really going on under that frozen surface. In the orbiter, they would run a series of inferogram computations and adaptive filtering calculations to gain as much information as possible about the inside of Jupiter's satellite.

If they were really lucky, they would be able to recover the log data from the ice-drill, which was lost on the moon back in 2015.

All he had to do was survive a couple more months here keeping the array

ticking over, and then he would be free to apply for the mission.

And he was in a very good position to get it. His wife Janice was the Space Foundation's primary PR guru at Lincoln's Reach. She had a lot of contacts inside and outside the Foundation.

Through her he had met a lot of influential people, especially in the media world. And he hoped that he could use her contacts to get himself a bit of media exposure. If he got his face shown in all the right places, he was sure he could land the Nav position on the Europa crew.

It was Janice who had put him in touch with Brad.

Bradley Robertson was considered to be the most important man in Earth's colossal multimedia empire. There were very few pies Robertson didn't have his finger inserted firmly into, up to the elbow. He was a clever and shrewd businessman, whose wealth had snowballed into the trillions a few years earlier when he acquired the rights to all nano-cranial implant broadcasts. Soon his news and information programs were beaming into the cerebral cortex of all those who owned an implant. The man was extremely wealthy for it.

A good man to have on your side, Mike thought.

But when the signal arrived, it triggered a sequence of events that would change Mike's life forever, and ultimately end it.

The coffee was ready, and Mike took a sip of it through a mini-straw. It was still a little hot, so he set it down on the desk. As he did so, the narrow beam radar unit started beeping at him.

He rolled his chair over to the unit and peered at the screen. At first he though it was a malfunction. But his second glance convinced him otherwise.

The array had been programmed to ignore the background noise given out by local stars, radio and television signals, and communication bands used by Earth's orbiting satellites. So whenever it picked up an unnatural audio signal, it sounded an alarm.

Mike looked closely at the monitor.

The letters PMC-04-A were flashing next to a cluster of stars in the Proxima Centauri part of the sky, which had just ascended over the moon's horizon.

'What the hell?' he tapped a command into the unit, which isolated the signal and increased the gain on the array.

Then he switched on the speaker, and set the unit onto record/analyse mode.

He heard a 'beep'. The computer registered it as one point two seconds long.

Silence. Then, fourteen-point-seven seconds later there was another beep, distorted by the distance it had travelled. The beep lasted one-point-two seconds. Then another fourteen-point-seven second gap, followed by another beep.

Lonely sounds in the expanse of space.

Mike typed a manual override command into the unit, confirmed his password and

took control of the array. He tweaked the telescope one-degree off the beam, and then waited.

Twenty seconds passed. The signal had vanished.

He re-aligned back to point five of a degree. Still no signal.

My God, thought Mike, This isn't background shit. This is tight.

He moved back to point two of a degree.

Still nothing.

It was no use. The radar had to be pointing directly at the signal; otherwise it was impossible to detect. And it was an incredibly weak signal.

Mike reached over to the comms unit and patched through to the Very Large Array on Earth.

'Yeah go ahead Mike,' came the response, four seconds later.

'Hi guys I'm picking up an audio signal on my Azimuth Elevation scope. I'm transmitting the co-ordinates down to you now. It's in Proxima. Can you confirm it for me?'

'That's a negative Mike it's below our horizon. We won't get Proxima for another two hours. I suggest you try Jodrell Bank. Do you want me to patch you across?'

'Yes please.'

A few seconds later, Jodrell Bank in England came crackling across the line.

'Hello?'

'Hi, this is array controller Mike Taylor at Lincoln.'

'Hello Mike how's it going up there?'

'Fine, sir. Though I think we've got some rain coming in soon!'

It was somewhat frustrating, working with the time delay. At times they would speak over each other.

'Ha ha, nice one Mike, what can I do for you?'

'Do you have Proxima Centauri above your horizon?'

'Yes we do.'

'Okay, I need to get your IP. I have a signal I want you to confirm.'

'A signal? Right, okay, my v-eight number is…'

Mike jotted down the list of v-eight numbers, and then attempted a connection to transmit the co-ordinates.

'Okay co-ordinates received, hold on a minute while we reposition.'

Mike stood up from his chair. His palms were clammy and there were beads of

sweat on his forehead. He took a sip of coffee, he found it had gone cold. If he could get confirmation of the signal from Earth then he knew that he was onto something big.

Jodrell Bank came back on the radio, ‘Hello Mike?’

Mike leapt back into his chair, ‘Yes?’

He waited a few seconds for the response, hoping desperately that they were getting it down on Earth as well.

‘Mike we have a negative on your signal. It’s dead up there.’

‘No. Surely you must be looking in the wrong place. I’m re-sending the co-ordinates. Can you try it again?’

‘Okay, but the co-ordinates are correct. We have Proxima, but there’s no signal.’

Mike was frantic, ‘It’s on a tight band, and it’s weak. Maybe you’ve got some atmospheric occultation.’

‘Maybe so Mike. But like I say, we’re getting nothing down here.’

The line was silent for a moment. Mike considered his next move. Maybe he should notify his superior. But what if the array had malfunctioned? What if his interpretation was wrong?

‘Jodrell, can I get back to you?’

‘Sure Mike, but remember, if you need us, we’re going to lose Proxima over the horizon in about…’ there was a pause. ‘…Fifty three minutes. Then you’ll have to go back to Mexico.’

Mike’s superior was Ivan Brinkman, the Space Foundation’s chief science officer at the Lincoln Outpost. Mike had called him in to listen to the signal, though Ivan seemed somewhat nonplussed by Mike enthusiasm.

After a few moments consideration, Brinkman spoke, ‘How do you know the signal is occupying a narrow band?’

‘Well, If I move the telescope out even point two of a degree then we lose it.’

‘But all that means is that it’s coming from a well defined point. The signal could be as wide as you like.’

‘True, but they’re not picking it up at Jodrell Bank.’

‘Well if that’s case then it’s not atmospheric occultation that’s stopping them from hearing it. Occultation would just distort the signal, not eradicate it completely. I’d say the reason they can’t hear it is because the beam is pointed directly at the moon.’

They looked at each other as the implications of what Ivan had just said sunk in, Mike said, ‘But we’re moving. Orbiting the Earth.’

‘I know,’ said Ivan, ‘And that means it’s tracking us!’

The hair on the back of Mike’s neck stood on end.

‘My God,’

Brinkman was back in his office, patching calls through to the Space Foundation headquarters in Nevada. For the moment, Mike was alone with his signal, probably for the last time before it was taken away from him. No doubt someone else would receive the credit for the discovery. Probably Brinkman. It would certainly no longer be Mike’s.

Unless, of course, Mike made it his.

He moved back to the comms unit and patched through to Sydney Australia.

After about a minute, the call was answered. ‘Mike, what are you doing, it’s four-thirty in the morning, can’t you call me later.’

‘Hi Brad. I’m sorry. You see, it’s always night-time on the moon.’

‘This had better be good.’

‘I don’t often call you from another planet, do I? This is the best. This one’s gonna wake everyone up.’

‘What is?’

‘I am about to give you the biggest piece of news that that the Earth has ever seen. And you’re going to be the first to transmit it.’

‘Stop playing games with me Mike, what the hell happened up there?’

‘We’re picking up a transmission. It's artificial. It’s being sent directly to the moon, directly to the Lincoln Outpost. Unknown Origin.’

‘Do you have a recording?’

‘You bet.’

‘How soon can you get it to me?’

‘We interrupt this transmission to bring you a special report.

‘At approximately 20:30 Universal Time this evening an audio signal of unknown origin was picked up by the Lincoln Outpost Radio Array on the moon’s surface. A leaked copy of the signal was sent from an unknown source to several press offices around the globe this evening. The Space Foundation has refused to comment on the signal, saying that it was ‘too early to speculate’, but that it would be releasing an official statement in the morning after more extensive monitoring and analysis. The White House has also refused to make a statement at this time…’

Mike’s door buzzer sounded.

He stood up from his bed, switched off his implant and walked over to see who it was.

He had only opened the door slightly when Brinkman forced it open the rest of the way, knocking Mike to the floor. He marched into the room.

‘What the hell do you think you’re doing?’ he shouted.

‘Sir, I don’t know what you mean?’ Mike replied calmly.

‘Don’t play the innocent with me, I’ve got a nano-cranial implant and I just saw the news update. It’s been all over the news. It’s on the standard waves now. And we’ve tracked the data transfer through the IPV8-Link satellite to your comms unit! Are you completely stupid? You didn’t even try to encrypt it! You surely realise that you have breached the clause in your Foundation contract that states that all scientific discoveries made on Foundation time are solely owned by the Foundation and can only be released to the press by the Foundation!’

‘Sir, with all due respect this is not a Foundation issue. Mankind has a right to know.’

‘Don’t be so naïve, Mike. You obviously haven’t seen the rest of the bulletin. They’re calling it the Second Coming of Jesus down there. They’re calling it Armageddon too. In New York, London, Tripoli and countless other cities, there’s mass rioting. The implications of an extraterrestrial signal are more far-reaching than you or I could ever know.’

‘But Ivan I…’

Brinkman waved his hand. ‘I’m sorry Mike. I have no other option but to recommend your immediate dismissal from the program, and the Foundation. I’m ordering you a seat on the next supply ship’s return journey to Earth.’

CHAPTER THREE: CONSTRUCTION
2048 AD

Within two weeks of receiving the signal, the Space Foundation signed off on three trillion dollars of investment into the Daedalus project. As far as the field of space exploration was concerned, the timing was perfect. The Space Foundation had expressed added confidence in Daedalus after the outstanding success of the Mars Lander mission that returned to Earth in 2029.

After work began on the immense spacecraft, the budget swiftly doubled to six trillion dollars and many politicians and government treasurers began to question the merits of the project. Searching for justification amidst rising costs, caught between a rock and a hard place, where tax payers and private sponsors wanted confirmation that their money was being well spent, and scientists kept asking for more and more cash for their systems testing.

The bureaucratic turmoil lasted for seven years, during which the ever-impressive Daedalus was built, piece-by-piece in space using the immense NEO Rig.

The massive NEO Rig structure was four kilometres in length. Shaped like a huge g-clamp orbiting four hundred and twenty kilometres above the Earth, its shape could be made out from the Earth’s surface. On a clear night it could be seen hanging in the sky like a man-made star.

The huge base began its life as the infamous International Space Station.

The ISS project began back in the late 1990's and was finally completed in 2015 amid harsh political wrangling. It seemed to many as though mankind back then wasn't really able to overcome prejudice and the burden of history to unite in a common goal, as a lot of lives were ended and careers ruined putting the ISS in the sky.

When, after twenty-three years of service, the ISS went the way of the Russian Mir Space Station before it and became almost uninhabitable. Rather than shunting the metallic heap of junk into a safe orbit, or burning it up in the Earth's atmosphere, ideas for its further use were called for, and after much deliberation, it was converted into a construction Rig for future spacecraft building. The NEO Rig began its new life in late 2043. The term 'Rig' however was really a bit of a misnomer. Due to the microgravity environment, falling around the planet, it wasn't really necessary to 'hold' anything up in order to prevent it from dropping away. The term was adopted merely from the point of view of accessibility for the engineers and scientists who were involved in the construction of the ship.

Prior to the Daedalus project, four Space Shuttles and the Hubble-NextGenST5 had previously docked with the Rig for repairs and additions. The Daedalus however, was the first craft to be built in space and launched using the grand structure.

There were distinct advantages to this. Up until the Daedalus mission, all spaceships had been built and launched from Earth, and all constraints in the ship design reflected that. Due to the expense of blasting even the lightest object into space; crew habitation modules, workshops, food pantries and hygiene facilities had to be made small, cramped and functional; a less desirable design aspect which any astronaut who had flown in the previous hundred years would verify. The Daedalus however, was the first craft to break the mould.

Admittedly, all the materials that made up the Daedalus still had to be hauled into space from Earth, as the mining of raw materials in space was a technology yet to be employed by mankind. So, like the ISS before it, the Daedalus was built in stages.

But, to coin a phrase, the whole was greater (and so much more majestic) than the sum of its parts.

CHAPTER FOUR: HYAKUTAKE

7 February 2059 AD

Ian sat back in his chair, rubbing his eyes as he leaned away from his terminal. He turned to Frank, 'The ISOE log indicates that the Daedalus will pass comet Hyakutake's tail in forty-seven minutes. Have you seen it yet, from the observation suite?'

'Not yet. How does it look?'

'Nothing short of spectacular, my friend.'

Indicating the small camera unit in Frank's hands, Ian asked, 'Is the CHAMP unit ready.'

'I finished unpacking it this morning. I even double-checked the batteries. Both sets. We sure are going to get some excellent pictures of that baby'

In the observation suite, Frank sat with the CHAMP unit held firmly in both hands. The camera poised and ready to start photographing the beautiful comet that reared close to the Daedalus.

Next to him, Ian sat and talked into a digital recorder, making eyewitness observations about the blue comet trails and the behaviour of the ice particles that flowed off the bulk of the body.

Frank raised the CHAMP and started snapping. Using the zoom facility to pick up the tinier details - the nuances and the secrets of Hyakutake.

As they worked, the onboard computer also performed analyses of the comet. In the brief time that they would spend flying past Hyakutake, they would have to gather as much information as was humanly and electronically possible.

Opportunities like this were few and far between, and such analysis helped put more pieces of the jigsaw in place.

The jigsaw with a billion, billion pieces. It was the jigsaw of the universe.

But eventually, Frank lost interest in photography, and Ian was too speechless to use the digital recorder. Instead they just sat and stared as the beautiful and wondrous display of nature at work gave them a show they would never forget.

The blue streaks of debris from the comet trail - in opposition to the direction of the sun because of the solar wind – stretched for thousands of miles into the distance to their left. As the Daedalus flew by, Frank could see along the length of the trail, as vast quantities of dust and ice particles flew off the rock and were dispersed into space. It all seemed to happen in slow motion, but he realised he was being deceived by it's sheer size.

The rock itself was covered in plumes and clouds of dust, like a coating of icing sugar. Hyakutake looked – to Frank – like a giant boiled sweet. Beneath the plumes, he could see that the surface was peppered with impact craters, both large and small.

'Look at those impact craters,' he said to Ian.

'Yes. It just goes to prove that no matter how small an object is, it still gets hit by smaller things.'

'It's the embodiment of fractal geometry. It emulates a universal concept,' said Ian. 'Do you realise how many people would kill to change places with us now.'

Frank found he was unable to reply. He just stared open mouthed at Hyakutake, as the Daedalus cruised past it at thirty thousand kilometres per hour.

A few hours later, at the table while they were eating dinner, Frank raised the question that had been on everyone's mind (and not just the Daedalus crew either) for the last eight years.

'Do you think the signal was sent by an extraterrestrial intelligence?'

Ian sighed, as though the point had been discussed one too many times now, ‘I’ve given this subject a great deal of thought over the last few years, and even now I cannot decide upon an answer.’

‘What if it is aliens? How would you handle being mankind’s ambassador to them? What would you even say?’ asked Frank.

Ian said reluctantly, ‘My friend I have no idea. The very thought chills me to the bone. Whatever I think of now, will undoubtedly go straight out the window when the time comes, because whatever we encounter will no doubt be the strangest thing any of us will ever experience.’

CHAPTER FIVE: AEGEAN DISTORTION I
Greece - 2407 BC

In the still heat of a tranquil summer’s day, a little boy ran down the weathered stone steps to the beach, and raced across the sand to where the others were playing.

Behind him, the granite cliffs loomed over the water’s edge and a vast cave entrance yawned beneath. Near the entrance, some older boys were climbing up the rock face. The boy thought it looked dangerous.

In the scorching heat, the sea looked inviting as the sun shone directly down onto it; scattering reflections into the young boy’s bright green eyes. A few children were swimming naked in the warm sea, splashing and laughing and occasionally diving below the surface to look for shells. When he reached the small gathering of boys on the beach he saw what they were doing, and he begged to be allowed to join in.

After some teasing and laughing, they let him play the game with them, which involved throwing small stones from behind a line in the sand into a series of concentric rings to score points.

The game went on for most of the day. The other boys were so much better than he that they laughed and jeered at him, accusing him of cheating for no reason other than spite.

Eventually they kicked him and punched his face until he ran away along the beach to sit on his own.

The salty air made the boy’s skin feel dry. He wanted to swim in the sea, to feel the cool wetness.

He stripped out of his cloth and ran towards the sea.

CHAPTER SIX: VR DAEDALUS

‘Good Morning, and welcome to the Museum of Interplanetary Science here at the headquarters of the Space Foundation. You will now be taken on a virtual reality tour of the Daedalus spacecraft, mankind’s first crew-based extra-solar vehicle. During the next hour, you will learn all about how this wonderful spaceship functions, and what this unprecedented mission will involve. Please lower your helmet visors now.

‘Construction on the beautiful and impressive Daedalus spacecraft was completed in the year 2056. The ship measures a kilometre long on its horizontal axis and it is made up of four component modules.

‘In front of you now is the Command Module, an area divided into three colour-coded areas. Red for Navigation, Green for Communications and Blue for Systems. It is here that the crew performs all mission-related functions.

‘Behind the Command Module is the Science Module, which contains a miniature microgravity lab and a cache of bio-safety equipment. There is, after all, a possibility that biological organisms could violate the Daedalus. Organisms that are alien to us and may need to be contained. Science Officer Harold Gunther is on hand to perform any bio-safety work that might be necessary.

‘Behind the Science Module is the Accommodation Module, which spins at a steady rate to simulate conditions of point eight of a gee. Part of the spinning module is also set aside for hydroponics and zeoponics, which is where the core elements of the Closed Ecological Life Support System are contained.

‘The Daedalus is the second CELSS spacecraft ever. The first was the manned Mars mission launched in 2023. In a CELSS environment, the crew’s food, water and breathable air are regenerated through waste material and plant life. Nothing is wasted. Everything is recycled. The system enables a crew to be entirely self sufficient on long space missions.

‘The major foodstuffs that are grown in the hydro- and zeoponics areas are wheat, potato, lettuce, radish, strawberry, rice, soybean, sweet potato, peanut, coffee and tomatoes. Not a particularly luxurious diet, but nonetheless one that contains all the basic food groups. And as for the coffee? Well, the crew refused to fly at all without coffee!

‘The plants are stored in the CELSS environment at a steady average temperature of 19 degrees centigrade. Inedible organic matter from the food growth process is re-integrated into the soil to encourage further plant growth.

‘It is always necessary to keep these plants in a centrifuge, as the root systems would have no sense of ‘up’ or ‘down’ in a weightless environment, and therefore would not know which way they had to grow. Plants rely on gravity just as much as we humans do. Experiments into weightless plant growth in the past have produced some bizarre and comical results!

‘Air is recycled using the Regenerable Absorption Process. The crew’s exhaled Carbon Dioxide finds it’s way into an ion exchange resin unit. The unit sits behind the absorption vents situated around the craft. As the carbon dioxide passes over the ion pylons, it is chemically and electrically transformed back into oxygen. After a month of use the ion exchange resin unit is exposed to the vacuum in order to be cleansed of waste, but after that it is fully usable again. The whole process is fully automated by the onboard computer. Multiple backup resin units are held in the ships stores, enabling the crew to re-use air for over six hundred years solely from a spaceships single tank.

‘A similar process is used for the crew’s water, which is filtered through similar resin units situated alongside the wastewater drains.

‘In front of you now is the Mars Lander. Notice the smaller centrifuge system. This was because there was a smaller crew, and subsequently, a smaller hydroponics area. Zeoponics were not used on the Mars mission, and are therefore unique to the Daedalus.

‘The Mars mission proved several fundamental things. Firstly, the CELSS environment worked, and could sustain a crew for an indefinite period of time. Secondly, cryogenic sleep is a feasible method for transporting astronauts over long distances without ageing them significantly. In fact, for every twenty years in cryogenic stasis, a human will only show signs of ageing equivalent to seven months.

‘Lastly, the Mars mission proved that if the correct exercise procedures were followed, it was possible to defeat heart shrinkage and postpone the onset of calcium deficiency and bone degradation in astronauts, especially with the use of the new drug Trizoliphium-i3a.’

‘You are now looking at the advanced propulsion systems of the Daedalus.’

‘The Daedalus uses twelve exhaust accelerators to fire xenon-ion particles at thirty kilometres per second out of vents at the back of the craft. Ample reserves of the heavy gas xenon are stored in high capacity compression tanks at the base of the science module. The xenon cannot be fired out of the vents as it is, so it needs to be electrically ionised. This is achieved by filtering the xenon gas through several flow-pipes to the ionisation chamber, where it comes into contact with the electricity stored in power cells from the photovoltaic scoop, which the Daedalus will perform on arrival at Proxima Centauri.’

‘In front of you now is the accommodation module. The circular outer corridor is commonly referred to as the ‘rim corridor’, and the four ‘spokes’ that connect the rim corridor to the axis are marked as Service Tunnels A, B, C and D.

‘Using centripetal forces to counter the effects of inertia, anyone standing in the module with their feet pointing out towards the stars and their head pointing toward the axis corridor would feel just like they were standing in a room on Earth, only a little lighter.

‘The accommodation module houses all the crew cabins, a recreation room, a pantry, the hydro- and zeoponics areas, and a minigym.’

‘Behind the accommodation module is the cryogenics module, which contains seven pods. The distance to Proxima Centauri is so great that the crew will sleep in these pods for over one hundred years.’

‘Moving round to the back of the Daedalus we can see the acrobatics room and the observation suite. In the past, these rooms would never have made it onto a spacecraft configuration that would have been launched from Earth. On previous space missions, many astronauts claimed that they would have liked a place to perform weightless acrobatics, as it was an enjoyable way to pass the time between work shifts. The Daedalus is the first spacecraft to employ this feature.

‘The observation suite provides a similar luxury. The two hundred and twenty degree viewing globe is made out of an enriched polyvinyl butyral plexiglass compound, allowing unprecedented views of the starfield.’

‘On arrival at Proxima Centauri in the year 2171, the first crewmember on the Daedalus will be woken from cryogenic sleep three months prior to interception with the Red Dwarf at the centre of the Proxima system. Once the

interception takes place, the spacecraft will pass the star at forty thousand kilometres per hour at a distance of fifty six million kilometres. For a short while, the Daedalus will be under the influence of the star's gravitational pull, before swinging into its escape trajectory on course for a geo-synchronous orbit over PMC-04-A. It is anticipated that the journey to their destination will take a further two years. During that time the crew will perform extensive studies of Proxima Centauri's composition.

'For the time period while Daedalus passes by Proxima, the solar panels aboard the craft will be extended to absorb light from the sun. The converted electrical power, combined with the xenon reserves held on the ship will aid the spacecraft's braking manoeuvre at PMC-04-A, to enable the Daedalus to be trapped by the planet's orbit.

'It will be then, we hope, that they will learn the truth about the origin of the signal they travelled so far to investigate.'

'All the crewmembers on the Daedalus have been carefully selected to work alongside another based on extensive analysis of their behavioural patterns during initial project planning. If crewmembers were required to spend many years working alongside their colleagues, it was vital that they had a positive working relationship, and that they also be good friends. Though this personality matching technique would never be an exact science, it had worked many times before in some of the Biosphere experiments on Earth in the 1990's - though the experiments themselves had turned out not to be successful - and in long winter settlements in the Antarctic.

'Of the seven crew members on the ship, five were placed in cryogenic stasis a week prior to launch so that the pre-launch science crew could monitor the first few days of cryogenic sleep closely. It had been decided at the beginning of the project that if the first week of monitored stasis threw up even the slightest problem, the plug would be pulled on the whole project. Though many were opposed to this view, and were of the opinion that a lot of the necessary troubleshooting could continue after the Daedalus had launched.

'Needless to say, the whole furore amounted to nothing and the Daedalus undocked from the Rig on time at 06:00 on March 15 2056.

'But the launch was not without it's fair share of trauma. During the initial spin-up of the accommodation module, an Automated Maintenance Clamp had failed to remove itself from the side of the module, causing a catastrophic disaster that cost the lives of three astronauts.

'But from the flames of tragedy rises the phoenix of hope. Hope that, upon arrival at Proxima Centauri, the crew of the Daedalus will discover many wonderful things that will not only enhance our comprehension of the universe, but also allows us to understand our place in it.'

'That concludes our virtual tour of the Daedalus. Please remove your helmet visors now and wait for the lights to come up before leaving the arena. On your way out, don't forget to visit the Daedalus gift shop for all your interplanetary souvenirs.'

CHAPTER SEVEN: AWAKENING IN PROXIMA

17 March 2171 AD

Desolate, distant space. Distant from Earth, relatively speaking. But now, Proxima Centauri was local space, and Earth had become the distant body.

The Daedalus floated silently through the void at forty thousand miles per hour against the beautiful backdrop of the Large Magellanic Cloud, the immense galactic cluster that looked – to the naked eye - just the same in Proxima as it did on Earth. All functions on board the ship were on standby, using up as little power as possible without compromising mission parameters.

The internal computers had been waiting for one hundred and fifteen years. Nearly six generations spent ticking over on a regenerating power supply, counting up to one single moment.

All this time, the Daedalus had been a cocoon. A hibernation capsule that protected the people within from the hostile space outside.

A time capsule.

A precarious existence.

Aboard the Daedalus a computerised timer loop reached a numerical value and an internal circuit triggered a program to load. At that moment, the entire mission hinged on whether that timer worked. Had the trigger not kicked in, Frank's fears at the start of the mission would have been realised. But of course he would never know it. The entire crew of the Daedalus would have remained in cryogenic sleep forever, the origin of the signal from Proxima would never have been known, and they would float endlessly into the distant reaches of space.

The program loaded, and a monitor came on in the cryogenics module. If anyone had been there to see the screen, they would have read the words:

ISOE LOG ITEM 17154A: 217103170001

CRYO-SUBJECT GUNTHER: THAW INITIALISED

But at the moment, everyone was asleep.

The Daedalus's onboard computer had kicked into life, and was now beginning to increase the temperature in the habitable areas of the ship to twenty degrees centigrade. A hissing sound was barely audible over the hum of the Daedalus's machinery as the vents pumped oxygen into the accommodation and cryogenic modules. Once the oxygen reached a breathable level, a secondary routine triggered the mechanism on Harold Gunther's cryogenic pod door. It slid open and to the side. Within four hours, the science officer would wake up.

25 April 2171 AD

Pulled back from the icy precipice. The first thing Frank could feel was the cold. The temperature suit, which was designed to alter and monitor his heat levels during cryogenic sleep, was warming slowly, steadily increasing his body's overall temperature until he could feel the heated blood coursing through his veins.

Behind his closed eyelids, he could see coloured flashes of light. This time they were in his head, and his eyes were slowly becoming accustomed to light filtering through his eyelids.

He could hear the crashing sound of his blood pumping through his inner ear. His heart rate was still very low, and he felt weak.

He tried to move his right hand, it was incredibly stiff, but after a few moments of effort he felt his fingers curling inward.

Thoughts began to form in his head. A dim realisation of where he was, and disjointed ideas of why he was so cold.

He fought to open his eyes. Slowly he pulled them apart, sticky from a century's worth of sleep, even though the pod's hygiene jets had cleaned them regularly.

Objects tried to swim into focus through the tiny slits of his eyes. All that greeted him was a foggy view of the inside of his cryogenics pod. Beyond it, the flashing lights on the monitors on the other side of the room, but nothing more coherent than that was being processed by his brain.

He had no strength. He knew it would come back to him eventually, but at the moment, all he could manage were very basic movements, which required all of his concentration.

His first big breath tasted strange, the slightly medicinal air caught the back of his throat and he coughed and wretched. Then he took a second breath, which went down much better.

Frank was able to consider the irony. His body had been ticking over unconsciously for the last hundred and fifteen years, but as soon as his conscious mind took over the reigns, he fell at the first hurdle, unable to process the air that he had been breathing slowly for so long.

He tried harder to regulate his breathing, and after a couple of minutes, he felt much better. He turned his attention onto the task of getting himself out of the cryogenics pod.

As soon as this thought occurred to him, he heard faint beep off to the left and the frosted glass front of the pod began to slide outwards and to the side to reveal Dr James Clarke standing over him.

James Clarke was the first medical officer aboard the Daedalus. Born in London, England in 2023, he was now at the ripe old age of one hundred and sixty-one, though he looked no more than forty.

'Commander Chambers', whispered Dr Clarke.

Frank fluttered his eyelids a little to blink away excess water.

'Good Morning sir, welcome to Proxima Centauri,' said James.

It took a few moments for realisation to dawn on Frank. He rubbed his eyes and stared intently at James.

'We made it.'

'Yes sir, we've made it, and you look like you need a haircut. I'm afraid I also have some very sad news.'

'What news, Dr Clarke' said Frank in a half whisper.

'It's Harold sir. I'm afraid he's dead.'

Janice Taylor couldn’t sleep. For some reason, tonight of all nights, her first night out of the pod, she found herself thinking about Mike.

She climbed out of bed and moved over to the small cupboard near the door. Opening it, she took out Mike’s wedding ring.

The officials had removed it from his body after they had cut him out of the wreckage.

Why had he been so stupid?

Her husband had been dismissed from the Space Foundation for releasing sensitive data to the media about the signal. An inquest had later heard that, according to the data transfer logs, unsolicited information had been transmitted from Mike’s comms unit at the Outpost on a number of occasions.

The transfers had been tracked to the Bradley Robertson Media Company in Sydney, Australia.

It became evident that the two gentlemen had had a long standing ‘arrangement’ whereby sensitive data would be sent down from the moon by Mike in order to give Bradley Robertson a head start on any Space Foundation stories that came to light. In return, Mike would get a head start on the ladder to win a place on the Europa seismic mission. Ironically, the mission had been cancelled anyway.

Bradley Robertson was fined seventeen billion dollars for professional misconduct, and Mike Taylor was jailed for three years.

A couple of weeks after he was released, Mike’s car was found at the bottom of a ravine in the Sierra Nevada Mountains. He had plummeted four hundred metres off the cliff after his brakes had failed.

The circumstances, it was concluded, were not suspect.

But Janice was convinced that Bradley Robertson was behind Mike’s death. She had campaigned for several months to try and incriminate the trillionaire, but her voice was too small against the clout of the world’s biggest media empire.

Once the Daedalus project had got underway, and she had applied to be on the spacecraft crew, she knew she had to stop making noises about Mike’s death and the Taylor Inquest. She was ruffling too many feathers and making a bad name for herself, and that had to change if she was to stand any change of being accepted onto the team.

She had ultimately won a place on the mission. But she knew deep down that part of her successful application to be on the Daedalus was because she was female, and she fitted nicely into the balanced gender criteria that the Space Foundation were adhering to.

Still, with the circumstances of her acceptance aside, she was in a unique position, serving her country and her species. But, more importantly to her, she was serving her late husband, whom she still loved with all of her heavy heart. She was now on the team that was investigating the signal that her husband found. She was - in a strange, convoluted way - trying to make some sense of his untimely death.

She had brought a lot of his belongs with her. In the realm of astronautics she knew she was lucky. Because of the design process of the Daedalus – with most of it built in space - she and her crewmates had been allowed to bring a lot of personal items with them onto the ship. It had to be this way of course. The Space Foundation couldn't pack up a bunch of people and haul them to the other side of the solar system (and beyond) without allowing them to take a fair sized cache of personal belongings with them.

So Janice felt that Mike was with her now. Joining her on the investigation of a lifetime - or two lifetimes, for their journey was so long. Travelling to see what it was that started all of this.

6 May 2171 AD

Each member of the crew was required to perform two hours a day in the gymnasium on the bicycle ergometer and the treadmill to build up muscle tissue. Although the Daedalus accommodation module rotated to simulate gravity for the occupants, the rest of the ship was non-rotational. In an ideal situation, the entire Daedalus would spin, bringing gravity to all areas. However, downlinks to Earth through an antenna that would only point home for a small period of time each rotation would not be feasible, and it was hard enough for a crew to maintain perception of an 'up' or 'down' in space, without the situation constantly changing to confuse things.

Mankind's need for an 'up' and a 'down' was one legacy of evolution on Earth that had yet to be discarded in space.

A lot of the crew's work time therefore was spent in a weightless environment. On a spacecraft where centrifugal cabin space was at a premium, it could be hard for an astronaut to get the right amount of exercise to prevent muscle degradation, so use of the gym was an essential part of life on the Daedalus.

During cryogenic sleep, Frank's body (along with all the other members of the crew) had been pumped intravenously with a muscle-preserving vitamin every 5 months to maintain tissue. Use of the vitamin meant that the time spent in the gym after waking was considerably reduced. However, the vitamin would never completely eradicate the post-cryogenic need for exercise, so the crew was required to spend extra time over the first month after waking, in the gym building up muscle tissue. To this end, a member of the crew had been woken weekly, so that the exercise machines could be used in rotation.

Frank had been the last to wake.

'Jake,' said Frank as he pedalled the bicycle slowly on the lowest setting, 'I'd like you to fill me in on the events leading up to Harold's death.'

Jake was a short man for his age, and was prematurely balding. The hair he did have was light brown, and he possessed a pair of radiant blue eyes that captivated all who looked at them, as though he were wearing blue contact lenses. His eyes betrayed his Nordic ancestry. He was sitting on the edge of the crate that housed the dumbbells. In his hand was a pinch-force dynamometer, used for testing finger strength. He toyed with the device as he spoke.

Jake was young for an astronaut, aged thirty-one, give or take a hundred and fifteen years. Frank was always slightly dubious about having younger astronauts on his crews. But Jake's medical adeptness was hard to beat, and he provided a certain youthful flair that was lacking in some of the older, more experienced crewmembers.

When Jake spoke, his voice quivered slightly, and Frank considered that maybe this investigation was happening too soon.

‘Harold had been running some chemical analysis tests. It all seems like such a haze now. You see, he was trying to ascertain the density of the hydrogen particles in the solar wind.’ he paused.

‘Go on’

Looking down at his hands, Jake continued. ‘He was carrying a tray of test tubes and slides and other stuff, I don’t know what was in them, I was only following him around to try and learn something. I had nothing else to do. We climbed through the axis corridor into Service Tunnel A and we were making our way down the ladder.’

Jake met Franks eyes as a tear rolled down his cheek, ‘Harold was in front. He was below me. Then there was a massive jolt. The whole of the Daedalus lurched. I think something must have hit us. It must have been a small meteorite perhaps. Or possibly the termination shock.’

‘No,’ Frank interrupted, correcting him, ‘it wouldn’t have been the termination shock. Proxima’s solar winds would have hit us years ago. It probably was a meteorite. Go on.’

Jake looked up at Frank. More tears had welled up in his eyes. ‘Well, Harold lost his footing. He was only holding on with one hand. He slipped and fell all the way to the bottom of the tunnel. Okay, it’s a reduced gravity but it’s still a long way to fall and he hit his head on the patch unit down in the rim corridor.’

‘Did you make any attempts at the time to find out what hit the Daedalus?’

‘No. I thought of using the EVA unit, but I’ve never operated it so I couldn’t take it out and search for a dent in the hull. Perhaps I should have been cross-trained on it after all. It would have been a big risk for me to try to use it. I figured there had to be another person inside here for that to work. Besides, I had to look after Harold.’

‘Yes, of course. Let’s go back to Harold. Did he die straight away?’

‘No. He’d sustained a massive head injury and there was no doubt the prognosis was bad. He actually died of acute subdural haematoma three days later. I made it as comfortable for him as I could. But once haematoma sets in it’s pretty much time to wave goodbye.’

‘What is subdural haematoma.’ Frank asked.

‘It can develop as a complication after a head injury. The blood veins that are located between the membranes covering the brain start to leak. It causes intracranial pressure, pressure inside the head from cerebral edema - swelled brain tissue.’

Frank tried to imagine what that would feel like, and realised that he was frowning deeply at the thought of the pain that Harold must have gone through, ‘Why didn’t you wake any of us up?’

‘What good would that have done? I’m the second medical officer. Only James outranks me in that department.’

‘So why didn’t you wake James?’

Jake became agitated, ‘I didn’t think it was necessary. I had the diagnosis in the bag. I gave Harold the best care that I could. Don’t you understand that? There’s nothing James could have done. It would have messed up the ISOE if I woke him early.’

Frank nodded calmly, ‘I understand. It must have been very traumatic.’

‘After he died I moved his body back to his cryogenics pod and put him on ice. It was the only thing I could think to do.’

‘Okay. You’re probably aware that Mission Control will want a full statement from you. I will send a preliminary message tomorrow and then you can follow up with your statement. I’ll help you write it if you want.’

‘Thank you Frank,’ said Jake, wiping some of the tears from his face. ‘If I’m excused. I have some post-cryo tests to run on the rest of the crew.

Frank smiled reassuringly, ‘Yes Jake, of course, and well done. You’ve coped very well under the circumstances.’

Ian Byrne and Frank Chambers sat in the observation suite. With the internal lights switched off, Frank felt like he was floating in space without a suit.

Before them, through the curved viewing window, lay the vast expanse of the universe, populated not only by millions of tiny points of starlight, but the vivid colours of galactic clusters. Gas plumes of giant and distant nebulae. A rich tapestry of pink, orange, blue and red. A swathe of beautiful three-dimensional structures that conveyed so incredibly the size of the universe that enveloped them. The constellations - Orion’s Belt, the Plough, the Bear - all still recognisable from here, so far away from home.

In the observation suite it was very easy for Ian to force the sounds of the ship’s machinery out of his head, and become caught up in the beauty of creation.

‘This reminds me,’ said Frank, ‘of the times I used to spend on the beach up at Big Sur. When I was a student at Berkley we used to meet in a burrito bar on Telegraph Road and head on out to the beach. We’d camp out there the whole weekend. We’d have parties and beach fires. And the starry panoramas were so incredible. Okay, maybe we wouldn’t see as much celestial stuff as through a telescope….’

‘Or here,’ Ian interrupted.

‘Or here. But at least it had a context. A situation. A moment in time that you would remember forever. Like a young love or a piece of music. The context is so important, don’t you think?’

‘I know exactly what you mean,’ replied Ian.

‘What do you miss most from home?’ Frank asked.

‘More than anything, It would have to be the rain, and the smell of forest dew in late May. I miss the beautiful romance of sharing an umbrella with a loved one." Ian laughed at his own words, ‘I know it sounds stupid, but I miss splashing around in puddles. Dashing in and out of doorways to avoid getting wet. Standing at the window and watching a fierce downpour from the warmth of

my living room.'

'Hmm, way out here. So far away from home, it's hard to imagine rain, and sun, and wind. All the things we take for granted. All those wonderful things.'

'There's nothing like a bit of interplanetary space travel to put things in perspective, huh?' Ian laughed.

'How little we know. Sometimes I'd be walking down a street somewhere and I'd look at all the people rushing around. And I'd look at all the buildings and cars and I'd think; we humans live in a little pocket of air on the outside of a little rock which we call Earth. And we busy ourselves by messing around. Messing around with what we find and make. That's all we really do. It's all we've ever done. And we've spent so much time messing around, that we've lost our purpose – in a way. It's not until you're lifted into space, and look back at that little rock, that you realise how much time we waste. Not just within our individual lives, but as a species. I wonder if all that's about to change. I wonder if what we find - in Proxima - will be the thing that changes the way we look at ourselves, the way mankind looks at itself.'

There was a knock on Frank's cabin door. It was James.

'Sir, do you have a minute? There's something I would like to discuss with you, about Harold's death.'

James looked somewhat apprehensive, and Frank began to feel a little edgy.

'Come in. Have a seat.'

James walked over to a chair near the view-port and sat down. He looked nervously back at the door, seemingly to make sure it had closed behind him.

Frank leaned forward on his desk and clasped his hands together, 'What's on your mind?'

James avoided his gaze, running his hands through his floppy black hair, he said, 'It's Jake.'

'What about him?'

'Well sir. There's something confusing me, and I want your opinion on how I should proceed. You see, Jake said that Harold died of acute subdural haematoma.'

'Is there something wrong with that?'

'There might be. You see. Subdural haematoma, while it's extremely serious, would never kill somebody in three days.'

'Are you sure? Doesn't it depend on the seriousness of the head trauma?'

'Well, yes. But subdural haematoma is more of a side effect than a full-blown cause of death. Now if it were concussion it would make sense, but to say that Harold died of subdural haematoma…' he trailed off, 'No, there's something about Jake's diagnosis that doesn't sit right. And I can't put my finger on it.'

‘What are you saying?’ Frank asked.

‘What I’m saying is. Well, what I’m asking is. I would like your permission to perform my own post-mortem to establish cause of death.’

Deep down Frank knew this was coming. He sat silent for a moment before speaking.

‘This is a serious accusation against Jake’s diagnosis. Why would he lie about the cause of death. It’s not as though he has anything to gain from it. We’re all working to the same common goal here.’

‘Yes I understand that sir.’

‘I realise that Jake ranks lower than you, but he is a competent medical officer and I defend his position. You and I both know that we could undermine his valuable trust by performing a post-mortem. In a confined crew environment that could be potentially destructive to his personal well-being. He could retreat from the group and -’

‘Then don’t tell him, sir. Jake and I perform opposite shifts. Let me perform the post-mortem while he is asleep. He need never know.’

‘Why are you so keen to do this James?’

‘Sir, as chief medical officer I deserve the right to a final say in matters of crew health and safety. And I believe that there is a fair enough sized discrepancy to warrant a second opinion.’

‘But Harold’s dead. It’s too late for that. Surely second opinions are for less extreme situations.’

‘Sir, I think the crew deserves to know. What if Jake is lying?’ James said quietly.

Frank sat again in silent contemplation, almost unable to believe the scenario that was unfolding before him. He spoke softly.

‘James, do you believe that a post-mortem performed by you would add anything to Jake’s account of his death. So much so, that you’re asking me to spare you from other, more pressing duties so that you can perform it?’

‘Yes sir, I do.’

‘Very well then. As you outrank Jake, I grant you permission. But you are to perform it tomorrow night when Jake is asleep in his quarters. And you are to speak of it to no one. Understood?’

‘Yes sir. Thank you.’

‘Tomorrow morning I’m holding a meeting in the Rec room at 07:00. Can you make sure everyone knows?’

‘Yes sir, I’ll do that.’

After James had left Frank’s cabin, Frank undressed, put on his gown and made his way through the rim corridor to the low-gravity shower unit. He did a lot of thinking in the shower, and he always relished the luxury of having

such a sophisticated unit in space. On his previous missions, the hygiene facilities were, quite literally, antiquated.

He pondered the day's events. Not long ago he had woken up from an extraordinary sleep that had lasted over a hundred years. Then, upon waking, he had been presented with the sad news of Harold's death. Today had been an emotional journey. In the extreme circumstances of the Daedalus mission, he found himself torn between the more pressing aspects of the mission, and grief for his friend Harold. He wished he could lay the matter to rest, put the grieving behind him, and turn his efforts to the mission. But part of him wanted to grieve. Part of him knew it was necessary to spend some time saying goodbye. However, he knew that a half-hearted order or an error of judgement could cost the lives of the rest of the crew. He knew he needed to keep things in perspective.

There was something about James's request that unnerved Frank. As far as Frank was concerned, Jake's story seemed perfectly feasible. However, Frank was not a trained doctor and would not necessarily detect any minor discrepancies in the medical aspects of Jake's story. And suddenly it had become a story. It was no longer the truth any more, merely a version of the truth which was open to interpretation. James had changed Frank's perspective on the matter.

Frank switched off the shower and stepped out of the unit. As he did so he noticed that his feet were covered with clumps of hair.

He looked back into the unit. He noticed more hair had collected on the floor near the water suction pipe. He reached his hand to his head. The hair was his colour, but it didn't feel like he'd lost any. He switched the shower back on and washed the hair into the suction pipe.

Back in his cabin, Frank looked in the mirror. He seemed to have a full head of hair, but then there wasn't that much in the shower unit, maybe he'd lost a little from all over. He began to worry. Maybe he had had an adverse reaction to the intravenous drugs he had received during cryogenic sleep.

Or perhaps he had suffered mild radiation exposure.

He made a mental note to discuss it with James after the meeting.

7 May 2171 AD

'Good morning, and can I be the first to offer my congratulations to all of you. You are now officially the farthest travelling humans mankind has ever known, and also the oldest.'

Franks opening words elicited some laughs from the other five members of the crew.

'As you all know, in the last hundred and fifteen years we have travelled over two-hundred and fifty thousand astronomical units. That's a quarter of a million times further than the distance from the Earth to the Sun. Remember, we left the solar system after only ninety astronomical units. Anyway, this communication from Earth,' Frank held up a palm computer, 'was sent nearly five years ago by someone old enough to be my great-grandchild.'

More laughter from the crew. At least the cryo sleep hasn't destroyed everyone's sense of humour, Frank thought.

'It's somewhat ironic that this pioneering mission is being undertaken in a

spaceship which is now an antique! And that most of the technology on this ship will have been superseded back on Earth several times by now. We are, for all intents and purposes, a time capsule, a little piece of history floating through space. I hope these facts are putting things into perspective for you, and not making you feel too old.' He continued.

'Before I read this message and go on to talk about the mission, I would like to say a few words about the sad loss of our crewmate and friend, Harold.'

'No doubt you're all by now aware of the circumstances surrounding Harold's death. It seems as though an external force believed to be a meteorite hit the Daedalus. The timing was such that Harold sustained an injury from which he never recovered. We may never know the real cause of the jolt we encountered because, through no fault of his own, Jake had not been sufficiently cross-trained to respond to such an emergency and track the location of the object that hit us. I can only conclude that this is a hazardous mission, and we all knew the risks when we started. Harold knew those risks also, though I feel that it's important we complete this mission successfully in his honour.'

Frank caught James's eye, a knowing glance. Then he continued.

'Jake did his very best to make Harold's last days comfortable and we should all be thankful that he was on hand to administer the correct level of treatment at such an early stage. Jake, I commend your actions and would like to thank you on behalf of the crew.

'We will be preparing a statement for downlink to Earth tomorrow. Which brings me on to our message.'

'Mission Control has sent us a greeting. It's over 50 pages long and it contains a substantial amount of information about what has been happening at home over the last hundred and fifteen years.

'I will circulate this to all of you in due course, but if I may, I would like to outline the main points now.'

'Our new boss - the seventh female President of the United States - named Tamara Hayward, is in her fifth presidential year, and she's doing really rather well in the opinion polls at the moment. I guess there's less scandal when a woman runs the show.'

More titters of laughter from the others.

Frank suddenly had a flashback of the day he performed best-man duties for a friend of his back in New Jersey. Twenty months before the launch, it was a very hot June day, and he was delivering a speech to the intoxicated and expectant crowd. Hoping to God that he would be funny. And for a moment the sights and smells of that wonderful occasion flooded back to him as though he had showered in the very essence of it. He had to stop speaking for a moment while it passed, until the smell of cherry blossom was gone, and the sun no longer glistened on that nearby lake.

He was suddenly catapulted back to reality. Into the Daedalus, where the birdsong was replaced by the machinery hum, so far away from home, spiralling through the cold icy void of space.

His speech that day had been well prepared. His delivery now was very much in the improvisation style, but he thought the style befitted him quite well.

He took a deep breath and carried on.

‘President Hayward has prepared a message for us, which reads… “Greetings to the crew of the Daedalus on this, the most brave and courageous mission ever undertaken by mankind. In the time that you have been gone from here, so many things have changed. Things that even I cannot tell you about, as they precede my lifetime and many lifetimes that have gone before me. You will be somewhat relieved to learn that the signal that you have been sent to intercept is still beaming to the Lincoln Outpost, just as it has for the last hundred years. All our thoughts are with you, as we honour the sacrifices you have made for the advancement of your race, and I’m sure I speak for all the citizens of the Earth when I wish you, the ambassadors of our species, a safe and prosperous trip into the pioneering depths of space.” It’s just a big slice of Mom’s Home Made Apple Pie if you ask me.’

‘It then goes on to talk about power sources. I’ll just read this bit. “Oil and Gas now provides less than two percent of the Earth’s power supply, the majority now being taken up by solar, wave and wind technology. Vast solar sails of highly reflective aluminium compounds are now tethered in space above the polar ice caps to channel solar wind energy into vast processing stations at ground level. The advancement of this technology was pioneered after the rainforest amnesty of 2082, which became the catalyst of change from an energy point of view. The Green Revolutionist Army had developed a latent chemical with high toxicity to humans and zero toxicity to plants, which they deposited over thousands of square miles of rainforest in South America using crop spraying planes. The chemical,’ (unnamed by the way), ‘was absorbed harmlessly into the tree bark and released when the inner rings were exposed. In other words, anyone attempting to fell a tree in that area would be exposed to traces of the lethal chemical. Many say the Army’s move was brutal, but they stood by their policy that if they needed to kill a man to save the planet, then so be it.”’ His voice trailed off.

Frank then felt the colour drain out of his face. He could feel the prickles of sweat on his face. ‘This is strange. Get a load of this. Attempts to land the first men on Jupiter’s moon Europa back in 2099 proved unsuccessful, even disastrous. A manned descent capsule named Horizon was dropped from an orbiting habitation module. All eight members of the descent team and the orbiter crew were lost in “an unprecedented and catastrophic accident”. Whilst the Horizon descent capsule was making its final drop to the moon’s surface, the Orbiter circled to the other side. The two spacecraft were out of radio contact for three hours and twenty minutes, during which time the Orbiter had a disastrous accident. It was not known what exactly happened for over a year, until a salvage vessel was despatched to retrieve the wreckage and bodies. What they found was somewhat unbelievable, yet categorically true. The NASA Pioneer space probe had crashed into the Orbiter, causing an immense explosion and killing the entire crew. The ground team, clearly reliant on the Orbiter for their return trip to Earth, perished on the surface of the moon. Not a single astronaut survived the incident, and no further missions to Europa have been launched since. It is still not known how the Pioneer space probe, last seen on an outbound journey for the stars, managed to turn up around Jupiter in 2099 and cause such an accident. Clearly it doesn’t make any sense.’

Frank scanned the document some more, ‘What else. Ah, Cryo Dude 142 has just hit theatres across the mid-west. Only kidding.’

‘I think we’re the cryo dudes now, sir’ said Ian.

Everyone burst into laughter.

‘Okay, I don’t want to spoil all the surprises, so I’ll leave the rest of this for your private reading later. Loretta, can you copy this to everyone’s message box?’

Loretta Pearce, the systems engineer - nodded back at Frank.

‘On to our mission related agenda for today. Firstly, you can pat yourselves on the back for making it this far. You are all heroes in my eyes. But don’t go writing your acceptance speeches just yet, we have only accomplished the easy part, getting here. And we did that part with our eyes closed. Now, we’re headed straight for Proxima’s star, we have a lot of tough objectives ahead of us, and I’m going to need a hundred per cent from all of you. The photovoltaic scoop project has never been accomplished in this way before, so the majority of the task is theoretical.’

‘Let’s start with Loretta. How are the systems shaping up…?’

James pressed the button that released the catch on Harold Gunther’s cryogenic pod door. As the front of the pod slid to one side, the smell of the decaying body hit him.

As a doctor James was very used to the smell of dead bodies, and the cool temperature inside the pod prevented the stench from becoming too strong. But it was still unpleasant, especially after smelling the clean regenerated air in the Daedalus for the last few weeks.

He hooked the straps of the overhead pulley system around Harold’s waist, ankles and upper body, before activating the joystick, which enabled him to manoeuvre Harold over to a worktop and lower him onto it.

Using the pulley system was not really necessary in a weightless environment, as Harold’s body would have been relatively easy to move without any help. But the scene would have been a little undignified.

James climbed over to the worktop and detached the straps from Harold. Then he re-attached them to the metal hooks on the underside of the table.

Once Harold’s body was held in position, James moved the Freefall Doctor unit into position, and pushed the activation switch. A tinny, metallic voice emanated from the electronic sphere.

‘Online… Hello James, do you have some work for me?’

‘Hello FD. Yes, we are going to perform an autopsy on Harold Gunther.’

The Freefall Doctor was a more advanced weightless medical assistant than anything previously designed for the Space Foundation. Essentially it was a sphere that was slightly larger than a basketball, and all around it’s surface we’re sliding compartments marked with holographic labels indicating what was held inside. The design was simple but perfect. It could hang motionless in the air directly above the patient and enable the medical officer to access the basic tools he required to administer a wound or perform any other type of surgery. Using pressure jets it could rotate like a planet on any axis to enable easy access to its compartments, and could move out of the way if necessary. There was also a ‘dirty’ compartment into which used needles and other surgical tools could be deposited for sterilisation prior to automatic re-routing to their relevant compartments for further use. James found it ironic that this fantastic – and award winning - invention of Jake’s was being

used in an examination that could disprove Jake’s own testimony of Harold’s death.

‘James, please calibrate my camera to the orientation of the subject.’

‘Okay.’ James tapped in a command on the remote keypad. The pressure jets on the FD unit fired and the camera moved down to point at Harold.

‘Performing initial scan, x-ray and infra-red scan complete. Cranial impact point detected. Would you like me to remove the hair around the wound?’

‘Yes please.’

A small razor slid out of the side of the Freefall Doctor, and the unit moved itself closer to the wound.

‘Please wait while I scan the contours of the work area.’

The FD unit emitted a high pitch beep, rotated itself slightly, and then extended the razor to Harold’s head.

8 May 2171 AD

Ian floated up to the command module where Loretta sat alone in the half-light tapping commands into her unit. She had some music playing. It was Dido and Anaeus played by the Tokyo Philharmonic Orchestra. Outside the window, the star field hung motionless in the distant void amidst scattered nebula and swathes of galactic clusters. Here more than anytime during his Earth orbit missions, he could see the depth in that star field.

‘Are you all right up here on your own. I noticed you missed dinner.’

‘I wasn’t hungry. I needed to get these diagnostics finished.’

‘I didn’t know you liked Purcell.’

She smiled, ‘I like to keep it secret.’

Ian laughed, ‘What checks are you running?’

‘Oh just boring old gyro stuff. I seem to spend more time checking things than anything else nowadays.’

‘Have you managed to find out if PMC-04-A is still beaming the signal?’

She looked up at him, and when their eyes met Ian wondered if there wasn’t something in that look. He became more than a little lost in it. ‘There’s no point,’ she said.

‘What? No point in what?’ Ian snapped back to reality.

‘There’s no point in trying to find out. We have no way of knowing if the signal’s beaming from where we are at the moment. You see, the signal was broadcast to the Lincoln Outpost on a very narrow band. We could only pick it up if we were directly in the line of the transmission. But, because of the orbital paths of the planets, the journey we have taken has not caused us to cross the signal’s path.’

‘How come?’

‘Well, Pluto’s orbital ellipse is angulated seventeen degrees above the remaining planets in the solar system. Our gravity assist threw us onto an upward climb to meet with Pluto’s orbital path. Ever since then we’ve been nowhere near the line of the signal. Everything else has been happening on the flat elliptic below us. We probably won’t be able to pick up the signal until we get to PMC-04-A.’, she looked out of the view-port, ‘Provided it’s still being transmitted when we get there.’

Ian smiled, and fixed Loretta with a steady stare, ‘You know, you’re very attractive when you get scientific.’

James stepped into Franks cabin and pulled up a chair. Frank poured a couple of glasses of water, and sat down across from him.

‘You performed the autopsy?’ asked Frank.

‘Yes sir.’

‘And what’s your verdict?’

James was silent for a moment before speaking, as though he was carefully considering the implications of his words. He had a good head, and was often able to assess a situation with a single glance of his quick dark eyes. He resembled one of those old Hollywood brat-pack kids from the mid 1980’s

‘Sir, I am of the opinion that Jake has not told us the truth about Harold’s death. I have a number of findings that back this up.’

‘Like what, exactly?’

‘Well sir, the injury to Harold’s head was much more severe than Jake indicated. I don’t think he would have survived for as long as three days, probably not even three hours.’

‘So why do you think Jake lied about that?’

‘Well, I was getting to that. You see, the point of impact was, or rather is, should I say, a point of multiple impacts.’

‘I’m not following you.’

‘According to Jake’s story, Harold fell down the service tunnel and hit his head. But the markings on his head show multiple impact points. He died of several blows to the skull.’

Frank looked at him sternly, ‘James, are you sure about this. I have to stress again that the implications of…’

‘Sir, please. I’ve thought about this long and hard. I couldn’t sleep last night for all the thinking I was doing, but I can’t shake it. Jake simply has to be lying.’

Frank sat quietly. James spoke again.

‘Sir, do you think we should detain him?’

Frank examined his hands thoughtfully, ‘No, it would undermine the trust of the rest of the crew. I want to keep an eye on him. I’ll notify Ian. But

we'll keep this between the three of us. We'll watch Jake and see how he behaves.'

'Okay sir.'

'I don't doubt your findings James, but I'm not ready to believe that Jake killed Harold. This mission is unique, vital and precarious, and an incorrect command decision could mess up everything.'

'I understand. I'll help you monitor him, sir.' James stood and walked to the cabin door.

'James, one other thing.'

'Yes sir.'

'While I was in the shower last night I noticed that some of my hair might have fallen out.'

'Really?'

'Yes, it was quite alarming. I thought that maybe I had suffered mild radiation exposure, perhaps while I was sleeping. Are there any tests you can run?'

'Why didn't you tell me before?'

'James, there's been so many other things going on.'

'You have to promise you won't leave anything this long again. I really need to be notified straight away if anyone thinks they may have an illness.'

'Okay okay, point taken James, I won't do it again.'

Ian placed the photograph of his late wife back on the table beside his bed. If she had still been alive, he would never have applied to join this mission. They would have continued their peaceful life in Alloa in Falkirk, on the banks of the river Forth, and the Daedalus mission would have passed him by. He would probably still be with the football team. Out drinking with the boys on a Saturday night in the bars on Clackmannan Road, just like the old days.

Maybe he'd even have had kids.

In the hundred years that had passed since he left, so much would have happened. It was likely than none of those things existed anymore. No football, no bars. He had sacrificed so much to be here, but never doubted that the Daedalus mission would be his way of getting into the history books.

He knew it was the right decision.

So strange how one event causes another to happen. Sometimes, when he really thought about it, it was hard to imagine how he had gotten from there, to here. The sequence of events and twists of fate that had caused him to be so many millions of miles from Earth, floating in an antique tin can.

Space did funny things to people, he thought. It redefines one's social role. For example, on Earth, day after day, humans perform thousands of different roles. One minute you would be husband to a wife, or a father to a

son. Then you would play the role of a customer in a shop, an agony uncle to a friend in distress. A teacher, a pupil, an employee or employer. Those situations enable the development of one's identity, because each one requires a certain type of behaviour, even a certain type of vocabulary.

In space, those roles just didn't exist. At least, not in the same way. Everything in space just is. All you did was sit on your branch of the hierarchical tree, performing the tasks you were there to do, perhaps with a little bit of crossover, but certainly nothing involving radical social and professional dynamics.

Without those roles, the reserves of experience from which to draw become smaller, and it ultimately affects one's ability to balance ideas in a decision making process, and evaluate one's progress alongside others. Everything had a knock on effect.

He was no longer a husband. Now he was just Ian, the astronaut.

He looked at his watch. It was time for dinner, and he made his way out of the cabin and along the rim corridor to the Rec room, where Janice was serving up a wonderful potato bake.

At least the food in a CELSS is good, Ian thought. They say an army marches on its stomach.

Mealtimes were an important event in the social calendar of the Daedalus. It enabled the necessary winding down associated with stress depletion in the confines of the ship. Isolation and confinement could often lead to loss of motivation, and there really couldn't be any allowance for that on a space mission, so the meals were made into a bigger deal than perhaps was necessary. And often, when there was little else to do, mealtimes became a highly anticipated milestone in the crew's recreation time.

It was good to punctuate the perpetual night with events to look forward to.

'Did you know,' Janice said to Ian after they had all sat down, 'that the Daedalus tracked a second comet while everyone was asleep?'

Ian blinked with surprise, 'Really, after Hyakutake? Was it a new one, or one the Foundation has already catalogued.'

'Oh it's one we've seen before,' added Jake, '418-Minos, named after the Greek king. Three hundred kilometres at its widest point.'

'It's somewhat ironic,' said Ian, 'that a spacecraft named after Daedalus, aid to King Minos, builder of the labyrinth to contain the Minatour on the island of Crete, should – some five thousand years later – fly past and catalogue a comet named Minos. Don't you think?'

'How can you place a date on a mythical legend.' said Jake laughing.

'Wow, Ian you really know your Greek mythology.' said Janice.

'Daedalus and Minos meet once again.' whispered James.

'What goes around, comes around.' added Ian in his most mystical of voices.

The others laughed, and carried on with their meal.

‘Sir, I’m going to pull out a couple of your hairs for analysis,’ said James

‘Good, as long as you don’t stick any needles in me.’

‘I didn’t know you were scared of needles.’

Frank laughed, ‘Can you believe it? Me. A member of the Space Foundation Astronaut Team. I became a damn pincushion during training. I hated every minute of it.’

James tugged at Frank’s hair, pulling out a couple of strands and placing them on a slide. Then he put the slide under the microscope.

‘Well, there’s no sign of any cell damage. Certainly no sign of any radiation exposure. Did you retrieve any hair from the shower unit?’

‘No, I didn’t. Stupid of me. I should have got some, but I guess I wasn’t thinking.’

‘Well, it was only yesterday that you took the shower, the CELSS dumps won’t have churned it up yet will they?’

‘No I think it takes about a week, but you don’t really want to climb around in the dump unit looking for bits of hair. It’s pretty foul. The toilet sewage goes in there also. And what’s to say that the hair you find will be right stuff. I mean, everyone uses that shower.’

‘Which actually means that the hair might not be yours mightn’t it?’ James added.

‘That’s a good point.’

‘It backs up what I was about to say anyway. Judging by this sample, you’re in the clear. But someone on this crew, with brown hair like yours, could be suffering from the results of mild exposure to radiation.’

‘Brown hair. It could only really be Jake.’ Frank said.

‘Then we’ll need to get a sample from him. There’s no point in me testing the medical store sample. It was taken back at the Rig long before any of us would have been exposed.’

Ian had been doing some hard time in the gymnasium. He spent most of him time working on his upper body, which is where most of the strenuous work was done now. In the weightless environment, he had to use his hands to pull himself around the ship, pulling on grab bars, and attaching velcro strips, and also use them stop himself from crashing into walls. He also found that his fingers ached a lot from all the extra work they had been doing. But he was used to it now, especially after the amount of space flights he had performed to date.

Sometimes, after a stint in the gym, he liked to go up to the acrobatics facility.

He loved being weightless. It was an entertaining novelty that never really wore off. Many astronaut crews had petitioned the Space Foundation in an

effort to get the company to include an acrobatics room purely for fun.

The Daedalus was the first ship to get one. A five metre by five metre padded room with nothing in it but a door and a small view-port. It was housed in a small room at the back of the cryogenic module near the observation suite.

As Ian lifted himself into the room, he grabbed the door handle behind him and swung it closed with ease.

He was alone. He floated up to the ceiling, flung her body round and pushed against it with her feet. He darted around the room, spinning round at the last minute and kicking off the opposite wall before he hit it.

Then he stopped his motion, and moved along the wall. Pushing himself away he put his arms out, spinning slowly in the air, and as he drew them in, his spin rate increased like a ballerina, until his hands were down by his sides and he spun at an incredible rate. By raising his arms again, his rate of spin declined.

He was killing time until his next shift. For once, taking his mind off the pressing aspects of the mission.

Where were they going? What was the meaning of the signal? Would they survive this unprecedented situation? What will PMC-04-A look like up close? A whole new world of wondrous things.

Of aliens perhaps.

These things could not be ruled out. The stuff of science fiction was now the stuff of fact.

The door opened beneath him, and Loretta floated up into the room.

‘Thought I might find you here.’ she smiled.

‘Am I that predictable?’ Ian asked in a joking manner.

She reached a hand to his and he took it, helping her up through the door and into the room.

‘Don’t worry, Ian. I’m not stalking you.’

He smiled, ‘I wouldn’t mind it if you were.’

‘If I didn’t know better I’d say you were flirting with me.’

‘Really? Well I’ll be damned.’

He moved closer to her. In the weightlessness, they pulled each other into a deep kiss. It was a wonderful moment for him. He could feel within him a release of so many tired emotions that he longed to be free of. He only half realised how much he had longed for her kiss.

Now, after all this time and all this distance, he finally felt as though he had found a home inside himself.

CHAPTER EIGHT: AEGEAN DISTORTION II
Greece - 2407 BC

There were strange ripples in the water.

Tiny and fine, as though the sea were the contents of a crystal glass and some higher power was running its fingers round the rim, creating minute waves.

The vibrations extended, and the boy could feel his skin and bones tingling under their influence. It tickled, and he started to giggle, letting salty water into his mouth.

But the vibrations increased further, and the boy's laughter soon stopped. He was beginning to feel uncomfortable.

He started to swim back to shore. The other children on the sand had stopped playing their game. He could see by the look on their faces that they too could feel the strange vibrations.

As the boy stumbled out of the water, the tremors became so strong that he fell, hitting his head on a stone as he dropped to the ground.

As he lay on his side, he could see a group of crabs dashing away from the waters edge and burrowing into the wet sand.

The boy picked himself up, rubbing his sore head. He heard the others shouting, pointing at the ground.

He went over to them, and looked down to see the fine grains of sand jumping in a merry dance. Even the smaller stones were beginning to move - such were the vibrations.

Despite the shaking, everything was unusually quiet.

It was enough to scare the young boys. Even the more adventurous ones who had been climbing on the cliff face started to descend to the ground as loose rocks began to rain down on them.

All of a sudden, an unrecognisable and rancid smell filled the air.

This was the overture. Soon the distortion would come, and this was the stuff of legends.

CHAPTER NINE: REFRACTION ANOMALIES
27 June 2171 AD

James plugged his palmtop computer into the network point in his cabin. Once he had logged into the system he accessed the medical database, which contained seven petabytes of medical information. In the symptoms search page, he entered the keywords 'HAIR' and 'LOSS' and submitted the search to the database.

When the results appeared, only one page seemed relevant. The entry for Trizoliphium-i3a;

TRIZOLIPHIUM-i3a (n) [try-zo-liff-e-um]

Drug used to prevent calcium deficiency, heart shrinkage and bone degradation in astronauts exposed to a prolonged weightless environment.

Dosage: The human body cannot store Trizols. Excess Trizols are excreted through the bowels once required levels attained. An overdose is not

possible.

Possible side effects: Loose bowels through excessive intake. Possible hair loss reported in 1/20,000 subjects when exposed to low-level gamma particles. Acute paranoia may ensue.

Reference note: For twelve months prior to launch of Daedalus, Trizoliphium-i3a was integrated into the crew's diet. All the food supplies that were taken onto the Daedalus contained traces of the drug. It was also genetically incorporated into the organic material that makes up the soil used in the hydro- and zeoponics area.

James stood up from his seat and moved over to his comms unit and patched through to Frank's cabin.

'Sir, are you there? It's James.'

There were a few comical fumbling noises as Frank wrestled with his comms unit.

'Yes James, what is it.' He sounded tired.

'I've found something on the medical database that I think you ought to see. It's about T-i3a.'

'What about it?'

'One in twenty thousand subjects who take the drug suffer from hair loss as a side effect.'

'You mean Jake.'

'Yes I mean Jake. But it's worse than that. Subjects who reported hair loss also experienced acute paranoia.'

'And they passed this drug into the program?'

'One in twenty thousand would be considered as an acceptable risk, especially considering you probably need to throw some gamma particles into the equation.' James reasoned.

'What would indicate the manifestation of paranoia in Jake?' Frank asked.

'He would think that people were out to get him. Possible violent outbursts.' James said.

'You still think he killed Harold, don't you?' Frank asked.

James was silent for a moment, 'I think we should revisit that theory.'

'James we don't have time. The photovoltaic scoop begins in two hours. We've got too many other things going on.'

'Yes sir.'

'But we could detain him.'

'Where?' James asked.

‘In his cabin. Meet me outside my cabin in ten minutes. I’m calling Ian.’

‘Okay sir.’

‘Sir?’ said the Freefall Doctor.

‘Yes FD, how can I help you?’ replied Jake

‘Would it be possible for you to run a routine diagnostic check on my System Register Log?’

‘FD you know you can run that diagnostic yourself.’

‘I realise that sir, but I would feel more comfortable if you were able to run the check for me.’

‘Why?’

‘There is an erratic routine in my upper memory which appears to be self-contradictory, and is looping infinitely.’

‘Perform a re-boot.’

‘I have tried that sir, and the loop has re-initiated. The main file has become truncated and I am unable to close it for backup.’

‘What is the file?’

‘It is an extrapolation file, sir.’

‘Ha! You’ve been thinking again haven’t you? You know that some of your more advanced thought routines haven’t been perfected yet. What were you thinking about.’

‘I was thinking sir, about the autopsy,’ said the metallic voice.

‘What autopsy?’

‘The autopsy on subject Harold Gunther, sir.’

Jake stared directly at the floating unit, ‘But no autopsy was performed.’

‘I am referring sir, to the autopsy performed by Dr James Clarke on May 7th.’

‘What!’

‘My extrapolation file… accessing… indicates that my creator may be incriminated as a result of the data from the autopsy performed by me. It appears as though I have been used to aid that end. It is a contradictory situation, and one I am unable to resolve.’

Frank, Ian and James were stood outside the door to Jake’s cabin. After one final nod of approval from Frank, Ian knocked on the door.

‘Jake?’

Silence.

‘Jake, are you in there?’

Still nothing.

‘Where do you think he is?’ James asked.

‘I don’t know,’ replied Frank, ‘Put out a call and retire everyone to their rooms.’

‘What, so close to the scoop?’

‘He’s right, it’s too suspicious. Let’s split up and look for him. If anyone finds him, don’t confront him, just call the others and we’ll do it togeth…’

He was interrupted by a woman’s scream elsewhere on the ship.

‘Loretta.’

‘James, check her cabin, we’ll check the cockpit.’

They split up. Frank and Ian raced to the service tunnel and climbed the ladder to the axis corridor. The transition from the centrifugal force to the feeling of weightlessness was always uncomfortable, but Frank paid no attention to his stomach now, and the two of them used the climb bars to pull themselves through to the command module. All the time they could hear Loretta screaming.

When they arrived at the cockpit, they saw Jake floating above Loretta with his arms around her neck. She was strapped into the chair, and was fumbling with both hands to release herself, but Jake’s arms were obscuring her view. Her face was almost purple.

‘You shaved his head. Don’t you trust me?’ Jake shouted furiously.

‘Jake, let her go.’

‘Why are you all against me. Did you think I lied?’ his fist came down onto Loretta, landing squarely on her cheek, she squealed in pain.

‘Jake, let’s discuss this like adults.’ Frank said.

Ian interrupted, ‘Forget it. We’re not discussing anything until you let go of her.’ he launched himself at Jake, grabbing his arms. Jake released his grip on Loretta and turned towards Ian.

As Ian hit him, his momentum carried both of them over to the control panel behind Loretta. Jake slammed hard into it, and was momentarily winded. It was just enough for Ian to overpower him, forcing Jake into an armlock.

‘This has nothing to do with Loretta. If you have a problem about anything then you come to me.’ said Frank.

Loretta began to undo her straps. Frank went to her and began to examine her neck. She was shaking, as though she thought she had finally met her end.

‘Are you okay?’

She moved her hands to her head, ‘Yes, I’m fine. Ian, thank you.’

Jake gave up his fight with Ian. He knew he was outnumbered. He began to sob. A puzzled, childish look crossed his face.

‘Jake, I’m confining you to your room until after the scoop.,’ said Frank, ‘then we’ll discuss this further.’

‘Solar panels on standby.’ ordered Frank.

‘It’s beautiful. Loretta, look at that star. It’s so beautiful.’ said Ian.

‘Panels on standby, sir.’ replied Loretta.

‘Ian, can we have your full attention, please. I need you to check the panel arms.’

‘Sir, the panel arms are secure.’ Ian responded.

‘Okay, let’s undock them.’

‘Panel undocking initiated. Should take a few minutes sir.’

Janice walked along the rim corridor of the accommodation module carrying a tray of drink cartons for the crew.

As she passed Jake’s cabin door she could hear him moaning softly. It sounded to her like he was in some pain.

‘Hello,’ she heard his voice through the door, ‘I need some help. Can somebody help me? My foot is stuck.’

Janice hesitated by the door.

She knocked lightly, ‘Jake, are you okay?’

‘Ja...Janice, I need some… can you help me get my foot… it’s stuck.’

Janice bent down and put the tray on the floor. She pressed the button to open the cabin door and stepped over the tray and into the room.

‘Jake?’ she looked around but she couldn’t see him.

As the cabin door slid closed she turned, and saw Jake standing behind her with a wild and crazy look in his eyes.

Before Janice even had a chance to scream, Jake slammed the Freefall Doctor unit down on her head.

It was a forceful blow. She heard a dull crack, and felt her skull split. But that was all she felt. Her eyes rolled upwards in their sockets and she collapsed to the floor.

‘The scoops is going fine, but the solar panels are getting pretty hot, sir. Do you want me to override the routine?’ Loretta asked, clearly agitated, ‘We can’t afford to lose them.’

‘We can’t retract them yet. We haven’t filled the reserve cells.’ Frank said impatiently. He knew the implications of retracting the cells early, just like the others did. They needed to get all the power they could from this scoop.

‘Don’t do anything until you absolutely have to,’ he added.

Jake?

Jake was sitting curled up on the floor at the foot of his bed.

Jake. I want you to listen to me.

Jake lifted his head slowly, through the tears in his eyes he peered around his cabin.

There was no one there.

Jake. Do you know who I am?

‘Hello?’ Jake croaked.

They imprisoned me, like they imprisoned you. Jake, can you hear me.

‘Who are you?’

I built a maze. But it could not contain the monster. So they imprisoned me.

‘I don’t understand.’ Jake muttered, ‘Why can’t I see you?’

There is a maze inside your head, but it cannot contain your mind. And now they have imprisoned you.

Near the door to the cabin, Jake could see a distortion in the light. It was as though he was looking at the room through a pair of spectacles that didn’t belong to him. Everything was blurred and out of focus.

Then, over his bed, hanging in the air, weightless, defying the centrifuge was a figure dressed in white robes. An old man. The apparition shimmered as though through a heat haze.

Jake, you are like my son. So clever, but so desperately naïve. His name was Icarus.

‘I don’t know who you are. Tell me who you are.’

I am here to warn you.

‘Warn me?’

Jake. I love you like my own child. So I am telling you. Heed my

warning. Do not fly too close to the sun, Jake. Your wings will melt and you will fall to the sea.

‘Daedalus!’

My father named me after your star-bird. Break free of your prison, Jake. But do not be too hasty in your escape. There is so much more destined for you and those who share my namesake.

‘You. You’re not real. I don’t see you. You are not here.’

Jake, I want you to watch closely, I have something I want to show you.

The Daedalus figure raised his arms, and moved toward Jake as though he was about to embrace him.

This is what you came here for. You and your friends. Listen to my words Jake. I am named after your star-bird.

Jake could see a brilliant white light emanating from between the apparition’s arms, which seemed to make the cabin appear much larger, as though he was being transported somewhere. And then he saw it. He saw what the apparition wanted him to see, and he clamped his hands over his eyes in horror. But it was behind his eyes. The realisation had hit him hard and fast, and he screamed louder than he ever had before.

My father named me after your star-bird. Remember this Jake.

My father named me…

The lights on the Daedalus went out.

In the dark, over the humming systems, somewhere on the ship, they could hear Jake screaming.

Frank’s heart stopped, and suddenly a multitude of thoughts pertaining to backup measures sprung into his head. He knew that after five seconds the red emergency lights should come on.

But the main lights were not down for long enough, and he gave out a sigh of relief when they came back on within three seconds.

He turned to the others, ‘What was that?’

Loretta looked up from her unit. ‘Sir we had a brown out, but it hasn’t affected any of the systems. The lights are always the first to go.’

‘Any idea what caused it?’

‘I’m checking sir, but all the power cells are fully operational.’

‘Maybe it was magnetic.’

‘Has it affected the scoop?’

‘No sir, we’re still gathering, but the panels are becoming dangerously hot.’

‘James, Ian, I need you to go and check on Jake.’

‘Yes sir.’ replied Ian. He and James manoeuvred themselves over to the hatch and disappeared through.

Jake could feel the module twisting beneath him, seemingly in several directions at once. He fought frantically with the syringe packet and brought out the needle. Then he scrambled over to the Freefall Doctor, climbing over Janice’s body as he went. Tears of anguish streamed down his face.

Halfway to the unit, his vision washed over with a grey hue and he lost his balance, falling and hitting the FD unit. It rolled away across the floor, reciting the ‘r’ section of the medical dictionary in its calm metallic voice.

He lay there for a moment, unable to move while the ceiling of his cabin faded in and out of view. Confused thoughts marched through his head, begging him to take notice, but he could not allow himself to pay them any attention.

He could taste blood in his mouth. He had bitten his tongue, and he spat, arching a globule of bloody saliva through the half-gee where it splattered on the opposite wall. He swallowed some of the fluid and coughed. Every heave of his chest filled his lungs with a burning pain, as though he had swallowed some of that desert sand.

His arm reached out to the FD unit. When his hand had a purchase on it, he rolled it back over and opened one of the compartments and took out the bottle within. When his palm closed around it, he pulled it down to his face and buried a needle into the cap, sucking out most of the bottle into the syringe.

The bottle fell out of his weakened grasp, and it rolled across the floor to where Janice lay.

The FD unit continued to recite words from the dictionary, oblivious to its master’s pain.

Then, in one swift movement, almost without a second thought, Jake raised the poisonous dose up to his neck, and plunged it deep into his main artery.

James was first into the cabin, followed by Ian.

James spotted her first, ‘Janice!’

‘She’s dead.’

‘My God. What did he do to her?’

Jake lay on the opposite side of the cabin, he was speaking slowly through a mouth caked with dried blood.

‘Up. Upside down,’ he gargled, ‘the whole thing’s upside down. It’s all so messed up. I’ve seen him. We need to turn back. Don’t you see. History repeats itself! The legend, Daedalus. Our ship isn’t named after him. He is named after us!’

‘What is he on about?’

‘I have no idea, he looks pretty bad. He’s been at the FD unit. Help me get him up onto the bed.’ James said. Ian moved in to help him as they lifted Jake off the floor.

‘I’ve seen it,’ Jake muttered, ‘How can we be expected to-’

‘Seen what, Jake?’ Ian asked him.

‘Forget it Ian he’s delirious, he can’t even see you. Get me that bottle. I need to know what he’s taken.’

Ian grabbed the bottle from the floor on the other side of the cabin, ‘It’s codeine.’

‘My God, he’s jabbed the whole damn bottle into his jugular,’ said James worriedly, ‘We’re going to lose him very quickly. ‘Maybe we should get Frank.’

‘No he’s tied up with the scoop. How long does Jake have?’ asked Ian.

‘An hour, maybe two, but he’ll probably slip into a coma before that.’ James checked his eyes, ‘His pupils have dilated. Damn, the symptoms have come on already.’ He looked up resignedly at Ian. ‘We’re too late. There’s nothing I can do for him. He’s already dead.’

Ian surveyed the carnage in the room, and could sense the bitter irony of the situation. Jake, the brilliantly intelligent inventor of the FD unit, had used the very fruits of his labour to end his life.

But why?

The FD unit was muttering metallically at them.

‘Shut that thing off.’ said James.

Ian reached over and clicked the switch on the FD unit. It fell silent, almost in harmonic sympathy with its master. And now, Ian could see a peace in Jake’s eyes that was never there before.

It was a brutal scene, and an increasingly desperate situation. And now they were down another two crewmembers.

‘I’ll go and get Frank.’

Loretta was becoming increasingly uneasy. The panels were beginning to melt. The temperature had become too high. She knew they needed to retract them now or risk losing them.

She was trying to think of a hundred things at once. Frank had been called to Jake’s cabin. Jake and Janice were both dead, and now she was stuck on her own in charge of the scoop.

She tried to concentrate, running the calculations through her head.

Oh Ian, where are you when I need you?

The power cells had reached seventy-six percent. It was an adequate amount for their deceleration around PMC-04-A. But that was all. They wouldn’t be

able to burn much when they got there, and would certainly not be able to accelerate out of PMC-04-A's orbit when the time came to leave.

The calculated trajectory had not allowed for a second pass by the star on the way back, as they would be swinging out past PMC-07 on a shorter solar orbit.

But if the panels melted, there would be no opportunity to perform a scoop later if such an opportunity arose. That left only one option. A decision she could not take lightly.

She tapped in the command to retract the panels. But the command was rejected. The panel arms were stuck. The axle mechanism had malfunctioned. Perhaps they had become too hot.

Loretta thought fast, trying to remember if there was a manual lever or something. But she knew only too well that the system was fully automated, and that the only redundancy consisted of a spare set of panel arms, but they would have to be fitted in a spacewalk. There was too much heat for that.

Another screen flashed a message.

'Dammit!' she cursed aloud. The panels were damaged. They were lost, and were no longer taking in any more solar radiation.

28 June 2171 AD

James leaned forward in his chair and addressed Frank and Ian 'We need to establish the course of events since Jake came out of cryo stasis.'

'Well, we're in no doubt that he had an adverse reaction to the T-i3a.' said Ian.

'No doubt whatsoever. As you already know, my records show that T-i3a does trigger a paranoid response in a small percentage of subjects. That, coupled with a dose of radiation exposure during cryo sleep obviously triggered a negative response. It fully explains the hair loss and the paranoia.'

'But why didn't the radiation affect all of us?'

James leaned back in his seat, 'Maybe it did, but the levels were so low that it will take longer for the affects to show. Nothing showed up in the hair samples though. Sir, we can't even be sure that there was a radiation level increase. We're only assuming it because that's what the database says.'

'Does anyone know what would cause a radiation level increase?'

'The termination shock?'

'No, I wouldn't have thought so.'

'Solar winds.'

'Same thing.'

'Maybe it was a wormhole.'

'Ian let's keep this serious. Okay, we're pretty adamant that Jake concocted the meteorite story in a more rational moment after a paranoid episode where he killed Harold with a blow to the head. And it was a similar, but much more brutal blow to the head that killed Janice. So let's look at the events

leading up to Jake's death. We locked him up because of his paranoid outburst at Loretta. I think we're all agreed that the safety of the ship's crew is paramount, especially during a procedure like the photovoltaic scoop. I think my decision was correct at that point. Then, because the scoop came up on us pretty quick, we had become caught up in it, and we hadn't had a chance to notify Janice that Jake had been detained. Janice went into his cabin, possibly to give him a drink, when he attacked and killed her. We're all fairly sure that that's what happened.'

'Definitely. I can see no other explanation.'

Frank folded his arms over his chest and took a deep breath, 'Which leaves one, no two more questions. What the hell caused the brown out? And why was Jake screaming?'

'Maybe he was screaming because of the brown out.'

'No,' Frank replied, 'the screaming came first, then the brown out followed.'

'Did the brown out have anything to do with the scoop. Maybe the power got routed to the primary cells instead of the reserve cells.'

'That would have resulted in a surge, not a brown out.'

'There's nothing Jake could have done to cause the brown out.'

'No, but there's a connection I'm sure, and I'm sure Jake isn't scared of the dark. And what was he muttering about before he died. Something about being upside down, telling us to turn back.'

'He said he'd seen something, sir, and that we cannot be expected to do something or other. You're right, it's nonsensical, but he was drugged up and delirious, probably hallucinating. He was high as a kite. Don't invest too much in what he said. Transcendental experiences are not uncommon in space. Remember that incident we heard about on Soyuz 7 when the flight engineer reported looking at the Earth from low orbit and hearing a dog barking. Maybe Jake experienced something like that. But I keep thinking about that thing he said. It was such a strange thing to say.'

'What did he say?'

'It was about Daedalus, the legendary character, being named after the ship.'

'Well, that's impossible. It's the other way round.'

'Yes, but Jake was talking about things being round the wrong way. I don't know what it means, but there's a consistency to his words.'

'Well, whatever he said, and whatever happened, he felt the need to end his life straight afterwards. My God, this has been a truly terrible ordeal for us all.'

'The panels are damaged sir, we had to cut the scoop short.' said Loretta in a dejected manner.

'How much power do we have?' asked Frank

'We managed to fill the cells to seventy six percent capacity.'

‘Is it going to be enough to enable us to decelerate at PMC-04-A?’

‘Yes, just about, but we won’t be able to leave. We’ll be stuck there. We won’t have enough power to TCM out.’

‘Dammit! Is there any way we can get more power from anywhere?’

‘Not without the scoops.’

‘Then we’re in a lot of trouble.’

‘I can’t help thinking about the parallels here,’ said Ian.

‘What parallels?’

‘Parallels with the Greek legend of Daedalus. Tracking the comet 418-Minos for a start.’

‘That’s a coincidence.’

‘Okay, maybe so. But what about the photovoltaic scoop. In the legend of Daedalus, he warned his son Icarus not to fly too close to the sun, right.’

‘And his wings melted and he died. Falling to his death. But that was Icarus, not Daedalus.’ added Loretta.

‘It doesn’t matter. It’s close enough to be uncomfortable.’ said Ian.

12 May 2172 AD

James was scratching his head, ‘Well how the hell did they get here?’

‘Did we really send this many?’

Ian laughed, exhibiting more than a little nervousness. ‘Did we?’ he said, ‘Of course not! We sent only one Voyager II probe out past the edge of the solar system, and there should only be one here now.’

‘How were we able to catch them up? Voyager II had an eighty-year head start on us.’

‘Maybe they were slowed by the termination shock.’

The crew were all crowded round the window in the observation suite, pressed up against the glass, breathing condensation and misting up the view.

It was a phenomenal sight, yet completely inexplicable.

The Daedalus was floating past a huge cluster of Voyager II probes. Hundreds of them, hanging in space, attached to each other in a long line, as though they had linked arms in protest against some celestial outrage. Solar panels pointing upwards.

As the Daedalus cruised by, Frank could see each probe glinting in turn as its solar panels reflected the light of the star that loomed behind them. The star they had used for the scoop.

‘No,’ said Frank. ‘They only sent one Voyager II probe out here. I’m sure of it. We need to photograph this, get as much of a visual record as we can, and report this anomaly back to Earth.’

‘It’s just like the Europa Pioneer incident! It was the original probe that killed the Europa team back in 2099. It was a copy, just like these are copies,’ exclaimed Ian.

‘It’s nonsensical,’ added Frank.

‘Can we steal the solar panels?’ asked Loretta.

‘No, they have a different configuration. You’re talking about an eighty-year gap in the design layouts. They were never intended to be compatible with the Daedalus.’

‘How come we never spotted these probes before? From Earth?’ whispered James rhetorically.

‘There’s too many damn questions, and not enough answers. I think this is the start of our discovery.’

16 May 2172 AD

There was a knock at Ian’s cabin door. Ian was dozing lightly, but was jolted back to reality with a start. Slowly he rubbed his eyes and got off the bed, ‘Coming,’ he said.

It was Loretta. She looked slightly flustered, almost alarmed, ‘Ian, there’s something I need to tell you.’

Ian looked at her in puzzlement, ‘What is it?’

Loretta eyed Ian up and down, almost avoiding his gaze.

‘Ian, I’m pregnant,’ she said with a glazed expression, as though she had rehearsed the conversation a thousand times.

Ian was stunned into silence. But he made sure it was only momentary. It was obvious that she was waiting for his reaction, be it positive or negative.

‘Loretta, my God-‘ was all he could manage at first.

She waited.

‘Is…it mine?’ muttered Ian, still unable to believe what she had said.

‘Ian how dare you!’ she exclaimed, ‘of course it’s yours, what do you take me for?’

‘I’m sorry. Oh Loretta I-‘ he was still fighting for words. This was a moment he had been waiting for all his life. To father a child, yet he never imagined that his reaction would be so stifled and un-heroic, ‘I’m so happy!’

‘Ian, I love you. I want to go through with it.’

Ian could feel his eyes filling with tears, one escaped down his cheek and dropped to the floor, ‘That’s just… incredible!’

‘Ian?’ she added somewhat coquettishly, ‘I’m worried about what Frank will say.’

‘Frank?’

‘Do you think he’ll disapprove? Do you think he will order me to-‘

Ian put a finger on her lips, ‘Let me talk to him.’

She nodded.

‘Does anyone else know? How did you find out?’

‘James knows, he was doing a routine check up, we had actually been monitoring my menstrual cycle. It’s been all over the place for a while now,’ she smiled thinly, ‘no lunar cycle to adhere to. Anyway, he’s promised not to say anything until I tell him otherwise.’

‘Okay. Let me talk this over with the others, we’ll see where we go from here. But believe me Loretta,’ he rested his hand on her belly and spoke as honestly as he was able, ‘If you want to keep this baby, then - barring any complications - I will defend it’s life against anyone who thinks it might be inappropriate for you to deliver it in space.’

17 May 2172 AD

James turned away from the view-port in his cabin. ‘I can’t stare out there for too long. I start to feel sick.’ He said, smiling at Ian.

‘I know what you mean. The best stargazing is done from the observation suite, not from the Accommodation Module. Anyway James, I think you know why I’ve come to see you,’ said Ian tentatively.

‘Yes I do,’ he said abruptly, ‘Loretta’s pregnant and you’re the father. I have to say Ian, I’m a little surprised at your stupidity.’

‘Stupidity?’

James laughed, ‘Do I need to explain. We’re on a pioneering mission into a new solar system and you can’t keep it down. We have a whole load of virtual reality programs to help us out in that department.’

‘Pornography.’

‘It serves a very real purpose Ian.’

‘Anyone would think you were jealous?’

James stared coldly at Ian, almost accusingly, then spoke softly.

‘Because she’s the only woman left on the ship? Doesn’t mean I’m jealous.’

‘Well, you know James, we’ve all been out here a long time. The VR programs only do so much. It’s only natural that-‘

‘Ian, drop it!’

‘Look. James. I don’t care if I get your approval or not, but Loretta needs your help. I need to know if it’s medically possible for her to go full term here.’

James was holding his breath, and Ian could feel the tension in the air, though he could pinpoint the exact reason for his resentment.

‘Well, strictly speaking, I could deliver it. But no one’s every tried a zero gravity birth. Underwater births happen all the time, but that’s just the birth. As for the pregnancy itself, and after the baby’s born-‘ his voice trailed off.

Ian attempted to finish his sentence, ‘It’s too dangerous?’

‘Yes, I think it’s too dangerous. We can’t be sure of what affect the zero gravity will have on Loretta, or the baby. I think the term would be extended, possibly to ten or eleven months. But I can’t say for sure.’

‘But it could work if she stayed in the Accommodation Module at all times. Maybe we could rig up the systems unit in her cabin, so she can work from there. It’s not ideal, but I think it might-‘

James interrupted him, ‘No Ian. Like I’ve already said, I think you should recommend to Loretta that she terminate the pregnancy. I think it’s highly possible the child’s bones won’t develop properly in space. And there have been no tests whatsoever into the effect of Trizoliphium-i3a on an infant.’

‘But T-i3a is supposed to counter bone degradation.’

‘Yes, in adults. I’m sure it’s not recommended for a pregnancy though. There are too many risks, and we may not be equipped to provide a deformed child with the medical care that it needs. By delivering it in space, we may be giving it – and Loretta - a death sentence.’

CHAPTER TEN: THE FINAL YEAR
June 2172 – June 2173

Loretta’s baby was aborted three weeks later, and James chose not to tell her that it was a boy. The less opportunity she had to dwell on the situation the better.

For several months Loretta retreated into a silent void which even Ian could not pull her out of. She would spend all of her recreation time locked in her cabin, and whenever she emerged for meals her eyes were deep set, tired and bleak. It seemed that nothing the men did could bring her back into the group.

They maintained their distance, yet kept a close eye on her. They knew she needed to be alone, but in a confined crew environment there was a fine line between privacy and alienation.

Ian knew it had gone too far when, on one occasion she was late for her shift. He gave her a grace period of an hour before he climbed down Service Tunnel B, walked round to her cabin and found her lying unconscious on her cabin bed, having cut herself many times with a sharp instrument.

Her upper arms and thighs were covered in lacerations.

The wounds however, were not deep or life threatening, and she survived her

self-induced injuries.

There was a marked turn-around in her state of mind on the occasion of a secret meeting between Frank, Ian and James, soon after the incident in the rec room.

‘According to my records, and the medical database,’ said James as he glanced across at the other two men, ‘ninety-eight percent of women who have abortions have no regrets and would make the same decision again if the situation arose.’

‘James, that’s hardly the same. Those statistics were generated on Earth,’ said Ian.

‘It makes no difference whether we’re in space or not. The woman is still the same. Loretta’s brain isn’t operating any differently just because we’re in space.’

‘I disagree James,’ added Ian.

‘How dare you talk about me like I’m some kind of robot.’

Their heads turned. Loretta stood at the door to the rec room. She looked drawn and weary, as though she had foregone sleep for a considerable time.

‘Loretta, I thought you were asleep-‘

She ignored him and spoke sharply, ‘Let me tell you what’s going on inside my head, as I can’t expect you three to work it out.’

She took a couple of steps further into the room. Cradling her arms over her chest she moved over to the view-port and stared out for a moment, seemingly constructing the words to put her point across.

‘I’ve spent my life working in the military and with the Space Foundation. You all know that. I’ve worked very hard to get to where I am, and it’s been difficult for me. I managed though; I managed to elevate myself through the ranks to this-‘ she pointed out of the view-port, ‘to here, in a relatively short space of time. I’m at the peak of my career now. Being on the Daedalus is the most incredible achievement anyone could wish for. I have reached my goal. At least as far as my career is concerned, but-’

She took a deep breath and continued, ‘Like so many other woman who spent the early part of their lives pursuing a career, eventually there comes a time where nature takes it’s course and we have a desire to mother a child. It’s built into us. I believe that women who continue their lives without children are suppressing that urge within themselves. Suppressing that part of nature.’

‘Loretta you don’t need to explain-‘

‘Yes I do Frank. I want to put this matter to rest so that we can get on with this mission. You must realise that I wanted that child. Now that I have reached a pinnacle in my professional life I wanted to-‘

She was close to tears. Ian stood and put his arm around her. She buried her face into his chest and wept.

James and Frank stood quietly and left the room. Ian raised a hand and stroked her sandy coloured hair ever so softly.

‘We’re here Loretta. We’re here.’

A few weeks later it became evident to the men that Loretta had overcome the emotions that were getting her down. She began to re-approach the group, getting involved in crew activities. She would indulge in conversation more and join in the games they would play and the movies they would watch, and she was accepted in a new way. Not just as a fellow crewmember, but as a human being who was in pain, and needed help in an extreme situation.

Frank could see the crew becoming increasingly close as a result of the whole ordeal, although there was always a slight animosity between James and Ian, which was evident to Frank, but which they always kept hidden from Loretta.

It seemed the two men had an understanding, albeit not a completely amicable one.

CHAPTER ELEVEN: PMC-04
00:01 14 July 2173 AD

‘PMC-04 is still in its ice-age,’ said Frank as he stared out of the view-port at the planet’s surface, almost shivering as he thought of the brutal temperatures that would exist there.

Ian, Loretta and James stood before him. They were all aware of the gravity of the moment.

‘But,’ he added, ‘it’s in a transition period, one that will probably take thousands of years. This planet is steadily moving to a new era in its historical development, just as mankind is. And that is why I think we should give this planet a proper name now. Not just a cold, unemotional code from an age-old cataloguing system. I’ve been searching the ships database for an appropriate title, and I think we should name this planet Mycenae, after the name of the civilization that signified the transition in ancient Greece from the Dark Ages to the Iron Age. It was a new step for the Greek society all those many years ago. And now, as mankind sits on the edge of a new frontier in space exploration, it is only fitting that we - on a ship named Daedalus - should give PMC-04 a Greek name.’

Ian nodded, ‘Then Mycenae is an appropriate name, and I second your decision.’

Frank turned to Loretta. She was silent, but approving. She looked withdrawn, as though she was still not fully over the terrible situation with her pregnancy.

James was equally silent, but Frank saw there were tears in his eyes.

‘Welcome then, my fellow human representatives, and friends. Welcome to Mycenae.’

Using the power reserves from the photovoltaic scoop, the Daedalus had performed a final burn to decelerate steadily into a retrograde orbit around the planet Mycenae.

The huge planet was about three-quarters of the size of Saturn. Remote sensing equipment on the Daedalus revealed that the majority of the surface did seem to be made up of ice fields, which were over two hundred miles deep.

Other readings showed there to be a vast reserve of metallic compounds in the rocky outcroppings, as though some unknown chemical reaction had taken place at some time in planet's history. It could only be left to speculation as to what lay beneath the ice and rock, but it was probably molten lava. Over the visible surface of the planet was a turbulent display of ferocious electrical storms that raged around the equatorial perimeter.

Even from this high altitude, it was possible to see the immense ice covered mountain range that lay at the north polar region. Ribbons of glacial valleys complete with truncated spurs of sheared rock where the force of the ice had crumbled everything in its path. At the base of the glacial valleys were huge melt-water rivers, thousands of kilometres long and hundreds of kilometres wide. A glacial process very similar to that of Earth's, but on a much grander scale.

Later on, when the others had left, Loretta and Frank were alone in the Command Module, overseeing the final burns.

'We'll be shutting off the power in fifteen minutes. This is the last TCM brake prior to orbital insertion around the planet.'

'Still no sign of the moon.'

'Not yet sir. According to the Spread Spectrum analysis, the moon is on the other side of the planet, on the night-side. We should have a visual in about two hours.' Loretta said, 'But I'm getting anomalous results when I try to ascertain its shape and density.'

'What kind of anomalies?' Frank asked.

Loretta turned in her chair to face Frank. 'Sir, the moon is not spherical as we first assumed.'

'Not spherical? What would that mean?'

'It would indicate sir, that it's more likely to be an asteroid that was trapped in Mycenae's gravitational pull and became a satellite of it, rather than a piece of rock that was spun off the planet during its creation, like our moon'

'When do you think you can get some definitive results?'

'Sir, I won't know any more until we get a visual.' Loretta replied.

There was a moment of silence. Frank put his hand on her shoulder.

'Are you alright? You are handling this so well.' he asked sincerely.

She looked back at him with eyes that betrayed a little desperation. But finally she said, 'Yes, Frank, I'll be okay. Thank you.'

'How do you feel about the whole situation?'

She sighed, 'It was so hard to take at the time. You see, Frank, I wanted a child so much, and I know Ian did too. But it was easy for me to let my heart rule my mind. Deep down I know that James was right. There could have been any number of complications.'

'Loretta I think you've been so brave. So brave. I admire you for the way you have dealt with it.' Frank whispered.

She stared at him, tears welling in her eyes, ‘I can get through this by knowing that my chance will come again.’

‘Yes, it will.’

‘When I get home. When we all get back to Earth-‘

‘Life will be so different, Loretta. I am sure the world we go back to will be a better place. A better place for you to parent a child. Your time will come, I’m sure of that.‘

14:30 14 July 2173 AD

The final two hours leading up to the visual on Mycenae’s moon were among the longest and most frustrating Frank had ever experienced.

Everything, the whole of the last one hundred and thirty years of project planning and mission time culminated in this moment. This mission, which had become his life. His, and everyone else on the Daedalus. This was their moment. The moment they found, and saw the thing that they had been sent here to investigate. The implication for mankind was astounding, and Frank could hardly contain his excitement. During the last thirty minutes he paced (as best he could in half-gee) around his cabin, waiting impatiently for the call from Loretta that indicated it was time to go up to the command module.

He went up to his view-port and stared out at the star field as it shifted past. What would the next hour, two hours, day, week even, hold for them?

Then his buzzer sounded, and Loretta’s voice came over the speaker system.

‘Sir, we have five minutes until visual.’

Frank took one last look at himself in the cabin mirror. It was time for the moment of his career. The moment of his life. This was the moment that Larry, Samuel, Frederick, Harold, Jake and Janice all died for.

‘Visual on Mycenae’s moon in T minus two minutes and counting.’

‘Loretta. Lock the short-range antennae on the horizon’s moonrise location. If that signal is still beaming we need to pick it up.’

Loretta keyed a couple of commands into her unit.

‘Checking co-ordinates. Antennae locked, sir.’

‘Good. Now, Ian, can you get a camera pointed at the moonrise location?’

‘I’ve already done it sir.’ Ian replied.

‘Okay, set the zoom level to five times.’

Ian started typing commands into his unit. All flight operations required good keyboard skills as well as a technical head for the task at hand.

‘Zoom set, sir.’

‘T minus one minute.’ said Loretta.

Then James spoke, ‘Ian, can you patch the image from the camera to the other monitors?’

‘Yes,’ he replied, and tapped out another command. The image from the camera appeared on six monitors around the room.

The crew waited in silence. The large planet occupied the whole port side of the Daedalus. The tumultuous storms raged on the surface and in contrast, all was silent on the ship.

Then Loretta spoke.

‘Okay, we have moonrise in T minus ten, nine…’

Frank could hear his heart beating heavily in his chest.

‘…eight, seven, six…’

He stared intently at the screen.

‘…five, four, three, two, one…’

‘There it is.’ Ian pointed at the tiny edge of a white object as it began to emerge slowly from behind the huge planet, slightly distorted by atmospheric occultation.

Frank moved closer to the monitor, ‘An ice asteroid?’ he asked.

‘Sulphur deposits?’ added James.

‘It’s too hard to tell. We need a better look. Increase zoom to times twenty.’ Frank said.

Ian tapped another command into the keyboard and the zoom increased, the moon was not centred, and it edged off the bottom of the screen as the zoom intensified.

‘Okay, move down.’

Ian moved the image down the vertical edge of the planet to where the moon was rising, or shifting from left to right, out from behind the horizon.

And the whole crew saw it at the same time. They all saw what Mycenae’s moon really was. What they had come here for.

It wasn’t an asteroid covered in ice, or sulphur deposits. In fact, Mycenae’s moon wasn’t even a moon.

CHAPTER TWELVE: EUROPA DISTORTION I

16 September 2099 AD – Orbit of Europa, Moon of Jupiter

‘This is Horizon Orbiter calling the Horizon Descent Probe. Please transmit your amended descent trajectory.’

‘This is the Horizon Descent Probe. Our Europa altitude is seventy-five kilometres, angle of insertion six point two degrees. We should be touching down in approximately fifteen minutes. We’re getting busy with

the manual thrusters.'

'Congratulations team, you're making history.'

Above the Orbiter, Jupiter was beginning to emerge from behind Europa. The gas giant was nearly seven hundred thousand kilometres away from them, but the thick belt of liquid metallic hydrogen that formed the huge planet's magnetosphere was sending out an electrical field that was strong enough to break up the radio signal between the two craft. As the orange gas giant loomed more and more over Europa's horizon, Robert Donnelly felt his attention being drawn away from the task at hand. His gaze fixed on the eye of a huge storm just above Jupiter's equatorial region. It seemed as though the clouds up there were moving ever so slowly, yet he knew that he was being deceived by sheer distance. Those winds would be gusting at about six hundred kilometres an hour.

Nothing mankind had sent into those winds had ever come out.

Somewhere in the gassy atmosphere of the giant planet were the many broken fragments of the Galileo Probe which was swallowed up by the atmosphere in 1995, and the Unity Atmospherics Module, a futile attempt to return samples of Jupiter's atmosphere to Earth, which failed to escape Jupiter's ferocious atmosphere in 2066.

Eleanor's crackly voice from the Descent Probe came over the radio, snapping Robert out of his trance.

'Okay,' she said, 'you're beginning to break up. How long are you boys gonna be round the dark side.'

'We'll be out of radio contact from you for three hours twenty minutes, so you be sure to take a lot of pictures when you get down to the surface. We need to have something to send home to Uncle Sam. "One small step..." and all that stuff. And try to get some footage. Sorry we're not going to be around for the touchdown.'

'Oh don't worry; we've got this thing licked,' laughed Eleanor, 'Bob flew this thing in the simulator a couple of billion times. The view from here is absolutely stunning by the way. The glacial striations on the surface are fascinating. I'm no geologist but the ridges are a lot higher than I was expecting. I'm not gonna forget this in a hurry. Oh…okay, we're losing you. I guess we'll see you on the other side.'

'Good luck with the landing,' said Robert, who was rather embarrassed to feel a tear rolling down his cheek, 'we'll be thinking of you.'

There was no response from Eleanor. The descent probe had dipped below Europa's horizon, and there would be no contact with them until the Orbiter had gone all the way around the icy moon.

CHAPTER THIRTEEN: MYCENAE'S MOON
17:32 14 July 2173 AD

Mycenae's moon was a spaceship.

Mycenae's moon was another Daedalus.

As the two identical spacecraft met each other in orbit around Mycenae, Loretta used the TCM thrusters to manoeuvre their ship into position alongside the other craft. This involved a transference burn from a retrograde orbit

to a prograde orbit, which effectively turned the Daedalus on its heels once it had met with the second ship.

‘Trajectory Correction Manoeuvre complete. I’ve used up the power from the photovoltaic scoop to enable us to fall into a match velocity pattern with the other Daedalus. But we’re running on empty. I’m relying on the orbital ellipse to keep us nearby; with a bit of thrusting to keep us on track, but I don’t know how long we can stay here. We have enough xenon, but we’re almost out of electricity to ionise it with.’

‘Okay we need to think about alternatives. Loretta, can you confirm that the signal picked up by the Lincoln Outpost was coming from this other Daedalus.’

‘I’m unable to confirm that sir. I can’t intercept the signal until we get directly in front of that antenna.’

‘Okay, well we don’t have any reserve power for a manoeuvre like that so we’ll have to put the signal confirmation on hold.’

Frank climbed over to the view-port and stared out at the other Daedalus. The craft had several dents in its hull, as though it had sustained many meteorite hits. Otherwise, the hull looked intact, but the accommodation module had stopped spinning. He could almost imagine that he was looking in a mirror, except he couldn’t see another Frank staring back at him.

He turned to face the crew. Pointing behind him, out of the view-port, indicating the ship that hung in space less than a kilometre off their port side, Frank said, ‘Now, does anyone have any idea how that thing got here?’

He looked around the cabin, and all he could see were blank faces. None of his team was able to offer a solution.’

‘It’s incomprehensible sir.’ Ian said, ‘It’s like the Voyager II cluster.’

‘Did the Space Foundation trick us?’

‘How?’

‘The accommodation module has stopped spinning. There can’t be anyone in there.’

‘We’ve been travelling for one hundred and fifteen years. Maybe during that time, while we’ve been asleep, the Space Foundation built a second Daedalus that uses a faster method of transportation than ion propulsion. It would have enabled a second ship to overtake us while we were in cryogenic stasis, and get to Mycenae first,’ said Frank.

‘I’m sorry,’ interrupted Ian, ‘but there are two reasons why that theory doesn’t work. Firstly, the Space Foundation would have notified us in that fifty-page report they sent us that they had built another ship. They would have told us. And secondly, they would have given it a different name. Not Daedalus. Even if they had called it Daedalus, then surely it would be Daedalus Two. To build two ships the same and give them the same name and send them to the same place. That would be plain stupid.’

‘Okay. What if we were the subjects of an experiment?’

‘Ha! An experiment?’

‘Yeah. Perhaps our reactions are being monitored. Put us in a strange

situation and watch how we behave.’

‘That’s even more ridiculous. How would the Foundation have got the ship here?’

‘Like you said. A faster propulsion system.’

‘We’re going round in circles here. It’s not possible, it doesn’t add up. You’re insinuating pre-meditation. You’re saying that the Foundation intended to fool us, meaning that they already had the technology for a faster propulsion system available to them back in 2048, when they decided to build Daedalus. Which meant that they would have sent us on a slower route, with a slower propulsion system, deliberately. It’s ridiculous. And what about the signal?’

‘Maybe there never was a signal.’

‘Oh there was a signal alright. I heard it.’

‘You heard a recording which could have been faked.’

‘Bullshit. This conversation is getting stupid. There’s nothing suspect about the mission profile. We encountered an anomaly. A puzzle that we have to figure out. There’s a perfectly reasonable explanation as to why this ship is here. We just have to find it.’

‘I think we should board her. We can download the ISOE and log data. There’s bound to be some information there.’

‘Are you crazy. Board her? Shouldn’t we hail her first?’

‘I’ve already tried. On every frequency we have. There’s no response.’ Loretta interjected.

‘Well, what else do you think we should do? We found the origin of the signal. We now know for sure that it wasn’t an extra terrestrial intelligence. It was humans all along.’

‘Whoa, wait, wait, wait…’ Ian said, ‘No, you guys are missing a vital component here.’

‘What?’

‘Okay,’ Ian continued, ‘The Lincoln Outpost received the signal in… when was it 2048? The signal, we assume, is coming from that spaceship, that Daedalus, right? This is where we tracked the signal. We found the source, and it’s this other ship.’

‘Right.’

‘Which means that it’s been transmitting the signal for about a hundred and thirty years. That Daedalus!’

‘It’s been here all along’

Ian jumped in again, ‘Look guys, it didn’t get built at the same time as our Daedalus. It wasn’t part of some stunt pulled by the Space Foundation. It’s not a backup ship either. It was already here. That ship is the reason we came here. It’s the signal from that ship that we came here to investigate. It’s like we built a second ship, to come and visit the first.’

‘But that doesn’t make any sense.’

‘No, it doesn’t. Maybe it’s a decoy.’

James interjected. ‘We definitely have to board her. We need to find out if it’s transmitting a signal. Wasn’t that what our mission was in the first place?’

‘He’s right; we could sit and talk about this for hours. We have no choice. The answers to our questions lie on that ship, so we need to send a party in to investigate.’

‘Okay, who gets to go?’

Ian spoke up, ‘I’ll go.’

‘Okay, but we can get two in the EVA, who else is in?’

Silence, then James spoke.

‘Me sir. I’ll go with him.’

‘Okay James, follow Ian’s orders at all times.’ Frank said.

‘Yes sir.’

The two Daedalus spaceships floated alongside each other a kilometre apart, hanging in space at an altitude of 1,800 kilometres over Mycenae. The planet’s surface reached off into the distance above, below, in front and behind them. At regular intervals the turbulent storms on the planet’s surface beside them would throw up immense columns of steam into the sky, sometimes rising up as much as fifty or sixty kilometres above the orange sulphur cloud cover. Beneath those clouds were the secrets of this wonderful meteorological phenomenon.

Sometimes, the accommodation module’s rotation would throw out all sense of ‘up’ and ‘down’. Occasionally the Daedalus ships were hanging alongside the huge sphere, then, after a few degrees of rotation, one would be filled with the sense that they were hanging in the sky, on their side, directly above the planet. Then, shortly after, the notion that the ships sat side-on to a planet that hung directly above them, and the crew would have to shake the idea that gravity would cause the planet to crash down onto them, smashing the two tiny ships into a million fragments.

It was somewhat reassuring to Frank, (though he couldn’t really pinpoint the reason why) that Mycenae contained seemingly vast reserves of water. For when there was water, there would often be life, either in the past, present or future, provided the climactic conditions were favourable enough.

Whether life on the surface had had the chance to evolve out of the icy oceans was clearly yet to be discovered, but the presence of these ‘sky-geysers’ indicated that there was possibly heat somewhere on or below the surface. It was heat and water that enabled the development of life on Earth, in the depths of the sea where the thermal vents rose up from the core.

Then he understood why he felt contented by it. It was comforting to know that despite the massive - and yet universally tiny - distance they had

travelled, the building blocks of life were still prevalent in other parts of space, reinforcing the increasingly definite notion that mankind was not alone.

If life had evolved out of the oceans on this planet, and time had allowed them to mature their genetic make-up, then within a few million years, a civilisation could develop. Perhaps even a species that could make it into space.

There was no doubt that Mycenae held – quite literally – a vast ocean of secrets that could aid mankind's quest for knowledge in the universe.

'Maybe,' Frank whispered to himself, 'we need to send a probe down'.

Inside the Command Module, Frank and Loretta sat at the comms unit. Frank pressed the button to open the link to Ian and James, who were preparing the EVA unit.

'James, where's Ian?'

'He's just in front of me sir.' James replied through the radio unit.

'Tell him to switch his unit on.'

A moment later Ian's voice came over the unit. 'Okay, I'm in the EVA unit, James is just getting in behind. Ready for detach in about two minutes.'

'Okay, let us know when you're out of the airlock.'

'Does anyone think there'll be any hostilities out there?'

'James, we're in space, the whole place is hostile.'

'Okay sir, I'm opening the airlock.'

Through the speaker, they could hear the mechanical drive that rolled the airlock door open.

'I'm thrusting forward. We're clear of the ship and heading towards Daedalus Two. I'm moving at ten metres per second. I'm going to reverse thrust. I don't want to come up on it too fast.'

Silence.

'Wow! What a view. It's beautiful out here. We'll be there in less than a minute. Its strange isn't it James. Hanging in space between two Daedalus spacecraft. What the hell is this damn thing doing here?'

'How are you doing, Ian?'

'Okay, we're coming up on it now. I'm sending a localised airlock instruction to Daedalus Two.' A moment of silence, 'It's accepted the command. The airlock door is opening.'

'Can you see anything yet?'

'Not yet, but I'll keep you posted, out. Oh, okay there's another EVA unit in there. I'm going to manoeuvre it out the way. We may have to lose it or

we'll never get inside.'

'Ian, you can't lose it. Do you have any idea how much those things cost.'

Ian laughed, 'Frank we have no choice. I've got it with the grappler device.'

'Can you hook it onto the outside of the ship somehow?'

'No, I've got a better idea. I'm going to keep it in my grappler and reverse into the airlock. Hopefully we'll both fit inside and I can shut the door.'

A few minutes of silence, then a couple of metallic clunk sounds, followed by a further message from Ian.

'Okay, both the other EVA unit and us are in the airlock, and the door is closed. Depressurising now.'

Over the speakers came a faint hissing sound, followed by a beep, which indicated that the pressure outside the EVA unit in the Daedalus Two airlock was the same as the pressure inside.

'Oxygen levels are normal,' said James. 'Hull integrity seems okay.'

'Right,' Ian said, 'we're ready to have a look around. We're climbing out. The inner door is opening. All the remote commands I'm sending are being accepted.'

'Does that surprise you?' Frank asked.

Loretta interjected, 'Even though the frequencies may have been recalibrated if the ship was different. It doesn't surprise me that they're the same. This is another Daedalus after all. What surprises me is the fact that it's here at all.'

'Okay Frank,' Ian said, 'we're inside. It's dark, get the torches.'

'Any signs of life?'

'Not yet. I'm going to head over to a network point to do a download of the ship status.'

'Okay, and keep looking for…' Frank was interrupted.

'Sir, what's that?' James said.

'I don't know.' Ian replied.

After a moment James's voice came over the speaker. 'It's an artifact of some kind. It seems to be made of some sort of metal, and there's a carving on the front.'

Then Ian spoke, 'It's a strange object Frank, the engraving is a picture of the Earth, it's beautifully drawn.'

'Ian you'll have plenty of time to look around after you've downloaded the log data. Get to a network point.'

'Okay, I'm plugging in. I hope the systems are running. We may have to reboot if there's a… Oh. It's okay; the systems are still functioning. 'I'm

downloading the status data now.’

‘Okay. Good stuff. I want you to stay on the ship and catalogue what you find. We’re preparing to send a probe down to the planet’s surface.’

‘Sir, a probe won’t answer any questions about Daedalus Two.’

‘No, it probably won’t, but while we’re here, picking our noses waiting for Ian and James to gather some answers, maybe we can get a little science done. We can learn a lot from what’s going on down on that surface. Down there are the answers to serious questions about extra-solar planets. We can’t skip this opportunity.’

‘I guess you want me to Nav the thing,’ said Loretta

‘I’m afraid so.”

‘The probe’s parachute has deployed. EPI measurements indicate nominal levels of radiation. Angle of insertion is eight-point-five degrees. I hope this baby doesn’t bounce,’ said Loretta as beads of perspiration began to break out on her forehead.

‘We’ve lost visual,’ she continued as she pressed buttons and took readings off her screens.

‘It’s gone below the cloud tops. I have a confirmation that the heat shield has come away.

‘Okay we have a high-energy helium ion composite of twenty-three per cent. It’s very close to the helium content of Jupiter’s atmosphere. The planet’s interior is probably very hot. The Atmospheric Structure Instrument indicates mean temperature at the cloud tops is one-twenty degrees Kelvin, sir. That’s about minus one-five-three degrees Celsius.’ She looked up.

‘Can the probe operate under those conditions?’ asked Frank.

‘Yes, it’ll be okay sir, provided the winds aren’t too strong. I’ve got the Wide-Field sensor checking the speeds now. I think the orange clouds are formed out of some sort of sulphur deposits drawn up into the atmosphere from warmer regions. Okay, we now have twelve times Earth atmospheric pressure, and a wind speed of one thousand and fifty kilometres per hour. The temperature’s increasing. I’ve got the Nephelometer testing the cloud density.’

‘Nephelometer?’

‘The probe has an extended arm on it that reflects a laser beam back at its main body. The refraction of the beam shows how dense the cloud layers are.’

Loretta typed another command into her unit.

‘It looks like we have an ammonium hydrosulphide cloud layer at this lower altitude. Lower wind speeds, we’re down to seven hundred kilometres per hour now.’

Although he had seen her work this quickly in the simulator, Frank was still impressed by her speed and accuracy. I really do have a top class team working for me. He thought.

Loretta continued to speak. ‘We have lightning. Electrical disturbance pretty high, it’s affecting the telemetry. I’m switching the remote camera on.’

A snowy image came on the monitors in the Command Module. Frank turned to look at one of the screens. The majority of the image was made up of orange cloud layers.

‘Pressure reducing, we should break below the clouds in a few seconds.’

And then it happened, the probe broke through the lowest layer of clouds and the picture on the monitors became much clearer. The probe was descending slowly now through the last few hundred metres of its flight to the surface of the planet

The view was quite stunning from this altitude. The weather was much calmer down at this level, the sunlight broke through the orange clouds and streamed down onto the surface.

Loretta spoke up, ‘Whoa, I thought it was ice down there.’

Instead of the ice-mountains they expected, all they could see were masses of darker objects, strewn all over the ground. In fact the objects were scattered all the way to the horizon.

‘Are they rocks perhaps. Turn the camera.’ Frank said.

As Loretta spun the camera through three hundred and sixty degrees, they saw that the view was the same in all directions. ‘They aren’t rocks, sir. It’s those metallic compounds we saw as we were approaching.’

‘No, they aren’t metallic compounds. Not natural ones anyway.’

Strewn all across the frozen wastes of Mycenae, stretching from horizon to distant horizon were hundreds, or even thousands, perhaps millions of scraps of broken spacecraft. All of the broken up modules were familiar to Frank. He had, after all, been involved in the design process of the Daedalus right from the beginning.

‘Jesus Christ Almighty.’ said Frank in stunned awe, ‘How did this happen?’

‘There must be hundreds of them,’ whispered Loretta.

They both stared open mouthed as the probe floated down to the surface on its triple parachute system, bringing the frightening image closer to them.

In increasing detail they saw smashed up parts of the Cryogenic Module, the Accommodation Module, the Science Module and the Command Module. Thousands of copies of the Daedalus.

Mycenae was covered in them.

Then the probe impacted with the ground, and the image was gone.

‘Ian, James, how are you doing over there?’

Ian’s voice crackled back over the speaker from Daedalus Two, ‘Frank you’re

not going to believe this. I've found a journal here written by you. The dates are all messed up, but I'm uploading it to you now.'

'Okay, keep up the good work. I've got some strange results from the probe. We'll talk when you get back.'

Frank expected a response from Ian, but there was only the hissing static.

'Ian, is there any news about the beacon?' Frank asked.

More silence.

'Ian. I said, is there any news about the signal?'

Still silence.

'James, is Ian okay.' Frank asked.

'Sir… I'm okay', Ian said finally, 'I…I think you need to hear this.'

'Hear what? You've found the signal?'

'Yes sir, I've found the signal, but I don't understand it. This thing's been broadcasting a message to the Lincoln Outpost for over a century. It doesn't make any sense. Anyway, I'm patching the message through now. By the way, it was backwards, I've had to reverse the recording and make a new copy of it that plays forward. Get a load of this.'

There were a couple of spurts of static crackling followed by a beep. Then a message started to play, and Loretta's recorded voice came out through the speakers.

'This is a message from Systems Officer Loretta Pearce of the Daedalus calling the Lincoln Outpost from a geo-synchronous orbit around PMC-04, a planet we now call Mycenae. We have received news of a catastrophe that will befall the Earth. Take immediate evasive action to avoid the inbound asteroid. 418-Minos will destroy all life on Earth. Track the object. You must escape. I only hope we are not too late.'

There was another beep, and the message repeated. The recorded voice was close to tears. The sense of urgency and helplessness was evident in the words Loretta said and the conviction with which she spoke them.

After the message had played twice, and its implications had time to sink in, Frank turned to look at Loretta. Her eyes were wide, clearly very moved by hearing her own voice speak such words. There were tears in her eyes, and as Frank looked at her, the first of many began to roll down her face.

'What the hell happened here?' said Loretta.

Ian's voice came over the speaker, 'Sir, what do you think we should do now?'

'Ian, I want you and James to return to the ship. We need to regroup so that we can assess the situation. And bring that carving with you.'

'Yes sir, returning now.' Replied Ian.

Frank turned to the others, 'When they get back, I want everyone assembled in the Rec room. In the mean time I'm going to have a look at that journal Ian downloaded.'

Frank climbed down the service tunnel to the rim corridor, and walked round to his cabin. He was struggling to stay awake now. All he wanted to do was sleep. But there was no time for that. And he knew that he wouldn't be able to anyway. Not under these circumstances.

Once he was back in his cabin, he brewed up some coffee and settled down in his chair to read the journal.

CHAPTER FOURTEEN: FUTURE HISTORY
14 September 2483 AD

Extract from Commander Frank Chambers Journal, downloaded from Daedalus Two

We feel alone. We are so far from the Earth. Something strange has happened. Something we cannot comprehend.

The computer woke us up as planned. It was supposed to wake us after a certain amount of ticks. It performed the task perfectly. Except, the date is not 2171, as anticipated in the ISOE. The ship's timer indicated on arrival that we are in the year 2483. We are over three hundred years late.

PMC-04 wasn't there when we intercepted its orbit. All our timings are wrong. If the date really is 2483, that would explain why the planet and its moon are gone. They are elsewhere along their orbital path. The physics match up, but why is it the year 2483?

If we really have been travelling for more than three hundred years in cryogenic sleep, then we would be much further into space than just Proxima. The distances are correct but – again - the timings are all wrong. Did the spacecraft team back on Earth mess up the calculations?

But there are stranger things going on. Things that challenge my ability to think straight.

Time on the Daedalus is travelling backwards. Or, at least, that's what the ships clocks are reporting. Everything to us seems to be running normally. Yet time is counting down on the Daedalus. Loretta says that all the circuitry is fully functional. What is going on?

But it gets even stranger than that.

When we woke from our cryogenic sleep, we found a number of strange artifacts littered around the ship, strange metallic sculptures and wood-like carvings. Most of them were located in the accommodation module, where the centrifugal force prevented them from floating around the ship. We have no idea how they got here. So far we have found about thirty of them, but we keep finding more. God knows how many there are. There is no sign of forced entry to the ship.

Our only estimation is that someone or something is trying to tell us something. Somehow, they got inside the Daedalus while we were asleep and placed these items here knowing that we would find them when we woke up.

The thought of unknown beings moving about on the Daedalus while we lay asleep frightens me deeply. If they had been a more hostile race then we could have been killed. I am so scared.

What if they come back?

Each artifact has an engraving on it. Beautiful depictions cast in the wood-like and metallic materials. Pictures of the Earth, all geographically accurate. Pictures of the Daedalus etched in stunning detail. Pictures of the Lincoln Outpost and the NEO Rig. A picture of a young boy throwing stones on a beach. There is even a picture of Loretta, reaching towards a handle or switch of some sort. Some of the other pictures are also a little cryptic. There is one of Ian with a tentacle like object burrowing through his leg. One of Harold, looking up at the moon through a hole in his hand. If they are in sequence, then I am sure there are some missing. We have devoted our time to locating all of the artifacts. Hopefully in time we will piece together this extraordinary puzzle.

19 August 2483 AD

Daedalus time is still running in reverse. I am logging my journal entries as depicted on the ships computer. This is such a strange phenomenon. Can time really be travelling backwards? Is this some strange side effect of extra solar travel? Has Proxima's star messed up the time programs on the Daedalus? If that were the case then surely we would never have woken at all. The ISOE item that triggered the computer to wake us would never have occurred. We would be floating forever in empty space.

Last night I had a dream. I dreamed the Daedalus intercepted PMC-04 orbit when the planet was actually there. That we located the source of the beacon. That PMC-04-A was the home of the alien civilisation that created these artifacts. That we finally made contact with another intelligent race. But it felt as though I was looking at the Daedalus through a frosted lens. It's lines and curves distorted and fragmented.

I woke with an empty feeling in my heart. As though I was only seeing half the story, and that the other half was far more significant.

We have begun to piece together the artifacts. There appears to be a numbering system on the underside of each carving. The sequence resembles the dot-dash structure of Morse code. It is becoming easier for us to put them into order. The artifacts seem to construct a story about the destruction of the Earth by an asteroid. One picture shows the NEO Rig being torn apart by a massive chunk of rock from space. The Eiffel Tower in the shadow of the immense stone. The Sydney Opera house being destroyed by a colossal tidal wave. The statue of Liberty broken into pieces.

I recognise the shape of the asteroid. God knows I've seen it often enough.

It is 418-Minos.

How did these items get here? The complexity of the situation is maddening.

If an alien intelligence is trying to tell us something about the destruction of Earth, what can we do from four light years away. Are we too late?

Too late?

If time is running backwards, then perhaps we are too early.

18 August 2483 AD

I have just finished a meeting with the crew. The implication of the story

of the carvings means only one thing. Earth is in the grip of an extinction level event, and someone or something that wanted to tell us, possibly to help us, visited the Daedalus and left behind these artifacts. We do not know if the asteroid has hit Earth or whether the destruction is imminent. Perhaps it won't happen for a hundred years. Maybe it happened a hundred years ago. But there is little we can do from this great distance. Turning back to Earth, climbing back into our cryogenic pods and beginning our Hohmann transfer out past PMC-07 would be futile. For all intents and purposes, we are stranded.

Loretta suggested the only thing we can do is start transmitting a signal to Earth. Try to warn them in case the disaster hasn't happened yet. The rest of the crew is in agreement. Loretta has set the transmission beacon to point to the Lincoln Outpost, in case the destruction of Earth has already taken place and there are no telescopes on Earth left to receive our signal.

Hopefully, the moon will be able to pick up our signal. Loretta informs me that the telescopes at the Lincoln Outpost are only a fraction of the power of the Earth based scopes. We can only hope that our efforts have some effect, even if it is only an advance warning of Earth's imminent destruction.

12 July 2483 AD

Morale is extremely low on the Daedalus at the moment. We are getting at each other and having arguments. Everyone is so disappointed to have our mission objectives become so radically distorted. We are at a loss.

Ian put forward the theory today that the extraterrestrial visitors are bluffing us. That they entered the Daedalus and left these carvings here because they wanted us to think that the Earth has been destroyed. I have no idea as to what possible end their actions would have if that were true, but we are not in a position to rule out anything at the moment.

Yesterday we began a six-hour long TCM burn. Loretta has been performing some theoretical calculations and is convinced that a few minor attitude adjustments can get us on course to intercept with PMC-04-A. Of course, she has to work in with reverse orbits due to the time reverse anomaly, but she is an extremely clever scientist and I trust her postulations. Throughout the manoeuvres, she is doing an excellent job of keeping the antennae pointed towards the Earth's moon.

21 June 2483 AD

I am reminded of the words of Sir Arthur Conan Doyle, 'It is a capital mistake to theorise before one has data.'

But today I feel justified.

I have become somewhat troubled with the philosophical question of time moving backwards. With no point of reference it is a very difficult notion to comprehend. If we travelled through some kind of wormhole while we were asleep then it supports the belief that there are multiple planes of existence and that the wormhole acted as a doorway between two of those planes, or perhaps more.

Perhaps perception of time becomes more distorted the further into the wormhole we travel. This anomaly may only be the beginning.

Note: Euclid's first axiom. A straight line can always be drawn between two given points in space. Have we broken this law?

Wormholes are only theoretical in the field of science. There is no evidence to support their existence. But if they do exist, and we travelled between two parallel universes, why should we believe that time in other universes are travelling in the same direction. Time only exists because we perceive it. And time only runs forwards because that is how we perceive it. But the main thing about perception is that it is a single viewpoint, which means that there are other viewpoints. The human perspective is a single and very narrow-minded viewpoint.

It's like we are ants on the inside of a balloon. With only the balloon as a frame of reference, who are we to speculate on the world outside it.

Beneath the reality we know is chaos. We are balanced precariously on a knife-edge between infinite realms of crossing lanes. Time, or perception of it, like so many other things, has been shaped and moulded by humanity in an attempt to make sense of the things we do not understand. We give it names and we try to rationalise. But we don't really have any answers.

A further thought. Imagine if time were like an old roll of celluloid. The images would be presented in a certain order, which can be played forward or backward. However, despite the viewer's perception of the images (forwards or backwards), the images themselves remain in the same place. A constant, proving that time is really only an illusion, and that things just do what they do, regardless of how you view them. It is the perception of an object, rather than the object itself that creates the illusion of time. But beneath the order and stability that we so desperately cling to, lies a chaos that beckons our curiosity. Put one single toe into the ocean of things we don't understand, and the mind is changed forever. Ideas take on a new form. Perspective becomes confusion, and we try to forget that we ever went down to the water's edge.

Ian once said something that stuck with me for a long time. It feels appropriate now.

'The universe' he said, 'is far more easily explained with maths than with magic.'

12 December 2482 AD

Loretta has achieved a masterful piece of navigation work. Two hours ago the Daedalus fell into a geo-stationary orbit over the planet PMC-04. We are delighted to have completed this part of the mission even under the obscure circumstances.

We are still troubled to find however, that there doesn't appear to be a moon orbiting the planet. It seems as though many aspects of this mission were not as carefully planned out as we had first thought.

10 September 2440 AD

It has been some time since my last entry. The situation has become so desperately demoralising. I have let my crew down. My leadership skills were not able to create the cohesion needed within the group. I have had my eye on the airlock for some time now, and it seems like the way out of so many things. Maybe that is the only way I can conclude this. To become a part of the universe I came out here to explore.

5 September 2440 AD

My name is Frank Chambers. This is my ship. My Daedalus. God help us all.

CHAPTER FIFTEEN: EUROPA DISTORTION II
16 September 2099 AD – Europa, Moon of Jupiter

Eleanor rattled the comms beacon switch in a frustrated manner. The Orbiter was late. It should have emerged from its orbit around the planet. It had no reason to be late. The whole thing had been calculated perfectly.

She turned her head, and stared out of the view-port and the dark icy landscape of Europa. Jupiter dominated the sky above, and cast a wan orange glow across the tundra.

Suddenly the radio came alive.

'..ayday this is the Horizon Orbiter calling the Descent Probe can you hear me?'

'Hey Robert, we were beginning to wonder what the hell happened to you. We made it down. The eagle has landed. You are now talking to the first woman to stand on Jupiter's moon Europa. I hope you're impress-.'

'Eleanor. That you? Thank God!' Robert's crackly voice sounded desperate, 'Listen we've been hit! Something just came out of nowhere and slammed into the side of us while we were on the dark-side. Blown all our goddam xenon tanks the shit's really flying up here. We got fires everywhere. The whole Command Module's burning up. We're trying to maintain a steady orbit here but the damn thing was so big it whacked us right out of line. We're losing oh-two, and Systems are working on some TCM's to get us back on track.'

'Well what was it? A meteorite?'

'Haha! A meteorite. If only! No it wasn't a goddam meteorite, it was the Pioneer probe. It's got the words NASA written on it in big fucking letters on the side. Can't miss it! Ripped through side of the hull, we got C&W's wailing left right and centre here. The situation is critical. There's no way out of this.'

'Okay Orbiter, I can see you now. I can see your hull breach, it looks pretty bad. Correction, it looks goddam awful. Should we make an ascent to aid-'

'No you'll have to stay on the surface for now, there's a problem with the docking bay doors. They won't open. How are you guys doing for oh-two?'

'Oh-two's okay for now we've got about six hours on the clock,' replied Eleanor, 'We need to lift off Europa in three hours to leave enough of a margin to get us back to-'

'Don't worry. We'll have this baby fixed in two. Give us two hours.'

'Okay, good luck Robert, and keep me informed,' added Eleanor.

Two hours seemed like a very optimistic assessment from Robert.

Too optimistic perhaps.

CHAPTER SIXTEEN: SPLIT TIME
15 July 2173 AD

Ian sat in his cabin with a blank screen on his palmtop computer. He knew he was close to the answer. But there was something troubling him.

Using his laser-pen he drew a circle on the screen.

‘No,’ he whispered to himself, ‘This isn’t good enough.’

He stood and walked over to his computer unit and removed a pair of virtual reality glasses and a data-glove from the wall-mounted rack.

Placing the glasses over his eyes and the glove on his hand, he pinched his fingers and the display became live.

He was transported to a three-dimensional menu system. He selected the menu entitled ‘Missions’.

In front of his eyes, flowed a list of every space mission ever conducted by mankind.

Ian selected ‘Voyager II Probe’ and entered a further menu, where he selected ‘VR-Trajectory’

He was shown a computer animation of the Voyager probe flying past Jupiter, Neptune and Pluto. He paused the animation at the point where the probe hit the heliopause, and transferred the interstellar co-ordinates to the buffer.

Back at the main menu, Ian raised his finger to select the trajectory of the Daedalus over time, and ran the computer animation. At the point where the spacecraft exited the heliosphere, he paused the animation and ran a correlation based on the Daedalus exit point, and the Voyager exit point stored in the buffer.

There was no relationship. The two points were millions of kilometres apart.

Ian smiled. The very lack of a correlation in the coordinates meant that he’d finally figured it out.

Frank could not hold back the tears this time. He had fought against it for so long. But now the situation had become too much to bear.

He was tired. He and his crew had been working almost constantly for the last twenty-four hours.

He sat on his cabin bed with his head in his hands and wept. Wiping salty tears from his reddened eyes, he considered the plight of his other self. It filled him with an unnerving sense of sadness and wonderment.

He had seen, written out on this palm computer, the descent into madness and eventual suicide of – himself.

How was someone expected to react to such a thing?

The four remaining crewmembers of the Daedalus sat in the recreation room. The atmosphere was subdued. Frank could see there was a great degree of confusion in his colleagues' faces and he knew he had the formidable task of bringing this mission back on track, as it had undoubtedly gone quite seriously astray.

Ian however - perched on the edge of a wide bench - seemed strangely calm.

'Okay, can I have your attention please.' said Frank.

The talking stopped, and all eyes turned to Frank. He took a deep breath and continued.

'Now. We've all had a chance to read the journal that Ian recovered from Daedalus Two. And it seems to ask more questions than it answers. And the results from the descent probe are even more perplexing. However, we need to decide how to progress this mission. I'm laying it open to you.'

James interrupted, 'We can't go home, can we?'

Frank raised his hand, 'Now hang on. We don't know that the Earth was destroyed.'

'Was? Or will be?' James added.

'But going home,' added Ian, 'Isn't that exactly what we do do?'

All eyes turned to him. Frank spoke, 'What do you mean?'

He stood up and moved away from the others, folded his arms and turned to address them, 'Well, lets think about it. We definitely don't stay here - at Mycenae - do we?'

Frank clenched his fists behind his back. Ian seemed to have a theory for everything, 'How come?' he asked, feigning politeness.

Ian sighed, making his agitation known, 'Frank, do I have to think of everything? I mean; if we stay here, then we would become the second Daedalus.'

All he got were blank stares. Nobody understood.

'It's all about perspective,' he tapped his forehead, 'Did nothing of that journal go in?'

Ian was looking around the room, clearly waiting for the penny to drop, 'Okay, how can I explain this. We went through a wormhole, or a black hole or white hole, or asshole or a great big cosmic photocopier. Whatever you want to call it. Suddenly there were thousands of ships, just like the Voyager. But with the Daedalus, one of them got catapulted three hundred years into the future, but in the same place right?'

'Right.'

'Well, here we are, heading for that time, albeit much more slowly. What I'm saying is, if we stay here, Frank's journal would have referred to a second Daedalus. Us!' He drew his hands together and linked his fingers to illustrate, 'we'd have to meet somewhere along the timeline. Comprende?'

‘Ah!’ said James.

‘Ah, indeed.’ Ian smiled and exaggeratedly raised his index finger, as if telling a bedtime story, ‘Except, we’d all be dead, and our Daedalus would be the floating tomb. But because there’s no reference to us in Frank’s journal, a second Daedalus – or any other Daedalus’s when you come to think of it - orbiting Mycenae, it can only mean that we obviously head off somewhere else. Probably home."

‘Ian, are you saying our decision is pre-ordained?’ asked Frank.

Ian threw his arms up into the air, ‘Oh hell I don’t know do I?’

‘But how does that explain the others? The ones on the surface?’ asked James.

‘Well that’s easy,’ Loretta quickly interjected, ‘We all know that an object will fall to the planet’s surface if it’s orbital path caused it to graze the atmosphere each time it passed. The speed would slowly be shaved off it, and eventually it would drop out of the sky,’

‘If this wormhole really did copy us out lots of times,’ added Ian, ‘then who knows how many goddamn copies of the Daedalus there are! Throughout the course of history and the future, this scenario has been played out hundreds of times. Another Daedalus arrives at PMC, runs out of power and crashes into the planet. Then yet another Daedalus arrives at PMC, runs out of power and crashes into the planet. There are so many copies of us, strewn out through time. You see, we’re all a part of it. All the other crews of all the other Daedalus’s wake from their cryo sleep, and go about the task of getting to Mycenae, because that was what their mission specification was. We just found one of them, the most recent - so to speak. It’s exactly the same as the Voyager probes.’

‘This is too damn confusing. Are you saying that because so many copies of us have been made, we’re stuck in a loop, like an old broken record, where more and more copies of the ship run out of fuel at different points in time, over thousands of years, and just keep on crashing into the planet?’

‘Yes, and it may not just be here. Perhaps some copies even tried to make it home. Perhaps some copies appeared in places that we can never imagine! That would explain some of the strange images on the artefacts. But I think we are dealing with more than just a wormhole.’ said Ian.

‘You’re right. It would have to be a big mother of a wormhole if it was going to trap the Voyager and us! On an interstellar level, the distances are massive.’ said James.

‘Exactly, and that’s why I think that we are dealing with a spherical anomaly. One which surrounds the entire solar system in which Earth resides. It’s the heliopause, the outer reaches of the solar wind. Fly through it and you’re into a whole new area of logic.’

‘This is one hell of a theory Ian, when did you dream that one up,’ said James.

Ian raised a finger. ‘Don’t you see? The heliopausal anomaly distorts things, and then - as if to cover its tracks, or to keep us ignorant - it filters its distortions back into the solar system, so that those of us within it can’t see what it’s done.’

‘I don’t get it,’ muttered James.

Ian smiled, ‘James, ask yourself this. Why didn’t our Earth-based telescopes see the Voyager cluster? Why didn’t the Lincoln Outpost get a clearer copy of Loretta’s transmission? We only heard the beeps. Why did we think PMC-04-A was a moon? It wasn’t until we got here that we discovered that the moon was another Daedalus. These are all important factors that would have decided our course of action back on Earth. It all amounts to one thing.’

‘Yes, of course! We served its purpose,’ added Frank.

‘Yes! You see, we had to serve its purpose, because it’s all part of a loop. Call it fate. Call it destiny. God only knows how big that loop is. It may even reach into places and times that we’ll never understand. But the key is that we are serving a higher purpose. Playing out our part in a grander scheme. And it all comes back to that elusive concept of time…’

They were silent for a moment, contemplating.

‘So what now?’ asked James.

‘Well, I think we should make another sortie into the other Daedalus to recover any bodies we might find and the artifacts.’ said Ian.

James exploded, ‘Are you kidding? Other versions of us!’

‘We’ll need to perform an analysis on them if we can. The more we can learn about this crazy situation the better. We have to maintain a scientific viewpoint, in the light of all that’s happened.’ replied Ian.

He looked at the others. Everyone remained silent. ‘Okay, so we’re agreed, yes?’ he added. ‘I’ll lead again if that’s okay.’

‘There’s one more issue which we haven’t discussed. The most important one.’ James said.

‘What?’

‘How the hell do we get home?’ said James.

Ian turned his head towards Frank and stared at him. It was a cold, inquisitive stare, and it suddenly dawned on Frank that Ian was coming up with more of the right questions and answers than he was. The meeting was running away without him.

Loretta spoke up. ‘Our original mission specification was to orbit Mycenae for three months, but we don’t have enough power to TCM for that long anymore. So the only thing we can do is catch the earlier Hohmann Transfer window out of here. If we had the power of course.’

‘When is the earlier window?’ asked Ian. It was clear he was vying for the front seat.

Loretta laughed nervously, ‘Well, theoretically, it’s a continuation of the one we arrived on. I’d need to check it, but I think it closes out in about twelve hours.’

Frank opened his mouth to speak. Ian jumped in with another solution. ‘We’re all thinking the same thing right? We need to see if we can get any power from Daedalus Two.’

‘Surely that depends on whether they performed the photovoltaic scoop.’ said James.

‘They must have,’ replied Loretta, ‘otherwise they would never have managed orbital insertion when they got here.’

‘Maybe they blew their solar panels too,’ said Ian, ’maybe they ran out of power on arrival, just like us.’

Frank broke into a sweat. He could see from James and Loretta’s body language that they were beginning to see Ian as the leader now. Maybe Ian had said something to them, before the meeting. Something about the journal. Perhaps they thought that Frank was too close to the problem now. Too emotionally involved.

‘Well, it’s a possibility they blew their panels,’ Loretta reasoned, ‘but it’s unlikely. According to Frank’s journal, they made a lot of TCM burns prior to deceleration at Mycenae. They were lost remember? I’m pretty sure they’ll have power.’

‘Well there’s only one way to find out for sure,’ said Ian.

‘And we can’t waste any more time discussing it,’ added Frank, determined to assert himself as the leader, ‘We have to work quickly. Loretta, can you prepare the TCM burn to get us out of here in eleven hours, assuming we can get the power.’

‘Yes sir, I’ll get onto it right away.’ Loretta stood up and left the room.

‘But what if we miss it?’ asked James, ‘What if we miss the Hohmann transfer window?’

Frank looked at James and spoke in an almost apologetic manner. ‘I think what Loretta is saying, is that if we miss this window, we can’t guarantee that the amount of electricity we can retrieve from Daedalus Two will sustain us for another three months and get us out of here when the next Hohmann window comes along. We could end up stranded. Waiting to die. And then - perhaps in a few months - we’ll run out of electricity. We’ll have plenty of xenon, but it will be completely useless to us. If we don’t have enough electricity to fuse with the xenon, we won’t be able to TCM out of here when the next window opens, so we’ll get stuck in a degenerating orbit that will ultimately end up with us crashing into the surface of the planet. We can’t afford to take the risk. Which is why we have to leave straight away.’

‘But what if there’s no home to go back to.’ James asked.

‘Then we go back to the moon. There’s certainly nothing we can do here,’ said Frank.

‘We really are in the shit here aren’t we?’

‘Yes we are, and we don’t have much time. We have to get into Daedalus Two to retrieve as many things as we can. Ian, when you get in there I want you to do a full computational download.’

‘Sir, it’ll be tight. It may take several hours depending on how much data there is to get.’

‘Well you’ll have to prioritise your transfer, starting with the most important stuff like the ISOE confirmation logs. Then if we have to leave

anything behind, they will only be minor things.'

'Now. The electricity and the xenon,' Frank turned to James, 'I want you to spacewalk over to the xenon unit on Daedalus Two and retrieve it.'

'Wait, Frank. Are you sure there's no internal access to the unit?' asked Ian.

'No, he'll have to detach it from the outside. Don't worry James. It's a simple code-release mechanism.'

'Do we really need the xenon?' said Ian

'It's not essential, but while it's there we may as well collect it. It won't take up any more time. James can go down there while you're inside.'

Ian was silent. From the look on his face Frank could see he was against the idea of retrieving the xenon.

Frank continued, 'I'm gonna get philosophical for a second.'

'What's on your mind?' said James.

'Well, theoretically speaking,' Frank reasoned aloud, 'wormholes are supposed to transport matter from one point in space to another instantaneously. What we have here is the exact opposite. A 'time-hole', that transported matter from one point in time to another, instantaneously. But it has copied the matter as well. Almost like the time-hole acted as a prism; refracting matter instead of light. From only one Daedalus, we have many. Also, it has reversed the perspective of time for the copied Daedalus. It's miraculous that we are able to steal xenon and electricity from a ship that was – essentially – ours to begin with. We undocked from the NEO Rig with only a certain quantity of fuel. So where did the copied fuel come from?'

'Perhaps it came from another universe? A parallel one?' said Loretta, matter-of-factly, as though she had grasped the situation with ease, 'Maybe we're not stealing from our own time. Perhaps there's another reality where no copies of the Daedalus exist, because the one that was there has fallen through to here.'

'But you can't remove matter from the universe can you?' said Frank, 'Perhaps it was created out of dark matter.'

'All this damn speculation.'

'Come on. Let's get to work. We don't have much time.'

Ian caught up with Frank in the corridor after the meeting.

'Can I have a word?' he said.

'Yes Ian, what is it?'

'Sir. With all due respect, I think it is unnecessary for us to retrieve the xenon. We have plenty here. It's electricity we need. Maybe we should devote the time to replacing our damaged solar panels with working ones from Daedalus Two.'

Frank raised his hand, ‘Ian, please. We’ve decided to leave now. Which means we won’t have time to retrieve the solar panels from Daedalus Two. And besides, even if we do get the panels, we won’t be able to use them. Our outward trajectory doesn’t take us past a star that we can charge them from.’

‘But we can charge them here, the star isn’t that far away?’

‘It’s too far away. It will take too long.’

‘But if we can get the power from the other ship, surely we should stay.’

‘It’s far too risky to stay here now and leave at the next TCM window. The whole situation is far too complicated. I won’t have it.’

Ian looked accusingly at Frank. ‘So we’ve come all the way out here, only to turn back at the first hurdle.’

Shocked by Ian’s words, Frank could feel his face redden.

‘The first hurdle?’ he said, ‘How dare you say that. Do you view everything in such black-and-white terms that you cannot see the millions of shades of grey between?’

‘Frank…’

‘Have you forgotten how many people have died getting us here?’

‘Exactly, that’s why we need to stay and do more science, so that those people didn’t die in vain.’

‘But don’t you see. If we stay here then surely all of us will die. There are too many doubtful elements in the plan you propose. There are too many risks. And I don’t know about you, but I don’t intend to lose any more people on this mission. I want to get out of here as soon as possible.’

The EVA airlock on Daedalus Two hissed open again.

Ian and Loretta floated into the ship in the EVA unit.

‘Okay, the journal mentioned about thirty artifacts. We should try and find as many as we can. If we can figure out the code sequence, we might be able to work out if we’ve found them all. First, let’s check out the Cryogenics Module for bodies.’

They moved towards the Accommodation Module, and straight through the axis corridor towards the Cryogenics Module at the back of the ship.

James floated out of the airlock in his spacesuit. Tethered to the Daedalus by a lifeline that paid out as he moved away from the ship. Suspended between the two giant spacecraft, he fired the tiny pressure jets built into his backpack to alter his attitude.

Looking down he could see stars between his feet, millions of miles away. He was momentarily aware of his stomach, but then the feeling passed.

Slowly he approached the other ship. He found he was beginning to twist over to the left, and his angle of approach to Daedalus Two was becoming more horizontal than vertical. He fired another jet to counter the movement, and was soon able to bring himself back to the vertical.

The sound of his own breathing was loud in his ears. He could feel his heart, pumping hard in his chest.

He spoke into the radio.

‘Okay, Frank, can you hear me. I’m approximately fifty metres away from Daedalus Two. My pressure jets are firing. I’m moving down below the hull.’

In reply, all he heard was static crackle.

‘Frank?’ He repeated.

Still silence.

‘Can anybody hear me? I think my radio has stopped working.’

Ian climbed over to the onboard computer’s main terminal on Daedalus Two and plugged in his portable unit. Then he tapped a command into the computer, which initiated the transfer of the ISOE list across to the unit. As the data flashed across his screen, one of the ISOE entries caught his eye. He pressed a button to hold the data transfer, and then reached for his comms unit.

"Frank, are you there?’

‘What is it Ian?’ came Frank’s reply.

‘According to the ISOE on this ship, Daedalus Two is preparing for a TCM burn."

"Why would it...Shit, how long?’

‘It’s already started charging the ion chamber. They must have rigged it to fire automatically to counter the decreasing orbit.’

‘Why would they have done that?’

‘Well, to keep the signal transmitting, surely. They’ve programmed this thing to stay up here as long as possible. It was obviously long enough because here we are.’

‘But James is detaching the xenon unit now."

"Well you’d better get him out of there fast. If the pumps draw xenon out of the unit while James is detaching it, the thing could blow.’

"Can't you override the ISOE?"

"Not now the process has been initiated. For God’s sake, tell him to get away from there!"

James fired his jets again. He was coming in too fast, but he wasn’t quick

enough with the counter thrust, and he slammed heavily into the hull, hitting his helmet visor against the side of the ship and missing the xenon unit by a good few metres.

His breath was knocked out of him. He took a moment to recover, before climbing back along the underside of the hull to where the unit was.

The unit was set flush into the underside of the ship, and James felt around the edges until he found the flap that exposed the code release mechanism.

‘Hello? Boys can you hear me? Well I can’t hear you so I’m going to carry on talking anyway in case you can hear me. The damn thing came up on me too fast, but I’m okay now. I’m attaching myself to the unit. I should have this thing out in a few moments.’

Hanging onto the bottom of Daedalus Two, with the vast, looming surface of Mycenae to his right, James began to tap in the code to release the unit.

‘His radio is broken.’ Frank shouted over the radio, ‘I can’t get through to him! Didn’t anyone test it before he went out?’

Of course, Frank was talking to himself, frantically searching his brain for a resolution. He was alone on the Daedalus. Loretta and Ian were on Daedalus Two, and James was floating underneath it.

Ian, Frank thought. I hope you’re not up to anything!

He knew he needed to tell James to hold off until the burn was complete. It seemed the only way was to go out after him.

Ian’s voice came over the speaker. ‘Can anyone hear me?’

‘Yes Ian, go ahead,’ replied Frank.

‘TCM burn over here in four and a half minutes.’

‘Ian, I’m going after James.’ Replied Frank.

James could hear a strange ‘chump chump’ noise through the walls of the xenon unit.

‘What the hell is that?’ he muttered to himself.

He noticed that sweat was breaking out on his forehead. Suddenly he was overwhelmed by the feeling that he shouldn’t be there.

He started to feel dizzy. Clinging onto the bottom of the ship, he began to lose his sense of spatial awareness. He struggled against the sick sensation in his stomach and continued working to free the unit, tapping in release codes and authentication keys.

He hadn’t practised this particular spacewalk in the sims on Earth, he wasn’t quite sure how to deal with it.

The ‘chump chump’ sound became louder. It unnerved him.

Eventually, the unit came free, and he reached around the back of it to detach the outflow pipes.

‘Okay boys,’ he said nervously, more to reassure himself than anything else, ‘I’m coming home now.’

Frank yanked himself out of the airlock and frantically pulled the lifeline through his hands, climbing over to where James was. He tried to tug the wire, but floating in the microgravity he was unable to brace against anything.

He continued to make his way across the huge gulf between the two ships towards James.

Ian’s voice was patched through to his suit, ‘Frank, thirty seconds to the burn. You need to get away.’

‘I can catch him!’

Frank could see James at the other end of the lifeline, almost a kilometre away. He was working at the unit, levering it out of its compartment, and detaching the pipes at the back.

‘Frank, stop right there, you’re not going to make it!’

‘Dammit Ian, I…’

But his sentence was cut short. Daedalus Two started its TCM burn. He could hear the rumbling of the ionised particles firing out the back of the ship. Frank looked up at the huge craft. Silhouetted against the bright orange clouds of Mycenae, it began to twist in its path around the planet.

A chain reaction occurred.

Seconds later, an explosion rocked the underside of the hull. It came straight from where the half-attached xenon unit was. Cradled in James’s arms, it imploded, taking him with it. It literally blew him to pieces.

‘No!’

The lifeline in Frank’s hands went loose. It had become detached from the other ship, and began to fall away.

There was nothing left of James. Frank felt dried out and cold.

Exposed to the vacuum. The fire was extinguished soon after it had ignited. The silence was deafening. Frank closed his eyes, and gave a silent prayer to his friend and colleague.

‘Shit, is he dead? Frank I told you we didn’t need the xenon tank,’ Ian shouted over the radio channel.

‘Did you fuck with James’s radio?’ Frank said fiercely.

‘What? No. Are you saying I killed him?’

‘Did you fuck with his radio? You came to blows about the baby didn’t you, about his decision to terminate. You’ve hated him ever since. Ian,

you have the motive.’

‘NO! I did no such thing Frank. How was I to know that Daedalus Two would TCM?’

‘That’s beside the point and you know it.’

‘It’s not! You’ve got your wires crossed Frank. The truth of the matter is that you’re too close to the problem. Ever since we recovered that journal, you’ve been emotionally messed up by it. It’s affected your judgement. And now James is dead. Don’t you dare blame his death on me. I tried to stop you from letting him go, remember?

‘You were bluffing, to absolve yourself, and throw me off the scent.’

‘No Frank. Your heads not screwed on properly, you’re not thinking straight. How many more people are you going to kill? My God Frank there’s only three of us left!’

Later, after the tragedy and grief over James’s death had dissolved into determination to get away from Mycenae, the final aspects of work on Daedalus Two drew to a close.

Ian was about to make his way over to the EVA unit, when Frank’s voice came over the radio, ‘Loretta, while you’re there you might as well shut off that transmitter.’

‘Yes sir.’

‘Don’t you dare touch that switch!’ shouted Ian.

‘Why not?’ replied Loretta.

‘For God’s sake, don’t you get it? I have to think of everything here.’

Loretta moved her hand away from the switch. She pondered Ian’s words for a moment. Then she realised exactly what he was talking about.

‘Shit!’ she said, then opened up the comms channel, ‘Frank, sir. We can’t switch the signal off.’

‘Why not? Isn’t there a manual override?’

‘It’s not that, sir. You see. If we switch off the signal on a Daedalus that’s travelling backwards in time, then the signal would never have reached the Lincoln Outpost back in 2048.’

Ian nodded in agreement. Loretta was right on the button.

‘What? So you’re implying that we will all – what - disappear? Because there would have been no signal? A chicken and egg situation?’

Ian spoke up, ‘It’s a grandfather paradox, sir. You don’t really want to take that kind of risk?’

‘Ian, Loretta, this is a ridiculous conversation. Just switch off the beacon. Nothing’s travelling backwards anymore. We’re here aren’t we?’

Loretta rested her hand on the switch. It made Ian nervous. He raised his hand. He didn't want her touching it. She stared at him, clearly torn between the two opposing commands. Her breathing quickened.

'Sir, I'm afraid you've missed the point,' added Ian, 'Our perception of time tells us that the Daedalus left the Earth sometime in the past. But if your perception of time is reversed, then the Daedalus left the Earth in the future. Events in the past trigger events in the future, regardless of perception.'

'Ian you're confusing the hell out of me, and I'm not going to argue with you on this. We only have thirty minutes before our first TCM burn, and it's gonna take you half that time to get back, now hurry up and…'

'Surely there's no harm sir,' Ian interrupted, 'if we leave the beacon transmitting. Don't you remember? One of the artifacts showed a picture of Loretta, reaching toward a switch. Doesn't that seem like a coincidence to you sir?'

There was silence on the radio as Frank considered this. Ian and Loretta stared at each other.

Eventually Frank said, 'Dammit Ian. Get yourselves back here. I know you'd ignore my orders anyway. And with only thirty minutes left there's nothing I can do. Leave the beacon transmitting if that's fits in with your grand philosophical standpoint. But I'm sure you're wrong.'

Ian breathed a sigh of relief, 'Let's hope we never get a chance to…'

His voice was cut short. There was an explosion. It came from beneath them. The whole ship bucked and trembled.

Loretta and Ian stared at each other.

'Another TCM?' Loretta asked.

'Could be, but it's not happy about the missing xenon unit.' replied Ian, 'We're sitting on a time bomb. This thing could blow at any second. Anyway, we've searched this ship, top to bottom. There are no bodies, anywhere. Maybe they all walked out of the airlock.'

'We have to get out.'

'No. We can't leave. We have to stop it from blowing. If the ship blows up then the transmission will stop. Didn't we already discuss this Loretta? This ship transmitting the signal is the only reason we're here. This ship hasn't reached our past yet. Our past is Daedalus Two's future. What happens if the signal from this ship stops transmitting?'

'Shit! Well, how do we stop it?'

Then Ian laughed, raising his arm, he was one step ahead of them again, 'No no no. We don't have to do anything. Daedalus Two isn't going to explode. The answer is right in front of you. We're going to be okay.'

'How can you be so sure?'

'Well, we're here aren't we. That can only mean that the signal continues to transmit, regardless. It continues to transmit and we receive it at the

Lincoln Outpost.’

They looked at each other. Ian knew the paradox was becoming too complicated. Loretta’s wide eyed stare said it all. Ian was even afraid to move for fear that he might upset the delicate balance of the loop. The shivers ran up and down his spine. Hair standing straight up on the back of his neck. They were playing a dangerous game with time, and were in no position to outsmart the heliopausal anomaly. It was time to throw in the cards.

‘Let’s get those batteries and get the hell out of here.’

Loretta sighed, ‘That’s the best thing you’ve said all day.’

They had seven minutes to spare. Loretta had prepared the systems as best she could but they could go nowhere until the airlock door was shut with the EVA unit housed in it’s correct parking configuration.

Once the replacement batteries had been loaded into position, Ian gave her the okay over the radio, and she prepared the first TCM burn.

‘The co-ordinates for the burn match up sir, we’re in the clear. I’m starting the initial burn to PMC-07 now.’ She said.

‘Thank God,’ whispered Frank under his breath.

‘Thank God indeed,’ said Ian from behind him, ‘It looks like we’re going home.’

‘Going home.’

Suddenly Frank’s thoughts turned to his home planet, and wondered just what it was they were going back to. He found he could not fight the rising lump in his throat.

After Loretta had climbed back into her pod for the trip back home, Frank and Ian shared a drink together. Toasting all those who died for them.

‘You know Ian. It’s easy to think that we came out here only to fulfil a pre-ordained sequence of events in the grand scheme of space-time. Like the inevitability of a comet’s orbit, destined for one place. But there’s one question that still lies unanswered.’

‘What’s that?’

‘The alien artifacts. In this so-called grand scheme, are we destined to make contact with these aliens at some point?’

‘Maybe in a couple of hundred years time. After all, that’s when they boarded Daedalus Two.’

‘But they’ve been monitoring us, making those sketches of our history and our future. They mapped out the sequence of events for us.’

‘Keeping an eye on us perhaps.’

‘Maybe they’ve mastered how to use the heliopausal anomaly.’

‘Maybe they’ve left artifacts elsewhere. Maybe the pyramids are theirs too. The Inca temples. The meanings of which we have yet to understand. Or perhaps – now consider this – perhaps we are an artifact.’

‘I doubt it.’

‘You never know?’

‘And as for Daedalus Two. It’s going to live out its days in a spiralling orbit, only to crash into Mycenae. Sometime in the past. Long before we ever received the signal at the Lincoln Outpost.’

‘It will join all the other ones down there on the surface.’

‘Are we the only one’s that broke the loop?’

‘You can never break the loop Frank. It’s an intrinsic part of our fundamental universe.’

‘And what is waiting for us when we back home? A torn and broken world? Or was it all a sick joke?’

‘I don’t think it was a joke.’

‘No, neither do I. All I know is that we belong there, regardless of what state it’s in.’

‘There is one question that’s really puzzling me, though.’ said Frank sipping the last of his juice.

‘What’s that?’

‘Well, I can’t figure out who started all this.’

Soon after, they turned out all the lights, shut down the systems, put the Daedalus into automatic and went to sleep.

For a hundred years.

CHAPTER SEVENTEEN: AEGEAN DISTORTION III
Greece - 2407 BC

The others ran away, leaving the boy alone on the beach, compelled by the events around him. Almost rooted to the spot as though he had some higher reason to be there.

As though destiny had ordered him to stay.

The smell became so strong that he had to block his nose. Then the rumbling started. Quiet at first but building in volume with every passing second.

Then, the gentle lapping of the waves upon the shore was drowned out by the most violent and almighty crash. Three hundred metres out to sea, there was a massive upsurge of water, as though the most immense stone had fallen into the water and displaced huge volumes at great speed.

Except that wasn’t quite right. Nothing had been dropped into the sea.

Something had appeared within it. Sending vast volumes of water and rock away from the seabed.

The boy was thrown off his feet, the ground rising up as the displaced bedrock was forced aside by the spaceship, which sat in the water. In an instant, the rock had been exposed to such violent frictional forces that the high temperatures boiled and fused it into molten lava, which in turn came into contact with the water, boiling the area around it and shooting massive columns of steam into the air.

A fast rising wave began to surge towards the shore, and the boy, stricken with fear turned and ran over to the cave. As the wave chased him up the beach he ran as fast he could and shot into the cave, running for his life. Nobody saw him alive again.

The accommodation module became trapped in the rock and instantly stopped rotating.

The spacecraft began to sink slowly into the sea, and soon vanished without trace. The crew inside trapped forever.

But the boy saw the ship, and he saw the word written on its side in bold black letters.

His lifeless body was found the next day washed up on the shore. Near to where he lay were the markings he had made in the cave wall with a stone.

The markings. One word. The meaning of which bore no meaning to any of those who found him.

The men of the village carried the boy back to his family home where his father wept for three months and three days, and the boy’s mother, who was pregnant with child, wept at his side for the loss of their son.

But before the year was out, their new child was born, and their lust for life started anew. The child was a boy. And the final meaningless word - carved by his late elder brother in the stone on the beach - was to be their new child’s name.

The boy had seen the name of the star-bird that now rested beneath the waves. That name was Daedalus.

His newborn brother would grow to become a great architect.

He would be a legend. Because his name had been sent from the Gods.

THE END

AFTERWORD

Whilst I was writing this novel, I couldn’t shake the idea that a spacecraft named ‘Daedalus’ was too wonderful to be unique to this story. There’s no such thing as an original idea anymore, surely someone must have thought of it before.

It turns out I was right. Apparently, the British Interplanetary Society launched a study in the early 1970’s into the possibility of sending an

unmanned probe to Barnards Star, picking up some deuterium and helium from Jupiter on the way. The probe would have taken approximately thirty years to get there at 12% light speed (36,000 kilometres per second), slightly faster than my less ambitious 40,000 kilometres per hour, which gets my Daedalus crew to Proxima in a hundred and fifteen years. Just to put things in perspective, the Cassini probe, which is currently bound for Saturn, is travelling at 18,720kph.

To add coincidence to insult (if such a transition is allowed) I also found out about the existence of the Orion Project, and suddenly there was a link between the novel I was writing, and a novel I happened to be reading at the same time. The book was Voyage by Stephen Baxter, which makes a fictional assumption about the course of the space program if Kennedy had survived the bullet in November 1963. It also explains in great and gory detail what could have happened if the US had continued building a NERVA (Nuclear Engine for Rocket Vehicle Application) system. NERVA technology involved detonating atomic bombs behind a spacecraft to propel it forward. The theory may sound absurd but many people thought it would work, and Baxter postulated that it could have enabled us to put a man on Mars by 1986. The book is quite brilliant by the way.

Ironically, the BIS Daedalus project involved a hybrid version of the NERVA system, which would have created fusion 'microexplosions', caused by irradiated fuel pellets. I felt somewhat comforted by the fact that there were certain tenuous links between the names and ideas that I had used, and ideas used by others in the field.

For more information about Orion, NERVA and fusion drives, I recommend an article by Michael Flora entitled 'Project Orion: It's Life, Death and Possible Rebirth' which can be found on the internet, and of course the novel 'Voyage' by Stephen Baxter.

In the realm of science fiction, Star Trek fans will no doubt be somewhat angered to find that I have inadvertently copied the name Daedalus from the ship USS-CAROLINA, which, apparently is a Daedalus class ship that resides in the Starfleet Museum. As I am not an avid Star Trek disciple, the coincidence was wholly unintentional.

Last but by no means least is the recent movie "Space Cowboys". When I heard about this movie my face literally sank as I discovered that Clint Eastwood's space shuttle was to be called Daedalus, and that his main character would be called Frank. This – I swear – is a blind coincidence. I'm sure Mr Eastwood had no intention of stealing my idea.

I do, however think that the name Daedalus was not utilised to its full potential in the movie, and – as my novel shows – the parallels that can be drawn between myth and reality are too enticing to overlook.

Had I known at the outset that there were other Daedalus references in the fields of science and science fiction, I probably would have taken a very different route in the planning of my story. However, as I'm sure you understand, the name of my spacecraft becomes more than just a name as the novel progresses, and once I had committed myself to using the name Daedalus, I pretty much had to stick to it.

Another coincidence. Last month, while I was travelling to work through Vauxhall in London, pondering these very things, I looked out of the window of my train, and there it was, the London office of the British Interplanetary Society. I have since become a member.

During the Hyakutake flyby, Ian and Frank use a CHAMP unit. This is homage to the seven astronauts who died in the Challenger STS51-L explosion on 28th January 1986. Part of the STS51-L mission profile was to use an experimental version of the 35mm camera unit (CHAMP stands for Comet Halley Active Monitoring Program).

That explains why I chose another comet beginning with H!

Comet Hyakutake was actually visible from Earth during 1996, but was overshadowed (if that's the right word) by the rather more famous Halle-Bopp, which blazed across the sky in 1997. Come to think of it, maybe I could have used that comet also. But I think I prefer the name Hyakutake.

The CHAMP unit was also tested in an earlier mission STS61-C, which launched on January 12th 1986, but it encountered battery problems, which is why, on the Daedalus, Ian tells Frank that he has double-checked them.

Early in The Daedalus Transfer, there is a reference to a large planet orbiting Proxima's star. This is widely considered to be true, and the method of detection used in the novel is also accurate for determining unseen celestial objects. However, we are not absolutely sure that there really is a planet in Proxima because the 'gravitational wobble' in the star is not constant. In other words, there are long periods of time where the star is not wobbling, which could either indicate no planet at all, or a planet that moves in a very eccentric orbit, which brings it close enough to star only occasionally. This theory did not suit my story, so I chose to omit it, and also threw in a few more planets for good measure. I'm pretty sure however, that by 2056 we will have a very good idea about the contents of the Proxima Centauri. Who knows, we may have even launched a crew out there by then.

The heliopause is still a thing of mystery. At the time of writing, neither the Voyager nor the Pioneer probes have made it beyond the heliosphere of our solar system, so the composition of the heliopause is still wide open to speculation. Which proves that despite the awe-inspiring size of the universe in which we live, there are many undiscovered secrets right here on our doorstep.

Huw Langridge – November 2000

GLOSSARY OF TERMS

418-Minos (Fictional): Asteroid tracked by the Daedalus while the crew are asleep on the outbound journey to Proxima Centauri.

Acute Subdural Haematoma: Medical complication which can set in after a serious head injury. Blood vessels that are located between the membranes covering the brain start to leak, causing intracranial pressure.

Adaptive Filtering: A calculation performed by remote sensing software whilst

running a geological scan of a planets surface, enabling it to build a three-dimensional image of the surface out of a two-dimensional image. Also applies to “Inferogram Computations”

Aegean Sea: Body of water surrounding the Greek Islands.

AMC (Fictional): Automated Maintenance Clamp. Electronic units about 3 metres in size used to perform routine maintenance tasks on the external hulls of spacecraft.

Atmospheric Occultation: The distortion effect caused by a planet’s atmosphere, preventing waves (radio/light etc) from travelling through in a straight line.

Barotrauma: Pain caused by pressure imbalance in the inner ear, where the pressure inside the head is significantly greater or smaller than outside.

C&W Class One Emergency Tone: Caution and Warning Emergency Tone. Currently used on the International Space Station (ISS). Class One is the most dangerous (indicated by red lights) and indicates a pressure integrity breach. Space station crews are required to learn the tones and associated colours prior to boarding.

CELSS: Closed Ecological Life Support System. A

Centrifugal Force: (tbc)

Centripetal Force: (tbc)

Cerebral Edema: Intracranial Pressure, swelled brain tissue.

CHAMP: Comet Halley Active Monitoring Program. A 35mm camera unit designed for the crew of the space shuttle Challenger, which blew up after take-off in January 1986. The camera was intended to take photographs of Halleys comet.

Cryogenics: (Cryo) The process by which a living organism is cooled to a state where it’s development process is virtually halted. This is still a breaking science and, as far as science fiction is concerned, enables humans to travel long distances for long periods of time without ageing.

Enriched Polyvinyl Butyral Plexiglass Compound: Polyvinyl butyral is generally described in industrial literature as having great toughness, stability on exposure to sunlight, and clarity. Generally it is used for transparent surfaces of extreme strength, and is therefore ideal for use in space.

Europa: Ice covered moon of Jupiter. It is generally considered that life may exist under the surface of this moon.

EVA: Extra Vehicular Activity. Any astronaut who exits his spacecraft to perform a task (with or without the use of machinery) is performing an EVA.

FD Unit (Fictional): Freefall Doctor. A spherical device developed by Dr Jake Harding as an aid to medical officers in space. It performs most basic surgical functions.

Heliopause: Beyond the heliosphere is the heliopause. Part of the interstellar medium where no solar winds exist, because there are no stars.

Heliosphere: The spherical influence of the solar winds from a sun.

Hohmann Transfer Orbit: Physical process whereby a spaceship can travel between the planets by utilising the concept of solar orbits. By launching at the correct time, a spacecraft can traverse it's own solar orbit, to meet another planet where the two solar paths meet.

Horizon Descent Probe (Fictional):

Horizon Orbiter (Fictional):

Hubble NextGenST4 and 5 (Fictional): Postulation of the advancement of the Hubble space telescope technology. Currently in development is a Hubble NextGenST1, which will utilize a much larger mirror for deeper scanning of the star field.

Hyakutake: Not quite as famous as Halle-Bopp which came a year later, comet Hyakutake flew past our planet in Spring 1996. The comet was discovered in December 1995 by Yuji Hyakutake, a Japanese amateur comet hunter using a pair of binoculars. Hyakutake the comet is estimated to return to us in another 18,000 years. Who knows what Earth will be like then. These timings actually make it nearly impossible for the Daedalus to encounter it on its journey to Proxima, but I won't tell if you don't. Only 32 comets have had nearer approaches to earth than Hyakutake, in a record that dates back to the year 347.

Hydroponics: (tbc)

Inertia: (tbc)

Inferogram Computations: A calculation performed by remote sensing software whilst running a geological scan of a planets surface, enabling it to build a three-dimensional image of the surface out of a two-dimensional image. Also applies to "Adaptive Filtering"

Intracranial Pressure: Pressure built up as a result of inflamed blood vessels

around the brain.

Ion Exchange Resin Unit: Used in a CELSS environment. The unit is responsible for transferring carbon dioxide exhaled by humans back into oxygen.

Ion Propulsion: A method of propelling a spacecraft by firing ionised xenon from the back of the ship at very high speeds. Ion propulsion has been around for a while, but nobody has been bold enough to employ it in a space mission. Part of the reason for this is that acceleration by it is too slow, and would therefore only be useful on long interplanetary missions.

IPV8 (Fictional): Internet Protocol Version Eight. Networking protocol used to connect computers over the Internet, consisting of a leading and closing "address-packet" which encapsulates the data. Currently, version 4 is being used, but as more and more computers are attached to the Internet, more addresses will be required. IPV6 is currently being considered. It consists of an extra two sets of numbers, much like an extended telephone number.

ISOE: Integrated Sequence of Events List. Created in advance of a space mission by the spacecraft team on the ground. Its purpose is to plot anticipated events in the mission so that they can be correlated against real-time events. This assures the flight crew that all aspects of the mission on the ground and in the spacecraft are happening according to plan.

ISS: International Space Station. Currently under construction. Different parts of the station are being built by different countries around the world. It's anticipated completion will be 2015.

Jodrell Bank: Radio Telescope Array situated in Oxfordshire, England.

Lincoln Outpost (Fictional): Radio Telescope Array set up on the moon in the year 2040. Used for scanning deep space without hindrance from Earth's glare.

Microgravity: It is a common misconception that when a human leaves the Earth's atmosphere he becomes weightless. This is not true. The Earth's gravitational influence stretches millions of miles into space. The reason a person is able to float about an orbiting spacecraft is because he is 'falling' around the planet. Falling so fast that he never actually lands. Because he and his spaceship are falling together at the same speed, he is able to float around his craft in apparent weightlessness. Instead of 'weightlessness', the correct term for this is – in fact – 'microgravity'.

Mir: Russian Space Station launched in 1986, currently orbiting the Earth.

Nano-Cranial Implants (Fictional): Tiny electronic device that attaches directly to the brain to feed information straight into the cerebral cortex. These devices are currently being researched and will probably become widely available within the next fifty years. In his novel 3001, Arthur C. Clarke postulated that the 'braincap' will be fitted at birth. In Peter F Hamilton's Night's Dawn Trilogy, he employs "neural nanonics". In fiction, the

technology takes on many forms, but tends to achieve the same result.

NEO Rig (Fictional): Created out of the old International Space Station. The NEO Rig is a geo-synchronous space station orbiting 4210 kilometres above Northern Africa. Used as a construction and maintenance platform for space-based vehicles.

Photovoltaic: Solar power. Technology involving using solar cells to trap the sun’s energy and convert it into electricity.

Pioneer: Pioneer 10 was launched on March 2, 1972. It was the first spacecraft ever to fly though the asteroid belt between Mars and Jupiter, and it also was the first spacecraft to obtain close-up images and make direct observations of Jupiter. Pioneer 10 was equipped with instruments that enabled it to study Jupiter and Saturn's atmospheres, magnetic fields, moons, and rings. The craft made scientific investigations in the outer regions of the solar system until its mission ended on March 31, 1997. Pioneer 10 is now headed in the direction of the constellation Taurus (The Bull). It will take the Pioneer 10 probe over 2 million years to pass by one of the closest stars in the constellation

PMC-04 (Fictional): The fourth planet to be spotted in the Proxima Centauri system, later named Mycenae.

PMC-04-A (Fictional): A small moon orbiting PMC-04.

Proxima Centauri: Solar system located 4.3 light years away from Earth.

Red Dwarf: Stars that are smaller and less luminous than our Sun. Red Dwarfs are – essentially – colder, fading white dwarfs stars. White dwarfs were named so because of the white colour of the first few that were discovered, and are characterised by a low luminosity, a mass close to that of the Sun, and a radius comparable to that of the Earth. Because of their large mass and small dimensions, such stars are dense and compact objects with average densities approaching 1,000,000 times that of water.

TCM: Trajectory Correction Manoeuvre. A controlled thrust burst used by a spacecraft to maintain an intended flight path in space.

Trizoliphium-i3a (Fictional): Drug used to prevent calcium deficiency, heart shrinkage and bone degradation in astronauts exposed to a prolonged weightless environment.

Very Large Array: Radio Telescope Array in New Mexico used for deep space research.

Voyager: Probe launched by NASA in 1977. It was sent towards the outer planets in the solar system using a Hohmann Transfer Orbit. It sent back the first close up pictures of Jupiter, Saturn and Neptune, advancing our knowledge of these planets a long way. It is currently on it’s way out of the solar system

and will continue to send data back to Earth until it suffers a complete power failure in 2016, after which it will continue as a piece of space junk.

Wormhole: Theoretical anomaly in science. A gateway in space-time that links two remote parts of the universe, allowing anything that passes through it to jump to the ‘exit’ in a fraction of a second. Often used in fiction as a plot device to serve as a means of travelling across vast distances in space quickly. Also known as a ‘white-hole’. It should be noted that – scientifically speaking – the amount of energy required to make such a jump through a wormhole would pulverise anyone daring enough to attempt such a journey!

Xenon: An odorless, colorless, tasteless, non-toxic gas, which is chemically inert. Xenon gas is principally shipped and used in gaseous form for light bulbs, window insulation, ion propulsion and medical applications.

Zeoponics: A synthetic, inorganic highly reactive soil used for plant growth in microgravity using ‘zeolite substrates’. Zeoponics growth methods are currently under research. Plant growth experiments have been conducted to determine economics of plant production in zeoponics systems compared with other plant growth systems (e.g. hydroponics).