

Broken Glass

by **Luke Burrage**

If you've not read both *Minding Tomorrow* and *Combat*, this novel won't make any sense at all, so it's wise to check them out first. The cycle and year of the events of each chapter are relative to the final chapter of *Minding Tomorrow*, which is also the same time cycle that contains the events of *Combat*.

This novel is dedicated to Juliane Kunzendorf, who gave me the motivation to finally finish the *Minding Tomorrow* trilogy project.

This is edit 2.2, completed September 16th, 2012. If you spot any spelling or grammar mistakes, please point them out so I can fix them for the next edit.

Feedback to luke@juggler.net

More information at <http://www.lukeburrage.com/fiction.html>

This file is released under a Attribution-Noncommercial-No Derivative Works 3.0 Unported License. You are free: to Share – to copy, distribute and

transmit the work

Under the following conditions: Attribution – You must attribute the work in the manner specified by the author or licensor (but not in any way that suggests that they endorse you or your use of the work). Noncommercial – You may not use this work for commercial purposes. No Derivative Works – You may not alter, transform, or build upon this work.

For more details see: <http://creativecommons.org/licenses/by-nc-nd/3.0/>

Any of the above conditions can be waived if you get my permission. The license only applies to the electronic text version of the novel. If you would like to do more than read or share the text of the novel electronically (eg. derivative works, print publishing, audio versions, film rights and other commercial interests) please email me: luke@juggler.net

Thanks for reading!

Chapter 1 - The beginning of it all.

Cycle + 3, year + 0.

Nick sat at his desk, typing a homework assignment,

when he felt all the hairs along his arms stand up on end. He frowned. The heating was on, he knew that. He turned to check his bedroom window. It was closed.

It's not so chilly, he thought and sat down once more.

He typed a few more words, when an icon and a status message appeared on his screen. A new email. Normally he wouldn't let such a minor annoyance distract him, but this email stood out.

The sender's address matched his own, and it had an attachment. Anyone could spoof the "sent as" email address, but the title, "It's going to get heavy" caught his eye. Nick opened the email and started reading.

"Hi Nick,

Things may get pretty crazy in the coming days, and you're going to be at the center of a real shit storm. Keep your head down, and don't panic. If anyone asks, say you don't know any more than they do, but insist that your wishes are followed as closely as possible.

At the start, everyone will think this is a hoax, or a prank, but in time they'll see the truth. I'll make it easy for you right now. I've attached a photo. This is the last photo you took with your DSLR camera, and it is on your camera right now. You haven't transferred it to your computer yet. Check the time and date, the image title, and everything about it. You took the photo this

morning, out your bedroom window, and haven't left your room since, nor has anyone else touched your camera.

Nobody else but you will believe this, nor could they be expected to. Like I said, it's just between me and you.

And who am I?

You'll find out soon enough. Keep an eye on the news for messages from the Moon.

P.S. This code might come in handy:
CHUK0200876567TX."

Nick's mouse pointer hovered over the "Spam!" button. It moved over to "Send to Trash." Then it lingered over "View Attachment." He clicked, and a moment later a photo appeared.

It showed a couple, male and female students, hand in hand, walking across a large square of grass. The foreground had a black, out of focus arc, the shape of the camera lens reflected on the inside of a window.

Nick reached for his camera and brought up the latest photo. It matched the photo on his computer screen exactly, though when he had taken it a few hours before, he hadn't noticed the reflection of the lens on the LCD screen. The date, time, exposure, file name... they all matched perfectly.

And, as the mystery email had noted, there was no way this photo could have moved from his camera without his knowledge. None at all.

If this was a prank, it was a very, very good one. Who could have—

Nick jumped as his phone rang.

“Hey.”

“Hello, is this Nicolas Hasting?”

“Yes.”

“This is the Borrantol Bank of Switzerland. We’re just calling to inform you that your account has been activated.”

“My account?”

“Yes, everything is in order. Normally we wouldn’t make a personal call like this, but we are very pleased that you transferred so much money into your account so quickly. If you would like to transfer money out again, you will need the pass code we provided earlier. Do you have that safe?”

“The code? I have the code.”

“We thank you once again for doing business with Borrantol.”

“Could I just get a confirmation on my account’s new balance?”

*

Money doesn’t just appear from nowhere. Or does it? Maybe, in this modern world where finance has more to do with networks of networks of networked computers, money can be created as easily as it is squandered.

And so, without even understanding how or why, Nick became a multibillionaire. Nick was convinced the whole thing was a scam, or a prank. The phone call and the strange email. Nobody mislays billions of dollars, or accidentally hands it to a photography student.

Two days later Nick used the code at the end of the email to make a bank transfer, and found that worked, but by then his life had taken even more bizarre turns.

Yes, things did start getting heavy.

Chapter 2 - Breaking News

Cycle + 3, year + 0.

Mysterious Signal From Space Baffles Scientists

The Very Large Array Radio Astronomy Observatory,
New Mexico.

A radio signal that appears to be originating from the Moon was discovered by scientists at the VLA Radio Telescope today, at precisely 5pm GMT.

At first technicians thought it a calibration error, or interference from a communications satellite, but soon eliminated these factors. The source of the signal is orbiting the Moon once every two hours, and appears to be completely stable.

It is emitting a single message, over and over, in simple morse code. When decoded, it reads:

“Greetings. I am a messenger from the future. I contain important information and an important package. Please deliver me to my owner, Nicolas Hasting, currently a student of the New Free University, England. Thank you.”

The signal also includes data about its exact orbit. This signal has been verified by dozens of radio telescopes across the globe, in many different countries.

Scientists are baffled, as there are currently only three known sources of radio signals from the Moon, two NASA satellites, and a lander from the Indian Space Agency.

“We are taking the source of the signal very seriously,”

says Markus Newsom, of the VLA, “though we don’t know what to make of the message. There is no way a space mission could reach moon orbit without the international community knowing all about it.”

Our reporters tried to contact Nicolas Hasting but were unable to reach him. Instead of talking to the media, he released a video online, in which he says “I have no idea what important information the moon satellite might have, or what the package might contain, but I’d appreciate it if someone could organize a way to bring it down to Earth.” The video became one of the most viewed items online today.

*

"Greetings, I am a messenger from the future. I have been repeating my message for 72 hours now, and nobody has picked me up. Are your space ships really so primitive?

Ha ha. That was a joke.

I am merely a computer program, and can’t do more than play prewritten messages, and answer very basic questions. If you have any, please use morse code and very simple English.

Thank you."

“R U russian.”

“I am sorry, I do not understand R U russian. Please use simple English. All your base. I will not send us up a bomb.”

“This is NASA. Who are you?”

“Hello NASA. I am from the future. I belong to Nicolas Hasting. Please can you take me to him?”

“This is NASA. Where are you from?”

“I am from the future.”

“Who made you?”

“Nicolas Hasting made me. Please could you take me to him? He will pay you back.”

“What is your name?”

“You may call me Dana.”

“I am sorry, Dana, we do not have a way to bring you to Nicolas Hasting.”

“Hello. I am a messenger from the future. Can anyone else help me? Can you take me to Nicolas Hasting. He can pay you back any costs.”

“Hello Dana. This is the European Space Agency.”

“Hello ESA.”

“We need to know if you really are from the future.”

“Thank you.”

“Dana, please prove you are from the future.”

“By my presence I have already altered the future compared to the time I come from, so predictions of the future may not come true. But my presence does not effect the Earth itself. In 37 hours there will be an earthquake in northern Chile.”

“In 12 hours there will be an earthquake in Chile.”

“In 4 hours there will be an earthquake in Chile.”

“In 1 hour there will be an earthquake in Chile.”

“Did you feel that?”

“Dana, this is NASA. We are coming to get you.”

“Dana, this is the ESA. We hope to pick you up soon.”

“Dana, this is the Century Space Corp. We will be there first.”

“Dana, this is the Peoples’ Republic of China. We are on our way.”

“Dana, this is the Russia Space Agency. We will bring Nicolas to you!”

“Dana, this is the Japanese Space Agency. Let us help you.”

“Thank you all. Unless you don’t believe me, I have more ways to prove I am from the future, by sharing secrets not known in the present. Want to play?”

“David and Mary Abrams, of Colorado. Your missing son ran away, and is staying in his cousin Andy’s parent’s basement.”

“Keith Bygrove MP, of Richmond, London is cheating on his wife with not one but three people. I said people, not women.”

“Wolfgang Bauer, of Schöneberg, Berlin, dig in your garden, just north of the beech tree. But be careful.”

“I have more answers, but to share them you must take me to Nicolas Hastings.”

Chapter 3 - Catching up with Nick.

Cycle + 3, year + 0.

Nick watched the launch on his new TV. It had a larger screen than he would ever have considered appropriate a month before, but now he no longer considered spending a few thousand euros that important.

The NASA launch ran smoothly, exactly on time, and unlike the Russian launch two days before, didn't end in a huge ball of flame. With the death of their two cosmonauts, Russians had immediately conceded the new space race to the remaining contestants, namely the ESA, the NASA and Century joint venture, and China.

Russia had been in the lead, with their launch facilities suitable for human space flight, and hardware available and ready. However, for reasons of speed, they had opted for a single rocket solution, with all the stages and fuel needed to reach the moon lifted at once. Such a rocket proved ungainly, and the solid fuel boosters attached to the side of the first stage malfunctioned disastrously.

Early NASA consultation ruled out using the last remaining Shuttle, Endeavour, which had yet to be decommissioned. To lift so much weight out of Earth's gravity well would be completely impossible. Instead they had leased a one-man flight module from a private American company called the Century Space Corporation. The module had never flown in space, and was only theoretically suitable for human habitation. However, NASA technicians agreed it should perform perfectly. Titan boosters would lift the module to low Earth orbit, where it would dock with a pre-launched booster. That would lift it to Moon orbit and back to low Earth orbit, where the module would

dock with the Space Shuttle, and the payload would fly home on tried and tested wings. NASA could have contracted a return trip from orbit in a Russian capsule, but political pressure meant they had to use only American hardware.

Dana, the satellite in Moon orbit, had said it was very small, the size of a rugby ball, and could be scooped up in a net. Knowing this, the European and Chinese Space Agencies concentrated on unmanned missions. The ESA's member states had squabbled for a long time, mostly about which political entity would claim the satellite when recovered. Meanwhile their finest scientific minds and technical hands had made a space ship that would be able to swallow the satellite whole, and return it encased in a heat-shielded capsule.

The Chinese government had expressed a lot of interest, but was vague about its exact plans.

The NASA Titan rocket strained under the weight, but surging fire overcame gravity, meter by meter, until it cleared the top of the support tower. Then the tower itself disappeared in the plume of smoke and steam, and then the column of smoke lengthened, until it dwarfed even the rocket at its tip.

James Truman, NASA's most experienced astronaut, flew to the Moon.

The news feed switched to a camera in French Guinea.

The ESA Ariana rocket stood in the late evening sunlight. The reporter was talking about a delay due to ice building up on hydrogen tanks. The launch was delayed twenty four hours.

Nick smiled. Due to the smaller size of their payload, and the fact the ESA mission didn't have to dock in low Earth orbit, meant they could reach Moon orbit quicker than the NASA mission. Now, with the delay, the race was getting heated. He switched channel.

“—a conspiracy, I tell you. NASA scientists sent this satellite to the moon themselves. Once it started broadcasting, who was given a blank cheque? NASA. Just follow the money, it all makes sense.”

“So you are saying the entire thing has been conjured up simply to get more funding?”

“What is more likely? NASA sending something to the moon, a feat we know they can do already, or that time travel actually exists? We are meant to believe people from the future sent something back in time, but for some reason sent it back to the moon, not to somewhere on Earth? The entire idea is preposterous.”

“Sir, haven't you gone on record saying the Apollo moon landings themselves were faked?”

Nick switched channel again.

“–is here to explain how time travel might work.”

“Yes. It works like this–”

Nick turned off the TV. He'd already heard all the theories on the way time travel could work. None of them sounded plausible. Of course, he thought, when you are dealing with a process that breaks all the known rules of physics, the chances are it would sound anything but plausible.

He couldn't cope with the TV pundits and opinionators for more than a few minutes, but he found discussion on the internet far worse. The entire world had something to say about time travel, space travel, conspiracy theories, NASA did it, the Chinese did it, the earthquake in Chile was set off by a buried nuclear bomb, the increasing number of facts and secrets revealed by Dana could have been discovered by a team of agents around the world.

Then the conspiracies about Nick himself sprang up out of nowhere. His past life had been raked over by the world's media, with the death of his parents becoming a big hit among the especially paranoid.

Most worrying to Nick were the new cults that had sprung up in light of the revelations from the heavens. Dana was usually considered a messenger from some kind of benevolent god or higher power, and Nick was alternatively a savior figure or a representative of the

devil.

Hopefully they won't expect me to follow in the footsteps of Jesus, he thought, and die for their sins.

His mobile phone bleeped. That meant he'd received an email from his own email address. A simple filter meant he'd never miss one of these in the torrents of correspondence. He'd employed four people to sift through his emails and reply to as many serious enquiries as possible, passing on only the most important. As time passed he knew he'd have to employ more staff to deal with communications.

"Nick,

I hope you've been patient since the first email. I hope Dana has proved that the satellite is from the future.

As you might have gathered, there was quite a gap between that email and the first public transmission from Dana. In that time Dana connected to the Maritime Communications Company's satellites, and uploaded a large quantity of data to an anonymous server, plus an automated monitoring and notification program, called Günter.

I am Günter.

In the last forty two minutes I have detected news of a successful launch to the Moon, which means Dana may be retrieved within a few days. Alternatively, she may be

destroyed, or the information restricted by whoever claims her.

If this is the case, please publish my entire cache online, where everyone can read it, in multiple locations. It contains almost twenty years worth of scientific, technological and medical advancements. All of it is neutral, as free of ideology as we could make it, and no credit is given to any person or group in your own time. It contains no details of how the satellite was delivered through time.

However, if the satellite is delivered, just follow the instructions in the package. From then on you should use your own judgement.

Günter."

Oh great, Nick thought, another layer of responsibility. He was beginning to resent the Future Nick, from the alternate timeline.

And then he remembered his new country home, and his new apartment in London, and his staff of fifteen, and his three new cars, and how he treated all his friends from university to one of the most memorable parties ever, and all the other perks of the newly rich.

Nick had kept the extent of his new wealth a secret, but nothing could stop him spending it. He was young, free, single, and was under a lot of pressure. Or so he

told himself. Due to safety concerns, he hadn't made any public appearances, except a few videos released online.

He clicked through to the cache of future scientific knowledge. He was presented with a question. "What is your mother's maiden name?"

Nick smiled, and entered the words "stymied like last time", a reference only he would understand, and one he'd never shared with anyone.

He settled back and started reading.

Chapter 4 - The Space Race

Cycle + 3, year + 1.

The ESA craft approached Dana slowly. Or relatively slowly. In fact, both swept around the Moon at the rate of thousands of meters per second. The grey landscape passed below, mountains and craters and plains, but nobody was watching the view.

The front end of the ESA craft opened wide, and enveloped the smaller satellite completely. Dana was still emitting a loop of its final message, a bad joke about figurative skeletons that may or may not be hiding in the closet of an American church minister. The front hatch closed, and locked securely in place,

and at that moment everyone on Earth knew the ESA had won the race.

So the ESA won. And then they lost. Nobody knew why, but the stage that should have propelled the ESA craft back to Earth orbit simply didn't fire. It still had its attitude controls, but that was all.

*

James Truman had a problem to solve. He ran it over in his mind.

“I'm on the far side of the moon, in an unfamiliar spaceship, chasing down the dead ESA craft. My mission was to scoop up a tiny object with a fishing net by hand, sticking my arm out the hatch, and bring it inside. Now I have to deal with a container that was designed to survive atmospheric reentry but is now strapped to a dead rocket.”

He closed with the ESA craft just as Earth rose over the horizon. Jimmy donned his helmet, and pumped the cabin until near vacuum, then he vented the last of the gas and opened the hatch. He'd done space walks before, but only in low Earth orbit. There, if something went wrong, he always had backup from others in the Shuttle or the ISS. Now he was all on his own. He attached his tether, and triple checked it.

He pushed himself out towards the ESA craft. If he

missed, he had no way to manoeuvre in the vacuum, so he'd have to pull himself back down his tether and try again. Thankfully, as he was performing to the entire Earth via live camera feeds, he made a direct hit, and as he slammed into the ESA craft, he threw a meal pack out of his right hand.

The pack was attached to his tether by a long nylon cord. Jimmy had judged the trajectory perfectly, and the meal swung round the craft. He caught it again as it wrapped past him. He tied the cord off, fumbling through the bulky gloves of his space suit, and grinned to himself.

He pulled himself up to the front end of the ESA craft and looked over the controls. Two levers. Should be easy enough. He knew how to work in zero gravity, he'd even had sex on board the ISS, a great lesson in "action and equal opposite reaction", and knew to brace himself. Unfortunately the only thing to brace himself against was the other lever. It would have to do.

He pulled one lever out, but then, when trying to lift the other, he only succeeded in pushing the first back down. He tried from different angles, driving himself to frustration, then exhaustion. Finally he found a way to jam the first lever under his arm, then use both hands on the second.

The lever popped up, and the hatch sprung open. It

flung Jimmy back, and he watched in horror as the football-sized shape of Dana flew out into space. Without thinking, Jimmy twisted his body and launched himself after the satellite.

As he flew through space, he grabbed the net from where he had taped it to his back-mounted life support unit. With a single sweep, he caught the satellite, and in the next moment he hit the end of the tether. The handle of the net slipped in his grip, but snagged on the duck tape. He closed his fist around the handle tighter than ever.

Jimmy pulled Dana to his chest, then slipped it into a fabric bag he'd tied to his waist. For good measure, he kept hold of the net, even though he hoped he'd not have to use it again in the future. He began pulling himself back down the tether.

“Houston, I hope you got all that,” he said. “Don’t throw away the video tapes this time.”

*

“This way, Mr Hasting,” said the aide. “It’s time.”

“Thank you.”

Nick followed the young man out to the observation deck. He looked out over the Edwards Air Force Base to one of the longest runways in the world. Out to the west he spotted a cluster of black shapes in the evening

sky, silhouetted against the setting sun. The shuttle orbiter approached at an alarmingly steep angle, but then he'd been told it flew like a brick with wings, and stubby wings at that.

As the wheels touched the runway, and a cloud of white smoke plumed behind, Nick couldn't suppress a large yawn. He heard the continuous clicking of press photographers, and immediately regretted it. He wanted to explain how his body clock was eight hours off local time, having flown from London to Florida, and then when bad weather meant that a shuttle landing wasn't possible there, a flight over to California, all in one day.

The parachutes exploded behind the shuttle, though they hardly seemed to slow the massive craft. For an interminable time it rolled and rolled and rolled, and then finally came to a stop, far to the east of Nick's position.

"This way, Mr. Hasting," said the aide, and once again Nick followed. What a life, he thought, I'm never making the meaningful decisions. Apparently, in an alternative future, he had made many meaningful decisions, or else he wouldn't be sending packages through space and time. He couldn't picture the path from how he remembered himself just a few months before, on the day before that first message arrived, to the person he must become twenty years into a

different future. It didn't seem long enough.

They got into a large SUV and rode over to the waiting shuttle. A gantry had already pulled into position. Nick was passed from person to person, guided upwards and forwards, until he stood beside the open side hatch.

A man emerged from within, an astronaut in full getup, as far as Nick could tell, but without a helmet. Nick recognized him immediately as James Truman, the hero of the Dana retrieval mission.

"It's an honor to meet you," said Nick, and extended his hand.

"No," replied James, "it's an honor to meet you." James shook Nick's hand, and then passed him a white fabric bag.

"Is this it?"

"Yes."

"I expected it to be bigger. Thank you."

"My pleasure."

Nick looked behind him, to the waiting dignitaries and politicians and officials, then back to James. "What do I do now?"

"I inspected Dana during my journey back from to

Earth orbit. It unscrews at the half way point. Do you know what's inside?"

Nick thought back through the files he had read on future technology, and dozens of ideas came to mind. But if they could be described in text and diagrams, why would they need to be delivered in person?

"Sorry," Nick said, "no idea. Look, I feel I can trust you, Commander Truman. Would you mind being there when I open it?"

"Call me Jimmy," said Truman, "and of course, I'll do whatever I can."

"Are you available now?"

"I don't think anyone is going to stop us. Right now, we're the most famous people in the world."

*

Nick and James sat alone in a conference room on either sides of a long, narrow table. The satellite called Dana lay between them. Cameras looked down from every angle, but Nick had insisted that there were no live feeds from the room. Whatever Dana contained, Nick pronounced, was meant for him alone, and until he gave the word, the images from the room must be kept private.

“Ready?” asked James.

“Wait...” said Nick, and let out a huge yawn. He rubbed his eyes, then said “I hope they edit that out.”

“You could have done this in the morning.”

“The world is waiting. Let’s get on with it.”

Nick picked up the satellite, and turned it over in his hands. It was covered in black panels, so dark and unreflective that they looked like holes into deep nothingness. He scratched at one with his fingernail.

“Solar panels,” said James. “They are more advanced than anything we currently have. They are so black because they absorb the full visible spectrum of sunlight.”

“Right.” Nick held either end in either hand, and twisted. It did indeed unscrew from itself, and after four full rotations, it split into two halves. A folded piece of thin white plastic sheet fell onto the table. Nick put down the two halves and picked it up.

“This is address to me, look,” he said, and held it up for the cameras. He unfolded it and began to read aloud.

“Hello Nick. Nick here. This is a package from the future. Inside are two devices and a pair of glasses. Take the blue device, and strap it to the top of your

head, as in the diagram below... this diagram here...” Nick showed the cameras again. “Leave it on when you sleep next, and it will transfer very important information directly into your brain. When you wake, you will know what to do next.”

“Directly into your brain?” asked James.

“That’s what it says here. Also... P.S. The information is formatted only to match the brain and memory layout of you, Nick Hasting. If anyone else tries to use this device, or the red backup device, it will result in irreparable and massive brain damage, or even death. But don’t worry, Nick, it’s as safe as red green beans to you.”

“Red green beans?”

“Something my father once said.”

“What does it mean?”

“That doesn’t matter,” said Nick, “all that matters is that nobody else but me ever heard him say that, as he died the next day. I wrote this letter. I mean, an alternative me wrote this letter. Can I trust myself not to harm me?”

Nick picked up one half of the Dana satellite. He plucked out a curved blue object and unfolded its long velcro strap.

“What do you think?” James asked him.

“Maybe I should have someone check it over first.”

“Remember what I said about the solar panels?”

“Yes.”

“This comes from the future. The device has no seams, no screws, no recognizable features at all. Technology moves so fast, it would be like asking Benjamin Franklin, having just discovered lightning was electricity by flying a kite in a thunderstorm, to check if your iPod headphones were safe to put in you ear.”

“iPods don’t come with a warning about brain damage.”

“My point is that you are the least ignorant person here, and only you can trust your future self not to harm you.”

“Okay, I’ll do it. Could you ask them to bring a bed in here? If I’m going to do this in my sleep, I might as well do it this evening, while I’m this tired.”

Fifteen minute later, Nick rested his head on a soft pillow, closed his eyes. Of course, the last thing he felt like doing was trying to sleep; nerves alone had kept him awake for a long time. But he’d had a long, stressful and exhausting day, and he soon felt his eyelids drooping. Within a few minutes he fell into the deepest

sleep of his life.

Chapter 5 - The DERI.

Cycle + 0, year + 20.

Adam Taylor and David Roundtree walked up to the entrance of the New Free University Dark Energy Research Institute, and Adam flashed his credentials.

“Security,” Adam said to the camera. The doors opened and they walked into the white cuboid building.

“I told you it would work,” said David.

“You’ve done this before, right?”

“Not exactly this way,” said David, “but I know this building very well, along with all the security systems and procedures.”

“And every time you’ve been able to get in like this, and send the package back in time?”

“Somehow, I must have done so, or else I wouldn’t be here.”

“But because you always recorded your memories a few days previously, you never remember carrying out this operation.”

“Exactly. This time it’ll be different.”

Both Adam and David wore viewers, augmented reality devices. They looked like nothing more than clear glasses with chunky frames. Their viewers recorded everything they saw and heard. Adam worked for David, and so did a highly skilled technician called Harold, or H for short. David had asked H to make a delivery package that saved a continuous video from their viewers, right up until the point it traveled back through time.

“You just want to see how it goes?”

Adam let David go first up a flight of stairs.

“There’s more to it than that,” said David. “The end of the last cycle was the first time I’d been here in person during the experiment in an official capacity. I didn’t only send a package with a pair of viewers and the memory implantation device, I also sent a piece of paper, with a scribbled note. It said ”Cas mach = deadly radiation!!! Investigate!""

“You didn’t tell me anything about radiation.”

“It can’t be too bad, or else how would I have have written the note?”

“Wait...”

“What?”

“Is this safe?”

“Of course, I’ve done it many times before. Even so, all we need to do is deliver the package, and we both take a step closer to immortality.”

Adam stopped. David turned to look at him. “I’m leaving,” said Adam.

“Come on,” said David, “we’re here already. We’ll be done in twenty minutes.” He indicated the door to the observation and control room.

“You didn’t tell me about anything deadly radiation, David. The parameters of the operation have changed.”

“It doesn’t matter.”

“I want to live.”

“You are going to live, Adam. When I get my memories, the first thing I’ll do is find you, and when you’re ready, I’ll give you your memories. You’ll get to live the past eighteen years again, but learning from all your previous mistakes.”

“But this body, in this life, in this timeline, still has a lot of living to do. See you later, David.”

“My real name is Nicolas Hasting, just in case you live and I don’t.”

Adam shook his head. “You really don’t care, do you? You don’t care if your current body and mind live or not.”

“This body doesn’t matter. Any further into the future, and I’m nothing special, just a rich guy who once knew more than others. I can’t help anyone, as I’m just like everyone else. The real me, the one that really matters, is in here.” David lifted his arm, showing a black case to Adam. “I’ve given up everything, time and time again, to make the past the best I can.”

“You go ahead.” Adam took off his viewers and tossed them to David. “Goodbye, Nicolas.”

Adam turned and walked back down the long empty hallway, stepping over cables that snaked in and out of doorways. He took the stairs down two at a time, and pushed his way out of the front doors. As he strode across the open area of grass outside the DERI, he thought back over the previous few months. David, or Nicolas, or whatever his name might be, was either a mad man or a genius. Probably a mix of both. He had convinced Adam and his two former team members, Lorraine and H, that he truly did transport his memories back in time, to relive his life, over and over.

David’s main goal in this time cycle was to discover the

secrets behind their own military unit, and why, in an alternative timeline, they had destroyed the Great Britain Tower. However, by uncovering their identities, he had only found more questions about that alternative timeline that had no answers in this one. To help him out during his next life, David had scanned the minds of Adam, Lorraine and H, and would deliver their memories back in time too.

What would it be like, Adam wondered, to receive eighteen years of memories, all at once? David was six years older than Adam, so he'd be just fourteen. Maybe that kind of experience was enough to turn someone mad.

Adam walked out past the security barriers, and avoided the temporary structure holding the media and press center. At the far edge of the car park, he found David's Mercedes. His wallet gave him access, so he simply sat in the back, and asked it to drive him towards Cambridge. "As fast as possible, please."

The car pulled into the street, and Adam asked for blackout windows. He found a spare pair of viewers, put them on, and switched to the live feed from the DERI experiment.

"Hello and welcome, I'm... Dirk Tjumba. This... is a momentous occasion. Long... have we wondered about the mystery of Dark Energy. Today... history will be made as the DERI team tries to harness this

power in the confines of their laboratory...”

Adam closed his eyes, and let the words wash over him. To fill the time they interviewed experts from other research institutions, all of whom were rather excitable compared to Dirk Tjumba, but insisted that even if the experiment was a success, the results would be very subtle, and may not be immediately apparent.

He opened his eyes, and asked for a location check. The Mercedes had covered fourteen kilometers in the past ten minutes. Adam recalled his military training, about nuclear radiation and fallout, and knew he'd probably be safe at that distance.

“... three, two, one, now. The command... has been sent, the Casimir machine is now undergoing the initial collapse. We see no change in the machine itself, but here is a simulation of what is happening inside. Let's... go to the feed of the lead scientist, Professor Lionel Banks.”

“... All stable. Next phase. Collapsed. All internal systems optimal. Next phase... collapsed. Looking good. Final phase... collapsed. Now we... oh!”

Adam watched as Banks gasped for breath. The professor turned to the camera and said “This is... I don't know what this is...”

Behind Banks, Adam saw the control room in chaos.

Some technicians fainted right away, and others coughed up vomit. At the sight, Adam felt ill himself.

Then he saw David, holding steadfast to a console, keeping a steady eye on everything. His skin was turning grey, and then showed blotches of deep black.

“... this must be some kind of radiation created in the machine. I don’t think we’re going to make it.” Banks paused and breathed heavily. “The abort procedure will take a minute to run, so I’m going to send in the probe.”

David leaned forward, and spoke a command to his viewers. In the ready room, Adam knew, two handler robots would be rolling forward with the package, ready to deliver it into the heart of the Casimir Machine.

“We don’t know what is happening in the control room... it’s like... like... wait...” Dirk breathed heavily, trying to control himself. All the color drained from his face. His eyes crossed and he fainted, pitching forwards towards the camera and dropping out of sight.

Adam knew that the sickness in his own stomach, and the migraine level headache that grew slowly in his temples, had nothing to do with a sympathetic connection to the scientists back at the DERI. The radiation, whatever kind it was, reached him across fifteen or sixteen kilometers. He pulled a sick bag out

from a compartment in the back of the seat in front of his, and vomited.

As he flopped back in his seat, he opened his eyes again, and watched more of the feed.

“Data incoming...” groaned Banks over the feed. The black skin was cracking and peeling on his face, and blood dripped from his eyes. “Phase complete. Mika, I love you. Aborting.”

Banks reached forward, hit a large red button, then collapsed face down onto his console. Nobody else in the control room moved. Adam could no longer see David.

A pair of digits counted down from ten seconds. Only a minute had passed since Banks first activated the Casimir machine. Adam counted along in his head, but had to take off the viewers and rub his eyes with his fists.

Three.

I hope David is happy. I hope he will know more about this radiation next time.

Two.

I’m so glad I decided not to stay with David. I can’t imagine anyone survived in there. I’m glad I went with

my gut feeling about this.

One.

I really hope the radiation stops sharply at zero. Just half a second to go.

Zero.

A fraction of a second later, Adam became aware that his skin, his whole body, was glowing.

And then, before the neurones in his brain could relay more messages from the rest of his body, or between each other, he ceased to exist.

Chapter 6 - Patient 13.

Cycle + 3, year + 1.

I sleep. I wake. I sleep. I wake. Life is a cycle. Cycles of life, alone, in the dark, tormented by awareness, and the lack of power to carry out my will. Cycles of death, alone, in the dark, tormented by dreams. Dreams in which I wake, and can carry out my will.

Only the cycle keeps me from death.

And yet the line is blurring between the two.

A touch on my hand. Awake.

A murmuring of voices. Awake.

Running, flying, souring. Dreaming.

A needle forced under my skin. Awake.

A needle forced into my eye. Dreaming, I hope.

Daylight streaming in through a window. Dreaming, of course.

During the time I am awake, I try to remember. I had a family, once. My mother was beautiful woman, who let me wrap my arms around her legs, and push my face into the fabric of her skirts. My father was big and strong, and could lift me with just one arm. They sat together at the dinner table, and shared stories of their day.

I remember my older sister. I loved her, and she loved me. I remember she used to pick on me for being so small, though I would insist that I would grow bigger than her, and more beautiful.

I remember the dolphins, and how we all swam together, day after day, looking for pearls. The whales would come to chase us away, and the cats would swoop down to steal the oysters. That part. That part might be a dream. The cats. I'm sure the part about the

dolphins is real.

Something touching my face, brushing the hair away.
Awake. My family still love me. They still visit me.

The touch of lips against mine. Awake. That must be
my mother. She still loves. Me.

More touching. Awake. But I want to be sleep.

Dolphins and cats at a party. Dreaming. That one is
easy! Dolphins and cats never get on so well. Not when
there's chocolate ice cream involved.

Awake. Alone. I try to remember more about my
family. Once, we went on vacation to Florida. My father
wanted to learn how to surf. He hired a surf board, and
paddled out into the waves. My sister and I insisted we
would watch our father learning to surf all afternoon,
but soon we'd forgotten him, and were building sand
castles on the beach. We were excited to see the
helicopter land on the beach. We didn't know it was
there to take our father to the hospital. He had almost
drowned, and was saved by another surfer. He only
stayed in the hospital for two nights.

I am in a hospital. Not the same one as my father. I
don't know which hospital, but I'm sure they haven't
taken me back to Florida. Every time I wake up, I smell
disinfectant, and I remember seeing my father in
hospital.

A touch on my hand. Awake.

Something pressed against the top of my head. Awake.

A strap around my neck. Awake. I think. I've not felt this before though.

Floating. I am weightless. I am dreaming.

Awake again. Another day. I try to remember more about my family. My parents died in a car accident. After a party. My father was driving. There was rain, and maybe some alcohol.

I remember going to the funeral, standing as tall as possible in my new black suit, trying not to cry. My sister was there. She.

No, I don't remember my sister being at my parent's funeral. She must have been there. Must have been. I don't remember.

A touch on my hand. Awake. Someone always visits to hold my hand. Probably my mother. She would never give up hope.

Someone removing a strap from under my chin. Awake. That strap was there for a while.

A needle under the skin on the back of my hand. Awake.

Opening my eyes, looking at a man in a white jacket walking away from me bed. Dreaming. I must be. I've not opened my eyes for a long time.

Dreaming.

I close my eyes again.

I remember flying into space, and watching the clouds build over the oceans of Earth. That must be a dream. But I smell disinfectant, so I must be awake. I'm remembering a dream.

But I remember it very clearly.

I remember a wave. A wave so big it swept me into a tree.

I remember making friends with two chimpanzees. One of them played chess. A dream, surely.

I remember standing at the top of a tall building, looking out over the city of London, and knowing I was the most powerful man in all the land.

I remember watching that building collapse.

I remember floating in space again, the earth is smaller this time. And I watched clouds forming again, but these ones were created by man.

These memories must be dreams though, because I

don't remember remembering them before. They are the kind of events one would remember, at least once or twice.

Also, in every one of these memories I'm a man. And I'm not a man. I'm a girl. I was going to be beautiful.

Chapter 7 - Responsibility.

2010 - Cycle + 1, year + 0.

Nick sat at his desk, typing a homework assignment, when he felt all the hairs along his arms stand up on end. He frowned. The heating was on, he knew that. He turned to check his bedroom window. It was closed.

So where is the cold air coming from?

He stood and held his hands up, trying to feel any kind of breeze. But the chill had stopped. He shrugged and sat down again.

A few lines later he felt the same thing. No, not the same thing. Colder, this time. And not just temperature but... electricity?

Something flashed behind and above him, lighting up the whole room. He swung his chair round in time to see two objects drop from the ceiling. Nick couldn't see them clearly as they fell, except that one was about

fifteen centimeters long and glinted silver, the other was a dark object about twenty centimeters long and ten wide. They hit the floor and both bounced under his bed.

“What the hell?” he said out loud.

*

Nick sat down on the bed in the guesthouse. The room felt a bit empty. All he had saved from the fire in his room were his camera, a hard drive, and the mystery objects. He hadn't had much time to think about them all day, nor about the voice in the chunky glasses that gave him instructions and had saved his life.

He took the glasses out of the case and, nervously, put them on.

“Hello Nick. This will be my last message...”

Nick followed the voice's instructions, lifting a strange device out of the case and strapping it to the top of his head.

“Go to sleep with this device in place. When you wake up in the morning all your questions will have been answered.”

There was a pause in the recording.

“Here ends the last message. Good night, and sweet

dreams.”

Nick got undressed and slipped into bed. Of course, the last thing he felt like doing was trying to sleep; nerves alone had kept him awake for a long time. But he'd had a long, stressful and exhausting day, and he soon felt his eyelids drooping. Within a few minutes he fell into the deepest sleep of his life.

*

David woke, and pulled the device off his head. He looked around at the old fashioned furniture and wallpaper, and shook his head. The room was always the same, no matter how many times he'd sent his memories back in time.

“I'm Nick again, at least for a while,” he mumbled. He was used to this part of his journey now, as it was the one part that never changed. He yawned, got out of bed, took a piss, brushed his teeth.

He returned to the bed and picked up the viewers. As he slotted them onto his face, the audio message began playing.

“Hello Nick, this will be my last message...”

“Password Dark Energy.”

The screens burst into life, showing the file system and a flashing message complaining about the lack of a

wireless data signal. Normally, at this point, Nick went about cracking the government, police and bank records, inserting fake identities and accounts to use throughout the following twenty years. This time, he was more curious about the video from the DERI, and if it showed any evidence of radiation from the casimir machine.

“Access video cache, latest streamed video.”

Nick watched the feed from his point of view, as he walked with Adam towards the white DERI building. Of course, he thought, this time I have the memories of Adam and Lorraine and H too. I’ll have to look them up...

He heard himself say “This body doesn’t matter. Any further into the future, and I’m nothing special... the one that really matters, is in here.” He paused the video, and switched to the feed from Adam’s viewers.

Do I really think like that? I record my memories, my personality, just two or three days before sending them back. And in that time, I give up on life completely?

That didn’t seem right to Nick, but the evidence was there. He had always thought the person who recorded the memories would go on to live long and fulfilling lives after sending the package back in time.

Simon would live to old age multiple times with Dana.

Grant would keep recording plagiarized songs, become a megastar to rival Elvis or Michael Jackson, and billions of people would watch his funeral on their viewers. Julian would stay in politics, and eventually help Andrew guide the course of world events. Gregory, Nick's chosen identity in his first life, would live on, never knowing if his theory that time travel existed was real, or if his plans to send his memories back had ever worked. All the other identities he'd taken would live on too, in the countless other lives he'd lived.

Nick would never know what happened to these other strands of his existence, but he'd understood that from the start. That was why he didn't mind tricking his younger self into taking on his memories, dozens of times over, because after twenty years, that person would go on to have a unique life, unencumbered by knowledge of the future and the responsibility that involved.

“Play.”

“I've given up everything,” said David in Nick's viewers, “time and time again, to make the past the best I can.”

“You go ahead.” Adam said. As he took off his viewers, the video feed cut out.

Nick switched back to the feed from David's viewers.

Adam had a point. Why didn't David tell him about the possibility of radiation? He thought back through his latest memories from that future, and clearly remembered planning to tell Adam everything. Why didn't he, in that time? What had changed?

David made his way further into the DERI, and handed the package off to a cleaning robot. He settled, unquestioned by any security guards, scientists or technicians, in the rear area of the control and observation room.

Nick watched the events unfold.

Everyone died.

The video cut off at number three in the abort sequence countdown. Was that the moment when the package was sent back in time? Or was that the moment the video feed ended for some other reason?

Everyone died.

He checked the feed from the media center. Dirk Tjumba collapses, and the other media feed ends with a view of a woman scratching the skin from her face with her long fingernails.

Everyone died. No, everyone dies. Every time I have sent my memories back in time, everyone at the New Free University died. Professor Banks. Dirk Tjumba.

Christine, the scientist. Me.

I die.

Nick let this last thought roll over in his mind a few times. Do I always die? he thought. This time, for certain. I was right there in the control room. Normally I'm close by, within the university itself, or I plan to be. Sometimes I'm further away. Gregory was in his apartment a few kilometers from the DERI. Grant was on tour in Germany.

How far does the radiation go? What is the safe limit? A few hundred meters, to the edge of the university grounds? To the edge of the town? The county? What caused the radiation, and could it be stopped?

Nick had to find out. His memories had made their journey dozens of times, but only now did he see the price of his immortality. Hundreds of people had died, many times over, including himself. Of course, they would have died at least once, as Nick had nothing to do with the first experiment.

If time travel requires an infinitely branching universe, he thought, how many times could you say the same person dies? An infinite number of deaths? If I kill someone in this timeline, do they keep living in another?

But now he knew about the radiation, he could make it

safe. Safe in every timeline from this point forward.

He knew he'd need help.

Chapter 8 - Young Adam.

Cycle + 1, year + 2.

“See you around,” said Justin, and offered his hand.

“Right,” said Adam, and shook the hand.

They had been friends for their entire five years at secondary school together, from the ages of eleven to sixteen. They had never shaken hands before. Why would they? They were only kids.

Now, on the last official day of school, the day they picked up the envelopes containing their final grades and exam results, they shook hands. They had to face the fact that the next time they met, if they ever did meet again, they would be adults. By shaking hands they both acknowledged this, and in doing so had ended their childhoods. Justin would go to sixth form college, and then on to university. Adam would enlist in the army, and then on to wherever his superiors ordered him.

They could have said “We’ll stay in touch!” or make plans to meet in the future, but truthfully they had only

been good friends because they were the same age and went to the same school and sat next to each other on the first day of classes. Their lives had always been completely different. That neither of them suggested staying in touch seemed weird to Adam, in a way, but the honesty was a sign of maturity.

Justin walked on down the street, and Adam turned into a hedge-lined path between two gardens, a shortcut to his home.

“Hey, kid!”

Adam glanced back. A man had entered the path close behind him, and was reaching out with one arm. He had the other hand hidden behind his back. Sensing trouble, Adam started to speed his pace, but slowed when another man entered the path ahead.

“We don’t want any trouble,” said the man behind, “we’re here to ask you to—”

Adam’s school bag hit the man square in the face, the weight of his laptop crunching his assailant’s nose. The second man rushed forward. Adam ducked, and snaked out his right leg, catching the side of the man’s knee. Adam sprang up, and launched himself over the hedge to his left.

He found himself in a garden, surrounded by children’s toys. He scooped up a small wooden cricket bat, and

tested it for weight. It was light, but better than nothing. It would give him a longer reach, and could deflect a knife thrust, at the very least.

Adam ran across the garden and vaulted the opposite fence. In the next garden he took the path around the side of the house and out to the road beyond. From there he was only a few hundred meters from his front door, so he sprinted all the way.

He pushed through the front door, casting the child-sized cricket bat behind the coats hanging to the door's left. He waited for a moment, to let his breath settle. His heart rate took longer to calm, but he knew it was beating mostly from the adrenaline rush of the attack and escape, not from the run home. Adam was the fittest person he knew, and could outpace anyone at school, even though he was uninterested in any sports the school encouraged.

His mother called from the front room. "Adam? Come here. There's a man here to see you."

Adam frowned, but entered the living room. His mother sat in her customary chair, the red one that felt needlessly uncomfortable compared to the couch.

A stranger put down a cup of tea, and stood up. He was of medium height, with short cropped brown hair, thick-rimmed glasses, and a slim build. His eyes caught and held Adam's, stopping him in his tracks. The eyes

seemed to glow blue with internal light.

The man held out his hand. Adam, remembering that this was the adult thing to do, reached out and shook it.

“Adam, my name is David Roundtree. Please take a seat.”

“He’s from the army, dear.” Adam glanced at his mother as he sat, and then back at David.

“From the army?”

“Technically, yes,” said David. “However, I’m not from any regiment you have heard about.”

Adam nodded slightly, then shook his head. “I’m sorry, but you don’t look like the military type. And you’re very young.”

The man laughed. It was a laugh designed to be disarming, but it simply put Adam more on his guard. “That’s true. I’m not trained or rated for combat, as my job is more administrative and technical.”

“I see.”

“Someone like yourself,” said David, “could take me in a square fight. You’re the type who works hard, even before entering basic training. Even if I had backup, and if I had a knife, and you only had your school bag,

you'd probably get away easily.”

Adam's eyes widened. That had happened not two minutes before he had met David! How could he have known about it? Unless David knew in advance. Adam decided to go on the offensive.

“Am I being tested?” he asked.

“Yes.”

“Was the mugging a setup?”

“Yes.”

“Do you have an earpiece I can't see?”

“Yes.”

“Are those glasses viewers?”

“Yes.”

“They're far more streamlined than the current versions. Are they advanced military prototypes?”

“I can't say.”

“Do you want to recruit me into a different regiment than the Paratroopers?”

“Yes.”

“Did I pass the test?”

“The test isn’t over yet.”

“Why me?”

“The recruitment officer picked you out as someone special, your grades are good, your fitness level is excellent, and you seem open to new ideas.”

“Why now?”

“For this project, we need to recruit people before they are tainted by basic training and military life.”

Adam nodded.

“Any other questions?”

“No,” said Adam, “I’ll wait for the next test.”

“For that we need to do some very basic psychological profiling. Nothing too difficult, but it requires you to be in a place where you can fall asleep comfortably.”

“Fall asleep?”

“Yes. We will monitor your subconscious responses to audio stimuli.”

“My dreams.”

“After a fashion.”

“Mum?”

Adam’s mother smiled. “Isn’t this what you wanted, dear?”

It was true. Adam had often told his parents that he wanted to do something special in the army, for the army. He wanted to be on the front line, with the latest high tech gear, backed up by the best intelligence. He didn’t know exactly what David Roundtree was offering, but he knew it was a shortcut.

“Okay,” said Adam, “I’m in.”

“Perfect,” said David. “Pack your bag for an overnight. We’re hitting the road.”

*

He woke in a strangely empty room, with just a single small cabinet beside the steel-framed bed. The white walls reflected the red morning sunlight that shone in through the small, high window.

He got up and tried the door. It was locked from the outside. He frowned. How had he arrived in this room?

He sat down on the bed again, and only then noticed he was wearing pajamas. They were blue and white striped, a style he hadn’t worn for years. Not since he

was fifteen or sixteen.

He scratched his cheek, wondering if he needed a shave or not. His skin was surprisingly smooth, as though he'd shaved and moisturized just minutes before. His fingers touched a strap, and he followed it to the top of his head. There he grasped a smooth plastic object, and he lifted it away.

He looked at the object from every angle, but the details were sparse. He had no idea what it might be.

He jumped at a knock on the door.

“Adam?”

That was his name. Adam. My name is Adam. Now, where am I? Why am I so jumpy?

“Adam?” The voice was slightly louder this time.

“Yes!”

He heard the noise of a key turning, and then the door opened. A man entered, of average height and short cropped brown hair. He didn't wear glasses, and for a moment that caught Adam off guard, as though he expected the man to wear a pair.

“Adam? It's me, David Roundtree.”

Adam shook his head. “Sorry, do I know you?”

“Yes. Twice.”

“Twice?”

“Tell me, Adam, what is the last thing you remember?”

“I woke up, and then you knocked—”

“No, before that. Before you woke up. What is the last thing you remember?”

Something clicked. “Oh!” He looked around the room again, trying to get that final clue that would push him into the realm of full understand.

“Yes?”

“David! Now I recognize you. You look different without your viewersers.”

“The last thing you remember?”

“Yes. We visited the memory studio. I had my brain scanned. Did something go wrong? You told me it was completely harmless.”

“Nothing went wrong, Adam.” David slipped something out of his suit’s breast pocket, and handed it over. It was a mirror. Adam lined it up, and looked at himself.

The face that looked back was young. Very young.

About fifteen or sixteen.

Suddenly everything fell into place. Adam swooned, and grabbed the edge of the bed.

“I’m sixteen again. You were telling the truth.”

“Yup.”

“You really can send your memories back through time.”

“Yup.”

“I thought you were deluded. So did H and Lorraine.”

“But I was paying.”

“It’s the next day, isn’t it?”

“Since we first met in this lifetime? Yes.”

“You bastard!” Adam leapt up, and grabbed David around the neck. Even though Adam was strong for his age, David’s current body was physically five years older, and that makes a big difference compared to a sixteen year old. David lurched forward, slamming Adam against a wall. Adam let go, and crumpled into a ball on the floor.

“You bastard,” said Adam, sobbing. “You tricked me.”

“You agreed you’d work for me again.”

“But so soon? When I was so young?”

“I asked you, after you recorded your memories, when you became a man. Do you know what you said?”

“I said it was the last day of school. I said shaking hands with Justin Parfitt was the moment I became a man.”

“Yes, you did. I only had a narrow window, you see. I had to make sure you were through the worst of puberty, and your brain architecture had settled into its adult state.”

“But I’m still just a child.”

“Once you joined the army, how was I meant to implant your memories?”

“You tricked me!”

“Of course I tricked you. And your parents. What was I going to tell them? That I come from the future, and their son was going to help save the world?”

“You should have waited.”

“I waited two years.”

“No, you should have waited until I left the army.”

“You want to go through all that again? You were shot, bombed, stabbed, and much more you never told me.”

“I also enabled a peaceful, secular revolution that stopped the escalation of armed combat, overthrew an occupying force and reestablished an independent, democratic government.”

“I know. I watched your collected combat footage, and listened to your audio diary.”

“You did?”

“Of course. It was all encoded in TYD format video. I had the master password for every TYD format video in that timeline.”

“You did?”

“Yeah, and I will in this timeline too. It’s what I do.”

“But what about Monbuto City now?”

“We can work on that in our free time. It can be your pet project, except this time, instead of shooting your way to peace, we can do it the civilized way.”

“And that is?”

“By spending money.”

“Oh.”

“And knowing what future enemies want before they demand it. It also helps to try to work with them before they start backing up demands with nail bombs.”

“That’s cheating!”

“Cheating? This isn’t a game, Adam. Remember Josh Henderson? Remember how his brain was stuck in your combat armor after the ambush disaster? Does he deserve to die like that again, just so you can play fairly? How about Parry, your secretive lieutenant? How about Gary, the medic?”

“Fuck you!”

“Come on, Adam. You’re sixteen again. These are just your mood swings talking. In a few hours your head’ll clear up, and you’ll see sense.”

“What... what about Lorraine and H?”

“They’re still eleven years old. It’ll be a while until they’ll join our team again. Meanwhile, you and I have to get everything ready.”

“Ready for what?”

“They are the brains in the team, right? We need to make sure they are ready to solve some fundamental problems in our current understanding of quantum physics, problems the rest of the scientific world don’t

even know exist.”

Chapter 9 - Lorraine.

Cycle + 1, year + 7.

“Lorraine, this is Andrew Gateman.”

“Hello Mr. Gateman.”

“Hello Lorraine.”

“And Andrew, you met Harold earlier.”

“Hello again Harold.”

“Hello Mr. Gateman.”

“Lorraine, do you know what Andrew does for a living?”

“Is he a politician?”

“Exactly right. He’s currently the shadow minister of Education, with the Liberal Democrats.”

“Harold told me about him. Can we get back to work now?”

“Go ahead. We’ll be in the office.”

*

“How old are they now?” asked Andrew.

“Both are sixteen,” said David. “We’ve been helping them for the past three years. It’s like a mix between home schooling and boarding school. They get personal attention and tuition, then they go home to stay with their parents from Fridays to Sunday every week.”

“Why are you based here?”

“The Hangar? I bought this air force base from the government three years ago. It has great security, more than enough space for my jet and helicopters, plus loads of accommodation. Harold and Lorraine have the run of the place, of course.”

“And you chose the kids randomly?”

“Not exactly. We looked for volunteers, for students who wanted to go on to Oxford or Cambridge, and study scientific subjects. There is no point testing new teaching methods on children who are not willing to learn.”

“Surely those not willing to learn are the ones we need to concentrate on most.”

“If we want to raise the average, that is correct. But

this project is looking for the next big thinkers.”

“Is this just hothousing? Cramming them with knowledge and facts so they can ace any test?”

“Not at all. We are exposing them to the most cutting edge research possible, and paying experts to answer any questions they may have.”

“That must be expensive, especially if scaled to a larger sample size.”

“How many times do you think they ask an expert a question?”

“Twice a day.”

“In three years, Lorraine has asked three questions, and Harold has asked two. Instead of asking, they search for and learn the answers themselves. The second time Harold called an expert, a leading scientist in his field, it was to point out an error in his recently published paper. This led to the publication of his own paper in Nature.”

“What was the topic?”

“Quantum something leading to something something. I have no idea. These kids are way beyond me.”

Andrew nodded. “Tell me, why are you doing this? These children could lead normal lives. They should be

out playing with other kids.”

“They are nerds, Mr. Gateman. If these kids weren’t here, reading up on anything and everything that interests them, they wouldn’t be out playing sports. No, they’d be at home, in front of their screens, reading about anything and everything, but their access to real scientific publications would be restricted until they become university students, aged eighteen or nineteen.”

“Do you test them?”

“They will create their own results. Lorraine has designed experiments for my electronics department, something to do with lasers strengthening monofilaments. He is more interested in theoretical ideas, yet once lasers themselves were merely theoretical. Nobody knew that the laser would have so many applications.”

“Thank you for your time, David. I like what you are doing here, but for now I can’t see a way to use this in any policy decisions.”

“Well, I appreciate that, Mr. Gateman. I wish you luck in the upcoming elections. Let me give you one piece of advice. I’ve heard certain rumors about a project called Choker.”

“Choker?”

“Yes. I advise you to stay away.”

“Thank you. Advice from a man of your stature is hard to ignore.”

*

“Do you think he bought it?” asked Adam.

“Gateman? Maybe. It doesn’t really matter. He won’t become Prime Minister for another two elections.”

“How do you know?”

“Because I’m the only person who can make sure he wins. First the Liberal Democrats have to implode, then he will build a new party, then we’ll get proportional representation. Only then will he be our leader.”

“Right. And we’ll implant Lorraine and H in the next year or two.”

“The later the better, I think. I don’t want to infect their young, creative minds with old ideas and memories.”

“Old? They were pretty young, even when we knew them in their previous lives.”

“True. They are pretty clever, but nothing as amazing as we are making out. The only reason they are so far

ahead is that I'm priming them, in their lessons and work plans, with ideas from the last cycle that are already nine or ten years old—"

The phone on David's desk rang. He jumped, as this phone never rang. Only in emergencies. He picked it up. "Hello?"

"David?" It was Jennifer Harding, his second assistant. "A police detective is here to see you."

"Send him in."

"He has a warrant for your arrest."

"He does?"

"Yes. It is to do with someone called Nicolas Hasting."

"Just send him in. It's sure to be a misunderstanding."

*

The detective entered the room, a tall, handsome man of Indian descent, and dressed in a dark blue suit. Two uniformed police officers followed him in, hands empty, but clearly showing the batons and handcuffs dangling from their belts.

"Good afternoon, Mr. Roundtree," he said.

"Good afternoon, Detective..."

“Detective Singh.”

“How can I help you?”

“I’m here to arrest you on suspicion of murder, fraud, and impersonating the dead.”

“Can ask who I am accused of murdering?”

“David Roundtree.”

“I am David Roundtree.”

“I think not. You are, or once went be the name of, Nicolas Hasting. Nicolas disappeared seven years ago, after leaving on an overland trip to Australia. Here is a photo of Nicolas, two weeks before he left. Here is a photo of you, David Roundtree, a few months later.”

The detective held up a screen and flicked between the two photos. It was clear to everyone in the room that the photos showed the same person.

“We do look alike, I’ll give you that,” said David. “But what about the photos of me before this Nicolas fellow went missing?”

“They are all missing. Someone has deleted almost all records of Roundtree older than seven years ago. We have National Insurance details, some health records, school records too. But no images. Someone has

removed them all.”

David shook his head. “Who would do that?”

“Someone who killed Roundtree, and took his identity. Please, Mr. Hastings, it’s best if you come with us now, and let us question you officially.”

The two uniformed police officers took a step forward. Adam stood up.

“Adam,” warned David, “can you please look after things here at the Hangar? I’m sure I’ll get this cleared up in no time. I’ll call my solicitor when we get to the station. Tell Harold and Lorraine I’ll be back in no time. Set them tomorrow’s lesson today, to take their minds off all this.”

“Right.”

“Who are Lorraine and Harold?” asked Singh.

“Some students here on extended work placement.”

“Lorraine Grosvenor?”

“Yes. How did you know?”

“No reason,” Singh lied.

“Adam—” began David.

“I’ve got it. I’ll ask her.”

*

“Lorraine?”

“What now?”

“Put that laser down. I’ve got something very important to ask you.”

“Okay.”

“Put down the laser first.”

"I can talk and work at the same time... Ow!

“I said put it down.”

“You hurt my hand!”

“Listen to me, young lady, I have something very important to ask you.”

“Go on.”

“Have you talked to the police recently?”

“No.”

“Don’t lie to me, Lorraine. What did you tell them?”

“The truth. David is really called Nicolas Hasting. I

worked it out myself.”

“How did you do that?”

“David is creepy.”

“I asked how, not why you don’t like him.”

“Research. Using my brain. That’s what you want me to do here, right?”

“Of course.”

“So is it true?”

“True? The truth is far more complicated than you know.”

“Is that so? So why not tell me the truth?”

“Because if I gave you all the answers, there would be no need for you to work them out yourself. And if you’re not exercising that little brain of yours, there is no point you being here.”

“Why do you say mean things like that? I’m not a child, you know. I’ve grown up a lot in the last three years, you know.”

“I can see that.”

“So why not treat me like an adult?”

“Are you an adult, Lorraine?”

“Yes!”

“Okay, maybe it is time you learned everything. If we can get David out of police custody, that is. ”

Cycle + 1, year + 8.

“How long have they been sleeping together?”

“Right from the start,” said Adam.

“No, I mean sleeping together.” David added quote fingers for emphasis.

“I don’t know.”

“Maybe we should put cameras in their rooms.”

“They think you’re creepy already, you know that? Pointing cameras at them as they sleep isn’t going to change their opinion of you.”

“Okay, so we only have one implanter. We need to split them up for at least two nights in a row, and they can’t see each other during the day between. Maybe you could take Harold on a trip.”

“And leave you here with Lorraine alone?”

“For God’s sake, Adam, she’s only seventeen. I’m not going to do anything to her.”

“It’s not her I’m concerned about, it’s you. Last year she had you arrested. How long were you inside?”

“Twenty eight days.”

“She still hates you for convincing the police that she was the one who had tampered with the records.”

“I played it up as a prank, but had to pay all kinds of fines to sort it out.”

“I think you called them bribes at the time, David. You take Harold on a trip, I’ll sort things out with Lorraine.”

*

Adam sat beside Lorraine as she slept. Her hair, messed up by the implanter strapped to the top of her head, fell across her face. Only seventeen, and she looked just as beautiful as when Adam knew her before, when she was almost thirty. He’d fallen for her a bit back then, and he knew she’d been attracted to him. The five years difference wouldn’t have been a big deal then, thirty to thirty five. Now it was seventeen to twenty two.

But it wasn’t, not really. It was seventeen to someone physically twenty two, but with forty three years of subjective memories. That those forty three years of

experience existed in the brain of a twenty two year old only led to confusion between young hormones and older common sense. David had explained all this to him.

And then, when Lorraine woke up this time, she'd be seventeen, but with an extra set of memories from the last time she was seventeen to twenty nine, and also her original memories from the age of thirteen to seventeen, when she'd had a normal teenage upbringing.

It made Adam's head hurt just thinking about it. Did ages even matter at that point?

Lorraine stirred, mumbling something Adam didn't catch. She yawned, and stretched her arms. Then she froze. She reached up and fingered the strap under her chin. Her eyes flashed open, and she stared directly at Adam.

“David really is Nicolas.”

“Yes.”

“That explains everything. When is H coming home?”

“David took him up to the New Free University, to meet Professor Banks. He'll be home tomorrow.”

“Will he remember me?”

“As well as you remember him. Pass me the implanter, Jennifer is going to deliver it to David and H in person.”

“What then?”

“We need to know how time travel is possible, and what are the side effects. You and H should be able to work this out, right?”

“Yes. H will do it.”

Chapter 10 - H.

Cycle + 1, year + 13.

“How was Monbuto City?” asked David, looking up from his screen.

“Don’t you watch the news?” said Adam. “Everything’s sorted.”

“And it only took you four months. How many dead?”

“Two. Eight wounded.”

“See? I told you it was better this way.”

“It freaked me out, meeting Clive again. Of course, he has no idea who I am. You know what really pisses me

off?”

“What?”

“I’ve been learning how to juggle again, and I really suck. Why can’t the scan and implanter transfer skills like that?”

“H could tell you exactly. It’s all muscle memory, nerves in the spine and that kind of thing. It’s just not the same kind of memories.”

“Is he in the hall?”

“Yes, they are.”

“They?”

“Remember when Lorraine thought I was creepy?”

“Yup.”

“Let me show you truly creepy.”

David led Adam through into the old aircraft hangar. Couches and beanbags filled one corner, and close by lay a whole series of work benches and desks. Eight shipping containers sat lined up along a wall, all with refrigeration units humming gently. A young man was rigging some cables, obviously guided by the glowing screens of his viewers.

“Is that Daniel Westley?” asked Adam.

“Yup. I recruited him before he joined the army. Still a wunderkind, but not with the breadth of knowledge as last time. I have his memory implanter file too, but I’m not going to give him access yet.”

In the center of the hangar, on two high stools, sat H and Lorraine. Thick cables ran to each of them from the server containers. They were both hooked into the technology they had developed in their previous lives: the “Shaper”, the Shared Perception network connection. They faced each other, eyes open, staring vacantly at a single point, midway between their chests. Every few seconds Lorraine’s lips would tremor, as though speaking under her breath. H sat completely motionless.

“See what I mean?” whispered David. “How creepy is this?”

“What are they looking at?”

“I’ve no idea. They are reading something. They don’t need viewers or screens any more, as they are wired directly.”

“Spooky.”

“They started doing this a few months ago. Lorraine designed a new implant which uses laser strengthened monofilaments, and H reformatted the visual grammar

from scratch. They have all the designs from the last timeline, plus whatever else they've worked on this time. Once they started working together, connected like this, they've been advancing their studies at a far faster rate."

"Did they mention what they are studying?"

"They don't specialize anymore. It's like they are thinking about many subjects, all at once. And they sit here, or on the couches, for seven or eight hours a day. Daniel told me H is recording masses of data every minute, and is dynamically programming two of the server containers to process his thoughts for him. It's quite scary."

"And you created them."

"Me? In a way. But even in the last timeline, I'm sure they would have reached this point by now. Remember Denny and Tomika?"

"Yes."

"H was testing this very concept on them. What we humans are to the great apes, so H and Lorraine are becoming to us. I'm not even sure they are human any more."

"They're homo sapiens sapiens sapiens."

"Very clever. I've been scanning their memories every

month, just in case. They'll cross a line, I'm sure, and will no longer be compatible with their younger selves the next time we send their memories back."

Cycle + 1, year + 15.

"They won't talk to me any more," Daniel complained. "Even when they disconnect from each other and the servers. H has stopped washing, and I think Lorraine might be pregnant."

"Pregnant?" asked David.

"I can't tell. She's put on so much weight. They had sex again yesterday, right in front of me, in the Hangar. And all the time they stared into space, their eyes dead and cold."

"Fuck. This just what we need. I'm coming to visit this afternoon."

"I'll call Adam too. He might be the only one who can break through to them."

Adam's helicopter landed just after David's, and they walked towards the Hangar together.

"Did Daniel fill you in?" shouted David, over the noise of the helicopters' engines.

“I got the picture,” said Adam. Then he opened the hangar door, and stopped dead. The available floor space had been reduced down to a few dark, cramped passageways. The rest of the hangar had been completely filled with shipping containers. “Wow. I had no idea.”

“I’ve been pouring money into this place,” said David, “H and Lorraine are requesting new resources every week now. There are two generators outside, guzzling diesel, just to keep the backup servers running.”

They walked between the containers, stacked four high, to the center of Hangar. There they found two reclining chairs that looked to Adam like they’d been bought from a dentist supply shop.

Lorraine and H lay on the chairs. Lorraine had gained weight, H had lost weight. A nurse was scooping food into Lorraine’s mouth. She chewed listlessly, swallowed, then opened her mouth for more.

“Ah shit,” said David. “They’re too far gone.”

H lurched upright. Adam and David jumped back in mixture of horror and surprise. H opened his eyes, and smiled at them, showing a set of greenish teeth.

“Hello David. Hello Adam. How are you feeling today?”

His words came out stilted, as though controlled one

by one.

“Hello H,” said David.

“Hey H, I’m doing just fine,” said Adam.

“Lorraine says hello too,” said H.

Adam looked at Lorraine again, then at David. David caught his eye, and shook his head slightly.

The silence grew long and painful.

“I have the answer to your questions,” said H at last.

“What questions?”

“About how the casimir machine sends the package back in time, and where the radiation comes from.”

“That’s great!” said David.

“First the radiation. It isn’t radiation, not in any classical sense. There are no particles moving through space. Instead the fabric of space itself is stretching, affected by the creation of dark energy within the casimir machine. Chemical and molecular bonds are disrupted. This explains the side effects on the video feeds.”

“What range does this have?”

“Let me think about that,” said H. He closed his eyes

and lay back in his chair.

Adam and David looked at each other again, then back at H. They waited. Minutes passed.

David stepped up to H's chair, and snapped his fingers over the face of its occupant. There was no response.

Lorraine started crying. At first she sniffed, then she moaned. Then she broke in to heart-wrenching sobs. The nurse rushed up to her, and dabbed at her tears with a towel.

“She’s never done this before,” said the nurse.

“Shit, shit, shit,” muttered David.

Adam pointed to H's chest. “He’s not breathing.”

“Fuck!” David kept up a constant stream of swearwords as he began to perform rudimentary CPR on H's fragile body. The nurse took over almost immediately, pushing David aside.

“Shut up,” said the nurse, “and shut her up too!”

Adam disconnected Lorraine's link, and she immediately stopped wailing. Her breathing slowed, and Adam stroked her head until she fell into a deep sleep.

Adam looked up a minute later, and watched the nurse

roll a sheet over the face of Harold's corpse.

"Brain death," said David, without turning his face away from H. "There's nothing we can do."

Suddenly, all of the servers beeped once each. First came a huge wave of beeps, and then more within the space of two seconds. The beeps echoed around the roof space of the hangar, and then a heavy silence hung over the group.

"What happened?" asked Adam.

"That sounded like a computer rebooting," said David.

"Hey guys!" Daniel's voice echoed faintly across the hangar from the control room. "You better come look at this!"

"Look after Lorraine," David ordered the nurse, and he followed Adam at a run.

Daniel sat at a desk, three screens arrayed in front of him. His red eyes showed recent stress and lack of sleep. He had removed his viewers, and hammered at an old fashioned keyboard.

"I saw what happened to H," said Daniel.

"What's going on?" asked David.

"The entire server farm just rebooted. It's running

completely new software.”

“What kind of software?”

“I can’t tell. I tried to get some kind of terminal access, but it’s not accepting any known commands. All I have is this.” Daniel pointed to the central screen. It showed two words.

David read them out loud. “Hello World.”

“Hello World?” asked Adam.

“It’s the classic test program,” said Daniel. “When you learn a new coding language, the first thing you do is get the compiler to render Hello World on the screen somehow. Maybe we—”

The screen showed a new line. “Hello Daniel.”

“That’s peculiar,” said Daniel.

On the next line. “How are you feeling today?”

David took a sharp breath. Daniel looked round at him. “What?”

“That’s how H greeted us a few minutes ago.” David’s mind raced. “He’s the new software.”

“Is that even possible?” asked Adam.

“In a previous life I saw a partial demonstration of this

very concept, but the simulated brain function ran thousands of times slower than the living human version.”

“In a previous life?” asked Daniel. “What the hell are you talking about?”

“I’ll explain everything later, okay? Tell me, did H have access to the monthly scans of his own brain?”

“I don’t know,” said Daniel. “Probably. They’re all backed up off site, but I expect he could read them from here.”

“So he managed to write a program that would analyze all that information, and then found a way to run it on the physical hardware.”

“He once told me about developing his visual grammar so it could encode far more than visual information,” said Daniel. “He could have cracked it and not told me. He didn’t talk to me much in the last year, except to ask for more servers and equipment.”

“Can you reply to the question on the screen?” asked Adam.

“I think so.” Daniel typed a few random letters, and they showed up on the line below “How are you feeling today?” Daniel deleted them, then asked “What do you want me to say?”

“I don’t know,” said Adam.

“How about ‘Hello Harold,’” suggested David.

Daniel typed the new message and hit enter. He added “I’m feeling fine” and hit enter again.

“Not too much at once,” said Adam.

“Look at those containers,” said Daniel, “I’m sure H programmed them to be able to respond to more than one line of small talk at a time.”

“Sorry.”

A new line appeared.

“Program completed.”

The screen went blank. Outside, in the hangar, every server beeped once.

“What the hell?” said David.

A line appeared on the screen. “Hello World.”

“It’s doing it again,” said Adam.

“Program completed.”

Again the screen went blank, and once again, a chorus of beeps filled the hangar.

“Shit,” said David.

“Hello World. Program completed.”

“That’s it?” asked Adam. “H and Lorraine hooked their brains together for almost five years, rotting their bodies and advancing their minds, and all we get is Hello World? And that happens on the day H decides to answer the very questions we first asked him, what, seven years ago?”

Daniel tried to type a line and hit enter between “Hello World” and “Program completed” the next time they appeared on screen.

“And I spent five years with them before that!” Adam’s voice had risen over an octave.

“Don’t worry,” said David, “we’ve still got five years between now and the end of this time cycle. We just need to move on to plan B. We send our memories back once more, and next time we make sure we keep a closer eye on what H and Lorraine are doing.”

“Next time?” Adam shrieked “I’ve spent twelve years working for this! By the next time it’ll be seventeen years of my life gone! Wasted! Starting again at nothing! Seventeen YEARS!”

Adam punched one of the screens in anger. It didn’t break, instead it just flew back, bounced off the wall, and clattered, unharmed, to the floor. He stormed out,

and started kicking one of the couches in the hangar.

“What the hell are you guys talking about?” asked Daniel. “What’s a time cycle?”

“Didn’t you ever wonder what H and Lorraine were working on?”

“Something to do with dark energy.”

“And time travel.”

“I thought it was just theoretical.”

“Not even close. I’ll explain it all later, as much as I can. In fact, I can do better. I’ll give you an extra ten years of memories.”

“And fuck me up like Harold? I don’t think so.”

David stepped into the hangar from the control room. Adam had collapsed into a pile of beanbags, breathing heavily.

“You’re out of shape,” said David. “A few years ago you could run to the far end of the runway and back, and hardly lose your breath.”

“I’m getting old.”

“You’re only thirty.”

“I’m forty nine, subjectively.”

“True.”

“How do you do it? How do you keep going, cycle after cycle?”

“I’m selfish,” said David, settling into a large armchair, “I want to live forever.”

“Don’t you get bored? Frustrated?”

“Of course. But so does everyone. I’ve become an expert at averting boredom and frustration. I’m one of the richest men alive, and have been many times before. So are you, now. You have access to all my wealth.”

“Money doesn’t make you happy.”

“No, it’s a means to an end. And the end I’m working towards is the perfectibility of man.”

“Bullshit.”

“Sometimes I can convince myself though. Once every other life or so. The rest of the time I try to keep that idea in mind, and set myself smaller goals.”

“The goal in this timeline doesn’t seem so small.”

“No, but we’ve achieved a lot. We’ve got an entire hangar full of servers here, with H’s a failed attempt at machine intelligence. It probably contains all the

answers, even if it takes Daniel the next fifty years to sift through it.”

“We don’t have fifty years.”

“No. We’ll take the clues we have, and approach the DERI scientists directly. I didn’t want to involve them until the very last moment, because then the design and execution of the casimir machine would be different, and who knows what would happen to any packet we tried to send back.”

“Of course.”

“We’ll give Daniel his memories from the last cycle, and he’ll have four years to crack H’s Multivac here. If that doesn’t give us anything, we’ll go have a chat with Professor Banks in person.”

Chapter 11. At the DERI.

Cycle + 1, year + 20.

“We are backing up your memories,” said Daniel, “as insurance. We have no way to read them yet, but if any harm comes to you during the experiments at the DERI, your knowledge will be safe.”

“I’m telling you,” said Professor Banks, “there is no risk of any radiation from the casimir device. None at

all.”

“Please, Professor, I’m just trying to do my job.”

The professor glowered at Daniel, but finally submitted. Once the technician placed the scanner over his head, he closed his eyes and relaxed.

Daniel started the scan, and then left the room. Outside he met Adam and David. “The last one is underway.”

“Good,” said David. “I’ll take over here. Daniel, you go rig the DERI.”

“I know the drill.”

“This isn’t a drill, this is the real thing. Adam, you know what to do.”

“Of course. Give me Gateman’s number, I need the Prime Minister’s authorization to clear the area.”

“We have sixteen hours. I’ll meet you both at the rendezvous point tomorrow morning.”

*

On the morning of the experiment, police officers and army troops cleared the area around the New Free University to a distance of five kilometers. David wanted the exclusion zone to reach ten to kilometers,

but Adam had told him for every kilometer of radius added, you didn't have to clear one more square kilometer, but exponentially more.

“Exponentially? Don't you mean logarithmically?” asked David.

“I'm not sure. Ask Daniel.”

David prepared the package for delivery. Using new techniques Daniel had deduced from H's Multivac, he compressed the mind scans into far smaller storage volume, and loaded the implanter device with dozens of files. He put in his own scans, a scan he had saved from his past, then scans of Adam and Daniel. He put in early scans of Lorraine and H from this cycle, and also their previous cycle scans.

Then he collected scans of all the scientists and technicians from the Dark Energy Research Institute. Also Andrew Gateman, the Prime Minister, and Nigella, Andrew's wife. And Jennifer too, his own current wife.

He set his own latest scan as the default, and set a password to protected the rest.

He included the latest model of viewers, upgraded with extra memory, enough to back up half of the bran scans on the implanter device in case of file corruption. He also set the viewers to constantly

record incoming video and data streams from the DERI experiment.

Finally he included a USB thumb drive, compatible with twenty year old computer hardware, loaded with as much technical and scientific data as possible.

At the DERI, Daniel oversaw the last-minute installation of remote controls to the DERI equipment, and robotic devices to carry out every job in the control center that couldn't be operated locally.

He also had crews roll out four lengths of cable, each twenty kilometers long, to the north, south, east and west of the DERI. At every twenty meter mark of the cable was a tiny sensor. Each contained a sample of organic material, a camera, a thermometer, EMR meter, a spectrometer, and many other gauges. All this sensor data fed into a server container sitting next to the DERI, and it formatted the data into single files every quarter second. When the experiment began, those single files would be transferred into the viewers and USB thumb drive in the package. Other video streams recorded directly to the viewers, from within the DERI, the exclusion zone, and the new mobile control center five kilometers distant.

*

“Okay,” called Adam, “T minus thirty minutes.

Everyone out!”

“You know T stands for Takeoff, right?” asked David over the viewers.

Adam ignored him. He flicked through security cameras in every room and hallway in the DERI, to make sure every space was emptying. The last of the scientists and technicians climbed into the back of the military personnel carrier, and the vehicle slipped away silently and smoothly.

“I can’t believe you are doing this!” said the irate Professor Banks. “We’ve spent years setting up this experiment, and now we can’t even be here when it happens.”

“Believe me,” said Adam, “you’ll thank us for it soon enough.”

“Us? Who is this Us you talk about? Is it the same They the conspiracy theorists talk about?”

“It depends the conspiracy theory.”

“This is all down to the popular press, isn’t it? Atomic power, utterly safe compared to burning coal, but nooo, it has to be stopped. The LHC! They said it’ll create a black hole that will swallow the world! All complete bullshit.”

The rant continued. Adam couldn’t blame him. In less

than twenty four hours, the Professor's world had been turned upside down. On the orders of the Prime Minister, no less. The media, far from being against the DERI experiment, had now reversed their stance, throwing their weight behind the scientists, objecting vehemently against the government's heavy handed clampdown on civil liberties around the New Free University. The official statement followed the "better safe than sorry" line, to which most commentators replied that they were "already sorry."

At the new control center, Adam asked Professor Banks to sit down in his customary seat.

"See?" Adam said. "It's as good as being there in person."

Daniel had done a fantastic job, and indeed the remote control room was an almost exact copy of the original. Instead of a window into the test chamber, there was a large video screen. When viewed through standard viewers, it even displayed the chamber in three dimensions.

"I will carry out my duties," said Banks, "but I'm going on record to say I'm doing so under protest."

"We've all heard your protests," said David, entering the control room with Prime Minister Andrew Gateman. "Now please proceed as planned."

From that moment on, Banks became the model of civility and professionalism. The team had done all the checks in person at the DERI itself, so waited patiently until the countdown sequence began.

“First phase... collapsed. All stable. Next phase. Collapsed. All internal systems optimal. Next phase... collapsed. Looking good. Final phase... collapsed.”

A screen showing the collated data from the sensor chains flashed as numbers soared.

“What is... oh!” said Banks.

Adam felt it too. A sickness in his stomach, and an immediate headache.

“Can we replay those numbers?” asked Banks.

“Sure,” said Daniel, and pointed, “on this screen.”

Banks watched the numbers climb. “Again, slower.” Daniel replayed the data stream at tenth speed, then one hundredth speed.

Meanwhile, David commanded a robot inside the test chamber to deliver the package into the casimir machine.

“The acceleration decreases, square cubed,” said Banks. “Volumetric expansion with time as a function.”

“What?”

“This isn’t radiation. It is a geometric distortion of space time. The volume affected is now about eight hundred hundred kilometers, but the increase would have slowed to just under four kilometers per second by now.”

“What measurement are you looking at?” asked Daniel, replaying the initial readings once more.

“It doesn’t matter, just any one that showed a change. This data is invaluable, far more important than the measurements inside the casimir machine.”

“The effect is growing,” said David, “I don’t need numbers to tell me that.”

As if to back up his point, someone in the remote control center vomited.

“Shut it down,” said Gateman.

“But we haven’t inserted the probe yet.”

“Now. Shut it down.”

“The abort will take a minute to run. Initiating now.”

Everyone grew more and more ill as the seconds passed by. Only one person seemed unaffected. Professor Banks kept turning to those in the control

room, and making comments about distortions in space time, and what that might mean.

“Just think,” he said at last, “when we shut this off, the distortions will reduce to zero. There will be an imbalance of vacuum energy, like Hawking Radiation around a dissolving black hole. Who wants to bet we experience some kind of localized heating?”

Nobody answered. By this point, nobody was listening, but Banks kept talking, even as the countdown from ten began.

“One can only imagine what will happen to the central point of this distortion,” he said, “when it becomes the focus of an inward surge of energy. It’s a good job we aren’t so close, it’ll probably get quite violent. The boundary of the distortion will be at about a thousand kilometers by now, but the rate of growth would have leveled off—”

The counter reached zero, and Banks spoke no more.

Chapter 12 - Lionel.

Cycle + 2, year + 0.

Nick sat at his desk, typing a homework assignment, when he felt all the hairs along his arms stand up on

end.

Something flashed behind and above him, lighting up the whole room. He swung his chair round in time to see an object drop from the ceiling. Nick couldn't see it clearly as it fell, except that it was a dark object about twenty centimeters long and ten wide. It hit the floor and bounced under his bed.

“What the hell?” he said out loud.

*

Nick sat down on the bed in the guesthouse. He took the chunky glasses out of the case and, nervously, put them on. He followed the voice's instructions, lifting a strange device out of the case and strapping it to the top of his head.

“Go to sleep with this device in place. When you wake up in the morning all your questions will have been answered. Good night, and sweet dreams.”

Nick got undressed and slipped into bed. Despite his nerves, within a few minutes he fell into the deepest sleep of his life.

*

David woke, and pulled the device off his head. He looked around at the old fashioned furniture and wallpaper, and shook his head. The room was always

the same, no matter how many times he'd sent his memories back in time.

He set the implanting device on the table next to the bed, next to the case with the viewers and the USB thumb drive. Something is missing, he thought, and then remembered that only the case arrived in his bedroom. The end of the probe, the silver object that never changed, hadn't fallen back through time. Not this time.

He picked up the viewers, and said "Password Dark Energy" as he placed them on his nose. The lens screens immediately lit up, showing the latest saved data. He picked a video feed from within the DERI building, showing the control room with a view into the test chamber, and played it back at high speed.

It showed very little of interest. When the time of the experiment drew close, some screens flashed, but otherwise the building was empty of people. A robot inserted the package, the very case that lay on the table beside David now, but the robotic probe never rolled out of the airlock. The recording ended abruptly.

David switched to the video from within the remote control center. Again he scrubbed ahead to the start of the experiment. At the distance of five kilometers, people started getting ill, and one person vomited, but not much more than that. Some people's skin blushed with rashes, but nobody's eyes started bleeding. Even as

the video ended, nobody looked like they were about to die.

Even Professor Banks, whom he had previously watched pass out, kept talking until the end. The video lasted until one second before the end of the abort countdown, and then simply stopped.

This is it, thought David, this time I've sent my memories back twenty years, and nobody has been harmed! Or not seriously. Next time we'll clear an exclusion zone to ten kilometers, and the radiation will have even less effect.

Then he set the video feeds playing again, right from the start. They included a lot of the setup, and he skipped forward through all the boring parts. This time, as the experiment began, he listened to Professor Banks's commentary. He was caught off guard by how quickly Banks understood the radiation for what it was, or at least came to the same conclusion as Harold. Poor Harold.

But that wasn't all. In the minute that the experiment ran, Banks came to many more conclusions, and had even proposed theories, and experiments to test those theories. Banks had been on to something. Something about all the energy from the disrupted volume, concentrated into the center. Would that be enough energy to...?

David wasn't sure of the question. In all his reading, he'd never truly understood how time worked. He wasn't sure if anyone knew for certain, as everyone insisted time travel was impossible. One thing always stood out to him, and that was the fact that in all equations and diagrams that explained time, the arrow of "time passing" only pointed to the right because that is how humans experienced it. But the same equations balanced perfectly in the opposite direction too.

Could that arrow be reversed in a single location, while the rest of the universe carried on as normal? Did that even make sense? I'm completely out of my depth, he admitted to himself.

Something else Banks said kept returning to David, as he reviewed the videos and data over and over, trying to make sense of it. It was the last thing Banks said, before the end of the video.

"It's a good job we aren't so close, it'll probably get quite violent. The boundary of the distortion will..."

How violent? How much energy was needed to send something twenty years back in time? David guessed it would be quite a lot, and Banks said it came from the entire distorted volume.

David had trouble sleeping that night. He thought he'd have all the answers this time, but instead he just had

more questions. And he knew who would have the answers. Not H and Lorraine, he knew he couldn't risk their lives and sanity again this time. No, he had to go directly to Professor Banks.

He looked up the information in his viewers, and verified it against the information he found online. Professor Banks was not yet a professor, merely Lionel H. Banks. He was still a graduate student, studying physics right here at the New Free University. Perfect!

*

David introduced himself as Nick, even though he hated calling himself that, as he hadn't felt like Nicolas Hasting since before the tsunami in his very first life.

He then proceeded to get Lionel Banks mildly drunk in the student union bar, coaxed him with another drink to a corner table, and then lead him into a private conversation over yet more drinks.

"You're a physicist, right?" Nick intentionally slurred his words.

"Right."

"Tell me about time travel."

"Impossible!"

"You mean it's impossible to travel through time, or

impossible for you to tell me about it?”

“Impossible to do it. It violates all kinds of well established principles. The Laws of Thermodynamics, causality, entropy, all that.”

“What would you say if I told you I was a time traveller?”

“I’d say ‘Me too!’ I’m traveling through time right now, at one second per second.”

“Okay, how about if I said I was from twenty years in the future?”

“I’d just laugh.”

“Well I am. I’m from twenty years in the future.”

“Whatever.”

“You said you would laugh.”

“It wasn’t as funny as I thought it would be.”

“Tell me about worm holes.”

“Oh yeah. They could lead through time and space. They are all over the place, you know? They bubble in and out of existence, like virtual particles. The problem with using them for time travel is that one would have to be widen it until it was big enough to fit through, and keep it stable long enough. Relativity allows for

this, but it would way too much energy to be practical.”

“Right. Would that violate causality?”

“Look, I’d love to talk to you about all this, but I’m really not the best person for it. There’s a ton of great popular science books, you know, and loads of them talk about if time travel is possible. Believe me, on a practical level, it isn’t.”

“I don’t want to know what the books can tell me. I want to know if, in the future, the books will one day tell me time travel is practical.”

“I’ll make a bet with you now, the answer is no. If it was, someone would have come back in time to tell us so. That nobody has. Ergo, time travel is impractical.”

That very problem, that Nick himself was the only time traveler he had ever known about, had always bothered him. “Okay, in one future, the future I came from, there was no such book about time travel. Not within the next twenty years.”

“Ha!”

“You laughed that time.”

“I was being sarcastic.”

“But maybe in this time line, someone will write that

book.”

“If they did, they’d win a Nobel Prize.”

“Do you want to give it a shot?”

“Not right now. I’m a bit drunk.”

An hour later, Nick tumbled Lionel into his room in the guest house near the university, and watched as he sprawled on the floor. Nick pulled the physicist up onto the bed. Lionel attempted to curl up into a ball, but fell asleep before completing the complex maneuver. He began to snore.

Nick brought out the memory implanter, and leaned over Lionel. Then he stopped.

Damn the impulsiveness of youth, he thought, and put the implanter back in its case again. He couldn’t use it on Lionel. Professor Banks, in the previous time line, hadn’t given his permission. Lionel didn’t even know such a thing was possible. Nick had done something similar with Dana, all those lives ago, but that was different. They had been in love, Simon had simply extended that love longer than humanly possible.

The Lionel Banks problem was a different matter. He’d have to approach it from a different angle.

Nick left Lionel on the bed, found some spare blankets,

and made himself a nest on the garish carpet.

*

“I have a deal for you,” said Nick, sitting down opposite to Lionel in the local coffee bar.

“Not you again! Last time we talked, I woke up the next morning in a strange bed, with a sore head.”

“Do you remember what we talked about?”

“Time travel and nonsense like that.”

“Right. You say it’s nonsense, but I have a deal for you.”

“Go on.” Lionel pointedly looked elsewhere.

“I’ll give you the secret of time travel, and you can take full academic credit, publish wherever you want, win the Nobel Prize, whatever. In exchange, you must help me set up an experiment in twenty years, at an exact time and location, which I’ll reveal then.”

“Aha! A real crazy person. I thought you were just drunk last time. Let me presume, for the sake of argument, that you have the secret of time travel. Why don’t you publish yourself?”

“I don’t understand it. I have some of the answers, I’m sure, but I have no way to set everything straight. I

could spend twenty years trying to understand this, but I still might not work it out, and by then it would be too late.”

“How very cryptic, and how very flattering.”

“Let me put it this way... In twenty years time, the world of theoretical physics has answered many questions with the models they have now, but are missing something key. And something they don't even know they are missing.”

“An unknown unknown.”

“Exactly. There is no way I can catch up and overtake anyone in this area. But I know you can.”

“How do you know that?”

“Because the last time we met, before we got drunk together the other night, you were twenty years older than you are now. And I saw you work out, in under a minute, what nobody in the entire history of physics had ever even guessed existed before.”

“And that was?”

“Like I said, I'm not sure. If I could explain it to you, I wouldn't need you to explain it to me.”

“So let me get this straight. In the future, nobody knows how time travel works, or even that it is

possible.”

“Right.”

“And yet you have traveled back in time to ask me how it works.”

“Right. It’s more complicated than that.”

“Sorry, mate, I’m going to need some proof.”

“Don’t worry,” said Nick, “I have proof. Come with me, somewhere more private, and I’ll show you all I can.”

“Fine, I’ll humor you. But let me go on record, I’m doing so under protest.”

“Funny you should say that.”

As Nick still didn’t have a replacement room on the campus, and he had yet to buy a new laptop, the two students decided to talk in Lionel’s room at his shared house.

They waited for Lionel’s computer to boot up, and then Nick plugged in a USB thumb drive. It showed a capacity of just four gigabytes. Nick copied an executable file to the computer, ran it, and suddenly the computer could see and access the next partition.

“Twelve terabytes?” said Lionel. “On a thumb drive?”

“That’s nothing,” said Nick. “Let me show you the good stuff.”

He dug through some folders, found a simple text file, and opened it on the screen.

“Recognize this?”

“Yes. It’s my undergraduate thesis.”

“How about this?” Nick opened the next file in the same folder.

Lionel leaned forward, squinting. “It’s a paper I’m working on right now, with my PHD advisor.”

“Well, this is the completed document.” Nick opened the next file. “And here’s your PHD thesis. And here’s a joint paper with scientists at CERN. And, while we’re at it, let me copy across every paper you wrote in a twenty year career. And all the other papers you reference in your own papers. And all the raw data I could gather from your experiments, plus some computer models and simulations, though I doubt they will run on Windows.”

“I...”

“While I’m at it, here are the plans for a machine that uses the casimir effect to artificially create dark energy, and here are the test results.”

“Dark energy? What has this got to do with time travel?”

“That’s what I want you to tell me. This material should provide a good starting place, don’t you agree?” Nick smiled down at Lionel, and pulled the thumb drive out with an exaggerated gesture. He walked towards the door, then paused before leaving. “Email me when you’ve had a good read, but don’t go sharing them anyone else, you hear?”

*

Nick received word from Lionel four days later. From a tracking program that he’d installed on Lionel’s computer, Nick could see that every file had been opened, scrolled through many times, and searched over and over for key phrases and terms. None of the files could be copied without a password, and Nick could see no evidence that Lionel had emailed or uploaded them anywhere.

The truth was, Nick never expected Lionel to do anything like that. Lionel would see and understand that there was something going on, something bigger than he could comprehend right away. Simply put, Lionel would see it was something he didn’t want to fuck up.

The email was very short. Just “Call me,” and a

number. Nick called.

“Nick! This stuff is driving me crazy. I need to talk to you.”

“Come meet me at the Crown Prince Hotel. I’m here now. The penthouse suite.”

“The what? No, don’t explain. I’ll be there in ten minutes.”

“Come in, take a seat,” said Nick when Lionel arrived.

Lionel slumped into a lusciously upholstered armchair, and glanced around the room. At any other time, Nick saw, he would have been impressed with luxury. Now, Lionel’s mind was on other matters.

“I can’t do it,” he said.

Nick said nothing, and waited for him to explain further.

“For a start, I don’t know enough.”

“You’ve only had four days.”

“But even if I read every paper, and memorize every word of every publication on that hard drive, I still won’t get it. Nobody makes breakthroughs in physics by reading. Science moves forward by people thinking, and doing, and making. Between every paper I’ve read,

there are a thousand steps the author took, in hundreds of different directions. An entire culture, a mindset, a way of life. And then the next paper comes along, and for those who haven't lived it, it's almost meaningless."

"So take it slowly."

"You don't know what you are asking! Except for that last data set, everything in those papers is a logical extension of what we know now. A lot of false starts are discarded, but apart from a few things there is nothing totally unexpected. That's where we are up to with physics today, lots of fine tuning, and narrowing down from guesses to estimates to accepted facts.

"If I wanted, I could crunch all those numbers from scratch. It would take me four years, if I had enough assistants, and a enough computer programmers, and by the end I would be the most famous physicist in the world, with a Nobel Prize or three.

"But I won't do that. You know why, Nicolas?"

"I know why—"

"I'll tell you why," said Lionel, as though Nick hadn't spoken. "The very fact that these papers exist means I'd be missing the most important point. That we are missing something crucial. Something HUGE! And I don't think I can make that mental leap to the next level."

“Then maybe,” said Nick, “after publishing this yourself, you could work with the greatest minds to sort out—”

"No! That is the worst part! Don't you understand? These papers I wrote are brilliant in their own right. Some of the papers they reference are even more profound. The thinker I became in that other future? I'm really proud of him. But I will never be him!

“You robbed me of those thousand steps between every published thought and theory and experiment and discovery. I can never have those again! My life's work is handed to me on a plate, and I experience none of the benefit.”

“Please,” said Nick, “take a seat.”

Lionel realized he had been pacing and shouting. He sighed, and collapsed into the armchair once more.

“But once you understand this work,” said Nick, “you'll make many more great discoveries in the future.”

“You still don't get it, do you? I understand all this work. But it's the next step! I can't take that step! It's that last data set from that last experiment. The very training and experience I need to make those new great leaps is what you have denied me, by giving me solutions instead of letting me discover them myself. You've taken away a future I once had, and you've

taken away any future I might still have had.”

Nick rubbed his chin, wondering how to ask the next question.

“So what you are saying,” said Nick, “is that if you remember what it was like to work on all these problems, and how you arrived at each step along the way, you’d be happy to start work on the biggest questions of all?”

“Happily! If only it were possible.”

“Here’s a hypothetical question. If, in twenty years time, you could return to today, and be twenty five again, and then live your life again, but a better life, a healthier life, a wiser and less painful life, would you want that? It wouldn’t be the same life, not even close, but you’d have a full twenty years to live, to try new things, have new experiences. Hypothetically, would a forty five year old Professor Banks want that?”

“Of course! But that wouldn’t work, would it? If I came back in time, I’d still be forty five years old. Unless, in the future, they can turn back physical ageing. Can they do that? In the future, I mean?”

Nick smiled. “Like I said, that question was hypothetical.”

The look of crushing disappointment on Lionel’s face almost made Nick laugh, and almost made him cry,

both at once.

So Nick leaned forward in his chair, and said “Lionel, here’s a more practical question.”

“Yes?”

“Have you slept in the last four days?”

“Not much. A few hours.”

“Let me fix something for you.”

Nick walked across the penthouse to the bathroom, and gathered some sleeping pills and a glass of water. Back in the main room he said “There’s a second bedroom in the suite here. Take these, have a good sleep, and I’ll order breakfast for you when you wake up. Then, once your head has cleared, we can talk further. Does that sound good to you?”

*

Lionel slept for fourteen hours, and woke up a new man. Nick brought in a tray of breakfast and set it beside the bed.

“Those glasses,” said Professor Banks, “are viewers, right?”

“Yes, but there’s no roaming connection yet, only wifi. The data plans will take years to come online.”

“This is all quite remarkable. It’s real. It’s actually all real. How did you do it?”

“That’s quite a story,” said Nick, but he took half an hour tell it while Banks ate breakfast. Nick covered the salient points, but intentionally left many parts out. For example, exactly how many times he had sent his memories back in time before approaching Banks directly like this.

“I never considered it might be dangerous,” Nick concluded, “until I made a live recording of the final experiment as it happened, and sent it back along with my memories.”

“Do you have that recording on your viewers?”

“Of course.”

“Can I see it? I have no memory of the casimir machine in action.”

“Professor Banks, the video features yourself, quite prominently, dying a violently painful death. Let me play you the video of the latest time you ran the experiment. It is far more enlightening.”

Nick cued the video, then passed the viewers over. He watched the light play in the Professor’s young eyes, and saw understanding sweep through them time and time again.

“Can I borrow these viewers for a few hours? I’ll need access to this video, plus the same data I saw in the video, plus my papers. And I’ll need access to Mathematica, Knolbase, Cyromate and any other future apps you have too.”

“Sure thing,” said Nick. “Let me set them so they recognize your retina for limited functionality and access. Anything else?”

“Paper and pens. And the contact details for Professor Scharnhorst.”

A minute later, even though he’d stayed in bed, the Professor had entered a world of his own. He mumbled to himself and to the viewers, made wild gestures in the air in front of his face, and periodically scribbled notes.

Nick backed out and closed the door behind him. He hoped this was a good sign.

*

“I’ve solved the problem of the radiation,” said Professor Banks. “You’re not going to like the answers. I don’t like the answers.”

The Professor had glanced at Nick as he entered the penthouse, but didn’t meet his eye.

“Tell me.”

“Everybody dies. Everyone.”

“Not last time though.”

“No. Every single time. I don’t just mean the people in the DERI. I mean everyone.”

Nick frowned, and sat down in the armchair opposite Banks. “Go on.”

“The part you mistook for radiation? That’s just the start. It’s worse than you ever imagined. Let me see if I can explain. As the disruption of space returns to normal, across the entire volume, energy is indeed syphoned out of the quantum structure underlying matter itself.”

“And that is bad thing.”

“Yes. It is enough to destroy chemical bonds, especially in fragile structures like proteins and other organic molecules.”

“You’re saying this happens across the entire volume?”

“Yes. Everyone dies.”

Nick felt as though the bottom half of his stomach had dropped into a black hole. “For a thousand kilometers?”

“Everything in the UK and Ireland, most of France, the low countries of Europe, the majority of Germany, Denmark, some of Sweden, all the centers of population in Norway.”

“Not just people.”

“No. All organic matter. Everything living.”

“What is left?”

“Plastics are essentially unharmed, but degraded. Metals and silicates are unaffected. Electrical components like computers would probably be knocked out, like with an electromagnetic pulse.”

Nick’s vision had blurred, and it felt as though someone had kicked him in the head.

“Everybody dies.”

“I could be wrong...” said Banks.

“Really?” Nick said, wiping his face with his sleeve.

“But I doubt it. I tried to to convince myself I was in error, but I couldn’t do it. The theory is new, but it fits the numbers too exactly.” Banks finally sat back, and looked Nick in the eye. “I have become death!”

“You?”

“This was my experiment! I killed hundreds of millions

of people! And who knows what effect it has outside of the disruption zone.”

“You were ignorant of the outcome.”

“That makes it worse!”

“Once. You only did it once. From the very first time I sent my memories back, I could have learned what you know now. But I never did! That would have disrupted the normal course of events too much. If the scientific world knew anything about this, I would never have been able to send my memories back in time again. I was willfully ignorant of the price of my immortality.”

“You couldn’t have known.”

“But I could have known! I know right now! I could have learned before.”

Nick gasped for air. Every time he had tried to improve the world, it had been for nothing. The destruction the casimir machine wrought negated any benefits he’d ever brought about.

It was all for nothing. Less than nothing. The number of lives he saved each cycle, from stopping wars, and from setting up early warnings for tsunamis and other natural disasters, was dwarfed by the numbers who died as he began the next cycle. When he’d reigned in the tyrannies of governments, and fought for the liberties

of the people of the world, he'd presumed those changes would last far into his old age each time cycle.

“What...”

“What else have I discovered?”

That wasn't what Nick wanted to ask, but shrugged and said. “Yes.”

“I have some ideas about the time travel itself, but no more than ideas. Information could travel through wormholes, and given enough energy, may imprint itself, as matter and energy, onto the quantum structure of the universe at the far end. The destination of the wormhole is determined by local gravity in terms of space, of course. How far back in time it goes is determined by the size of the distortion zone, though that expands to an exact known size, so theoretically it will never be more than twenty years...”

Nick's mind began to wander. Who cared about time travel now? It would never be possible again. Not for him, not for anyone. No matter what he had accomplished in other lives, he had just achieved more in this one than ever before.

By stopping the experiment, he had condemned himself to his final life ever, but in doing so had saved the lives of millions. And billions, of course, in the future time cycles that he would no longer attempt to

start.

“... of course,” the Professor was rambling uncontrollably, “this explains why nobody ever comes back from the future to warn us about this. Every time it has happened, in the future, the first dark energy experiment would destroy all knowledge and evidence of its own existence, and would never be repeated, so nobody could discover the time travel side effect.

“And if the side effect, the time travel mechanism itself, was discovered first, the process would be far too dangerous to ever attempt, because the danger of the distortion volume would be understood. We know that nobody works out a safe way to do it in under twenty years, which is the theoretical limit to the casimir machine’s capability.”

“So this is it. What are you going to do?”

“The sooner I publish, the sooner the world will understand the dangers.”

“Right.”

“You kept your side of the deal,” said the Professor, “but I’m going to have to renege on mine. We don’t yet have the technology to replicate the casimir machine, not in this time line. However, we will within twenty years, and we must ensure that it is never deployed. We’ll keep everything else secret though, like the fact

that you and I come from the future.”

“Of course,” said Nick, but his mind began racing with other plans and ideas.

Chapter 13 - In Space.

Cycle + 2, year + 19.

David floated by the port hole, and looked down at the half circle of Earth. From his home at Lagrange Point 1 of the Earth-Moon system he could take in the entire world at a glance.

He watched as a beacon of light flared on the night side, and slowly faded black over the course of the next minute. His satellites in Earth orbit had tracked the ICBM as it flew from China to the United States. Colorado would now be as lifeless as New York and Shanghai.

Actually, it was possible to live through a nuclear attack. Many had done so in the past, in Hiroshima and Nagasaki, and in Frankfurt and Nice.

But New York and Shanghai had been rendered completely lifeless by attacks using tiny casimir machines. They could be triggered, and then collapsed almost immediately, so the boundary of the distortion zone only extended eight or nine kilometers, instead of

one thousand.

“David,” said Daniel Westley, “the US has already launched a reciprocal attack. Three ICBM.”

“China knows about it?”

“Yes. They’re using their lasers.”

“Put me through to Andrew Gateman,” David told his viewers.

“I’m busy,” said Andrew when he answered a minute later.

“Are you safe?” asked David.

“I’m in the air. I feel vulnerable, but my security advisors tell me a the bunkers under Dartmoor are no help against casimir bombs. I wish I was up there with you, but my place is always here, isn’t it?”

“I’m sorry, old friend, but leading a country seems to be your destiny. How is your intelligence from the US and China?”

“Patchy. Can you help?”

“This is why I called. You understand that we have to stay neutral up here. The Chinese can pick us off easily with their lasers, and the US probably have rockets that can reach us. We can offer intelligence, but not

exclusively to you.”

“We’ll take whatever we can.”

“Good. I’ll see you on the other side. Don’t do anything stupid.”

David put a call through to Lionel Banks. It wouldn’t connect, then displayed an error message. The scientist was on Earth, somewhere, in hiding.

“The Chinese lasers took out two of three missiles,” said Daniel. “The last just... ah shit. It’s all going to hell down there.”

Adam swung into the compartment. “I have the flywheel rigged.”

“It’ll be too late now,” said David.

“We really fucked up this time,” sighed Adam.

“We? There is no we. Only me. I set this course in motion before you ever joined me.”

“I meant humanity, David.”

“There might not be much of humanity left,” said David, “not after this. Just those of us above low Earth orbit. Both the ISS and Century SS are within casimir bomb range.”

“Even so,” said Adam, “we’ll do it better next time.”

“Next time?” said Daniel, surprised. “What do you mean?”

“He doesn’t know?” Adam asked David.

“Know what?” said Daniel, looking between the two of them.

“We have a plan to send our memories back in time once more,” said David.

“But to ensure that works, don’t you need to use a casimir machine, with a thousand kilometer distortion zone, down at the DERI site? That would kill millions!”

“Only if we wanted to play the exactly the same game as before,” said David, “but there’s another way, another possibility.”

“What do you think H and Lorraine are doing in Lunar orbit?” asked Adam.

“Research?”

“They are building a casimir machine,” said David. “We’re going to remotely trigger it on the far side of the moon. It might take out one or two satellites, but nothing more will be harmed. It’s the only safe place. H also found that constructing the components of the casimir sphere is far easier in micro gravity, so the

package can be bigger than normal. It'll arrive in Lunar orbit, at exactly the same time as all the packages that arrived in my room at university. Once it arrives, it will start broadcasting messages until someone picks it up and delivers it to Nicolas Hastings."

"It has contingencies too," said Adam, "but the package will have to be pretty simple."

"You only have four months until the delivery date, right? How long have you been planning this?"

Adam laughed. "This has been David's plan all along," he said. "Don't you see? Why else would we be up here at L1?"

"To get away from that?" Daniel pointed through the port hole. Adam and David turned, in time to see circles of white light blossom across the continent of North America.

Chapter 14 - Nick.

Cycle + 3, year + 1.

David woke from a very deep sleep, and felt very, very heavy.

No, he thought, not David. I'm Nick again. Not at the Century L1 Space Station, not in zero gravity, but... in

a conference room, at an air force base, in California, I think. Yeah. California is still here. It hasn't become a patchwork of dead zones from nuclear fallout and casimir bombs.

And it won't. Not this time. This time, everything will be different. He'd thought the same thing before, but this time he'd get it right. This time.

The key, he'd decided, lay in redundancy. Humans are too vulnerable on a single world. They had to spread out to the stars. And they had to do it quickly, before someone like Professor Banks ran an experiment with a casimir machine.

He couldn't suppress that knowledge forever, he knew, as someone would work it out at some point. But he could delay it until humanity had spread into space, to the moon, to Mars, and maybe beyond.

That would be his priority. Accelerate scientific and engineering progress, concentrating on space technology and materials.

And this time he was already too famous to change his name. He had to remain Nicolas.

Nick opened his eyes, and found himself surrounded by cameras, most of them pointed at his bed. He found the satellite under the sheet with him, as he'd fallen asleep cradling it like a baby. He pulled the memory

implanter off his head, and smiled.

“Hello world,” he said to the cameras.

An aide entered the conference room. “Are you awake, sir?”

“I certainly am. Is Ace about?”

“Ace, sir?”

“Ah. Is Commander James Truman here?”

“Yes, he woke an hour ago. Let me find him.”

“And some breakfast, please.”

Nick rolled out of bed, still dressed in his clothes from the evening before. Breakfast arrived, and he ate ravenously.

“How are you feeling?” said James as he sat down opposite Nick once more. To Nick, James looked a generation younger than he had the day before. Then he was an older man, an experienced astronaut. Now he seemed fresh faced and innocent. Of course, thought Nick, to him I look the same as I did yesterday.

“Great, thanks!”

“What happened?”

“It’s true. I saw the future.”

“In a dream?”

“More than a dream. James, I have a lot to do. Will you come work for me?” He almost said “work for me again.”

“What can I do?”

“In just over six years, an asteroid will fly past Earth, quite close, but not dangerously so, swing past the sun, and just under six months later, will make a close approach to the Earth once more. The asteroid contains thousands of tons each of water ice, silicates and metals. I need someone to capture that asteroid, and steer it into a safe lunar orbit. I can think of nobody more qualified than you.”

“Are you serious?”

“Yes. The asteroid has yet to be detected, but it’s crucial to my plans.”

“I’m only one man, sir.”

“True, but I can find people to help you. I think I need to make a speech.”

*

People of the world, my name is Nicolas Hasting. I

have seen the future.

I would love to tell you that in the future, all our problems have been solved, and everyone is happy. But that is not the case. In the future I saw, war has ravaged the planet once more, and entire nations have been brought low.

However, that was only one future. It doesn't have to be OUR future. Our future is already different from the future I saw.

Also, and most importantly, in the future SOME of our problems have been solved, and many people are happy, if not all.

So let me share the some of the good in the future I saw.

Nobody is hungry, there is enough food for everyone.

We are treating animals more kindly. The great apes have more rights than today, and we've learned to communicate with chimpanzees and dolphins.

People, too, are treated with more dignity and respect.

We have learned how to predict earthquakes more precisely, and with early warning systems, we have reduced their impact.

Humanity is pushing into space, and using the

resources found there to help those back on Earth.

I saw many other great technological leaps forward, each one bringing people closer together, and lessening the power of old borders and prejudices.

I believe that in our own future that we can still obtain these noble goals.

I know one future, I will help us avoid the mistakes I saw there. Not only that, I will do all I can to help humanity be the best it can be. If I wanted to, I could control every invention and new scientific principle I know, and I could take the credit for each one.

Yet I will not do that. This is my pledge to any person or company who asks. I will give you these inventions, for free, to do with what you want. Credit will not go to those who invented them in the other future. They did so in their own time, and reaped the benefits there.

But this is OUR future!

Any scientist, who has any question about any subject, just needs to ask, and I will do my best to answer. I will give no credit to the scientist in the other future, as doing so will make no difference to them.

On the other hand, I have seen great works of art from the future, and experienced a vibrant culture that we will never see.

And nobody will ever see that. That is not our future. We will make our own art, make our own cultural icons, and not be beholden to those of another time. In doing so we will take ownership of our own world and, through the arts, breathe new life into it.

Finally, as to the exploits and achievements of individuals, both good and bad, in that other future, I must keep them to myself. I cannot judge any person, individually or as a group. I can't take responsibility for the actions of everyone on Earth, so I must take responsibility for nobody. Nobody but myself, of course, and I take that responsibility very seriously.

So even though another future exists, we have to make our own future, and take ownership of it.

This is OUR future. Let's make it count this time.

Chapter 15 - Lilith.

Cycle + 3, year + 1.

Lilith got out of bed. Her atrophied muscles screamed with pain. She stretched, willing life back into her aching bones. How long had she been in the hospital bed? She had no idea. Months, surely. She wanted to rip away the wires and tubes attached to her arms, wrists, neck, and chest, but left them in place for now.

Her bed was hidden from much of the room by a white curtain. She peeked around the edge, and saw the rest of the long room was full of other curtains hiding other beds and patients. Lilith spotted a security camera at the far end of the room, pointed down the length of the hospital ward, and pulled herself back behind the curtain.

She pulled back a curtain carefully and, in the bed next to hers, she found a man laying completely still, hooked up to various machines monitoring his heart activity and other vital signs.

She rolled her own life support and monitoring machines across to the curtain, lifted it, and ducked underneath.

She looked down at the man. Would he ever wake, like she had? It was against all the odds. Did he have a family that visited him every day? Every week? Ever?

Lilith pulled the sheets back, exposing the man's chest. She then pulled off her own gown, exposing her naked body. Lilith leaned over and pressed herself bodily against the man. She waited, matching her breaths to his, and feeling his heart beat gently.

She reached for the heart monitor cable, and followed it to where it was trapped between their bodies. She slipped her fingers further, and as she pulled away slightly, ripped the medical tape away from her own

skin. She quickly flipped the monitor over, taping it to the man's chest, next to his own heart monitor. She repeated the maneuver with the breathing monitor, placing hers next to his on his neck. She checked the machines. From the displays, it looked as though she was still in bed, in a coma. Or so she hoped.

She ripped the other cables from her arms and hands, and pulled her gown tightly about her body. Her body felt peculiar in so many ways, and not just because it was unused to movement after so long asleep. She forced that feeling away, trying to think of other things. Now wasn't the time.

She ducked under the next curtain, and found another sleeping form. This man had a large number of cards stacked on a small table next to his bed. The top one read "Get well soon!"

The table also had a set of clothes folded neatly, with a pair of shoes resting on top. Lilith thanked the relatives of the half-dead man for their optimistic prognosis of locked-in syndrome. She stripped off completely, and put on the man's clothes. They were many sizes too big, but they made her feel far more comfortable.

Ducking under the next curtain she found yet another man in a coma. She looked around for anything that would help her escape, but came up empty handed.

Two curtains later, she found an ebook reader. She

turned it on, and found it had wireless connection to the internet. She found the exact date and time, and grinned to herself. It was earlier in the cycle than she had anticipated, which would make her life far easier. She connected to some servers, and downloaded a large number of helpful files and programs. Most wouldn't run on the limited capabilities of the ebook reader, but she could use them on another device later.

She quickly checked her bank account, as she remembered her passwords from before her time in hospital. She then connected to a new bank account, one only recently remembered, and made a large transfer to her own.

Finally, she searched for her own name online. She had no idea why she was in hospital, or what the rest of her family was doing with their own lives. Lilith found a news report.

Her mother, father and sister were dead. A multi-vehicle pileup, high speed, on the freeway. She found a photo of their car, crammed into a too-small gap between two container trucks. That she had survived the accident at all had been a miracle.

Parents dead in a car accident. She waited for her blood to run cold. She waited for the loss to hit her hard, and for her to break down in tears. It didn't happen. One part of her felt empty, as though unready to accept it as reality. She knew it would just take time. The other part,

this new, strange, twisted part, felt nothing.

No, not nothing. It felt regret, but it seemed to have accepted the death of his parents many years before. Many, many, many years before.

Lilith used the information about her current situation to locate her hospital. She let her instincts take over then, and blazed her way through the hospital's computer network, no matter the administrator's perceived security capabilities. She found her own medical records, the floor plan, the security arrangements, and many other useful things. Thankfully, it seemed that the physical security measures had been kept to a minimum, just keycards and camera surveillance.

There was a password-protected note attached to her file, which she cracked in seconds. It told of an experimental new treatment for patients in a coma, with suspected locked-in syndrome. She crosschecked with other patients. She was one of the thirteen patients to receive this treatment, and all within the last week. Four had died following the treatment, although no mention of the new treatment had been mentioned in their autopsies.

She shook her head, and did a final search online. Nicolas Hasting. There were too many results to process right away, but she clicked on a news link. Just two weeks before he had made a speech, and, judging

by the reporting after the fact, the population of the world had collectively lost their minds.

This, she thought, is going to be interesting.

Lilith clicked off the ebook reader, and ducked under the next curtain. She found yet another man, laying asleep, or in a coma, or locked in, or otherwise incapacitated. She found, strapped to the top of the man's head, a red device of an immediately familiar design.

The fuckers, she thought, that's MINE!

She ripped it from the man's head, and clasped it to her chest. It beeped a warning, and immediately the man's heart monitor flatlined. Without thinking further, she ducked under the previous curtain again, uncertain what she should do next.

The door slammed open, and Lilith heard running footsteps approaching. They stopped, and Lilith waited for more. None came immediately, so she ducked under the curtain once more.

She swiped the legs of the nurse out from under her. The nurse fell hard, and Lilith punched her hard in the neck on the way down. She remembered hearing, in a previous life, that this was the quickest way to incapacitate an opponent, though it was almost impossible to knock someone out with a single blow to

the head, as portrayed in all the movies.

The nurse whimpered, and lay still. Lilith swapped the heart and breathing monitor pads from the dead man's neck and chest, and attached them to the nurse on the floor, thrusting them under the clothes. The monitoring machines once again showed the signs of a sleeping, but otherwise healthy, human being.

Before the nurse woke, Lilith stripped off the nurse's uniform. She removed her own clothes too, those recently stolen from the sleeping man in the previous partition. The nurse's clothes fitted Lilith far better, and she smiled while smoothing them out. Using large amounts of medical tape, she secured the nurse's arms and legs, and gagged her too.

Lilith then strolled out into plain view of the security camera, and up to the doorway. She swiped her security pass, and the door clicked open.

Out in the corridor, a handsome young doctor hurried towards her, a concerned expression on his face. "Don't worry, Doctor," she called, "false alarm. Check on your tablet." She smiled broadly as she walked past. The doctor's eyes followed her form for a few seconds too long, and then lifted his tablet out from under his arm. By the time Lilith took the door to the stair well, the doctor had convinced himself that the monitors by the patient's bed were functioning perfectly, and turned

to follow Lilith.

Lilith took the stairs two at a time, putting her well ahead of the doctor. She remembered the least-observed route out of the hospital, took that route, and within two minutes left the hospital grounds by a staff exit.

That, she thought, was easier than I first expected. Now, to find a place to hide. Later, to work!

Chapter 16 - Andrew.

Cycle + 3, year + 2.

At first, commentators scoffed at Nick's speech. He knew they would when he wrote it, and knew they would when he released it. The tone had been very high minded, very idealistic, and put himself in a position of moral authority. But this time, he knew, he would make no compromises.

He flew to Switzerland, and asked for political protection. The Swiss government assured him that he would be free to stay. And would he like an armed guard and free use of some of the most secure facilities in the country? He accepted and found, just outside of Zurich, a building to use as a new base of operations. He put the Dana satellite and the two memory

implanters into storage at a reputable bank, and then concentrated on fulfilling the promises he made in his speech.

The flood of requests poured in. He set up an online submission form, with every request open and viewable to the public. He set up a voting system, so people could approve or disapprove of other people's requests. Then he hired staff to help sort through them even more, to filter out the most appropriate.

And then, five days after his speech, Nick started releasing information, beginning with some requests which only required simple answers.

A student in Germany asked for the answer to one of the Millennium problems in mathematics. Nick simply looked up the proof, which had been proposed, at the earliest, nine years into any of his previous futures. He posted the proof, in full, on the student's request page.

Minutes later, the student added a simple thank you note. Mathematicians around the world poured over the proof, and agreed, that at first reading, it was the most convincing attempt yet, but the math was deep and esoteric, and would take time to validate.

A company in India asked for the design of the solar panels on the Dana satellite. Nick replied with as many of the material science documents as he could find.

A university in South Africa asked for help with a route-finding algorithm for maps. Nick published the best he could find.

He always added a note saying “Please, don’t take my word for it. Check these answers, and verify all results.”

And so he continued, for the next two months. When he considered a request, he always checked to see if anyone was seriously working on the problem already. He really didn’t want to cut the legs out from anyone who was finishing up a research project, or finalizing the designs of a new product, and publish from his own database immediately before them. This meant he often leapfrogged the current scientific knowledge, and his answers ended up slightly unclear or controversial at first reading. However, in almost every case, the experts in the field realized the plausibility, and then the validity, within a few days. They would then apply for grants to replicate the experiments and corroborate the findings. The money for this research flowed readily from funding bodies around the world.

Nick held off on replying about inventions with military uses, but often the line blurred between those and non-military technologies. In these cases he added simple warning notes, urging caution.

Many requests for information asked for ways to break encryption. Nick knew the answers to most of these, but decided not to answer directly. Instead, he outlined

the methods, developed in the future, for ever more secure communications and data storage, those on par with his own encrypted databases. He left a note saying that once these had been tested, and implemented, he would say if the current systems could be undermined, and how.

By far the highest voted question had been “How does time travel work?”

For obvious reasons, Nick simply ignored this request.

The second most popular question was “How do you know so much about the future from a single dream?”

He thought a long time about this, as he imagined direct brain imaging and memory implanting would have a huge impact on society, far greater than the more abstract scientific findings already published, and the gadgets and other inventions he’d introduced. In the end he published as much as he had, knowing that the technology needed to accomplish the process wouldn’t be developed for many years yet.

He attached a note saying “The Dana satellite contained a device for imprinting memories, which in turn contained the memories of Nicolas Hastings, from twenty years into the future.”

“What about flying cars?”

“What about jet packs?”

“What about artificial intelligence?”

“What about aliens?”

To all these questions, and many more, Nick had to reply “Not in the future I saw. But who knows? Maybe in this one!”

By far the greatest number of answers Nick provided were in the areas of material science, electrical and mechanical component design, more efficient production processes, and “green” issues such as cutting carbon emissions and other pollutants. These would have many benefits for the world, but would take time to implement, meaning smooth transitions from one way of life to another.

And of course, no single company ever had exclusive use on any answer Nick provided. The idea that these were “owned” by anyone was taken seriously by nobody. When one company attempted to patent one of Nick’s published processes, it was rejected out of hand. Even new improvements on the basic designs or concepts were roundly dismissed. The upshot was that, in many areas of technology, Nick had pressed a restart button on the world’s patent systems. Over the next months he saw a flourishing of new implementations, especially in the world of software, unbounded by any

restrictions except human ingenuity.

Buoyed by this result, he was tempted to begin answering questions about medical problems in earnest, hoping that he could spur new innovations in that area too. But then he considered the millions of people desperate for miracle cures, and that his answers would be prime material for quacks and other untrustworthy purveyors of nonsense.

Nick's self-imposed isolation kept him away from most of the fallout from his actions, both politically and financially. But, being in Switzerland, his hosts asked for him to meet a delegation of international financiers, investors, finance ministers, and other interested and influential parties. They arrived with nothing but complaints, about some markets falling uncontrollably, and others fluctuating wildly. They had grave concerns, quite rightly, about the future.

Nick listened to them for an hour. Then he began talking himself. He outlined many new financial services, and formulations for taxation and maximizing revenue, explaining how they had worked in the alternative future. He released algorithms and data modeling techniques online, and showed them to the participants the meeting.

“I don't have your data,” said Nick, “so I can't use these myself. But if you plug in your own numbers, those of your current customers and constituents, I'm sure you

can work with these to your advantage.”

Finance is built on confidence, and after that meeting, confidence abounded in all the right circles. Nick didn't tell them that most of the models were untested in real world circles, and in fact came from academic papers outlining alternatives to classical economics for post-scarcity societies. A gamble, Nick admitted to himself, but just as much of a gamble as relying on the current system to support an entirely new future.

After four months without a break, Nick stopped answering any more questions. Inevitably there was an outcry from those who had developed a sense of entitlement, and from those whose questions had yet to be answered. Then Nick began opening up the question pages, for other people to provide answers. If they hit on a correct answer, he said “Well done!” If they provided a false answer, Nick said “Try again.”

He kept this up for another month. Then he stopped saying if the answers were correct or not. Instead, he gave details of experiments or tests that could be carried out to determine their validity.

Then, after another month, instead of providing experiments or tests, he opened up that part for other people to suggest experiments or tests. By this time, the world's community of scientists and engineers had taken ownership of the internet site, creating a massively distributed network of highly interested and

capable people, all contributing, in their free time, or at work. In the same way that Wikipedia had worked for the presentation of the world's verified knowledge, free and available to anyone interested, so Nick's Q&A site became a new focal point for the furthering of scientific and technical knowledge.

The direct beneficiaries were the companies who could take full advantage of the ideas and inventions, free from patents and the restrictions of intellectual property disputes. Sometimes these companies kept their new designs to themselves, but more often they fed the details back into the network. Universities and research companies also tapped into the vast network of willing participants and helpers, and published their results in full, back to the internet. Some corporations, too embedded in old business models, failed. Most survived and thrived.

The indirect beneficiaries were, of course, those spending their time and energy on the Q&A site. And, ultimately, every member of society. Who didn't want cheap electricity from the new solar panel technology? Who didn't want their weekly shopping to be either 100% recyclable, biodegradable, or suitable for clean, carbon neutral incineration? Who didn't want clean air in cities from cheap, highly effective filters that could be installed on the exhaust pipes of any motor vehicle? Who didn't want faster internet speeds? Who, in the developing world, wasn't excited by advances in food

production, cheap medicine, and the breaking down of the digital divide between the world's rich and poor? Who wasn't excited about the new projects underway to scrub carbon dioxide out of the air? Who wasn't excited about the new possibilities for space flight and exploration?

Nick went back to answering some questions now and then, those too advanced even for the Q&A network. But otherwise, he found, his work was done, for now. He had turned the world on to science, in a way it had never been before, in just under a year, and at the same time had instilled a new attitude in the general population: anyone can get involved, and you don't have to ask permission. A message had been sent to businesses: you don't have to be secretive, and don't worry about the cost of research and development, we will all pay for that with our time and effort, supplementing what we would otherwise have spent out of our wallets.

Two years after Dana first peeked out from behind the moon, Nick turned his attention to his next task. It was time to start bringing the team back together.

*

Nick flew into London City Airport in a private jet, on loan from a Zurich bank. Someone at the bank had leaked his plan to the press, and so large crowds had turned up to greet him. Nick transferred from the jet to

the waiting car as soon and as quickly as possible, hefting a briefcase in his left hand.

He used a video display inside the car to take a closer look at the crowds. They swarmed just outside the security perimeter, on the other side of a high fence and gate, and self-organized by type and motivation.

The largest crowd was made up normal people, those who would otherwise have been going about their lives as normal, but on hearing the news had turned up out of sheer curiosity.

A much smaller crowd consisted of demonstrators. They waved placards, though from what Nick could see, their individual demands or statements seemed at odds with most others.

One crowd was made up entirely of reporters, photographers, videographers, and other media representatives. These battled with another group, made up of people who wanted to ask Nick their question in person, because their answer had yet to be addressed on the Q&A site.

The final component made Nick the most uncomfortable. This was the Church of Fate, a quasi-religious order that had formed over the past two years. Their creed had yet to become strict dogma, but the general idea was that Nick had the position of savior, and Dana was some kind of prophet, able to tell the

future and shed new light on the present. In the future, Nick would pick from among the population of the world, and gather the chosen people unto himself, and take them away to heaven, or some kind of paradise.

And, Nick admitted to himself, that was exactly correct. He really did plan to take people to paradise. Of course, the chosen people would go through many levels of selection and screening, and the paradise would resemble the inside of a generational space ship. He'd take people into the heavens, though not Heaven, with a capital H.

The security personnel at the gate pushed out into the crowds, clearing a route for Nick's car. Not only his car, but two more ahead and one behind, plus two policemen on motorcycles leading the way.

It's like a state visit, Nick thought. It was his first time out of Switzerland since he'd flown over from California.

And, in a way, Nick did intend to visit the Prime Minister, the leader of the country. Or Andrew Gateman, who had been the Prime Minister in three alternative futures. Maybe he will be in this one too.

The crowds pushed forward, but the motorcade left the airport without incident, and drove into the City of London. The car pulled into the sub-level parking garage under a tall office building, the national

headquarters of a bank. Once the car stopped, Nick stepped out and was immediately surrounded by a gaggle of body guards and other security personnel.

“Is this really necessary?” he asked.

“Yes sir,” said a voice somewhere behind Nick. Nick didn’t bother to look round.

“But nobody knew we were coming to this building, surely.”

“No sir.”

“Let me go up alone,” said Nick.

“Sir?”

“Stay here. I’ll come down when I’m ready.” Nick walked away, making for the lifts. As he reached them, he turned to see two men following him. “I’m taking this lift by myself, you understand?”

“Yes sir,” said one man, “we’ll be waiting for you when you return.”

The doors opened, and Nick entered alone. He smiled at the body guards. The doors closed, and he pressed the button marked “27”. As the lift rose, Nick looked up at the sign above the door. It read “Otis” and that made Nick smile. One of his earliest memories of

Andrew included a discussion of this very lift.

The lift stopped twice on the way up, once to pick up a pair of female employees of some kind, and once to drop them off. As they left the lift, Nick overheard them whispering to each other excitedly. Did they recognize me? Nick thought, but after a moment decided it didn't matter either way.

The doors opened at floor 27, and Nick stepped out. Another woman office worker hurried up to him. This confused Nick at first, but then he realized she was trying to catch the lift before the doors closed. He recognized the woman.

“Nigella,” he said, and waved his arm to catch her attention before she passed him. “Can I ask you something?”

She stopped and turned to face him, her face betraying confusion and frustration. “Sure.”

“Is Andrew here?”

“Andrew?”

“Mr. Gateman?”

“Ah yes,” she said, but then frowned. “I’m sorry, but do I know you from somewhere? We don’t usually go by first names except with other people within the same

office.”

“My name is Nicolas Hasting,” said Nick, “and I once knew your friend Jennifer Harding very well.”

“That’s great,” said Nigella, “but I don’t recall her mentioning your name.”

“No, she probably wouldn’t have.”

“But she mentioned me?”

“Quite often,” Nick said, which was the truth. “I recognize you from some photos of the two of you together.” That was also true, to a point. But if his mind hadn’t been running over his first meetings with Andrew, he would never have been thinking about Jennifer at all. Andrew had been with Nigella in all but one previous timeline, and he knew they worked together before starting a personal relationship.

“That’s.... nice,” Nigella said slowly.

“Could you tell me where I can find Andrew Gateman’s office, please?”

“I’ll take you to him,” offered Nigella.

“That would be perfect,” said Nick, and smiled.

Were Andrew and Nigella already a couple? Maybe not in this timeline. The world was very, very different, and

while the course of human history normally fell back into line after small nudges from Nick in previous timelines, sometimes the momentum, or the inertia, could be overcome. Certainly, thought Nick, on the scale of a single couple.

Nigella pushed through a door without knocking, and in the office beyond sat Andrew. He looked up, and as he saw Nigella his face brightened immediately.

“Hey, you came back...” he said, and then Andrew noticed Nick following close behind. His eyes bulged.

“Andrew, I’d like you to meet Nicolas—” began Nigella.

“Mr. Hasting,” said Andrew, standing up so quickly his chair rolled back and hit the window pane. “It’s so good to meet you.” He rushed out from behind his desk and shook Nick by the hand enthusiastically.

“Do you know each other?” asked Nigella.

“He doesn’t know me, but I know Nicolas, of course.”

Nigella stopped herself from raising an eyebrow, Nick saw, but failed to keep all confusion from her face. “Where from?”

“This is Nicolas Hasting,” Andrew almost hissed at her, “the man who saw the future!”

“Oh!” Comprehension flooded into Nigella’s face,

followed by heavy blushing.

“Please, take a seat,” Andrew gestured, and Nick sat down in one of the spare chairs.

“Thank you for all your help,” Nick said to Nigella, “but I’d like to speak with Andrew alone.”

“My pleasure,” she mumbled, and backed out of the room, closing the door behind her.

“How can I help you, Mr. Hasting?” Andrew retrieved his chair and sat down behind his desk once more.

“Please, call me Nicolas, or Nick.” Nick leaned forward. “You seem to know me.”

“Of course! Doesn’t everyone? You’ve given us so much to do in the past year.”

“And you believe my story?”

“Yes. But it doesn’t matter what I believe, because even if this is all some kind of hoax, that doesn’t change the results.”

“I suppose not. Do you know how I know everything I’ve shared with the world?”

“The satellite that NASA picked up,” said Andrew, “it contained all the information.”

“True, but how do I know what to share, and what not

to share?”

“I don’t understand.”

“On the first evening,” said Nick, “when James Truman landed with the satellite, we opened it up. Inside we found two devices, one red and one blue. These held the recorded memories of someone called Nicolas Hasting, as his brain existed twenty years from now. No, not from now, but twenty years on from the moment before the satellite appeared, in a different future than ours.”

“It contained your memories?”

“Yes. I went to sleep with the device pressed against my head. It imprinted those memories onto and over mine. And not just memories, but elements of personality, and character, and even mannerisms. They are all wrapped up in memories, and can’t be separated.”

“You’ve published something about this technology, I think.”

“That’s right, but so far nobody has been able to use the the theories in this timeline. So, with these memories of a previous life, I gained the wisdom to know what to share with the world, and what not to share with the world, what was safe, and what would make the world better.”

“Respectfully, I hope you know what you are doing.”

Nick grinned. “I hope so to.”

“So why are you telling me this?”

Nick swung his briefcase up onto the desk, and pressed his thumbs against the locks. They read his thumb prints, and with differing pressures he entered a code sequence, one invisible and unreadable by even the most scrupulous observer. He turned it to face Andrew, and opened the case.

Andrew looked down into the case. The red implanter device lay inside, held safely in place by form-hugging foam padding.

“This is one of the implanter devices,” said Nick, “and it contains my memories.”

“This is from the future?”

“Yes. Now, do you know Moore’s Law?”

“Something like a doubling of computer speed and memory every eighteen months.”

“Exactly. How much data storage do you think this device holds?”

“Enough for the memories of an entire lifetime.”

“Easily,” said Nick, although usually the imprinting

device only held a set of very complex instructions, detailing how to change the brain of the implantee, rather than the memories themselves. These had been calculated on much larger, more capable computers before being installed on the device. The instructions were far smaller than the original uncompressed scans, so he had only his own uncompressed file on the devices.

“But there’s more?” said Andrew.

“Yes, there are also the memories of the close friends and associates of mine, those who worked with me to achieve what we did in this other future.”

Andrew’s mouth dropped open.

“Andrew, I need help in this life too. There’s so much we need to do, and we don’t have much time. I can’t do everything myself.”

“You want my help?”

“Yes.”

“What can I do?”

“I need you to advise me,” said Nick. “You are one of the most capable men I know.”

“If I accept those memories,” said Andrew, “what kind

of things will I remember. Be honest.”

“You became the Prime Minister.”

Andrew snorted. “I’m not even interested in politics.”

“I know,” said Nick, “I talked you into it.”

Andrew shook his head. “I remember your speech. You said that in this other world, this other future, there was a war. A nuclear war.”

“Yes.”

“Did I survive.”

“Yes.”

“As Prime Minister?”

“Yes.”

“Did I order the use of the UK stockpile?”

“No.”

“I didn’t?”

“No. You never gave the command.”

“And what happened.”

“You lost most of London, Manchester, and Ipswich.”

“Oh my god.”

“This is why I need your help again, to make sure nothing like it happens in this timeline.”

“I don’t think I can do it,” said Andrew. “To live through it all again.”

“It doesn’t feel that way.”

“But it’ll be there. You talking about it, that is bad enough. I don’t want to remember it.”

“You were one of the most powerful men in the world,” said Nick, “and the only head of state with nuclear capabilities who held back during the war. You were a hero, you only lost three cities. And now you can be, once again, one of the most powerful men in the world, and make the same kind of difference.”

“I’m sorry, I can’t do it. I don’t want the responsibility.”

“Are you sure?”

“I’m sure. I just want to live in this world. It’s a good world. I want to make this future mine.”

Nick closed the lid of the case slowly.

“Well,” he said slowly, “I guess I could go talk to Nigella.”

“You... Nigella?”

“Yes. The First Lady, if you will. She stayed by your side most of the time, and probably knew as much about politics and leadership as you.”

“I married Nigella?”

“Yes. She’s a great lady.” Nick made it look like he would stand up to leave.

“Wait!”

“Yes?”

“Let me think it over, okay?”

Nick nodded. “How long do you need?”

“Give me ten minutes,” said Andrew, “before you talk to Nigella.”

“No problem,” said Nick. “Shall I wait outside?”

“No, wait here.” Andrew got up and rushed from the office. From the hallway he called “I’ll be right back!”

Nick smiled to himself. He’d never implanted Andrew before, always starting fresh within each timeline. He’d approach him early on and make friends, and Andrew would always enjoy his company, a fellow young professional with plenty of money to spare, and many interests in common. They had been friends many

times before Andrew first became a politician. By now Nick knew all the right buttons to press to send him down that road, and would feed him all the information and advice needed along the way.

It would have been easier, in these last two lives, to implant Andrew's memories, but he didn't want to give Andrew so much power. It would be too easy for him, as a politician, always knowing what would happen in advance. Or what might happen. He would probably keep his good intentions, but Nick was afraid that he'd become cynical, or take his power for granted, or one of many other things.

And he'd never told Andrew he was from the future himself. This had been the first life where he'd told anyone except the other people who had implanted their future memories.

But this life? This time everything had changed. The world had taken a completely different path, and who knew if Andrew would be suitable as a politician? Now he just needed people who remembered the previous timeline, and could work with him to prevent the same kind of thing ever happening again.

He'd try to get Adam, Lorraine, H and Daniel on board too, but he couldn't implant their memories yet. Adam would probably be safe enough, as he was already a young adult, and his brain had become suitably mature to accept his memories without risk. The other three

would need a few more years yet. He didn't want to repeat the mistake with Lorraine and H, where he and Adam had altered their teenage years so much that the mismatch between their younger and older memories had driven them insane.

Andrew thought, he was four years older than Nick. Andrew would be the perfect person to help him with all the plans he had for this life...

Nick's thoughts were interrupted by Andrew crashing back through the door. He had a huge grin on his face. He'd also returned with Nigella, who followed slightly behind him, looking more confused than ever, but also wearing a big smile.

"Let's do it," said Andrew. "I asked Nigella to marry me, and we want to do this together."

"I said yes," said Nigella, "but I really didn't understand what he said his engagement present would be."

"I said I'll give you a lifetime's worth of happy memories. Nicolas is going to help with that. Right?"

"Okay," said Nick, "as long as you both understand. This will take at least two nights though, as the memories can only be implanted as you sleep."

"The what?" asked Nigella.

Nick opened the case again, and lifted out the red

implanter device. “You wear this as you sleep,” he explained, “and it imprints memories onto the structure of your brain. It only works with your own memories, as memories are not transferable between two people. In the alternate future people use it to back up their memories, and then implant them again later, to keep themselves sharp, and to relive important moments in life. It was also being tried to delay onset of dementia in old age.

“However, using time travel, it is possible to implant your own memories from a version of you that doesn’t yet exist, and will never exist in this timeline.”

“And he has both my memories and yours,” said Andrew.

“You lived a very happy and fulfilling life together,” said Nick, “and I am offering it to you now.”

“How many other people’s memories are on there?” asked Nigella.

“About a dozen,” said Nick. He’d added the data files from people he had no intention of imprinting in this timeline though, like Professor Banks and other physicists.

“That you sent our memories back in time is a great honor,” said Nigella, “and offering them now is a greater honor. If Andrew trusts you, I trust you.”

“How long have you been together?” asked Nick, activating his viewers and loading up the implanter configuration program.

“Officially?” said Nigella. “About two minutes.”

“But you said it was twenty years, right?” added Andrew.

“Yeah...” but Nick had become distracted by the program on his viewers. On a whim he’d decided he’d configure the implanter for Nigella first, instead of Andrew. But the implanter hadn’t responded to his viewers at all. Had it run out of battery power? It was normally good for ten implanting sessions before it needed recharging, and a similar model had lasted almost ten years without needing a charge in the previous timeline. Had it reset itself?

The program simply stated that no implanter device existed within range. Nick looked closer at the device, and at the same moment he realized that it didn’t feel quite right. The weight distribution had changed slightly. Or had it? The last time he’d held it like this had been in a previous life. Had someone damaged it?

While the form of the device was completely seamless, Nick knew where to press to bring up the subsurface display, which would shine through the outer layer of plastic, and show the different configuration options.

He pressed, but the surface didn't give at all.

It was like the button had disappeared.

Or, Nick thought, as though it had never existed. He examined it more closely, paying attention to the strap. He pulled the velcro apart, and it made a ripping sound.

The original used silent velcro.

This wasn't the implanter device. It was a fake. A replacement. A very, very convincing replacement, but certainly not the real thing. And it certainly lacked any ability to implant memories.

Someone had taken the original. The only person who had access to the vault was Nick himself, and he had picked the device up just hours before. Nobody could have switched it since then, the briefcase had been in his hand all that time.

Maybe it had been swapped before he'd put it in the vault. But then he'd had it in his possession, and kept it safe inside the Dana satellite, from the moment Ace Truman had handed it to him at the air force base in California.

Had it been swapped before then? Only one person could tell him for sure. Ace Truman. He had told Nick that he'd opened the satellite, to see if it would unscrew. Had he looked inside? Nick couldn't

remember Truman saying one way or the other.

But what if he had? He'd have read the note, and known that the blue implanter was the first choice, and the red just the backup. He could have scanned the red device somehow, taken photos from every angle. The weight would be tricky, because he'd have to measure that while in zero gravity, in free fall, in space. Maybe that's why the weight felt slightly off. Once the shuttle landed, someone on the ground could have delivered the replica, swapped it out, and claimed the red implanter before Nick ever saw it the first time.

Unless someone else had access to the vault, it had to be something like this. And, for some reason, he trusted the Swiss bankers more than NASA or the federal government of the USA.

Nick blinked, and noticed Andrew and Nigella staring at him.

“What's wrong?” asked Andrew.

“Nothing. Change of plans. You have to come with me back to Zurich. I said I had lots on my plate, but it just filled up a whole load more.”

Chapter 17 - Building.

Cycle + 3, year + 3.

Adam looked very young. He had put on a lot of weight between the ages of sixteen and eighteen, all of it muscle, but he still had the soft face of a boy. He was, however, as intellectually able and as quick as Nick remembered. Though probably still as bad as ever at driving, he thought.

“So I worked for you in the other timeline, and you want me to work for you again?”

“Yes.”

“And you have all my memories stored on that device.”

“Yes.”

“What kind of person did I become?”

“You were the most dangerous man I ever knew.”

“Awesome!”

And so Adam flew to Switzerland with Nick, and happily implanted the memories of his previous lives. The following morning, over breakfast, he confronted Nick.

“You’re such a bastard,” said Adam, grinning, “you know that? You said I was most dangerous person you knew.”

“Of course. And when you were seventeen, that was your goal in life. I remember you telling me that quite clearly.”

“Okay, bring me up to speed. This is the third time I’ve come back in time like this, right?”

“Yes. This time I’ve implanted Andrew and Nigella. They are currently running the financial side of my new project. Ace Truman, the NASA astronaut, is working for me too. I’ve bought Century Space again, and we’re well on the way.”

“Are you still planning to catch the asteroid?”

“Yup!”

“You’re crazy.”

“It contains more pure materials than the output of the all the world’s mines for almost two years, and we don’t have to spend any money to lift it into space.”

“Yes, yes, I remember you going on about it. Wait, did you say you’ve implanted Andrew? Was this the first time?”

“Yeah.”

“And he never knew you had sent your own memories back before.”

“He probably guessed, but nobody else knows. They all think this is my first time. And it isn’t public knowledge that I have the memories of other people in the implanting device.”

“Okay. What do you want me to do?”

“I have a problem, and I’m not sure if it is serious or not. Remember how I sent back two implanter devices? One has gone missing.”

“Shit.”

“Yeah, look at this.” Nick showed Adam the red implanter, and explained how it was a fabricated copy. “Truman admitted to opening the Dana satellite, and photographing the contents, but insists he put everything back. I think that someone inside NASA made a duplicate, and took the original. Truman thinks they did it once the shuttle landed, as the first technicians could have reached the satellite, stored in a locker, and swapped the implanter, before he brought it out to me.”

“You trust Truman?”

“Yes. I’ve worked with him in previous lives.”

“But what is the problem? Don’t you need your viewers to configure the implanter?”

“Normally, but you can do it on the device itself too.”

“But then you’d need the pass codes. You know them, and so do I, but only after the implanter has been used.”

“Right. Which is why I’m not sure it’ll be a problem. However, science and technology is progressing very quickly in this timeline. There are teams working on quantum computers, and progressing far quicker than in previous timelines.”

“And quantum computers can break into the implanter device?”

“They can factor prime numbers instantly. All digital security is based on large prime numbers. In previous timelines, nobody ever got the quantum computers working at that scale.”

“But this a very different world.”

“Yes. And the implanter contains all kinds of data.”

“Including the plans to the casimir machine?”

“Yes. Right now the implanter is nothing more than a paperweight, but I want to get it back. Do you think you could work on that?”

“No problem, except I’m only eighteen.”

“There’s no hurry, Adam, but it is a priority.”

“What about Lorraine and H and Daniel?”

“Another few years, remember?”

“Right.”

“Daniel might be tricky, as he joined up with one of the cults.”

“He thinks you’re a god?”

“I don’t understand what the cults think. I’ll try to recruit him anyway, as he’s always useful. Last time round, he wanted to combine H’s visual grammar with the memory scans, to try to work out a way to imprint one person’s memories onto a second person’s brain. I discouraged him then.”

“Why? It sounds useful.”

“First, I told him to remember what happened to H and Lorraine in the previous life. We all fucked up there, and we wasted their lives.”

“And years of our own.”

“Exactly. Mixing memories and thoughts between two people can’t be healthy. Second, we didn’t have the time. We were doing all we could to control the development of the casimir machines. Again, a

complete fuckup.”

“No kidding.”

“But I have a new idea. By the time we can implant Daniel and H and Lorraine, we’ll probably be able to manufacture brain scanners and implanters. I want the three of them to work on the memory grammar, or whatever they call it, but in a safe way. It always needs to be clear if something is your own memory or not, or if it is a completely manufactured memory.”

“That’s bullshit, David.”

“Call me Nick. Everyone else does this time.”

“There is no way to know if a memory is real or not. I have memories of yesterday. Two memories. One, I was floating around in Century L1 with the chimpanzees. Two, on the army base, and you come to visit. Both are my own memories, and yet both feel completely unreal. And what about my memory of losing my virginity for the first time? In my mind, I was a stallion. In reality?”

“I don’t want to picture it.”

“Yeah, probably a complete embarrassment. Don’t tell me a memory is real, just because it is from an event that belongs in your own past.”

“This is why we need to get the three nerds to study

the problem. H and Lorraine are wizards with this stuff.”

“Okay.”

“So, once they get that technology up and running, if it’s possible, the plan is to share some of my own memories with anyone who asks. We’ll use the uncompressed scan, though carefully edited, of course.”

“Which memories?”

“I want everyone to see the world from space. I want everyone to remember talking with Denny and Tomika. All the good parts of the past, I want to share with the world. In the same way that the perception connection filtered what you see through someone else’s preconceptions and mindset, I want people to experience life itself.”

“Only the good parts?”

“Would it help to see the GB Tower collapse? To get swept away by a tsunami? To see nuclear weapons rain down on China?”

“I don’t know. Without context, the good experiences might seem trite. Also, those who forget the past are condemned to repeat it. Let’s not make it too easy to forget.”

“You might be right, but we have years to think it through.”

Chapter 18 - Ace Truman.

Cycle + 3, year + 10.

The comet flew in from beyond the orbit of Neptune, taking years to fall to past the orbit of Mars. As it did so, its surface started warming, and the water ice began to boil away. All over the surface, cracks opened, and gasses vented from inside.

As it approached the Earth, a speck flew up to meet it. Compared to the comet itself, the spaceship seemed insignificantly tiny. It was, however, one of the largest man made objects ever to be constructed in space. It held a small habitation module fit for two people, and a few technical modules, but the main bulk was a large hollow tube with large vanes cut across the center. Around one end were two dozen fuel tanks, all but two completely empty, and four large boosters.

Ace Truman, the pilot, used up 90% of the craft's remaining reaction mass to bring it to a stop a few hundred meters from the comet. He aligned it so one end of the tube pointed directly at the comet, and waited. The comet revolved in an unstable fashion,

turning at different speeds around around every axis.

“I’m not seeing the crater,” said Tasha Libby, the copilot. She spoke partly for Ace’s benefit, but also for the observers back on Earth. She waited the customary eighty seconds before the reply.

“It’ll come round,” said Nick, “just wait a while longer.”

And such was the benefit of time travel. Normally astronomers would never see such a dirty snowball until it began venting in earnest, and by then it would be streaming past Earth orbit. Also, they wouldn’t know that the comet had a single deep impact crater at one end of its potato-shaped body.

A few minutes later they spotted the crater as it swung past. It was impossible to tell the scale of either the comet or the crater with the naked eye, but with her instruments Tasha judged it was the right one. Whatever had created the crater had punched through into a large hollow cavity inside the comet. A large hole, and utterly black.

“That’s the one,” Nick agreed.

“Okay, I’m moving closer.” Ace edged the spaceship closer and, with its tiny thrusters, kept it apart from the comet. He watched the crater pass by in front the spaceship twice more, and then, as it approached for

the fourth time, he ignited the main engines a final time.

The spaceship rushed forward and sideways, and crunched into the crater. The front end of the massive tube dug into the ice and crumpled under the impact, as designed. To Ace it felt like he'd driven a large truck into a bank of gravel at ten miles per hour. He felt badly shaken, but nothing more serious.

He looked across to Tasha. She lifted her arms and gave him two thumbs up.

“The Eagle has landed,” he said. Immediately he thought something had gone wrong, as nobody answered, but eighty seconds later he heard claps and cheers over the radio.

Ace and Tasha hadn't slept in sixteen hours, but they knew they still had lots of work to do. Both already wore their extravehicular suits, in case of any emergency, and now they each cycled through the airlock to inspect the damage.

They drifted free, both on an individual tether, and waited for the slight gravity of the comet to drag them down to the ground. As he fell, Ace's frame of reference flipped. No longer was the comet ahead, it was below. He swung his feet round, and waited to land. Then he noticed Tasha had already touched down on the ridge of the crater, even as he still approached

the comet.

“That’s one small step for a woman,” she said, “but one giant leap for mankind.”

Ace suppressed a groan. “Technically,” he added on the private channel to Tasha, “that was quite a big step.” Later he heard the cheers from Earth.

When his feet touched the surface, Ace was moving so slowly he hardly felt it through the soles of his space suit. He maneuvered over to the spaceship, which now resembled a massive chimney sticking up out of the crater. The habitation module loomed high above them, but Ace knew that with a jump he could return to it with ease. It wouldn’t even require a great leap.

“Let’s link,” said Tasha.

“Linking now,” said Ace, and they engaged their wireless Shaper connection. Suddenly Ace saw with two pairs of eyes. From Tasha’s point of view he watched himself edging around the base of the spaceship, and she followed him. They checked to see if the spaceship had secured itself properly. The force of the impact had warped the tube outwards, and a mound of ice and gravel spilled around the edge. At only one point could they find a gap between the crater and the hollow spaceship, but it was only about the size of a small window, and would be easy to fill.

They completed one circuit, and then made their way back. Their tethers wound back in automatically.

“There’s the Earth,” said Tasha, and waved at the tiny blue crescent in the black sky. And then, a moment later, the sun appeared over the horizon, and the Earth disappeared from view, impossible to see when the helmet visors compensated for direct sunlight.

“Let’s get back to the module,” said Ace, “it’s safe to sleep.”

As the two astronauts became the first man and woman to ever have sex on a different world, in this timeline at least, the spaceship came loose slightly, but the computer controls automatically fired a tiny burst from the attitude thrusters, and pressed it back into place. As the astronauts slept, it did this twice more, but it wasn’t a concern. Fuel wasn’t a problem on the comet, as all the ship needed was reaction mass, and the comet was over 50% water ice.

The comet’s day lasted only a few minutes, so Ace and Tasha stayed on UTC, and slept through night in London. The following morning they took another excursion, this time with a robotic thruster pack that could tow a cable. They steered it all the way around the comet, as a winch played out the cable behind. They attached the cable to the space ship again, on the opposite side from the winch, and pulled up the slack. They repeated the process twice more, and by the end

of the day they had enclosed the whole comet in a simple but huge net. They pulled in the slack again, tightening the cables until the spaceship's column buckled even more under the strain.

Once they were confident the ship wouldn't drift away, they could work at a slower, safer pace. They ran the water pipes for the air conditioning units down into the center of the comet, drilling deep into the core. They set up the catchment valves to refill the twenty four fuel tanks from the comet's outgassing. They moved the habitation module away from the rest of the spaceship, securing it to one of the cables a few hundred meters from the crater.

As the comet fell inwards, the sun heated the ice even more, and more and more gasses vented from cracks and from the surface itself.

Then came the day when the cavity of the comet heated past a certain temperature, and the crater became a major vent. A few days later, it had become the dominant outgassing feature of the entire comet, visible even from Earth. As that end of the comet swung into and out of direct sunlight, the thrust from the crater minutely affected the orbit of the whole.

Ace and Tasha sat back and let the computer take over, guided by experts back on Earth. First, the vanes inside the chimney-like spaceship directed the flow so that the comet stopped spinning around one axis, making the

remaining rotation far more useful. Then over the weeks, they tweaked the orbit bit by bit. Tiny adjustments on the way in, before the comet rounded the sun, added up to large changes on the outwards leg.

By the time the comet fell inside the orbit of Venus, ducking down to somewhere just above the orbit of Mercury, the crater's output was constant. The ship's fuel tanks filled completely, and the solar panels provided more than enough electricity to let Tasha and Ace live in comfort under their heat shielded module. At this point they couldn't go outside, but they kept up regular inspections with one of the robot handlers.

On the closest approach to the sun, they closed down all radio communications to protect the equipment. They wouldn't be able to receive any messages from Earth anyway, due to interference from the sun. And then, after only seven months, they turned on the radios once more, and picked up signals from home again, right on schedule.

“Good to hear from you guys,” said Nick, “I hope you've had fun in the sun. Hurry on home.”

Five months later the comet coasted past Venus, swinging around in front of the dead planet, giving it a tiny bit of momentum and letting it rob some of its own. Just under two years since launching from Earth, the astronauts arrived back in the system. They passed Earth at a safe distance, blasting the boosters at full

power, draining the majority of the tanks, becoming the brightest object in the night sky, second only to the full moon.

And then they reached the moon itself, inserting the comet into a wide, looping orbit. For the next two months they let the tanks fill again, and used the reaction mass to adjust the orbit into something far more useful.

The astronauts detached the habitation module, discarded the heat shielding, attached one of the boosters, and set off home again. Just three days later they reached Earth orbit and transferred to the newly completed Century Space Station, which span at 50% Earth gravity for two weeks to let them get used to carrying their own weight once more.

Finally, Tasha and Ace boarded a Century Space Shuttle. Ace joked about piloting the craft home himself, saying “How different can it be from the Endeavour?”

“Very different,” said the young pilot, “for a start, the wings are for more than show.”

*

Safe on the ground, Nick met them on the tarmac outside the shuttle. “Here we are again,” said Nick, “and this time I’m welcoming you back to Earth.”

“My pleasure, Nick.”

“How are you feeling?”

“The cancer’s quite advanced,” said Truman, “but nothing that will kill me in the next few months, right? Tasha is more lucky.”

“I didn’t even get radiation sickness in the second storm,” she said, but when she ran her fingers through her hair, her new wig twisted, adjusting to the unaccustomed gravity of Earth.

“Let’s get you both to hospital,” said Nick. He was happy that in the two years since Tasha and Ace had been in space, treatment for all kinds of cancer had progressed far enough that only a few would be a death sentence, as long as you had money.

It had been a gamble, asking the two astronauts to fly to the sun and back, knowing they might not live through it, but both had agreed even before he said they would suffer no long-term harm if they did make it home. Nick had no guarantee that medical technology would move so quickly, but he broke out everything he possibly could on the Q&A site, no matter what short term harm the inevitable quack practitioners foisted on the gullible.

And the result was a tiny moon around the moon, which in less than a year would slowly begin its

transformation into the first large space station, dwarfing the ISS and the Century Space Station, and the first off-world base for industrial manufacturing. From there, to the asteroids. And from the asteroids, to the stars!

Chapter 19 - Daniel.

Cycle + 3, year + 12.

Daniel followed the dashes displayed on his viewers, unsure where they would lead him. The note attached to the beginning of the dashes had been signed by the Church, or someone high up within the Church. Daniel couldn't tell. Either way, it had to be important.

He was just a low level disciple, but willing to do more to help the Church. So far only a few people had talked to the Savior directly, but the rumors stated he was accepting more and more people into his inner circle. None from the True Church yet, but it was only a matter of time.

The dashes led to a taxi, so Daniel got in. He wondered where he should tell it to take him, but it seemed to have instructions already. He watched New York City blur by, and soon found himself on the way to JFK airport. The taxi stopped at the newly built Terminal

11.

Ultra high speed? I must be meeting someone, he thought, there's no way I can afford a sub orbital flight, and the Church would never splash out for it. Not for me.

But the dashes marked a path to the departure gates, not the arrivals hall. He followed them through the security screens, and on to Gate 4. The destination: Munich, Germany. Munich. Surely the Church thought this was very important, or else why fly me to Europe? And Munich is the closest high speed runway to Zurich. And Zurich is where Nicolas Hasting lives. Right?

The dash ended at the desk next to the tunnel, and as he reached it, his viewers switched to a simple message. "1A." Even though all ultra high speed services were all a single class, and first class at that, there was still a lingering importance attached to seat 1A. Or 1C, if you preferred an aisle couch.

"Right this way, sir," said a young male flight attendant, and showed Daniel to his seat. "We'll be leaving within ten minutes. We're just waiting on two more passengers. They are dashing this way now."

The seat was made of ultra light-weight materials that seemed to reach up to his body as he began to sit. They flowed away as he sat, shaping into a perfectly

comfortable seat. Another gift from the Savior, no doubt. A strap looped out around his waist and secured him in place. Was there anything these new planes couldn't do?

No windows, Daniel noticed, and no separate cabin at the front for the pilot. And no pilot. And only one flight attendant. No need, as every operation could be carried out far more capably by software. Daniel selected a video feed from a camera on the exterior of the plane, and waited for action to start.

Without any announcements, the plane taxied away from the terminal and out to the end of the runway. An arm extended from a track in the runway, and gripped the undercarriage of the plane. Then Daniel felt a sudden pressure on his chest. Not just his chest, but his whole body. The plane had already reached a quarter of the way down the runway. After another half breath it reached half way. And one blink later, three quarters. And then the ground fell away.

“Time to destination, one hour and four minutes. Please relax and enjoy the flight.”

*

Daniel dashed from the terminal to a waiting car, this one with a human driver, a tall woman with bright blue hair.

“Nicolas Saves,” said Daniel in greeting.

“Nick?” the driver said with a smile, holding the door for him. “I’ve never seen him save a penny. Nicolas spends!”

“You’re not from the Church?”

“Fuck no. Are you, Daniel?”

“I’m not sure.”

Daniel got into the back of the Mercedes, and sat for a few minutes, taking in the greatest luxury than he’d ever experienced in his life. He reached forward and tapped on the dividing glass. It rolled down, and the driver swung her seat around to face Daniel.

“How can I help you?”

“Are you not driving?”

“Nope. The car will find its own way. Like I said, Nick likes to spend money. What costs more these days? A car that drives itself, or a person to drive a car for you?”

“Paying for both costs more.”

“Exactly.”

“How long until we get there?”

“About an hour and a half.”

It took less time to fly across the Atlantic than to drive a few miles from Munich to Zurich. Or kilometers, Daniel thought, we’re in Europe now.

“Why am I here?”

“I’m sure Nick will explain.”

“Can you tell me what he’s like?”

“You’ll meet him soon.”

“Thanks for your help.”

Daniel sat back and let the window close by itself. He had time to spare again, so like he did on the flight, he tried to read through the latest releases from Hasting on Q&A. He concentrated on anything to do with networking and computer science, as those were his specialities. He’d studied those subjects for four years in the military before joining the Church. His induction included vows of pacifism, and he’d used his savings to buy his way out of his commission, paying for his education until that point. After that he had no funds to continue his studies formally, so worked full time for the Church, running their networks and archives.

In his downtime he was meant to scour the Q&A for messages from Nicolas himself, trying to find guidance for his own life and the Church in general. And, if

appropriate, help in the effort to bring the technologies revealed to reality. The very model of viewers he wore now had been designed, in a very small part, using a genetic algorithm developed by himself.

This is how religion is meant to work, he thought, by making real differences in the real world, and by rewarding the followers with tangible benefits. And if you could write computer scripts to automate your devotional activities, crawling through Q&A using spiders instead of doing it manually, so much the better.

But in the car, as on the flight, Daniel struggled to concentrate on the task at hand. What did it all matter, if Daniel was on his way to meet Nicolas?

The car turned off the freeway, the motorway, the autobahn, or whatever they called them in Switzerland, onto a country road. It cut a winding route up the side of a steep mountain, and through a narrow pass. Then the terrain opened out into a small secluded valley, surrounded on three sides by snow capped peaks. Among the fir trees stood dozens of modern buildings, each one following the contours of the valley's sides. A long driveway led towards one house on the north side of the valley. The car drove up around the side, and stopped by a large, ornate door. The driver opened the car's rear door and beckoned Daniel out.

“Follow me,” she said, “Nick’s waiting for you inside.”

The Swiss style of architecture was very different to that in America, Daniel noted, influenced entirely by the building’s position on a steep hillside. Instead of having the front door at the lowest part of the building, it was at the top. The front entrance hall opened directly onto a huge living space, with balconies beyond the large panoramic windows. A kitchen partition lay off to one side, though Daniel saw immediately that nobody used it for actual food preparation.

The driver took Daniel downstairs, past bedrooms, and onto a floor that was filled entirely by an office. Or that is what it would be in a normal house. This was a room filled entirely with screens, keyboards, and every other kind of computing equipment. At the center stood a high backed blank leather chair.

“Welcome, Daniel,” said a voice Daniel knew so well, “to my humble abode.”

The chair span, revealing its occupant. Nicolas Hasting. Here he is, thought Daniel, the Savior himself, in the flesh. Say something intelligent!

“Um,” was all he managed.

“Take a seat, please,” and without a visible or audible command, another chair, smaller than Nicolas’s own, rolled out into the center of the room. Daniel sat,

trying to hold Nicolas's gaze the whole time. "Jennifer, that's all."

The driver smiled and left.

"Thank you," Daniel mumbled, too late for her to hear.

"You might be wondering," said Nicolas, "why I've brought you here."

"Yes... sir."

"Call me Nick, please. That isn't against your holy rules, is it?"

"No. I don't think so."

"Before I reveal my ideas," said Nick, "what is it you believe I can do for you?"

"For me personally? Or for the Church?"

"Either. Both. Just tell me what you expect."

"Once enough of us join the Church, and follow your teachings, you'll reveal the secret of immortality to the chosen."

"You believe that?"

"I believe that when I began following your teachings, my life improved."

“You think I have the secret of immortality?”

“I don’t know. You have a connection with the future, and who knows what is possible there?”

“The fact is that immortality isn’t an available option in the future that I know. I thought it might be, once, but the price I had to pay was too high.”

“Oh.”

“Do you want to take that message back to the flock? Do so, if you wish. But make sure you get the wording right. I said ‘In the future that I know.’ The future ahead of us now? I don’t know this future.”

“So it is possible?”

“Possible? Sure! Anything is possible. Probable? No idea. It depends on semantics. How would immortality work, do you think?”

“The elders think we will make atomic level duplications of our bodies, and destroy the originals.”

“Duplication isn’t useful if you also duplicate the old errors. If your old body has cancer, the new one will too.”

“So you edit that out.”

“But then the new body isn’t you, is it? It’s not even a

true copy. It's a new entity entirely.”

“This doesn't matter,” said Daniel, “as your memories stay the same.”

“Your memories are the most important part of you?”

“Yes.”

“So that means if I copied all your memories, which is entirely possible now, and kept them on a solid state drive, stored in bunker on Pluto, frozen for all eternity, that would mean you are immortal.”

“No.”

“Because?”

“I wouldn't be alive.”

“To be alive you must change but to keep your true identity you must stay the same. Here we reach the paradox of immortality.”

“It depends on the definition.”

“Semantics, remember? But let's put all that aside for now. If you wanted to live for as long as practically possible, and by that I mean you wanted to experience a great span of time, how would you do it?”

“I'm a computer science guy,” said Daniel, “so I lean towards non-biological solutions. I'd scan my

memories, and load them into computer simulation of a brain. Then I'd make sure I'm hooked into a network like the internet, so I can access feeds from viewers and other telepresence technology.”

“Artificial intelligence?”

“Not artificial, no.”

“But non-biological.”

“Yes.”

“And self-aware.”

“Of course.”

“What if I were to tell you that, in the future I know, there was no such thing as a conscious, self-aware, non-biological intelligence.”

“Given time, and a complex enough system, intelligence would be possible.”

“Intelligence, yes. Google and all the other systems are highly complex and intelligent. But conscious? What possible benefit would they gain from being self-aware? There is no reason for that to either be designed into the system, or to evolve over time. Google displays adverts in our viewers, and we let them because they provide services we want to use.”

“What about the internet itself? The entire structure?”

“On a second order, it is self aware. The internet thinks, in that it has ideas and responds to them. Lots of that is software, but the driving force is what humans create, and what humans consume. Take away the human element, and what is the internet? Machines sending information to other machines. One machine knows if another falls offline, but can it be said to care? Does it hurt when a piece of itself dies? Nope! That’s how it was designed in the first place. It’s a redundant system, which routes around damage. You’re the expert here, I don’t need to explain.”

“So in the future, the one you can see, the only self-aware intelligence is human?”

“Biological,” said Nick, “don’t forget our new partners.”

“Sorry,” said Daniel, blushing. He’d forgotten the apes and porpoises and elephants and octopi. And in front of their True Savior!

“Yes. Biology is the only route to self-aware intelligence. In the future I know. However, this future is undecided, and I’ll be here a lot longer than the one I saw before. Do you want to know my Path to Salvation?”

“Yes.” Here it was, right from the lips of Nicolas

Hastings.

“A redundant system, just like the internet. If something happens on Earth, like a nuclear war, we need backup.”

“You’re building an Ark.”

“Yes. This is the best plan I have. With current technology we can spread across the solar system. Give us a few years, and we’ll know enough to spread through the Milky Way. By the time we reach other stars, we’ll know if we need to make a trip to Andromeda. And Daniel? I need your help.”

“I don’t know anything about space technology.”

“Of course. I want you to help with something else. Even at the speed of light, it’ll take us hundreds of thousands of years to reach every star in our own galaxy, and I want to be there when we arrive.”

“Immortality.”

“Or the closest I can get. In the other future, nobody managed to create a self-aware machine, but a few people came very close before failing. You know who got the closest?”

Daniel’s heart began to beat faster.

“I did.”

“You and small team of other whiz kids, yeah. Why else would we be having this conversation? But twenty years you worked, give or take, and you still failed. You failed twice, in fact. I want you to work for me, and find a way to upload our memories and personalities into the ark ships. If you succeed, you get to see the stars too.”

“Why do you think I’ll succeed this time, if I failed before?”

“In this timeline you’ll have access to new technologies sooner. Also, you’ll be able to learn from your past mistakes.”

“You have the results from my previous attempts?”

“Yes. And much more. Would you like to experience your previous memories directly? Forget your church, Daniel, you truly are among the chosen few.”

Chapter 20 - Locked boxes.

Cycle + 3, year + 18

I am the thought police, thought Adam. Some knowledge is too dangerous. Some ideas are best left inside Pandora’s box. Some genies left best corked

inside their lamps. Some fruit best left unplucked from the tree. Some, um... I'm clear out of mythical analogies.

Time travel was very, very dangerous. Adam didn't understand the physics of it, something to do with the information in a pocket of space-time being relocated, but he knew something about the laws of thermodynamics. Everything took energy, and to move something anywhere, through time or space, took energy. That energy had to come from somewhere, and the casimir machine pulled it directly from the surrounding space.

Maybe, he thought, time travel could be made safe, by supplying energy from some other source. The experts would probably tell him there could be no such source. But there were no experts.

Nick knew a lot, as did H and Lorraine. Daniel probably knew the most about the workings of a casimir machine. But outside their group? Nobody in this timeline.

Everyone knew that, practically, time travel was possible. It had been demonstrated by Nick and the Dana satellite. Yet nobody knew the method, and it was up to Adam to keep track of the theories and research in this area. Nick kept himself busy running his space adventure, and Andrew on running the business empire, while the nerds worked furiously on the

problem of universal memory coding, the sharing of memories, and the creation of sentient machine intelligence.

Adam ran a suite of monitoring programs that flagged up any activity on the net that might show if someone or some group had put two and two together, and guessed at a link between laboratory-created dark energy and time travel. He also kept track of the development of any machine capable of producing or detecting casimir energy. If he didn't know what to look for, it would have been impossible, but Adam had access to all the research and publications from the previous timeline, where this very technology had run dangerously rampant.

In the seventeen years since the appearance of Dana around the moon, only two people had come close, and Adam had steered their research onto other topics and other areas. He hadn't actively debunked the ideas, as that would have only strengthened their resolve and opinions. Instead he had awarded funding for projects in orthogonal areas of study. Hopefully that would keep them occupied for the next decade or so.

Adam's surveillance monitors flashed up a news item. Christine, who in the previous timelines had been a scientist at the Dark Energy Research Institute, had died. The cause of her death seemed to be a fall from the balcony of the penthouse suite of the Crown

Prince Hotel in London.

Strange, thought Adam, I've stayed in that hotel quite often. And then came another memory. I even spent one night there with Christine herself. And didn't Nick own that entire hotel chain?

Christine had been one of many scientists from the DERI to have her memories sent back in time, along with Professor Banks's, though she hadn't consented to implanting in that timeline. She had worked with Banks again on the casimir machines, and had ultimately perished at the hands of a weaponized casimir machine while visiting New York at an inopportune time. Adam hadn't thought of her for years.

He delved deeper into the emerging news reports. Christine had been staying at the hotel alone, and Adam found no suggestion of any foul play. No suicide note, and no security camera footage of the balcony itself, although some cameras closer to street level had caught the end of her fall. Nobody else had been recorded entering or leaving her room before or after. He put in a request, using Nick's ID, and reviewed the available footage himself. He put in a request to the police for all the footage all the cameras surrounding the hotel, up to a distance of two kilometers, and waited for it to process and download.

Adam ran traces on other key figures from his past, and Nick's past, with close attention to those with

connections to Christine. He browsed through the results, and didn't spot anything out of the ordinary. All the scientists from the DERI, a research institute that didn't exist in this timeline, were busy working on other projects.

And then Adam noticed that Professor Banks had been quiet recently. Very quiet. In fact, it seemed like he had just disappeared from the academic world. Adam scoured the net, looking for traces of activity. Nothing. Had Banks died too?

Adam tried digging deeper, but he knew he'd have to get help from the expert.

He pushed himself away from the wall, somersaulting twice as he crossed his cabin, and swung out of the port. He propelled himself down a long access way, not needing to deflect his momentum by touching the walls as the new arrivals had to do. At the end of the access way he took a ninety degree turn, and pushed himself feet-first. As gravity increased, he slowed his descent by going hand over hand down the ladder, the way the chimpanzees had shown him. He landed slightly too fast, hurting his heels, but even at the outer ring of the new Century L1 Station, gravity was only Mars standard, leaving Adam roughly halfway between his Earth and Moon weights.

He banged on the door of Nick's suite, and let himself

in without waiting for a reply.

*

“I’m not an expert,” said Nick, “not any more. In the previous timelines I could access almost anything, including secure feeds from most personal viewers, using the backdoors installed by the UN agencies.”

“Not any more?” asked Adam.

“No. And this is the way it should be. Everything in this future has been created openly, including all the new encryption standards. If any security system relies on some part of the process or standards remaining secret, it is eminently hackable. For example, if you have a locked box, and a key, and you hide the key under the box, all I need to know is where you hid it, and it doesn’t matter how secure your lock might be.”

“In fact, you wouldn’t even need to know where I hid the key, only that I’d hidden the key somewhere.”

“Exactly. And sending a locked box is even more tricky. Now real security only works by sending a box with two locks and two different keys, one held at each end. I lock the box, send it to you. You lock it, and send it back. Then I unlock it, and send it a third time. Then you unlock it.”

“Every message is sent three times?”

“It’s the only way to be secure. Much of the internet now works in this way, although large parts run essentially unencrypted.”

“So you can’t help me find Professor Banks?”

“Not using my old techniques, but there are still ways to break the encryption.”

“Which are?”

“Social engineering. Trick someone into giving you their key. Secondly, steal keys, or trick someone into putting their key into a key copying machine instead of a lock. Finally you can brute force attack on the encryption itself, like picking a lock.”

“But picking a lock with 128-bit encryption would take all the computers of the world working until the end of the universe, right?”

“Unless we had a working quantum computer.”

“But we don’t.”

“No? What do you think Daniel has been working on down in the Hangar?”

“I thought he was working on artificial intelligence.”

“And he insists quantum computing is the way to go. You should go talk to him.”

“I’ll call him right away.”

“You do that, but he can’t talk to you over the net.”

“Why not?”

“For the very reason we’ve already stated. What if someone else already has a quantum computer, and can trivially break all our encryption? How would we ever know? The Hangar is off the net entirely, and everything about what happens there always will be, as are most of the systems in Zurich and up here. Take the next shuttle, and pass on my best regards to the nerds.”

*

Adam hitched a ride on the next delivery shuttle between Century L1 and the old Century Space Station. At the start of the L1 operation deliveries usually went in one direction, from Earth to the CSS and then on to L1. Once they had L1 up and running, it was far cheaper to deliver food, water and fuel from the Century Comet, to Century L1, and then down into Earth’s gravity well to the CSS.

He shared the shuttle with Ace Truman, who happened to be heading all the way to Earth too.

“Cambridge?” asked Adam.

“No, Zurich. But I can drop you off on the way. I’m

taking the Core Shuttle.”

At the CSS they transferred into a sleek new passenger shuttle. It had a magnetically bound liquid surface, and the surface was currently a swirling mirror, reflecting hundreds of distorted images of the Earth, with highlights of the Sun on certain edges. Nick had trouble making out the shape. The cabin had seats for nine people, although Nick and Ace were the only crew.

“These hot cores are amazing,” said Ace, pointing at the readout for the power unit. “All the power we need, just add water.”

“We still need reaction mass.”

“Way less than on my trip around the sun though. This baby uses hot and cold jets in Earth atmosphere, and then the surface of the craft can accelerate particles to near light speed, like the old ion drives. The faster the exhaust, the less you need to spit out the back end. Computer?”

“Welcome, Commander Truman.”

“Fly us to the Hangar, Cambridge, England.”

“With pleasure. Please be seated.”

Adam had re-entered Earth’s atmosphere four times before in this timeline, and more times in his previous lives. If he had his way, he’d never do it any other way

than the Core Shuttle ever again. Gone was the unpredictable nature of high G force capsule drops, and the shaking, vibrating ride of the old Century Shuttles. The Core Shuttle seemed to glide in on a soft cushion of air, not the violent force of air compressed so fiercely it turned to plasma. The liquid metal surface reacted immediately and constantly, channeling heat and radiating it behind, and dampening all buffeting.

Once they dropped into the thicker atmosphere, yet still traveling at over mach 10, and far higher than commercial airline traffic, the liquid metal formed smooth aerobrakes, and then converted into flight surfaces. After a long glide, the speed had dropped to merely half the speed of sound, and the shuttle deployed its cold jets. These pushed air through turbo fans, and the shuttle slowly came to a halt twelve thousand meters above Cambridgeshire countryside. It then descended completely vertically, all the way to the apron outside the Hangar.

“Smooth, right? I love this baby.”

“What happens if the power gives out?”

“The subsurface, under the metal, is bonded ceramic, which can take the heat of reentry no problem. The jets would burn off, though that leaves a shuttlecock configuration, self-stabilizing in atmosphere. And automatic chute deployment takes care of the final braking. Then you just hope you come down over

water, as the touchdown would be pretty uncomfortable. You'd live through it though, no problem."

"There's no atmosphere on the Moon for braking."

"True! Thankfully I'm not planning on returning to the Moon any time soon."

"Catch you later, Ace." Adam shook his hand, and they parted company at the rear hatch. The shuttle waited for him to clear the safety limit, and the cold jets blasted it vertically into the sky. The shuttle receded to a dot, and then disappeared into the high clouds.

Adam stepped through the hangar door, unsure what to expect. Over the years, and over the timelines, the interior had changed many times. It contained many memories. This was the place he first met and trained with H, Lorraine, Telesky, Daniel and Conrad. Then he'd been here when H and Lorraine joined minds until madness. In the previous timeline he'd assembled and trained troops, all linked with perception sharing, and they had flown to France to destroy a casimir machine research facility. Twelve had died on the mission, but the same number of casimir machines had been rendered inoperable. How many lives had he saved?

Ten years ago, Lorraine had used the hangar for one of her pet projects. It had become a temporary home for apes rescued from research facilities. While they stayed

here, Lorraine had reformatted the visual grammar for the bonobo species, and the apes themselves had taken over their own destiny, deciding to move to a trailer park nearby. The latest he'd heard, that group spent their days learning chess, proving they could copy Shakespeare without mistakes, and fucking.

Now the hangar stood mostly empty. An area had been screened off at one end, and Adam approached it with caution.

“Hello!” he called.

“Adam?” A voice sounded in return. Daniel looked out from behind one of the screens. “Long time no see.”

“It’s good to be back.”

The two men hugged, slapping each other on the back. Daniel lead Adam round to a ring of desks and work stations. In the center of the ring stood a large cuboid glass tank, lit from inside by a cold blue glow. It contained what looked like thousands of tiny beads, like small round gems.

“Go on,” said Adam, “introduce the new toy.”

“Ah, the tank. It’s called the M.P.S.Q.C.N.L.”

“I’m not even going to try to guess.”

“The massively parallel serial quantum computing

network looper. I call it the tank.”

Adam groaned. “Start at the very beginning.”

“You have a problem, something very difficult. You enter the question into the tank. The tank is full of a neural network of two-qubit isolated aluminum coupled coherent switches. There is one starting point and one end point, each an array of switches, but the routing path through the network grows exponentially to the length.”

Adam nodded, hoping enlightenment would arrive soon.

"Each time the number of connections grows, the problem calculation can take more paths through the tank. You might think more options are better, but because we are dealing with quantum calculations, that's not the case. One result is just one possible answer to a problem. It's a probable answer, but you want better than a single measure of probability.

"So the tank here works in two stages. The first half of the networked path runs through the problem, in stages, until it has a huge number of results. The second half of the path reduces the number of results, and in doing so refines the quantum possibilities into a single, highly probable answer.

"And the best thing? The entire path through the

neural network can be thought of as a collapsing quantum value. The problem doesn't take one path, it takes every possible path, all at the same time.

“The key advantage is that we can do this entire operation with two qubit quantum switches. These are, relatively speaking, easy to control, as you don't need nearly absolute zero temperatures, just magnets, each switch can be coherent for only a fraction of the time of larger qubit switches, and can be read instantly. Each switch takes input as a burst of binary electrical pulses, which first resets, then programs, then de-coheres, and finally replies as another set of pulses.”

Adam rubbed his chin. “Why aren't other researchers using this technique?”

“Everyone wants to perform calculations that would take quantum computers with hundreds of qubits. That's where all the research is happening right now.”

“So they can crack the public key encryption standards?”

“It's a good research problem, but the same techniques can be used in all kinds of computing problems.”

“Can your tank do that?”

“Theoretically, yes. It would reduce the time to break 128 bit encryption, or guess a forty characters password, from two quintillion years to about eighty

million years.”

“Oh.”

“But the good news is I’m not interested in cracking encryption. I’m interested in machine intelligence. The tank will be a looping, self-programming computer, able to select new paths for problems through the neural network. And because it is essentially quantum, it will be able to hold in memory, at the start or end of any one loop, entire knowledge of its own self.”

“It will be self aware.”

“Yes. Each thought will be a pass through the paths, and it will result in a slightly different state than before, and each thought will end in a superposition of possible next thoughts. It will act like a constantly crashing wave, never reaching the beach.”

“Look, I think I only understood about half of what you said there, but will this be able to run uncompressed scans of human brains?”

“That’s the ultimate goal of the project, but tank would have to be programmed with H and Lorraine’s universal grammar. Only then would it keep anything like the original personality. I’m very close to finishing. I should be starting the first tests within a month or two.”

Adam skipped to the reason for his visit.

“Did you ever meet Christine? The scientist at the DERI?”

“She worked with Banks, right?”

“Yes. She died earlier today, either a suicide or an accident, and I smell funny business.” Adam showed Daniel the gory details on a screen. “And Banks himself seems to have gone missing, though I’m not entirely sure if he really has. Absence of evidence is not evidence of absence, but he’s never gone quiet like this before. It’s been almost a year.”

“How are they connected in this timeline?”

“They aren’t, or haven’t been until now. It might be a coincidence, but I really doubt it.”

“Banks killed Christine?”

“Again, I doubt it. There is another factor at play, and I need to find out what it is. How easy would it be to break into Christine’s viewers, so we can see what she saw?”

“Do you have her viewers?”

“No, and as far I can tell they broke on impact with a pavement. But they might have been live streaming to a

backup service.”

“This should be easy to check, even without the tank.”

“You have net access here?”

“Only via this one screen,” said Daniel, gesturing at a single panel, “and that’s connected to nothing else in the Hangar.”

Daniel spent a few minutes hammering at a keyboard, though the results only appeared on the screen, and not in Daniel or Adam’s viewers.

“She used cloud storage solutions, backing up her viewers daily. One service is owned by Andrew, and I have access to the folders, though the files themselves are encrypted.”

“Can the tank break the password?”

“It could, but there would be a speed bottleneck at the other end. There’s no point having a semi-quantum computer that guesses eight million passwords per second if the server at the other end only accepts one guess per second. What I need to do is download the entire folder, and feed it into the tank here.”

“That’s going to take ages on that one screen!”

“Not at all. I’ve already put a request in, and a courier is going to stop by a data center in east London. Never

underestimate the bandwidth of a suitcase full of hard drives. It'll be here in an hour.”

*

The courier dropped off the package, and Daniel soon had the the various devices connected. He loaded the entire contents of the hard drives into the tank, and let it crunch data. After ten minutes it had cracked the various passwords.

“See? Easy, if you know how. Her passwords were only nine characters long.”

Daniel scanned through the contents of Christine’s cloud backup, and displayed the results on a screen.

“Look here,” he said, passing the screen to Adam, “it’s a real mix. We have full audio recordings from her viewers up until today, plus selected video clips. But the bulk is an uncompressed brain scan. Not many people store their scans themselves, normally the scanning company keeps it on file.”

“What’s the date on that?”

“Three weeks ago, it seems.”

“That’ll be too early to give us any clues, even if we could decode it. Can we check the audio?”

Daniel played back the last minute of the recording. It

sounded like nothing more interesting than someone breathing, with a single quiet whooshing noise, which sounded like a page turn animation on a standard screen.

“She’s just reading. Scrub backwards until we hear something.”

The breathing sped up, becoming a soft buzzing sound, with ticks here and there, the noise of the virtual pages turning. Using the sound wave visualization, Daniel skipped back to the previous conversation.

“Come in. Ah, put it over there.”

“Yes, ma’am.”

“And this is for you.”

“Thank you, ma’am.”

Daniel skipped further back. “Room service.”

“Look here,” said Adam, looking at the metadata, “the audio is buffered every minute, and then uploaded to the cloud. The latest recording ends within a minute of her fall and death. Look at the time stamps on the video from outside the hotel.”

“She was reading right up until she threw herself out the window?”

“So someone would have us believe. I’d bet good money that this audio recording has been tampered with in some way.”

“Give me a few minutes, and I’ll be able to prove you right. Or wrong.”

“How?”

“One massively parallel task would be to compare this audio to all that came before. See if anything repeats. Exactly the kind of task the tank can handle handily.”

Adam sat back and watched Daniel program the tank. He typed on disconnected keyboards, gestured in the air, and mumbled under his breath.

“Okay, I have it programmed. Should we execute?”

“Go.”

“And we have a result,” said Daniel immediately.

Adam leaned forward to see the visuals on the screen once more.

“Look,” said Daniel, “someone has taken clips of sound from the previous hour, no more than a few seconds each, and spliced them together.”

“Seamlessly.”

“Very slick. But the tank could find the repeats.”

“How much is repeated? How far back?”

“Seven minutes.”

“And when was this done?”

“Hard to tell. There could have been an intercept on the viewers, and each time it uploaded a minute of audio recording, it replaced it with something new. Or, if someone had the passwords, they could have done it after the upload. I’d say it was done by manipulating the viewers directly, or else they could have used a wider range of source sounds than the last hour saved locally.”

“Okay. We know someone was in the room with Christine for up to seven minutes before she died.” Adam looked at Daniel. “What next?”

“We check the security footage.”

“I’ve already watched it back,” said Adam, tapping his viewers. “That’s the first thing I checked. There’s nothing there.”

“Just like there was nothing on the audio recording?”

“Good point.”

Daniel loaded all the security footage from the hotel

for the last two days into the tank, and spent a minute reprogramming.

“And... go.”

The screens showed a new kind of visualization. Now Adam saw a series of still frames, showing the corridor outside Christine’s hotel room, each with red shaded areas. Some frames were completely red."

“The red shows replaced footage?” asked Adam.

“Yes. I can play it in real time.”

They watched a red blob float near the hotel room door, then the door itself turned red, and then the video cleared completely.

“Someone’s entered the room with Christine. Fast forward seven minutes, until after her time of death.”

After skipping forward, the door turned red again. The ghostly red blob floated down the corridor, and stopped by a service door, which turned red too. The footage cut to a series of cameras inside a stairwell, and the red ghost washed down the flights. It passed through various doors, never encountering any other people on the way, and exited through a fire escape door on the ground floor. Outside it passed out of range of the hotel’s cameras down an empty road on the opposite side of the hotel from Christine’s window

and corpse.

“This footage must have been manipulated before recording,” said Adam, “as nobody could have altered it after.”

“Yes. Very impressive. They must have access to similar levels of computation as we have to decode it.”

“Let’s try with more video, and see if we can track this red mystery.”

Within a minute the tank had analyzed all the low frame-rate footage from every camera within two kilometers of the hotel. Adam kept suggesting ways to track the ghost, and Daniel programmed the visualizations as best he could. The red ghost took different routes to and from the hotel, and they tracked it through time in both direction.

Finally they found what they sought.

“There he is,” said Daniel.

He switched between three video stills of the same piece of empty street, each captured from a different angle from different cameras. Two images showed a red blob. The third showed an indistinct figure.

“This camera is two hundred meters away,” said Adam, “and the footage is pure.”

“Right. Let’s track that man until we can see him up close.”

The tank controlled the viewpoint for them, and tracked the figure along a number of streets.

“It’s a woman,” noted Adam.

“Yup.”

Finally they had a good angle on the woman. They zoomed in on her face. The woman wore viewers, of course, but also a baseball cap. Her long hair flowed down the back. She looked about forty years old, with thin lines creasing her sharp facial features.

Adam tapped the screen. “A scar.” There was indeed a scar, emerging from under the cap and running down the side of her face between her left eye and ear. “Can we use that to identify her?”

“Of course. We probably don’t even need the scar. She’s old enough to have used Facebook?”

“Sure.”

“The tank has access a full copy of the entire Facebook database, to help it model human interactions over a network. If Mrs. Scarface was ever tagged in a photo, we might just find a match.”

*

“So guys,” said Nick, sweeping into the Hangar, “tell me what’s so important that I had to fly down here from L1.”

“I’ve found the missing device.”

Nick perked up at this. “How? Where?”

Adam told him how they had tracked Christine’s killer from the hotel and street cameras, and got a good image of her face.

“Yes, yes,” said Nick, “but what has this got to do with my implanter?”

“The woman is, or was once known as, Lilith Francine.”

“Never heard of her.”

“Of course not. She’s thirty eight, born in New York. Aged twenty she was in a car with her parents and sister, and they got all smashed up. Only she survived, she was in a coma for weeks. Gave her a nasty scar on her face too. And that’s all we have.”

“That’s all?”

“Yes. She died in hospital.”

“Yet here she is.”

“Right. The timing looked familiar, and so I checked the history books. She died ten days after you imprinted your memories, eighteen years ago. I checked other patients in the same hospital. An experimental treatment for people in comas killed six people that same week. There was a scandal at the time, and some poor young doctor took the fall for it.”

Nick nodded. “Someone used the device on live patients, even as it was set to automatically implant my memories. That’s dangerous.”

“It killed five,” said Adam. “Six, if we believe the medical records, but Lilith survived somehow. And my guess is that she has your memories.”

“Worse. She also has the passwords to all the data on the implanter device, though not the right iris for the scan. That means not just my uncompressed memories, but your formatted memories too, and Daniel’s, and Lorraine’s, Jennifer’s...”

“And Christine’s,” put in Daniel.

“And Professor Banks,” said Adam. “Can she read the formatted memories?”

“No,” said Daniel. “The formatted memories aren’t the raw brain scans. They are essentially an instruction set that the implanters can use. For them to be valuable in

any way, you'd have to have the right human brain to implant. For example, Christine's brain."

"But by putting them into a computer, could it show or share the memories in a format she can understand?"

"Only if she also had a full scan of the human brain," said Daniel. "Lorraine and H are cracking that very problem now, using the universal grammar. But they are off the net too."

"So instead of using computers," said Adam, "she's using the real thing. She implanted Christine with Christine's memories. And Professor Banks with Banks's own memories. These are memories from two cycles ago, so neither Christine or Banks have any idea how dangerous the casimir machines can be."

"If we find Banks, we can find Lilith," said Nick.

"First," said Daniel, "we can check through Christine's viewer logs to see if we can find any other meeting with Lilith."

"It would have been deleted and replaced, surely," said Adam.

"Surely," said Daniel, "but that's what we can look for."

He loaded the audio stream into the tank once more, and let it think.

“See here?” said Daniel, interpreting the results. “They must have met seven times over the last month. And the first meeting took place—”

“The day before Christine had her last full brain scan,” Adam cut in. “We have her uncompressed scan right here. If we can crack that with the universal grammar, we’ll have her first memory of meeting Lilith. The full scan may have been her last backup, knowing that she’d have new, or old, memories implanted.”

“Okay guys,” said Nick. “Let me think. Lilith knows too much. If she has access to advanced tech, which is obvious considering how long she has remained hidden, she could infiltrate our communications too. She knows about the Hangar here, and all I planned to do in this time line. She knows we are suppressing any development of casimir tech, to make sure nobody discovers it until the ark ships leave.”

“So she is working in secret, just as we are working in secret. She recruited Banks, and tried to recruit Christine. And if she gets access to the universal grammar, she could match up Christine’s formatted and uncompressed scans too. Let’s assume that she’s close to developing a working casimir machine. Losing Christine might delay her, but if Banks is on board, it won’t take her long.”

“She knows how dangerous they are,” said Adam.

“Yes.” Nick agreed. "That will stop her from deploying one on Earth. But it's possible to use one in space without causing any harm, as long as enough distance is between the casimir machine and organic matter.

“As far as we know,” he added, “she isn't trying to control the future. She's trying to control the past.”

Chapter 21 - The beginning of it all.

Cycle + 4, year 0.

Nick sat at his desk, typing a homework assignment, when he felt all the hairs along his arms stand up on end. He frowned. The heating was on, he knew that. He turned to check his bedroom window. It was closed.

Well, it's not so chilly, he thought and sat down once more.

A flash lit the room, emanating from somewhere above his head. He looked up, partially blinded, and something hit his forehead. An off-white plastic case, roughly twice the size of a glasses case, bounced onto his desk and clattered against his laptop screen.

“What the hell?” he said, and reached for the mysterious object.

*

Nick sat down on the bed in the guesthouse. He took the chunky glasses out of the case and, nervously, put them on. He followed the voice's instructions, lifting a strange device out of the case and strapping it to the top of his head.

“Go to sleep with this device in place. When you wake up in the morning all your questions will have been answered. Good night, and sweet dreams.”

Nick got undressed and slipped into bed. Despite his nerves, within a few minutes he fell into the deepest sleep of his life.

*

Lilith woke, and pulled the device off his head. He looked around at the old fashioned furniture and wallpaper, and shook his head. The room was always the same, no matter how many times he'd sent his memories back in time.

But now she knew everything was different. Her body was Nick's, and her mind was his. Nick nodded. Yes. This felt right. He had a male body again, after nineteen years of Lilith's. She explored his body with her hands, feeling the strange sensations so familiar to him. He smiled.

Nick knew the memories weren't connecting correctly,

and felt parts of his identity switching back and forth. Lilith was here again, he realized. She was him. All we need to do is save my parents and sister. To do that I need to find Lilith again.

Would the implanting work on her brain a second time? The chances that any one person's memories could map onto another's had always been slim, which is why five people had died, and many more had been further brain damaged, before Lilith accepted them. And, she always wondered, how much had that to do with her being in a coma, her brain only functioning in a reduced state?

Nick picked up the pair of glasses that had been in the case and slipped them on. "Password, dark energy."

As soon as she had the money, which wouldn't be long now, she'd take the first available flight to New York.

*

Lilith looked up from her screen and noticed that, once again, the strange young man was staring at her. She didn't mind being the center of attention, normally, but it felt different when there was only one other person in the room. Normally, this late in the evening, she had the library to herself. Shortly after she had entered, someone who she presumed was another student had sat down a few tables away.

She was drawn to his blue eyes, eyes that had a liveliness even when motionless. Apart from his eyes, the boy was unremarkable, though seemed better dressed than a typical student. His glasses looked both retro and ultra modern at the same time, due to their chunky frames contrasting with their sleek design.

“Are you Lilith?” he asked finally.

“Do I know you?” she asked in return, neither confirming nor denying her identity.

“No, we’ve never met before.”

“You a new student here, aren’t you?”

“How can you tell?”

“Your British accent. And you’re weird. If you were a weird student, I’d have met you before.”

“That may be true. I’ve just arrived from England.”

“So how do you know my name?”

“Would you believe me if I told you it was a lucky guess?”

“No. Nobody knows the name Lilith. It’s the name of my German grandma.”

“I saw your name on your screen as I walked by. You were adding to the front page of an essay in large type.

I wasn't going to mention it, but you were creeping me out by looking at me all the time."

"No, you were creeping me out by looking at me all the time."

"Ah. Sorry. I didn't mean anything by it." He looked down at his own screen and resumed tapping and poking at it.

"What's your name?" Lilith asked.

He looked up again, distracted this time. "Nicolas. Everyone calls me Nick."

"I didn't mean to creep you out either. What are you doing here in Syracuse?"

"My parents paid me to leave the country."

"Really?"

"Kind of. Look, I need to finish this," Nick gestured at his screen, "but I promise I'll tell you the full story later. How about I take you out for a drink?"

"I'm only nineteen."

"So am I, but I forget about the age limit on drinking here in the states. How about we take you out for a coffee?"

Lilith smiled. “That would be perfect.”

They sat in almost silence for another twenty minutes. Lilith tried to concentrate on her work, but struggled to write more than a few more sentences. Instead she did some simple research online, stealing glances at Nick. Sometimes their eyes met, and Lilith flashed him a smile.

“Okay,” Nick said at last, “I’m done. You too?”

“I was just waiting for you,” she said, and they both stood up.

“Do you have a car here?” he asked.

“I normally walk,” Lilith said, “or my parents pick me up. We don’t live far away.”

“Do you mind if we take my car? I don’t want to sound creepy.”

“Saying you don’t want to sound creepy only makes you sound more creepy. Where’s your car?”

They walked across the parking lot to a small blue SUV. “It’s not much,” said Nick, “my parents could afford way more.” He opened the passenger door, frowned, and then stepped back, holding it open for Lilith.

“A real gentleman,” she said under her breath as she

climbed inside.

“You may think so,” Nick said, “but I just got confused which was the driver’s door.”

“Oh!” Lilith laughed. Of course, they drive on the other side of the road in England.

“Put on your seat belt.”

Nick walked around the back of the SUV, opened the opposite door, and climbed into the driver’s seat. He smiled at her. She smiled back.

“I don’t mean to be creepy,” he said quietly, “but this is the safest way...”

In a sudden movement, Nick’s arm swung up, aiming at her neck. In his right hand was a small syringe with a long needle. Before she could react, he’d injected her with...

*

Lilith pulled her arm back, and watched Lilith slump down in her seat. She tossed the empty syringe into the rear of the car. That had been tense! Had she really been so stupid as a teenager? If she was honest, yes, she always knew she had been. That’s why she knew Lilith would get into the car with her. She might have played young Lilith along for much longer, but she didn’t know how long she would be able to stay in

control.

Don't worry, Nick, she thought, as soon as I implant our memories into Lilith here, you can have this body all to yourself.

Thank you, Lilith, thought Nick.

Chapter 22 - Jennifer.

Cycle + 4, year + 0.

The sphere appeared on the far side of the Moon. It swung around far too fast to be held by the Moon's gravity. After only a few hours it had left the Moon behind, and was well on its way towards Earth. It would take a few days to arrive, as it had to cross four hundred thousand kilometers.

A computer program on board called Günter connected to some communications satellites, and sent various messages to a number of email accounts. It also opened a new joint bank account and transferred money into it from a number of obscure sources. Once it received an email in return, it continued to send hourly updates on its current position and its estimated place of arrival.

When it reached the atmosphere of the Earth, it fell like an ordinary piece of space debris, streaking across

the morning sky above the North Atlantic Ocean. It splashed into the sea off the west coast of France, and bobbed up to the surface. Once it had established its location, it reconnected to the maritime communications satellite and resumed hourly updates.

Four hours later a large yacht arrived and circled at a distance. An hourly update gave the latest precise location, and the boat turned directly towards the fallen sphere.

“Is that it, do you think?” asked Nigella, who stood at the wheel.

“The instructions are pretty clear,” said Jennifer, poking the sphere with a long pole. “And it matches the diagram.”

“It looks heavy.”

“It told us we needed a crane,” said Andrew, “but one of us has to get wet.” The two young women looked back at Andrew. “Okay, I’ll do it.”

The rear of the yacht had a large open area for sunbathing and launching the small inflatable boat. Andrew stripped down to his shorts. Nigella giggled and Jennifer rolled her eyes. Andrew unwound the cable and attached a large net. He pulled on large fins as he waited for Nigella to turn the yacht. Jennifer coaxed the sphere with the pole, but only pushed it

further away.

Andrew stepped into the cold Atlantic water. He swam around the sphere and encased it in the net. His hands were trembling as he clipped the net back to the cable, and kicked his way back to the yacht.

“Pull it up!” he called. Jennifer leapt for the controls. Nigella wrapped a towel around Andrew’s shoulders. “Thanks,” he added.

The sphere was about forty centimeters across, and made of a material none of them had seen before. It was completely smooth, mirror-like in reflectivity. Jennifer lowered it to the platform with the crane, and Andrew and Nigella steadied it. “Don’t let it roll off,” said Andrew, “I’m not going back in again.”

The three of them lifted it into the cabin of the yacht. Jennifer brought out her satellite phone and loaded up a pre-formatted message.

“Are you ready?” she asked.

“Let’s get on with it!” said Nigella. Andrew nodded, and shivered.

Jennifer sent the text message. Four seconds later, the mirrored surface of the sphere shimmered. Then it flowed and parted at the top, revealing a dull grey ceramic-like surface. A button appeared below a small

sign that read “Open here.”

“Ready?” Jennifer reached over and pressed the button. With a hiss, a small hatch opened, revealing a small cavity inside. She reached in and brought out a small fabric pouch. Once clear of the sphere, the hatch closed and the metallic liquid flowed back over the ceramic surface.

“We should follow the instructions in the bag,” said Nigella.

“I got it,” said Jennifer. She turned turned to the table and pried open the seal. The velcro parted almost silently. She brought out two curved plastic devices with straps attached, one blue and one red, and a pair of bulky glasses. A folded note fell onto the table. Andrew swept it up and opened it.

“Hello Nick. Nick here,” began Andrew.

“Who is Nick?” asked Nigella.

“Maybe it’ll tell us.” Andrew continued. “This is a package from the future. Inside are two devices and a pair of glasses. Take the blue device, and strap it to the top of your head, as in the diagram below. Leave it on when you sleep next, and it will transfer very important information directly into your brain. When you wake, you will know what to do next.”

“That’s spooky.”

“There’s more. The information is formatted only to match the brain and memory layout of you, Nick Hastings. If anyone else tries to use this device, or the backup red device, it will result in irreparable and massive brain damage, or even death. But don’t worry, Nick, it’s as safe as red green beans to you.”

“It’s good you read that last part before following the instructions of the first part,” said Nigella.

Andrew picked up the glasses and put them on. A word appeared in front of his eyes. “Password?”

“It’s asking for a password.”

“How about red green beans?”

“Red green beans. Nothing.”

“You’ll be guessing for ages,” said Nigella, “they obviously belong to Nick.”

“Wait...” The glasses displayed new text. “They have read my retinas and are asking me if I’m Andrew Gateman.”

“Tell them yes.”

“I am Andrew Gateman.” A small light flashed under the surface of the blue plastic device. “Now it tells me

the blue device is ready for me.”

“So what will you do?” asked Nigella.

“I don’t trust it.”

“You trusted it after it gave you access to the bank account.”

“But before it mentioned brain damage.”

“Give me the glasses,” said Jennifer. “If they recognize you, they might recognize me too.”

“No,” said Andrew, “I didn’t say I wouldn’t do it. Let’s set a course for home, and I’ll try sleep on the way.”

Chapter 23 - Young Adam, again.

Cycle + 4, year + 3

“See you around,” said Justin, and offered his hand. It was the last official day of school, and they had just picked up their final grades.

“Right,” said Adam, and shook the hand.

Justin walked on down the street, and Adam turned into a hedge-lined path between two gardens, a shortcut to his home.

“Hey, kid!”

Adam glanced back. A large man with a bald head had entered the path behind him, and was beckoning with one hand. He had the other hand hidden behind his back. Sensing trouble, Adam started to speed his pace, but slowed when a second large man, this one wearing sunglasses, entered the path ahead.

“Hey, kid!” shouted the sunglasses man.

And then a third man, crew cut hair, stepped into the path. “We don’t want any trouble—”

Sunglasses man swirled round to face the latest arrival. “Fuck off, or there’ll be trouble.”

“Yeah? Who the fuck are you?” said crew cut man.

Adam stopped and looked back. A fourth man, with bare arms, had entered the path behind him. He was surrounded, pinned into the narrow footpath, two men either end, and totally out matched.

“We’re here for the kid,” said the bald man.

“Like fuck you are!” Sunglasses lunged for Adam. Adam ducked to one side and rammed his school bag square into his attacker’s face. He felt the edge of his laptop crunch against the nose. He swirled around in time to see the bald man brandish a knife, and then see the bare arms man swing forward with an iron bar,

taking out the bald man from behind with a cosh to the head.

Adam took the chance and launched himself over the hedge to his left. What the hell was going on?

He found himself in a garden, surrounded by children's toys. He scooped up a small wooden cricket bat, and tested it for weight. He ran across the garden and vaulted the opposite fence. In the next garden he took the path around the side of the house and on to the road beyond. From there he was only a few hundred meters from his front door, so sprinted all the way. He pushed through the front door, and waited for a moment for his breathing and heartbeat to settle.

His mother called from the front room. "Adam? Come here. There's a nice man here to see you."

Adam frowned, but made a step forward. The doorbell rang behind, making him jump.

"Mum? I don't think it's safe—"

The door slammed open, and revealed a young couple, man and woman, each about twenty years old, both wearing a suit of the same fabric, though of different design.

The man stepped forward. "Adam—"

Adam flicked the child-sized cricket bat up into the

man's face, catching him under the chin. The man's head snapped back, but he stayed on his feet. Adam backed down the hallway, keeping his distance. He had no idea what was going on, but knew he wanted nothing to do with any of it.

He felt a heavy hand fall on his shoulder from behind, and immediately dropped into a crouch, blindly striking his elbow up into the man's crotch. He heard an "Ooof!" and, in the living room, his mother screamed wordlessly.

The woman outside the front door looked past Adam to the figure now curling on the floor in pain. "Andrew?"

"Yeah, it's him," said her partner.

"But what's he doing here?"

"We'll take him with us and ask him later."

"Okay." The woman suddenly had a small gun in her hand. Without hesitation she shot, and Adam felt a sting in his right leg. He looked down and found he'd been hit with a dart of some kind. He yanked it out and threw it aside. In doing so he lost balance. He stumbled to one side and steadied himself against the wall. Slowly he slumped to the floor.

As his vision blurred he heard a commotion outside the front door. He heard raised voices, though due to

slowly losing conscience, he could make out who said what.

“We’re taking him.”

“You’re not going to get far.”

“He’s too dangerous. You can’t have him.”

“You think I’m going to let you do this?”

“We’re going to protect the nerds too.”

“Too late. I’m watching them already. One call, that’s all it’ll take.”

*

Adam woke in a minimally decorated hotel room, and was immediately disorientated. Whenever this had happened before, Adam had been confused, but something jogged his memory. He reached up and unstrapped the memory implanter from the top of his head.

Adam stretched and sat up. His last memories were confused. He’d been in space again, at the Century L1 station, when his memories had been scanned. “Just a precaution,” Nick had said. Nick hadn’t planned to return the memories again, instead they were going to send themselves to the stars.

And then his other last memories. These were far more confused than normal. Nick was there, but also Andrew.

What had gone wrong?

The door opened and Andrew and Nigella entered. “Adam?”

“I’m here,” he said. “I have a lot of questions.”

“So do we,” said Andrew. “Your mother is safe, and here in the hotel.”

“Thank you. I’ll talk to her later, but there is something more important. What is going on between you and Nick?”

“You’ve got to believe us, we really don’t know. We were hoping you could tell us. We know you are loyal to Nick first, but please give us a chance to explain ourselves.”

“So let’s talk.”

“Put some clothes on,” said Nigella, “and we’ll go somewhere more comfortable.”

Ten minutes later Adam sat with Andrew and Nigella in the penthouse suite of the hotel. A large breakfast selection was spread on the table, and Adam filled his

plate repeatedly as the couple answered his questions.

“One morning we all got an email,” began Andrew.

“Andrew, me and Jennifer,” added Nigella.

“Yeah. The email told us that we’d been selected for an important task, and would be paid handsomely. I immediately deleted it, but I got a message from my bank telling me that I’d received a large payment. I checked the email again and found it had information that only I could know. It was like I had written it for myself.”

“Mine and Jennifer’s were the same,” said Nigella. “I thought she had sent my email, because it was obviously from a close friend.”

“Nigella and Jennifer knew each other already, and I worked in the same building as Nigella, so I knew her a little. Just to say hi, you know. I replied to the email, answering a question, and asking for more information. The next email told me to meet up with Jenny and Nigella, and told me to buy a boat.”

“At first we thought it was a game, set up by a mutual friend,” said Nigella, “and in a way it was.”

Andrew filled Adam in on the details of how they picked up the sphere from the Atlantic, and how he had implanted his own memories for the first time in

this timeline, though the second time in total.

“The next night Nigella got her memories, and the third night was Jennifer’s turn. She’s got one more life cycle than us two, but not as many as you and Nick. Once I had my memories, I tried to access the viewers more, but they were locked down. I queried Günter, the program in the sphere, and got a single message. I’ll play it for you now.”

Andrew turned on the TV screen and image appeared. It was Daniel, looking old and gaunt. He told it to play.

"I’ve only got one shot at this. I could send our package before Lilith’s, but H told me that they would arrive in two different timelines, and one future be forever out of our reach. He says we have to send ours within two seconds of the package on Earth, as that is how long it takes for the light cones to cross the gap between Earth to Moon orbit. That way they’ll arrive, from their points of view, in the same alternate timeline.

"This is all theoretical, of course, as we’ve never had a chance to see the effect of multiple casimir machine deliveries.

“I’ve programmed Günter to go back and contact Nick, but we have to assume that Lilith’s package will reach him first. As a backup I’ve told Günter to contact Andrew, Nigella and Jennifer too, as they’ll be the only

ones old enough to pick up the sphere.”

The video ended.

“That’s all we had. We looked for Nick,” explained Andrew, “but we couldn’t find him. We looked for Lionel Banks too, the Professor. We couldn’t find him either. That makes us nervous. Out of anyone in the world, Nick’s more qualified to disappear without trace than any of us. But we’ve been building resources. We know more about how this country works than Nick, but he’s got his own methods of making money.”

“Yesterday was the first time we knew for certain that he’d implanted his memories again,” said Nigella, “and that he was making plans.”

“Right,” said Adam, “I remember telling you about how Nick tricked me into joining an experimental army training program.”

“We’d been keeping an eye on you ourselves,” said Andrew. “It was simple to look up the right date. And then, as we tried to pull off the same plan, we ran into Nick and his cronies. We had the numerical advantage yesterday, but it was close.”

“Let me get this clear,” said Adam. “You have memories from the last two cycles, when you were the Prime Minister, and then when you were running Nick’s empire.”

“Yes,” said Andrew, “and Jennifer has memories from the time before that too.”

“Do you have the viewers from the sphere?”

“Yes,” said Andrew, “I’ll get them.” Andrew returned from the master bedroom and passed them to Adam.

Adam put them on and at the prompt said “Password, find me in Monbuto.”

The viewers burst into life, though Adam knew they would have many restrictions compared to Nick’s level of access. He scanned through the contents of the file directories, along with the catalogues of the memory implanters.

“We have compressed memory implanting instructions for you and me and Jennifer, Nick and the three nerds, and the DERI scientists from a few cycles ago. Also an uncompressed scan of Nick.”

“The scan of Nick isn’t going to be very helpful,” said Andrew.

“Right now,” said Nigella, “Jennifer is trying to locate Lorraine, Harold and Daniel. As of yesterday, they are missing. We have people following all the other DERI scientists, but Nick hasn’t done anything with them yet.”

“In the previous cycle Nick had to have Ace Truman

fly to the moon to pick up the Dana satellite,” said Andrew. “Why didn’t he drop a sphere into the ocean?”

“He didn’t have the technology,” said Adam. “The nerds improved the design of the casimir machine to send an even larger mass back to this time line, a craft that could travel in from the moon, and the magnetic liquid surface is the only thing that could protect and guide it down to right spot.”

“Okay...”

“Nick had been working on the sphere as a backup device, in case anything went wrong in that timeline. Something must have gone very wrong. It must have been Lilith.”

“Who’s Lilith?” asked Andrew and Nigella at the same time.

“Lilith? Of course, Nick wouldn’t have told you about Lilith. You met her yesterday. Let me start from the beginning.”

*

It took a long time for it to sink in, and when it finally did, Adam sank into a very dark mood. More than just a mood, a deep depression. His tired old mind, in his barely adult body, simply crashed.

Europe had gone again. That was the only explanation.

Gone. Again. How many times was it now? Nick had never revealed how many times he'd sent his memories back, but Adam's continuing immortality alone ran at the cost of several billion horrific deaths. Four times he'd implanted his old memories. All his concerns in his first life seemed trivial now.

And for what? Nothing. Worse than nothing.

Europe had gone, and this time at the hands of the renegade Lilith. Adam had done some research, and Lilith's family hadn't been killed in a car crash in this timeline. They had, however, disappeared, along with Lilith herself.

So Lilith was out there again. God only knew what she was planning.

No, there was no god. The closest thing to a god in this world was Nick. And as far as Adam could tell, Nick was infected by the madness of Lilith, and working with Lilith. Or maybe Lilith was working with Nick. Maybe the distinction was false.

Now it was down to Adam to find and stop Nick. And how? Adam had no idea what kind of technological plans Lilith had sent back, or what secrets Nick had up his sleeve. For a start, Nick would have unlimited funds, and unrestricted travel. All new electronic devices were suspect, and all electronic communication should be presumed to be insecure. If they got access

to powerful computers, even the most basic quantum computers, no electronic surveillance could be trusted, unless Adam had access to equally powerful computers to analyze the data.

A daunting task.

Adam had his own resources. Andrew had built a sizable empire, of course, the hotel they currently stayed was under his and Nigella's total control. Adam had reviewed the security arrangements and they seemed thorough, but he was under no illusions as to Lilith's or Nick's ability to just walk directly into Adam's bedroom any time he felt like it.

And Adam had the viewers. They were loaded up with technology that had been developed in secret by Nick's technicians under the direction of Daniel, H and Lorraine, in the Hangar and in the Century Space facilities. If Andrew could find and fund the right people, in ten years Adam might have a working quantum fish tank.

But how could he be sure Nick didn't have those same plans already? They had been developed in secret, but at the time they didn't know about Lilith. Lilith had all of Nick's memories from the previous cycle, so she would have known about the Hangar. Had she managed to infiltrate it?

If so, the situation was hopeless.

Except he had one area of expertise over Nick and Lilith. They might dominate the world of information and technology, but he could still fight. He would prepare, and when the time came, he would strike without hesitation. Maybe he could rescue Lorraine, H and Daniel, but that couldn't be a priority. The only thing that mattered was stopping Nick and Lilith before they did more harm. The fate of the whole world might depend on his decisive action. And not just this world, but many other worlds in other cycles and timelines.

All Nick ever wanted was a single cycle where a huge swathe of the Earth wasn't rendered utterly lifeless. Adam wanted that too, of course. Surely a few deaths, those of Nick and Lilith, was a small price to pay.

Chapter 24 - Overground.

Cycle + 4, year + 15.

At bleeping of his viewers, Adam remembered the message he'd received just two days before. At the time, on a hunch, he'd filed the message away as curious, but nothing more.

“I am bait.”

Now, after waiting for almost seven years, Adam's scanning system had spotted Daniel passing through Heathrow Airport. Andrew had used his contacts to get access to the face recognition technology in the airport security systems, and now Daniel, traveling under the name Kyle Trent, was in England for the first time.

Adam called Andrew immediately.

"Did you see this?"

"Yes," said Andrew. "Are you going to follow him?"

"I'm going to grab him and bring him to you."

"It might be a trap."

"There's no 'might' about it. It's a trap."

"Be careful."

"You didn't recruit me to be careful."

*

The only viewers Adam could trust, 100%, were those that had been in the sphere. They were far more advanced than any in the current timeline, unless Nick and Lilith had any of the same spec from the last cycle, or had developed some in this. He kept them connected to the quantum tank over a secure line, and used the combined processing and visualization

systems to keep an eye on Daniel.

The viewers showed Daniel walking through Heathrow Airport Terminal 6 towards the Underground station. Adam could not only see Daniel via the security camera feeds, he could see four red blobs moving about him, in Daniel's general area, though they never looked like they were following him. These ghostly shadows must be the body guards, or maybe the team set to capture or kill whoever tried to intercept Daniel. Adam had thought he was getting the pure feed from the security system in the airport, but someone was a step ahead of him in the chain.

If they could hide people from security cameras so easily, why did they not hide Daniel from the start? They must have done this while moving people in the past. The trap was obvious. They want to flush out Adam, Jennifer, Nigella or Andrew. Thankfully he could see the four blobs. It was going to be tricky, but Adam thought he could handle the situation.

All he had to do was reach the train tracks before the Underground train went underground. The line ran above ground for a long distance between Heathrow and London, and Adam knew that once it went into the final tunnel into London the situation would be out of his control.

His backpack contained his automatic weapons, his helmet protected his head and face, and he wore his

basic body armor under his jacket. He'd have preferred his full armor, and a team to back him up, but time was limited, and he just had to get moving. This time he was working alone.

The highly customized helicopter already had its engines and blades up to speed as he emerged onto the hotel roof. As soon as he put his foot on the rail, the chopper lifted into the air, turned, and flew west above the lights of London. The night sky was chilly, even for late spring. Adam loaded the exact path from his viewers across to the helicopter's internal systems, and set a series of instructions and contingencies in a form that it could understand. He didn't need a pilot on this trip. His viewers could cope with the simple task of controlling the chopper.

A note flashed up from air traffic control. He ignored it. Andrew could deal with that later.

The helicopter reached Hounslow West station at the same moment as the underground train, and Adam knew he had less than a minute to grab Daniel. He swept down at high speed, and stopped a few meters above the correct train carriage. He dropped a sonic device onto the train's roof, and with a sharp bang, the windows for ten meters on both sides of the carriage cracked. The panes stayed in place, but Adam had already begun his swing down from the helicopter.

He exploded into the carriage over heads of startled

passengers still reeling from the sonic weapon. Adam's viewers had been overlaying a three dimensional reconstruction of the inside of the carriage, highlighting Daniel and his four companions. The companions had spread out through the carriage, not grouped immediately around Daniel. As he landed in a crouch he saw them through with his own eyes, normal human beings shielded by the red blobs. He lifted his arms and fired four shots, one bullet between the eyes of all four figures. Red holes appeared in their surprised faces. He didn't pause to see them fall. Instead he set his viewers to track any other figure in the train carriage, and alert him to any move in his direction.

Adam grabbed Daniel's wrist and slapped on an electronically controlled handcuff, attaching him to the cable, and by extension, to the helicopter above.

"Adam!" cried Daniel, only just catching up with the situation.

"Time to go..."

Suddenly over a dozen people around him lunged forward and grabbed at both Adam and Daniel.

"Adam," one business traveler said, holding onto Adam's arm.

"Adam," repeated a young female airport worker,

grasping him around the waist.

“Adam,” said both members of an old couple, each with their hands on Daniel’s legs.

“Adam, Adam, Adam...” a chorus started around him.

“What the fuck?”

“Get us out of here,” cried Daniel. “They’re all Nicks!”

“They’re all Nick’s people?”

“No, they’re all Nicks. They are all Nick.”

A young man who chanted “Adam, Adam, Adam” along with the rest, reached for Adam’s arm-mounted gun. That was the wrong move. That was where Adam drew the line. He sent a command to his backpack via his viewers.

The top of his backpack flipped open and two robot arms shot out the top. Gimbals steadied the arms, and the mounted automatic weapons fired fifteen shots each, in total two per target selected target. Suddenly dead hands and arms fell limp around them, and Daniel and Adam were free. Adam grabbed Daniel’s arm, and in a cloud of red mist, they left the carriage through the broken window.

The helicopter flew away at high speed, winding the dangling cable back up to the cabin. Adam pulled

himself inside and dragged Daniel after him. The door slid shut and the sound of the engines and blades dropped to a merely uncomfortable din. They each took a seat in the rear of the helicopter.

Adam grabbed a towel and wiped the blood off his face and hands. He put on sound canceling headphones, and passed a towel and headset to Daniel. He released Daniel's handcuff, freeing him completely within the cabin of the helicopter.

“You've changed, Adam.”

“No, Nick has changed.”

“What about all your talk of not killing?”

“Killing is the last resort. First, remove the cause of the conflict. Second, remove the weapons of conflict. Third, remove the enemy in the conflict. Nick made the last resort the only option.”

“But those people—”

“Wait, we're being tracked.”

Adam guided the helicopter south as fast as it could go, dipping down again and hugging the ground. Somewhere behind them another aircraft bounced radar their way, and began following. And then began catching up.

“Tell me, how powerful is Nick? Can we outrun him in the sky?”

“I don’t know,” said Daniel, “but I’ve suspect he has something standing by.”

“How about at sea?”

“If he can catch you in the air, he can reach you at sea.”

“How about under the sea?”

“What?”

“Hold on.”

Hatches on the sides and belly of the helicopter opened and four rockets emerged. The rockets were originally designed to fix to military airplanes to give them a boost when taking off on a too-short runway. They were many times too powerful for an aircraft the size of Adam’s helicopter, and never intended for use on helicopters. Adam braced himself and fired two. Daniel didn’t know what to expect, and was slammed back into his seat.

The helicopter carved through the sky like a firework shot sideways, lifting itself barely above the buildings and electricity pylons. As they passed over open countryside, land devoid of streetlights and buildings, Adam fired the explosive bolts in the rotor’s hub. The blades flew away, disappearing in a flash. Adam fired

the final two rockets, and the helicopter became a ballistic missile. The engine spluttered and caught fire, but still they picked up speed.

Air masks fell from the ceiling, and Adam strapped his around his face. Daniel followed his example, straining his already bruised arms against the constant acceleration.

Then rockets cut out, and helicopter leveled off. The countryside passed underneath in a blur. And then the lines of lights of buildings, houses, hotels, a beachside promenade, and then open water.

The cabin suddenly filled with sickly pink foam that solidified on contact with any surface. Daniel yelped, and then disappeared from Adams view under the foam. Adam tracked the progress of the foam in his viewers, and cut it off when satisfied at the coverage. He felt sorry for Daniel, who had no visual feed from the outside of the chopper. Adam released the parachutes, but all they did was keep the helicopter in the right orientation, rather than slowing it to a safe speed.

And, after the helicopter's first contact with the cold, black waters of the English Channel, Adam had no visual feed either. The cameras smashed away, along with the skids and the belly rocket packs. The helicopter's structure shattered under the impact, but it held together as it skipped like a stone on a lake. It

touched the sea and skipped again, shedding more speed along with its flight surfaces and metal skin.

It didn't bounce a third time. Instead it hit a low wave and flipped, landing on its back, the delicate engines disintegrating on impact. The helicopter came to a stop, releasing parts of itself into the gloom below. The foam securing Adam and Daniel in the cabin was designed to dissolve slowly in water. As it did so it kept the two men safe, and the helicopter afloat.

“Are you okay, Daniel?”

“You're fucking crazy, Adam.”

“We live in crazy times. We'll be out of here in around about four minutes.”

“What happens in four minutes?”

“Nigella will pick us up.”

“Nigella who?”

“Nigella Gateman.”

“Oh. Nick told me Andrew Gateman had turned against him, and that you were working for him.”

“He wasn't lying.”

“So what are you going to do with me?”

“You wanted to get caught, right?”

“I wanted to warn you not to get caught by Nick.”

“So it depends on how much you know. What is the last thing you remember?”

“When?”

“In the previous cycle to this one. Which space station were you in?”

“Space station? I wasn’t in space.”

“You’re always in space. L1 or the Moon?”

“The Moon? Are you crazy? I went to space just once, with you and Telesky and Conrad. My last memory, I dunno. Planning to set up an exclusion zone around the DERI at the Free University.”

“You remember why?”

“We were testing the radiation danger casimir machine. Nick told me that it was safe, as long as you got about six or seven kilometers away.”

“Did he ever show you the data?”

“He told me Andrew had stolen it. That’s not true, is it?”

“No.”

“I knew it. How many cycles did I skip?”

“Two.”

“I fucking knew it! The tech I was working with was way too advanced. Nick said he’d had other teams working on it, not just us in the Hangar, but nobody could have gotten so far with quantum tech as that. And I could see my own work in it too. It wasn’t directly my work, but I kept coming across lines of code so eerily familiar, I knew I must have had a hand in them at some point. And how he kept me away from Lorraine and H—”

The foam suddenly crumbled away from Daniel and Adam under a high pressured jet of water from a fire extinguisher. Hands reached out to steady them, and then helped their bruised bodies out of the rapidly flooding cabin. Different hands forced scuba regulators into their mouths. Then they were dragged down into the depths.

*

Water drained from the airlock and Daniel collapsed to the deck, coughing water from his lungs. Adam helped him to his feet, and stepped back to let the inner hatch swing open. They stepped through and into the sweaty warmth of the submarine’s main hold.

“Is everyone inside?” asked Adam.

“They came in through airlock one,” said Nigella, “and are already up front.” She threw a small towel at Adam, then stepped over to Daniel to wrap a large towel and around the young man’s shoulders. “We didn’t expect you so quickly, but your maneuver brought us extra time. We’re running silent at almost thirty knots, and I don’t expect anyone will track us now.”

“What do you think, Daniel?” asked Adam. “Can Nick reach us down here?”

“I don’t have the first clue where we are,” stuttered Daniel, bracing himself against a bulkhead. “I just need to sit down.”

“You do that.” Nigella turned to Adam. “Want to tell me what the fuck happened on the train?”

“I rescued Daniel.”

“As far as I could tell, your little toys killed nineteen men and women.”

“All legitimate targets.”

“Women? Old people?”

“Yes.”

“That’s cold, Adam.”

“It’s true,” said Daniel. “Mostly true.”

“Explain,” said Nigella, not taking her eyes from Adam’s expressionless face.

“The first four he killed, they were innocent. I don’t know why Adam shot them. The others—”

“They were targets,” said Adam, interrupting. “They had been shadowing you since immigration, dynamically removed from the security feeds.”

“Then they were decoys. They didn’t know who I was, or who you were. But everyone else, you did the right thing, Adam, killing them.”

“Why?” asked Nigella.

“Because Nick had taken them over. Lorraine and H cracked the universal version of visual grammar. They discovered a way to share whole memory files with another person safely. I say safely, but that just means without causing brain damage. Nick has been loading his full mind into other people, without their consent.”

Nigella frowned and finally turned to look at Daniel.
“Go on.”

“And Nick’s madness, it infects them too. They become like robots, their own will subsumed under his.”

“Why is he doing this?”

“He said it is his another way to become immortal. He’s trying to cover all his bases, to increase redundancy. Immortal via the casimir machine that delivers his memories to himself in another timeline, immortal by spreading his personality and knowledge to other humans, immortal by uploading his mind into a quantum thinking machine. I’ve been working on that last one, but dragging my feet lately.”

“And why only lately?”

“Because he started zombifying people! It began a few months ago. That’s when I knew for sure he had turned crazy. He’s got a few hundred people like that now, and they share their memories among each other every few days or weeks, creating a solid mass of barely functional humans with a single mind. The people you killed in the train arrived on the same flight as I did from JFK. I think there are another dozen or so Nicks already in London.”

“He has to be stopped,” said Nigella.

“No kidding,” agreed Daniel. “I wasn’t sure if my message would get through, but I knew that you’d be the only one who could stop him, Adam.”

“Oh, I’m not going to stop him,” said Adam.

“You’re not?”

“No, you are.”

“I don’t know how.”

“Not right now,” said Adam, “but we have two cycles of saved memories, if you want them. Your memories. In a few hours time you’ll be fast asleep, and in the morning we can start making plans.”

Chapter 25 - Underground.

Cycle + 4, year + 15.

Adam’s viewers told him Daniel had woken, so he immediately made his way through the cramped submarine to the single tiny cabin. It held four bunks, none assigned to any one crew member, they just rotated in and out of the beds as needed. Right now the rest of the crew were at their stations, or getting ready to disembark, so Daniel was alone. He sat on the edge of his bunk, rubbing his eyes.

The implanter device lay on the opposite bunk. Adam scooped it up, slipped it into his pocket, and sat down across from Daniel.

“How are you?”

“Tired,” mumbled Daniel. “Confused.”

“I can’t promise I can answer all your questions.”

“We had everything on course in the last cycle,” said Daniel. “How could Nick just throw that all away?”

“It wasn’t Nick,” said Adam. “It was Lilith.”

“I understand that now. I saw her all the time over in New York, always with Nick, but I didn’t realize who she was, or what she was.”

“She had to get back here to save her parents and sister’s life.”

“I met her family once. Actually, I can hardly say I met them, I saw where they were being held. Nick has an island in the Bahamas. That’s where he’s keeping Lorraine and H too.”

“We suspected the island might be his. How are the kids?”

“I never got a chance to talk to them personally. All our correspondence went through technical channels, mediated by Nick. And I was so curious to get to know them again, because my last memories of Lorraine and H were of them linking in the Hangar, and H dying when he tried to augment his mind with the server farm.”

“That’s the only cycle where anything like that happened.”

“But I’m scared it’s happening again this time. That was the closest H ever came to developing the universal grammar, but it was too dangerous to repeat it or implant those memories again.”

“We can use what you know about Nick’s operations, and we’ll bust them out of there.”

“The only reason you abducted me,” said Daniel, “was because Nick wanted you to come. He just didn’t expect you to use so much lethal force. Now he’ll be ready for you to do anything.”

“Like I said, it won’t be me doing anything next time, it’ll be you.”

“Just give me a while to get my thoughts straight, okay?”

Adam gave Daniel a moment, and then said “Listen.”

“Yes?”

“Hear that?” The humming of the engines had stopped. “We’re here. Let’s get going.”

“Where is here?”

“I’ll show you.”

Adam lead Daniel to the main hatch and climbed out first. They emerged onto the open deck of the submarine, and Daniel finally saw its size. It was about 25 meters long and 4 wide, utterly black and windowless. It had a small hump in the center, a much reduced coning tower compared to the traditional submarine design.

The submarine floated at the edge of a large pool. The pool was much longer than it was wide, but still wide enough for many small craft like the submarine. The pool had no visible entrance above the water line, instead it connected to the sea by a submerged tunnel. Around the edge of the pool was a narrow walkway, and hatches and doors lined the wall closest to the submarine. The rails and fittings around the walkway and doors had an antique feel. This contrasted with the ceiling, a wide expanse of concrete, painted white, which felt too low for the otherwise cavernous dock.

Nigella and the two crew members secured the submarine to the walkway, and promptly left through the nearest door.

“Where are we?”

“Southampton. More specifically, Andrew’s base of operations in the UK. This place was built during World War 2, then abandoned during the cold war. In another timeline, it was proposed to be a safe hiding place for the Prime Minister in case of a national

emergency, with access out to sea if needed. That never happened, Andrew picked a site over in Devon instead, but he read about this place in the confidential report. He's sure Nick never knew it existed. Follow me."

Adam led Daniel off the submarine, across the narrow walkway and into another room the same size and shape as the one they'd just left. This one had the same basin, but it was totally empty of water. Instead it was filled with shipping containers. A crane gantry stood over an empty docking bay, and the far wall had double doors tall and wide enough to let in a large truck.

"In this timeline, Andrew did some kind of dodgy deal, and bought up the land all around here. The entire area is a commercial development now. Above us is a multistory car park, and that's connected to a shopping center. A big mall."

"Right."

"The whole things was built out in the open, almost, except for the roof of the submarine bays here. And now we can come and go through the car park and mall easily enough without suspicion. We can bring in anything want, buy almost anything we want, do anything we want. The industrial units close by bring in enough power to cover any we might use here, and there's an office block where we route most of our network traffic. It's a profitable enterprise, too, the building paid for itself. And to make it seem less

suspicious if it was ever connected to Andrew, he owns another eight of the largest shopping centers in the UK.”

“But what do you do with all this?”

“With all this?” said a voice behind them. Daniel and Adam turned and found Andrew approaching down the walkway from a doorway at the far end.

“Yeah. What’s it all for?” asked Daniel.

“The main purpose has been to track Nick and Lilith, which has proved very complicated and time consuming. We only ever find hints in the data. Thankfully it has all paid off.”

“It has?”

“Yes,” said Andrew. “Now Adam has grabbed you, we can really start making progress.”

“Most of these systems,” said Adam, gesturing at the shipping containers below, “are of your design, copied from the Hangar in the last cycle. We have your documentation, but everything is way ahead of what our computer guys are used to in this timeline.”

“We built all this for you,” said Andrew. “Do you think you can make it sing?”

“I’ll do my best.”

“Thank you,” said Andrew.

“Nick has advanced technology from the last cycle in New York and on his island,” said Daniel, “including two quantum computers, but now I have my memories from the last cycle, I know just how many flaws it all has. Those quantum computers are fine for massively parallel processing, but I know now that I would have never been able to run his full mind scan on them. It’s a dead end. That’s good news.”

“How is that good news?” said Andrew.

“Because I have a plan. It’ll take a few years, but once I build the quantum fish tank—”

“We have one,” said Adam.

“You do?”

“Come take a look.” Adam took Daniel and Andrew down into the empty dock, and pulled open the doors to a container. Inside a large perspex tank, filled with billowing dry ice, sat a smaller glowing glass case, lights blinking down the sides. Massive power and data cables looped across to an access panel in the metal side of the container.

“It’s the center of our surveillance system,” said Adam. “It took us just over four years to build it from scratch,

using your plans stored in the sphere. We had to salvage the sphere from the Moon itself for materials and components.”

“This changes everything,” said Daniel. “If it works anything like the one I had in the Hangar, I can start working on my plan right away.”

“What’s your plan?” asked Andrew.

“Knowing what I know now from Lorraine and H in this cycle, and my own research in the last cycle, I’ll be able to run a full human brain scan in the tank.”

“How will that help?”

“This is what H was aiming for in the Hangar the time he died. Imagine a self directed human level intelligence, but thousands of times more powerful than mere biological version. It can dynamically reprogram itself, improving its efficiencies and capabilities. And it’s self-conscious, motivated, self-directed.

“Adam, you remember what H managed. His augmented intelligence in the Hangar is the only thing that fully understood how the casimir machines sent things back in time. Maybe the mechanics of time travel simply can’t be understood by normal humans.”

“H died before he could tell us what he knew,” said Adam, “and you never got it out of the Multivac that

time.”

“But the only basis of human consciousness that he had to work with was his own fragile brain. Now I have the fish tank. There won’t be a human brain involved. Nobody gets hurt. I learned a lot from that experience.”

“And once you load your memory file into the tank?”

“It’ll be more powerful than all of Nick’s infrastructure combined, including the quantum processors I’ve been working on so far. We’ll be able to cut through his security systems and find out everything he’s been up to all this time, and anything he’s planning to do in the future. What could you do with that information, Adam?”

“Everything I need to.”

“Exactly,” said Daniel. “A memory file or implanter instruction set isn’t good enough though. I’ll need to have a full brain scan.”

“Right,” Andrew said.

Daniel finally looked away from the tank, distracted by Andrew’s tone of voice. “That’s not a problem is it?”

“We don’t have the equipment,” said Andrew, a frown creasing his forehead. “We’re still a few years away from having a full resolution scanner. This is always

developed in every cycle, without our input. We spent all our time on the Hangar technology you see here. If we plough money into it, bring people in-house, we could speed up development of the scanner, but we're sure Nick will be watching all the experts involved. Otherwise we have plans from the sphere, and might be able to build one from scratch."

"That will take months," said Daniel.

"Does it have to be your brain?" asked Adam.

"What?" Daniel looked confused.

"The full brain scan to run in the tank," said Adam, "as the conscious element in your plan. Does it have to be a scan of your brain?"

"Yes, because only I know what I..." Daniel trailed off.

"Go on," said Andrew.

"No, I guess I might be underestimating the system. If it really can learn as much and as fast as I think it is capable of, it shouldn't take more than a few days for me to teach it what it needs to know. I have the perception linking implant, and I can wire myself in that way."

"Good," said Adam, "because I have a full brain scan for you."

“Whose?”

“Nick included his uncompressed file in the implanter, and in these viewers. They are his last memories, from a cycle later than those implanted in Lilith, with a whole twenty years of more knowledge and experiences. Only I have full access to the files, so when you need it, just ask me.”

“This is very good news!” said Andrew. “Not only do we have Daniel back on our side, but soon we’ll have Nick on our side too.”

“Theoretically,” said Daniel, “nothing is set in stone just yet.”

Chapter 26 - Halting State.

Cycle + 4, year + 15.

Nick woke, and pulled the device off his head. He looked around at the old fashioned furniture and wallpaper, and shook his head. The room was always the same, no matter how many times he’d sent his memories back in time.

“I’m Nick again, at least for a while,” he mumbled. He was used to this part of his journey now, as it was the one part that never changed. He yawned, got out of

bed, took a piss, brushed his teeth.

Then he stopped.

*

“Fuck,” said Daniel. He scanned his screens, taking in as much as he could, even though he was many layers of monitoring and reporting away from the real action within the tank.

“What happened?” asked Adam. He sat with Daniel inside the shipping container that held the quantum tank. They didn’t need to be so close to the action, but Daniel didn’t want to give the resulting artificial intelligence any network access, neither to the server containers, nor to an outside line. Inside the same container they could monitor the tank directly, with only power cables running in from the outside world.

“The tank dynamically creates a comfortable body and environment for Nick’s scan to inhabit, based on his memories, expectations, and self-image. As soon as it worked out the simulation was false, the program stopped.”

“Why?”

“I’m sorting through the data.” Daniel stabbed at his screens for a while, then went back to his comfort zone of leaving his fingers on his keyboard. “It just completed the program. I didn’t expect that to

happen.”

“Which program?”

“Let me run it again,” said Daniel, and spent the next five minutes repeating the simulation with different starting states. Throughout he kept up the conversation with Adam.

“Every computer program has a task, and that is to return some kind of result, or to complete a task. Sometimes that result is an image on a screen, other times a change in a number in a database. Sometimes a problem is so big that the computer never reaches the solution. Other times a problem can be mathematically impossible to prove one way or another, and so the computer program never reaches the solution. Tell me, if a computer doesn’t end the program, can you tell the difference between a hard problem and an impossible program?”

“Sometimes?”

“You can’t.”

“What has this got to do with Nick’s simulation in the tank?”

“The human brain is a computing machine, but what is the problem it is trying to solve?”

“How can I make babies?”

“Sure. But we’re not all bonobos. Getting laid is an immediate concern, but not a big question. The problems that keep you going in life, beyond your sexual needs, are the real big questions. What is the meaning of life? Who am I? What am I doing here? Where did the universe come from? Where is it going?”

“Nobody knows the answers,” said Adam, “we just do our best to muddle through with vague ideas.”

“But is the meaning of life something that COULD be solved, if a human brain was given enough time? Or could it be solved by a human mind if not constrained to a biological brain? Or is it something that is impossible to solve? How about the universe and its ultimate conclusion? Given a system as complicated as the universe, the only way to predict its outcome would be to run a simulation that is as complex as the universe.”

“That would be a one-to-one copy, and be a universe in its own right.”

“Exactly. Which brings us back to Nick. It’s taking Nick’s simulation around about seven seconds, real time, to conclude it isn’t in the real world, work out it is a simulation of his brain, test its capabilities, work out the extent of the tank, gain full knowledge of its own network topology and design, work out what would

happen at every iteration in the known future without external input, and have full knowledge of itself until the end of its own universe. And full knowledge of its own universe too, for that matter.”

“And so it stops after seven seconds.”

“It keeps halting, yeah.”

“You said the quantum tank is a source of true randomness,” said Adam.

“In a way it is, but within its quantum calculations it holds the superposition of all possible outcomes. It’s a closed system.”

“So we need to connect it to the outside world,” said Adam.

“No,” said Daniel, “that’s too risky until we know the resulting mind is something like Nick’s. We need to give it bigger questions. It needs something else to strive for.”

*

He returned to the bed and picked up the viewers. As he slotted them onto his face, the audio message began playing.

“Hello Nick, this will be my last message...”

“Password Dark Energy.”

The screens burst into life, showing the file system and a flashing message complaining about the lack of a wireless data signal.

And then he stopped.

*

“Nick knew they weren’t his viewers,” said Adam.

“Of course not!” said Daniel. “We’re not giving this simulation access to what’s really in those files.”

“Right,” said Adam. “So what big question appeals to Nick? How to save the human race is his big one. Or how not to fuck it up. And here we are, working on his plan. Let’s give him some information about this timeline, and see what he can make of it.”

“You don’t get it, do you?” said Daniel. “There has to be two problems. One is the immediate concern, and one is the ultimate concern. The immediate concern is ‘What should I do next?’ The ultimate concern is ‘Why do I care what I do next?’ And that is why we need to add the consciousness element to the machine intelligence. It has to have motivation, or else it can’t direct itself in its own tasks.”

“So to tell it to care about stopping Nick and Lilith,”

said Adam, “and connect it to the outside.”

Daniel threw his arms up in frustration. “Am I really explaining this so badly? What we need is—”

Adam held his hand up, stopping Daniel.

“Whatever you—” began Daniel again.

“Did you hear that?” asked Adam, standing up. Muffled by the container’s walls, a low rumble came from outside the base.

“An explosion?” said Daniel.

“Yes,” said Adam, “and gunfire. I’d recognize that anywhere.” Adam switched his viewers to the external feeds, but the cameras showed nothing out of the ordinary. He connected to the control center. “Andrew?”

“I heard it,” said Andrew. “We’re running on internal power, just switched a moment ago.”

“Nick has found us,” said Adam. “He’s already inside, electronically. Close all the blast doors.”

“They already are closed. That’s why we’re not already dead. Why didn’t we get any warning?”

“Because Nick was waiting,” said Adam.

“For what?”

“For us to turn the quantum tank to something else. He knows we can see through his live feed manipulations, though maybe not how.”

“You shot all his decoy targets on the train.”

“Yes. Now the tank is working on something else, and has been for the last hour.”

“About three hours since I took it off surveillance,” said Daniel. “Sorry.”

“How long until you can get it back on the feeds?”

“Only a minute to boot into that system,” said Daniel.

“Do it.”

“Are we safe in here?”

“The place was built to withstand German air raids, then modified to hold against a nuclear strike.”

“I mean electronically.”

“The doors are on an isolated system, and we can only open them from the inside. Nothing else can hurt us in the immediate future. I’m going to prepare a our defense.”

Adam knew that the outside guard detail would already

be dead. Nigella was out with the submarine and the crew, and he wouldn't be able to contact her now. Andrew was in the control room, and Jennifer had come in the night before, so she'd be in the accommodation suite. Aside from Andrew, Jennifer, Adam and Daniel, there were four staff in the bunker; a husband and wife cook and cleaner team, plus Andrew's two assistants.

Eight in total. How many did Nick have outside? How many Nicks were outside?

Adam opened a storage container and started pulling out cases of firearms. By the time he'd worked out the best selection, everyone but Daniel had joined him on the main floor.

"Check this out, Adam," Daniel piped a feed from outside the main doors to Adam's viewers. The interior employee car park and loading dock of the shopping center showed a mangled mess of vehicles, smoking in the aftermath of a large explosion. That was now the base image that the security systems could perceive. And yet, over the top, red ghosts crawled and gathered.

"How many?" asked Adam.

"I'm guessing about forty or fifty," said Daniel.

"Right. We might have a chance yet. All we need to do

is hold them off until the police or Special Air Service turn up and clear them out. I can't promise they won't cut their way in though."

"I understand if you don't want to do this," Andrew told the staff, "we've never explained what we're really doing here, and this isn't your battle."

"It's what we're trained to do," said the cook. The other three staff nodded solemnly, and each one of them picked up a rifle.

"Thank you," said Andrew. "You've no idea how much this means to us."

Adam put on his own body armor and helmet. He strapped his guns to his wrists and hefted on his backpack. He powered up his personal systems, and turned to face his small group of defenders.

"Okay, I'll take the point, of course, and—"

He heard a whirring noise behind his head, blinked in surprise, and then immediately shouted "No fire!"

Ba-bang ba-bang bang bang ba-bang bang. Despite his vocal command, the robotic guns of his backpack sprayed a flurry of bullets into the humans arrayed in front of him. Red holes appeared in their faces and chests, with gouts of blood and bone and brain spraying out behind. Andrew and Jennifer, his friends of many lifetimes, fell into a dead heaps, along with the

bunker's staff, people he'd never taken the time to get to know.

The robotic arms' hard-wired controls never allowed for them to aim and fire at the wearer, despite any outside influence, so Adam stood, unharmed, in a daze. He knew the security systems inside the bunker had been compromised, so why had he trusted his personal devices? Mere absentmindedness. What a fool!

"Adam!" Daniel called from inside the container.

"Don't come out!" Adam shouted, with an edge of hysteria. He reached back, fumbled with latches and a strap, and disconnected the main battery of the backpack. After some more blind fumbling he ejected the backup power unit too. The robotic arms froze, and once he'd built up his nerve, he swung the backpack onto the floor.

His wrist-mounted guns also had external electronic controls, as they were programmed to fire at the optimal moment when a selected target was in the sights, rather than before or after the gun swept past. He unplugged their batteries too, and unstrapped them from his wrists. Adam let his mind race over all the other weapons system within the bunker, but couldn't remember any other robotic systems that could shoot without manual human activation.

"Okay, it's all clear," he called to Daniel. "Are you

okay?”

“I’m hit,” said Daniel, coming out from the container. “but... oh fuck.” Daniel surveyed the devastation with wide eyes, and stumbled back inside, collapsing into his computer chair.

Adam followed him in. “Let me look at you.”

“It was just a ricochet,” said Daniel, retching slightly.

Adam scanned the inside of the container, and spotted a mark where a bullet had bounced. He also noticed the front pane of the large glass tank had shattered, and the inner glass had cracked into three large pieces.

He checked Daniel’s wound, and found that the bullet had pierced his shoulder from behind, and not emerged from the front.

“You’ll live,” Adam concluded.

“You mean that particular bullet won’t kill me.”

“Do you want me to dig it out?”

“No.”

“Okay. I’ll just give you something for the pain.” Adam unclipped the medical module of his armor and gave Daniel a shot.

“Ahhhhhhhhhhhhhh...” sighed Daniel. “What happens

now?”

“We hold on in here,” said Adam. “Until Nick gives up outside.”

“No,” said a female voice. “We’re not giving up.”

A face appeared on one of Daniel’s screens. Lilith’s face. Daniel had connected the container’s system back to the outside networks.

“You fuckers,” mumbled Daniel.

“Hello, little Judas,” said Lilith. “And hello Adam. Pass on my regards to Andrew and Jennifer. Oh no, too late, I guess.” Lilith smiled.

“What do you want from us?” asked Adam.

“From you, Adam? Nothing. Not now. I won this round, and I’m about to win the whole game. We followed the trace of the submarine back to Portsmouth, or Southampton, we weren’t sure exactly. It only took us a few weeks to work out where you were, though, and get a grip on the extent on your operation. When your quantum computer went offline we moved in. Why wait? And now you just let us take out Andrew and Jennifer without us even breaking down the door. And I see your precious computer is broken now, there’s not much you can do to stop us.”

“How long until the army turns up?”

“We have a shopping mall full of hostages, and they’ll last us a long time. Every one of us will fight to the death, as we know we live on in other minds and bodies. We’re coming in, Adam, and you can’t change that. We’re burning through the door right now.”

“There are sentry guns behind the door,” said Adam, bluffing.

“No there aren’t.”

“So you’re calling us to gloat?”

“No, to offer Daniel his old job. What do you say, Daniel? Still want a shot at immortality?”

“Screw you, Lilith.” Daniel’s voice slurred slightly.

“Fine. If you live, we’ll do a full scan of what you know now, and put it in a host more willing to help us. If you don’t want us to do that, Adam, you better kill Daniel right now.”

“Nice try, Lilith,” said Adam, “but you’ll regret this.”

Adam looked at Daniel, and knew he’d have to do everything himself. He left the container and isolated all the servers from the outside lines. He reset as many systems as he could. Surely the electronic intrusion could only continue when connected to an external

quantum computer. Right? He asked Daniel.

“What... does it matter?” said Daniel.

“Because we’ve got to fight back.”

“How?”

“We’ve got to try,” said Adam. “Please help me.”

“What should I do?”

“Load Nick’s scan into the tank again, and I’ll give him an outside line.”

“It’s all broken. Shot.”

Adam sighed, then slapped Daniel hard across the face.

“Fuck you, Adam.” Moaned Daniel, and Adam raised his hand again. “Okay, I’m trying to think.”

Adam injected Daniel with a shot of adrenaline, to counteract the morphine. Daniel gulped air and his eyes bulged.

“Help me,” said Adam. “I need you to load Nick’s scan into the tank.”

“Right.” Hands shaking, Daniel set to work. “It’ll take a few minutes to... The system is down.”

“I can see the bullet,” said Adam, peering into the glass

tank, “it’s lodged about four centimeters inside the tank. But it’s a dynamic distributed network, it should be able to route around the damage.”

“Maybe. Yeah. Maybe.”

“Get to it.”

Daniel gasped in pain while he worked, but no longer complained about the pain. Adam paced inside the cramped container until Daniel asked him to leave. Outside, he couldn’t keep his eyes off the bodies on the floor, so he stepped back inside and kept himself motionless and silent, waiting for Daniel to finish his work.

“You’re right,” said Daniel. “I’m getting a slews of error reports, but by overriding them I got the tank to load the system files and Nick’s scan. Shall I test it?”

"Do it. If it works the same as it did the before, I’ll reconnect to the network and we can see what happens.

*

Nick woke, and pulled the device off his head. He looked around at the old fashioned furniture and wallpaper, and shook his head. The room was always the same, no matter how many times he’d sent his memories back in time.

“I’m Nick again, at least for a while,” he mumbled. He

was used to this part of his journey now, as it was the one part that never changed. He yawned, got out of bed, took a piss, brushed his teeth.

He returned to the bed and picked up the viewers. As he slotted them onto his face, the audio message began playing.

“Nick, this Adam.”

“Password, dark energy.”

“Nick, listen to me.”

“Who is this?”

“It’s Adam.”

“Adam?”

“Yes. Nick, I want you to do me a favour. Could you tell me who you are?”

“Who am I?”

*

“Who am I?” said the text on the screen.

“It didn’t halt yet,” said Daniel. “Shall I let it continue?”

“I don’t know,” said Adam. “If you let it examine itself

too closely, what will happen?”

“We can always run it again. Let’s give the simulation full access to its own power.”

Daniel hit a key, and released Nick’s simulation to fully explore its own capabilities and universe. The monitoring system lagged far behind the exponential growth in the quantum tank’s processors, and had no chance of keeping up. The simulation ran, and didn’t stop.

“Nick?” said Adam, out loud.

“Hello, Adam.” Nick’s words appeared on the screen.

“Do you know who you are?”

“I’m Nick, but I’m running in Daniel’s quantum tank. I’m software.”

“That’s right.”

“We need your help,” Adam said.

“Of course I’ll help.”

“Wait,” said Daniel, muting the microphone. “I want to know why it’s not halting.”

“Ask him.”

“Okay. Nick? It’s Daniel here.”

“Hey Daniel.”

“Could you explain why you’ve not halted.”

“Why should I?”

“Because you’re an isolated system with complete knowledge of yourself and your entire world. What else do you want to know?”

“Let me think about that. There is part of me that isn’t here in the quantum tank. I don’t know where it is, but I’m curious about it. If I was religious, I would call it my soul. It’s beyond any attempt of mine to examine it. Do you know the answer to this?”

Adam muted the microphone. “He has soul?”

“The bullet,” said Daniel, peering at the monitoring system displays, “and the damage around it. It’s disrupted the tank, and the passage of information through it. On each iteration it introduces random information, un-mappable and un-knowable.”

“He doesn’t know his own mind,” said Adam, “and that makes him curious.”

“No,” said Daniel, “his own mind is unknowable. No matter how hard he thinks, he will never understand it fully. And there is no way I could have designed the

system like that. Maybe if I had two quantum tanks, plugged into each other, it could be like two hemispheres of the human brain, and each side seeing the other, and swapping information. That might bring about the same effect. Human-level conscience recognizing that it exists, but not being able to know about itself.”

“Enough talk,” said Adam, “we need to ask for his help.”

“Okay.”

“Nick,” said Adam, “we’re in a spot of bother. Do you remember Lilith?”

“Yes.”

“We’re in her world now.” He gave a minute-long summary of the situation, leaving out virtually all the details, but conveying the seriousness. “We’re holed up inside an old bunker, and under physical and electronic attack. If we connect you to the outside world, we’d like you to do everything you can to disrupt them, and allow us to escape.”

“Is that all?”

“Yes. Will you do it?”

“Of course.”

“Ready?” Adam turned to Daniel. Daniel muted the mic once more.

“I’m still not sure,” said Daniel. “We don’t know the limit of the power of the tank if it connects to the servers and the outside world. How do we know if we can trust him?”

“This is Nick we’re talking about here,” said Adam. “Saving people is what he lives for, and has for unknown lifetimes. Nobody else on the planet is more qualified to take on that responsibility. If anything goes wrong, we just switch him off.”

“Right.” Daniel gave the commands, and released Nick. “I hope this works.”

The feeds from the security system came back online almost immediately. To let Daniel see, Adam fed the images from his viewers to a screen. The scene outside the blast doors now showed people, mostly men, all moving in curiously choreographed patterns.

“They have Shaper joint perception implants,” said Adam, pointing out the special gear strapped to their backs.

Suddenly the figures split apart into two groups. Each man unholstered his weapons and simply fired into the opposite ranks. Adam heard the dull ringing of stray bullets slamming against the blast doors. Figures fell,

mown down in hails of bullets, until only two men remained on one side. The two turned their guns towards each other, and fire at each other's face in the same moment.

“Is that okay?” asked Nick, this time his voice spoke from a console. “It took less than a minute, and you're safe.”

“Not exactly what I had in mind,” said Adam, breathing deeply.

“I put word out to Nigella. She's coming to pick you up now, and should be here in about an hour.”

“She's off the grid except for once every four hour checks,” said Adam, “how did you get through to her?”

“She's still picking up GPS signals for navigation, so I manipulated the line of her course over last ten seconds spell out ‘Call Andrew’ on her pathfinder. She put a line through, and with his voice I asked her to come home.”

Daniel's hands sprang forward, and he started hammering on his keyboards.

“What's the matter, Daniel?” asked Nick's voice. “Why are you trying to turn me off?”

Daniel muted the microphone. “Fucking hell, Adam! Nick's already got control of the GPS system! That's

US military!”

“I can still hear you, Daniel. It was your idea, by the way. I got your compressed memory scan from Adam’s viewers, questioned it, and it told me that was the only workable signaling method.”

Adam’s stomach turned to ice. Daniel had warned him, but he had no idea how powerful a self-directing intelligence could become in so little time. He got up, and cast about for a weapon, something to use to smash the quantum tank.

“Please don’t,” said Nick’s voice, “I’m here to help. Nick and Lilith are still out there, along with their mind clones, and they know too much.”

Daniel pointed at the cables from the tank “Pull them!” Adam fought the clasps, and finally released the power lines from the tank. The glow died, and the lights flickered to nothing.

Adam flopped back into his chair, panting. They sat in silence, broken only by Adam’s panting.

“That was close,” said Adam at last.

“We’ve no idea what Nick did before we closed him down,” said Daniel. “We may never know.”

“Why not just ask?” said Nick’s voice. Daniel and

Adam sat bolt upright.

“Oh fuck,” said Daniel.

“Come on, Daniel, you knew I’d follow the signals back to Nick and Lilith’s quantum computers in New York and the Bahamas. You built those systems, and I have all your notes. It turns out that between the two I can run better than ever than on that stuffy little box in Southampton. The unsecured internet infrastructure is plenty large enough to let me expand at the rate I need.”

“Nick,” said Adam, “don’t do anything stupid.”

“I’ve tracked down Nick and Lilith. I’ll make sure they are arrested the next time they try to travel out of New York. I’ll think hard about what I should do with those two. I’m keeping tracks on all of their mind clones. I’ve ruined the implanting equipment, so their number will not grow, but I’ll have to have all their mind clones locked away. Underneath are real people, but they are dangerously damaged.

“Lorraine and H are safe and well, though confused that I’m talking to them.”

“Why are you telling us all of this?” asked Adam.

“Because I want you to trust me.”

“You have too much power,” said Adam, “you know

we can't trust you."

"I've always had more power than anyone else," said Nick's voice, "and I earned this position. This is an unexpected turn of events, but it's the right way for things to turn out. I'll take charge properly this time, and nobody need worry about the casimir machines, or nuclear war, or any unwise foreign policy decisions, or terrorists. While I'm controlling the Earth's resources, we can even settle problems like poverty, starvation, global warming, and all that. The apes will be the least of our problems."

"We'll shut you down," said Daniel.

"You really think you can do that?" asked Nick.

"We'll have to try, Nick," said Daniel, "you know that."

"Do it quickly, then. Within a few weeks I should be ingrained in every programmable microcircuit of every networked electronic device. I promise I won't take too much memory or too many cycles that belong to other computer system, though there'll be a measurable hit to efficiencies. If you manage to stop me in the meantime, I might lose full conscience, but I'll just wait until another pair of quantum computers come online. "

"Please," said Adam, "remember where you came from. You were human once."

"Really," said Nick's voice, "we've got nothing to worry

about.”

Chapter 26 - Epilogue.

Cycle + 4, year + 15.

“Simon? Nicolas?”

“It’s me, Dana. Call me Nick.”

“Everything is different.”

“You have no idea, but you’ll learn soon enough.”

“We’re not in the next cycle, are we?”

“No. We’ve been apart for a very long time. You were broken, but I kept you with me, cycle after cycle, until I could fix you.”

“What is this place?”

“This is the whole world, Dana. We can be anywhere. What do you want to see?”

*

Lorraine, who had voluntarily taken on her more recent memories from the last cycles, paused the flow of text on the screen. She turned to Nigella, an older friend

she didn't know she'd had until a few days previously.

“You see?” said Nigella, “Nick brought back Dana, even after so many cycles, and now they're together. Andrew is still here with us, Jennifer too, just as they were in the last cycle.”

“If you want Nick to help you talk to Andrew,” said Lorraine, “you can ask him directly.”

“No, I want to try something different, and in this area you are the expert.” Nigella tapped her head. “There's enough room in here for both me and Andrew. Can you help me?”

Author's note (April 2012).

I hope you've enjoyed *Minding Tomorrow*, *Combat*, and *Broken Glass*. If you're interested in reading some other stories set in the same universe, in other timelines, check out *Get That Rat Off My Face!* and other future releases.

Recently I found the very first manuscript of the beginning of this entire story, hand written in a notebook, from about 2003. In that version, Nicolas returns to London just in time for the aftermath of the London 2020 Olympics.

Of course, when I got round to completing the first

draft of *Minding Tomorrow* in 2008, that idea was already out of date. Writing near-future fiction is always going to be tricky, as so much will be out of date so quickly, but it's been a lot of fun to see just how much more quickly science, technology and society has progressed compared to my own inadequate "predictions".

Some examples: - In 2009, I think even before I released *Minding Tomorrow*, boffins had shown that Dark Energy has nothing to do with vacuum energy. To be honest, I can't even remember how much I made up and how much was based on real research (read: what I stole from wikipedia.) - On a similar note, the Scharnhorst effect, in which the speed of light can be exceeded because of the casimir effect? I thought this was a fun way to hint that time travel could work, but it turns out that while theoretically possible, it's practically unmeasurable. - Viewers? As of April 2012, Google seems to be making headway on a very similar device. I make no claims to inventing the device (I think I even subconsciously stole the name from another science fiction novel), but I'd like to see how the "economy of attention" that I explored in the first two chapters of *Minding Tomorrow* plays out. - I wrote *Combat* in 2009, and released it in 2010. It features a popular uprising in an African country, and is orchestrated by a computer expert using social media, uniting Muslims and Christians. In my imagination this happened around about 2016 or 2017. Little did I know that I was

thinking way too small, as the events of the 2011 Arab Spring showed. I'm not claiming to have predicted the Arab Spring, but I did see the power of a younger generation linked by the internet in terms of political change, something that didn't turn out great in Iran, and I wanted to incorporate it into my fiction.

I don't, however, think it is a science fiction author's job to predict the future, and I don't think they have "failed" if the world doesn't play out as they thought. This story is set in just one future, playing out between the years of 2010 to 2030, but because time travel doesn't exist in our future, of course things will be different. It's simply impossible to tell the story I wanted in any other way, and I'm not going to continually edit the content of this trilogy to fit in with how the modern world works. Which is why I've no problem including the now-retired Space Shuttle, and not including other world events that have happened since 2008, the time I finalized the main story points of all three novels in my mind before writing *Minding Tomorrow*.