CHAPTER 6: ARRIVAL

Log date: Summer of 2415
Location: Xanthe
Log note: A song in the night

VICTOR STRYKER SPENT AN ENTIRE WEEK trying to decode the mysterious signal that the Nehemiah IV probes had reported. He knew it was going to be a difficult challenge, but he wasn't prepared for just how frustrating it turned out to be. The first problem he ran into was the nature of the signal itself. All space transmissions since the days of the Mayan Republic shared one thing in common: they were digital signals that conveyed a computerized message. It was true that protocols, formats, and encoding mechanisms had changed a great deal in the past thousand years, but all of those signals could still be converted into ones and zeros. That, after all, was the whole idea behind a digital signal. To Victor's immense horror, it was immediately obvious that this new signal was not in a digital format. Instead it was *analog*.

Who in their right mind would generate that kind of signal? Victor wondered, as he stared in disbelief at the waveform on his monitor. *I don't think anyone has used technology this primitive since the days of Adam and Eve. I have no idea what to do with this. I guess I can quantize it and force it into a digital stream, but what kind of crazy person would generate something like this? Is this the result of faulty equipment? Is this a message from some long-lost pre-Flood probe? Where do I even start?*

Victor searched through the Corporation's historical archives but he found nothing. The signal didn't match any known protocol – which didn't surprise him, considering that all known protocols were digital. He was tempted to dismiss the signal as some freak natural occurrence but he knew that wasn't the case. *There's too much information here for it to be the product of random chance. The signal isn't random and it's not short. It's eight minutes and 37 seconds long, and after a brief pause it repeated itself seven times. There is clearly information here; I can see that. There seems to be intent as well. But I don't know how to decode it. It this some new messaging technique? Does it have some advantage over digital signals that I just haven't heard about? If so, who could be creating this new technology?*

The most obvious possibility is that it had been sent by aliens, but that was absurd. If there were aliens out there then surely they would have been found by now. *Perhaps I'm overthinking this*. *Maybe this signal is being generated by a complete moron on one of the Ranger worlds. He wants to steal a probe, but he has no idea how they work so he just cobbled together a machine and ran with it. Perhaps what I'm really looking at is the most pathetic hacking attempt of all time.*

There was just one problem with his theory, and that was the source of the broadcast. The Nehemiah IV probe was able to pinpoint the signal's origin – but the coordinates were outlandish and so ridiculous that Victor immediately dismissed them. *That's got to be a mistake. There's no way it can be right. If the probes ever pick up the message again I'll have them get a better fix on the source. Until it repeats, though, I'll just assume this was the result of abject stupidity and will dismiss it.*

But the message did not go away. To his utter amazement the probes continued to pick up the same strange message in the weeks that followed. It seems that whoever was sending the message was very persistent – and try as he might, the bizarre origin of the message never changed.

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Since the first Nehemiah IV probe was not scheduled to arrive at its destination until the end of August, that gave Victor plenty of time to work on his microprobe project. It was true that Professor Grimes assigned a fair amount of homework, but since his real job was on hold for the time being Victor still had plenty of hours to spend on other matters. With the help of some experienced engineers he was able to design a basic prototype. The probe was incredibly primitive, and had the fewest parts Victor could get away with. All it could do was travel to another star system, replicate itself, scan that world for books, and then bring the books back. Victor added a rudimentary communications systems so he could tell if anything catastrophic happened, but that was it. He didn't even have the ability to upgrade the probes remotely: if they broke in the field then it was all over.

The probe's technology was quite old. There was nothing cutting-edge about them. Since adding a ZPE was out of the question, Victor used a scaled-down nuclatomizer. When the probe arrived at Alpha Mensae it would take rocks and dirt from the planet and convert them into plasma. It was then supposed to use that plasma to create a new probe – a task that truly strained its feeble abilities. There was only one pattern programmed into its replicator, and that pattern had been simplified to minimize the elements that would have to be fabricated.

Even with all the simplification, though, the probe was still larger than the average car. It was a hideous monstrosity and had parts sticking out everywhere. There was nothing sleek about it. Victor had no doubt that things would go wrong – but his time was limited and he didn't have a hundred years to perfect the design. *This probe is not going to be able to handle a hundred generations of replication, let alone a thousand. But I don't need much. All I need is something that can find my books. If half the probes break, that's fine as long as the other half work. I just hope there are books on that planet that are worth reading. I'd hate to go through all this trouble and end up with ten copies of some book on dog breeding.*

Victor used a virtual reality matrix to design the probe and test its functionality. This was an ancient technique that had been perfect back in the days of the Spanish Empire. Since the Corporation was limited to one heavily-armed building and did not have access to the outside world, employees did most of their testing in virtual reality simulations. Testing in the real world was a dangerous thing to do. Fortunately, though, his probe was small enough to be built inside the building. Once Victor was convinced that his design might actually work, he fabricated one in an unused laboratory.

The first probe was constructed on April 9th – just two months after Victor got the idea. Once the construction process was complete Victor began running tests on the probe to find bugs that his virtual tests had missed. He knew that it would take multiple iterations before he had a design that was ready for launch, but he felt good about his progress. *I just need to get this finished before the Nehemiah IV probes arrive at their stars. Once that day comes I'm going to be much too busy to work on anything else. That means I've got to be quick and I've got to keep things simple.*

As it turned out, Victor just barely made it. On July 30th he asked Dr. Mazatl to come to the lab and approve the launch of his probe. Even though Dr. Mazatl was quite busy, he still found the time to review Victor's work.

“Are you sure it's ready?” Dr. Mazatl asked, as he stared at the probe. “I don't mean to criticize your work, but it looks a bit odd to me. This may be the most ungainly probe that the Corporation has

ever designed. Shouldn't it have some sort of protective casing?"

"The problem comes down to the sensors," Victor explained. "In order to keep everything simple and minimize the number of elements that the nuclatomizer has to fabricate, I had to use equipment that's kind of terrible. I can't use any fancy alloys or artificial elements or anything like that. I know it looks ridiculous but it truly is the best design possible, given the limitations. At least, that's what the genetic algorithm I wrote told me. I had it iterate through billions of different design permutations. This is as good as it gets – and it passed all the fitness tests. I really think it's going to work."

"Well, it's certainly creative. I appreciate the way that your probe can replicate itself. I'd like to see that approach used in our maintenance bots. Considering how often they are destroyed I think that could be significant improvement. I'll talk with Bernard about it and will see what he thinks. The problem, of course, is that implementing your approach would mean redesigning all of our bots, and we just don't have the time or manpower to do that right now. We are very close to arrival day."

"It would be a big investment," Victor agreed. "The system of bots we have in place right now does seem to work, more or less. It has its problems but it's manged to keep everyone alive. I'm sure it could be better, but then again so could everything."

"That's certainly true. Well, Victor, I've read the diagnostic reports of your probe and it does meet our standards. It should be able to do what you want it to do – although, once again, this probe won't be able to replicate itself for too many generations. Problems are going to arise around the tenth generation, and your mechanism for catching replication errors is not very robust."

"Which is fine. This doesn't have to be perfect and it doesn't have to last for all of eternity. It's really not very ambitious."

"Then you are cleared to launch." Dr. Mazatl pressed a few buttons on the electronic device he was holding, and then put it back on his pocket. "I've uploaded the probe's pattern to our space station and gave approval for the creation and launch of three copies of your device. They are scheduled to depart in a few hours. Once they have launched, any telemetry data they send will be routed directly to you."

"Thank you very much! I appreciate it."

"Not at all. Personally, I think it's great to see people doing projects like this. It makes me think there's hope for us yet. Just don't let this take up so much of your attention that you neglect your real job. There is another set of probes that needs your attention as well."

"I know," Victor replied. "The big corporate meeting is tomorrow at 10, isn't it? I 'll be sure to be there."

"That is correct. Don't forget that you will be presenting! Be sure to have a report ready on that signal you've been picking up."

"I'll do that," Victor promised.

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At precisely ten o'clock on the following day, the Corporation held the big kick-off meeting for the Nehemiah IV's arrival. All employees were required to attend, but there was no single room big enough to hold everyone. Most people attended it from their desks (while paying questionable amounts of attention), but a large number of employees were packed into an enormous auditorium on the 114th floor. Victor had to attend the meeting in person because he had a report to deliver. He

knew it wasn't going to be a very satisfactory report, but there wasn't much he could do about it.

Dr. Mazatl began the meeting by talking about the great work that each department had been doing. He then talked briefly about the building's new security system and the work that had been done to protect them from President Rios. After answering a few questions he began to talk about the probes.

“The first Nehemiah IV probe will arrive at its destination precisely on schedule, on August 22, 2415,” he announced. A large holoscreen behind him displayed a realtime image of the probe's current location. “The probe will be arriving at a planet that is a particularly poor candidate for terraformation – which is exactly why it was chosen. The planet is located dangerously close to a star and completes its orbit once every few days. This horrifying world has no moon, and the star is particularly violent. It will take a great deal of effort to move the planet into a different orbit, cool it down, change the star's chemistry to something that is more stable and suitable for life, and then terraform the planet.

“Nothing about this process will be easy, which is why this is such a terrific test of the probe's abilities. This is by far the most challenging terraformation that we've ever attempted. Not only is the job itself incredibly difficult, but the whole area is saturated with radiation and deadly particles. If the probe can successfully change this world into a habitable environment then it should be able to tackle any challenge that it faces.”

“What about the worlds in the galaxy's core?” Connor Morris asked. He worked in stellar navigation. “Those stars are incredibly close together and their worlds are saturated with lethal radiation. Nothing about that region is conducive to life. Surely those systems are going to pose an even greater challenge!”

“Absolutely – which is why we are going to avoid them as long as possible. There are around a trillion planets in this galaxy, and some are far better candidates for colonization than others. With the exception of these hand-picked 'starter' star systems, the Nehemiah IV probes will focus on promising worlds that can be terraformed using traditional techniques. Their goal is to create worlds that are naturally stable and which do not require artificial shields or atmosphere generators to remain habitable. It will be a very long time before all of those worlds are terraformed and only the core stars are left. We are hoping that by the time that day comes, our technology will have advanced to the point where even the core can be colonized. However, that is not under consideration at this time. We can leave that question to our descendents.”

“How long will it take?” Jane Hart asked. She worked in biochemistry.

“About a year,” Dr. Mazatl replied. “In most cases the probes wouldn't take so long to terraform a planet, but this is an extreme situation. In fact, the first dozen worlds on all of the probes' itineraries are difficult cases. We already know how to terraform simple worlds. What we really want to see is how the Nehemiah IV operates under pressure.

“This means that for the next ten years what we will see is problem world after problem world. It is our hope that if there are any flaws in the probes, they will arise during this time of testing. The other two probes will arrive at their own stars by the end of September and will begin work on equally challenging planets. It will be the job of all of us to closely monitor the probes and make sure that they are making the right decisions. Are the probes responding to situations in the most rational and efficient manner? Is their method of terraformation the right one and will it result in success? Are the probes showing any operating problems or flaws?

“All of you, in one way or another, have worked on the probes' systems. You know what those

systems are and you know how they should work. If you see any deviation from the plan it is your job to notify us immediately so that we can put together a team to resolve the problem. I know that you all did an excellent job, but these probes are enormously complicated and it is difficult to believe that they are flawless. Our job is to find the flaws and fix them before those flaws are passed down to the probes' children.

"In order to simplify operation and troubleshooting, the telemetry feeds from all of the probes is being fed directly into SOLOMON. This data is very nearly in realtime and dates back to the moment the probes were launched. Victor Stryker has been put in charge of the probe telemetry. If you need information or have any questions, please let Victor know."

Carroll Lane spoke up. "Have any problems been found so far?"

"That's a difficult question to answer," Dr. Mazatl replied. "Victor, would you care to address it?"

Victor, who was sitting on the row directly in front of the stage, reluctantly walked onto the platform and over to the podium that Dr. Mazatl had been using. "The probes themselves have all been operating within their established parameters. No systems have malfunctioned and no failures have been detected. However, there has been an event that raised some concerns. Shortly after the probe's launch one of the probes began receiving an anomalous signal. The nature and content of this signal is not yet understood. However, the signal appears to be coming from outside the probes, and is not a product of the probes themselves. Therefore we do not believe that the signal represents a flaw in the probe design. Other than that, no other anomalies have been discovered."

"Can you triangulate the signal's source?" Cynthia Glass asked. "I would think that it should be pretty easy to find the broadcast point."

"That's a good point," Carroll Lane agreed. "We don't want outsiders to be communicating with our probes. We need to find out who's doing this and shut them down."

Victor sighed. He tapped some buttons on the podium and the picture on the holoscreen changed. "This is the data that is being picked up by the probe. You can see the signal trace on that graph, along with the packet structure and contents. In addition to this you can see the origin data in the lower-right-hand corner. The Nehemiah IV probe claims that the signal is coming from outside our galaxy. In fact, the data indicates that it is coming from the edge of the universe – at a point in space that is 9 billion light-years away."

"But that's ridiculous!" Jose Avila exclaimed.

Victor shrugged. "I am quite aware of that. However, that is what the probes claim, and we have not found any error in the probe's subroutines. The signal has repeated itself every few days since it was first detected and the reported source is always the same. If the signal is *not* coming from billions of light-years away – which is certainly the most reasonable guess – then whoever is generating it has found a clever way to mask the signal's true origin. And as far as the message itself goes, you can see that it does not conform to any of the standard communications protocols. There is currently no known way to decode this message."

"Have you run it through a statistical analysis?" Cynthia asked. "Surely you can use pattern matching or something. There's just got to be some similarity to *something* that you can use to identify it!"

"The problem with pattern matching is that we only have one pattern. The message never changes. And yes, I have run it through an analysis." Victor pressed another button on the console and brought up the results on the holoscreen. "These are the results that I got. As you can see, the

analysis is inconclusive. The computer requires additional samples in order to form a conclusion, and we just don't have that. This is all we have available."

"So what's going on?" Jose asked.

Dr. Mazatl spoke up. "I am afraid it is impossible to tell. Like many mysteries in life, some things are simply not solvable. It is clear that the probes are detecting a message, but that does not mean that the message was intended for them. In fact, it is quite likely that they are eavesdropping on a conversation that was not meant for them at all. That is why we have decided to put this investigation to rest. We will continue to monitor the situation in case the message changes, but until further information comes to light we will consider the matter to be closed."

Victor nodded and stepped away from the podium. As he walked back to his seat, Dr. Mazatl continued the meeting. He didn't like closing the investigation but there wasn't anything else that he could do. He could not solve the mystery with the information he had, and there was no good way to obtain more information. Traveling 9 billion light years across the universe was out of the question – and even if he somehow managed to do that he doubted he would find anything.

It's probably just some crazy person trying to send a message to someone, he thought to himself. *The galaxy is full of lunatics these days. There's just no telling what people are up to. It's probably not worth worrying about.*

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After the meeting was over, Victor tried to make his way back to his apartment. However, when he reached his floor he found that Cynthia Glass was waiting for him. "Do you have a minute?" she asked.

"Um, sure," Victor said nervously. "Is there a problem?"

"I just wanted to talk to you about the signal, if that's ok. Have you run it by Professor Grimes? This is just the sort of thing that he'd enjoy. You know how he is!"

"Right. Well, actually, as a matter of fact, I did. He didn't have an answer but he did have a guess."

"And you didn't mention it in the meeting?" Cynthia asked, astonished. "Wouldn't that have been highly relevant?"

Victor sighed. "I don't know. All he had was a crazy guess. Grimes doesn't think that it was a message at all. He thinks it's a song."

"Are you serious? A *song?*"

Victor nodded. "That's his opinion. He said the waveforms look like music to him. It reminded him of a violin or something."

"Was he right?"

"I have no idea. The problem is that even if it is a song – which would be crazy – I don't know how to decode it. How do the waveforms correspond to notes? I made a few attempts to convert it to music but none of it was conclusive. A small change in my base assumptions resulted in a big change in the melody. I don't even know what the tones are supposed to be."

"How did it sound?"

"Kind of odd. Some variations were better than others."

"Could you send it to me?"

"Um, sure. It's not really that great, though. And I'm not convinced that Grimes is right. Don't

forget that Grimes' favorite pasttime is burning, um, communications devices."

"I think the word you're looking for is *phone*," Cynthia replied. "And of course he hates them! When he's teaching he wants people's attention to be on him, not on some dumb game. He sees them as a distraction – a monumental waste of time. So since they are a force of evil in the world, Grimes wants to burn them with fire. However, he only seeks to destroy the ones that are actively interfering with his teaching. I think that's a perfectly reasonable stance. But to get back to the conversation – who did Grimes think was sending the message?"

"Well, about that. Grimes said that since the probes claim the message is coming from 9 billion miles away, that means there is a good chance the message is coming from 9 billion miles away. And since there aren't any people in that part of the universe, that means it probably isn't being generated by, you know, people."

"Well, that makes sense."

"Not really. I mean, why would there be aliens way out on the edge of the universe? What's the point of that? Why not put the aliens here? It doesn't make sense for God to leave our galaxy empty and put the only alien race in existence at the other end of eternity."

"Maybe God wanted to keep them away from mankind," Cynthia suggested. "I mean, we're kind of a mess, in case you haven't noticed. All that distance could be a quarantine of some kind."

"I guess. I suppose we'd have to make a trip out there to find out for sure, but there's no way that's going to happen. Even the Nehemiah IV probes can't travel that far."

"Are you sure? Have you tried?"

"What do you mean, have I tried?"

"Has anybody ever tried?" Cynthia repeated. "I mean, come on. We can change the chemistry of *stars*, Victor. We can move planets to different orbits. We have access to *free energy*. Has anyone actually tried to travel that far? Maybe it is possible."

"We can't even travel outside our building," Victor pointed out. "No one is going to be traveling to the edge of the universe – especially not in search of imaginary aliens."

"Where's your spirit of adventure?"

"I kind of prefer the spirit of sitting on the couch. It's a lot safer."

"Is that why you never respond to any of my invitations? I've only asked you over, like, a million times! We could be friends, you know. We do have things in common."

Victor shifted uncomfortably. "I appreciate that – really, I do – and I'm sure you're a nice person. But I'm really pretty happy living alone. By myself. Without, you know, other people. It's a pretty good life."

"No it's not," Cynthia said. "You're lonely and unhappy. You hate your life."

"Well, maybe. But it's better than the alternative. I don't know if you've noticed, but mankind is pretty much a race of evil undead zombies right now. The people outside this building are all criminally insane. The people *inside* the building are barely any better – they're rude, mean, selfish, and horrifying. Have you seen Derek? He's a nightmare!"

"But we're not all like Derek," Cynthia protested.

"Then why don't relationships ever work out? I've been around married people, Cynthia, and they're all deeply unhappy. Maybe hundreds of years ago things were different, but that was the past. Husbands and wives hate each other and never stop fighting. Whenever you pass them by in the hall, all they can talk about is how evil so-and-so is and what horror they just did. Practically no one gets married anymore, and those who do never stop talking about how bad it is. And we're the *good guys!*

The world outside is enormously worse. Oh – and don't even get me started on what kids are like these days."

"Well, without parents, what do you expect them to be – model citizens? Yes, I know this isn't happy bunny funland. I'm aware of that. There aren't a lot of talking ponies anymore. But not *everyone* is evil. Grimes is pretty sane. Mazatl is nice. There are good people out there – or, at least, people who are trying to be good. Those good people should stick together. They should be friends and help each other."

"I tried that, Cynthia. Oh, I've tried that. My parents tried to be nice to outsiders and it got them killed. I tried to be nice to Susanna Hamilton and she had the SSF steal everything I had. What you're asking me to do is trust you. But trust is dead. There's no trust anymore – not between the sexes, not between people, not even between Christians. You seem nice, but for all I know you could be a psychopath who's putting on an act. I'm not interested in rolling the dice and hoping that this time I can defy all odds and find a real friend. It's just not going to happen. It's never happened before."

"What about Carroll Lane? Isn't he your friend?"

Victor shrugged. "He's a coworker. For all I know he'll try to kill me one day. Everyone else has."

Cynthia shook her head. "You need therapy, Victor. Or maybe counseling. You are in desperate need of *something*. Don't you remember what Christ said? 'Because iniquity shall abound, the love of many shall wax cold.' Don't let that person be you. Love matters in this world. It especially matters when it's in short supply."

"I'll, um, think about it," Victor replied.

"You do that."

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Precisely on schedule, the first Nehemiah IV probe arrived at its destination on August 22. It immediately began generating an enormous quantity of data – and that data stream dramatically increased as the hours ticked by. For the first few planets Dr. Mazatl had enabled trace logging. Not only did this log everything the probe did, but it also logged the internal reasons that explained the choices the probe was making. This resulted in a staggering deluge of data.

How are we supposed to sort through all this? Victor wondered, as he tried to find a way to analyze billions of pages of information. *SOLOMON can't possibly handle this much information. It will reach its maximum capacity in five years, at the very most. I suppose we don't actually need to* keep *this much data. If we only store data from the previous terraformation cycle and discard everything else we might be able to keep it manageable – although as we replicate more probes even that will be too much. If we can't even manage the operation of three probes, how are we going to handle hundreds of them?*

Victor put the problem out of his mind. His job was communications; managing SOLOMON was the responsibility of the infrastructure team. He was sure that the storage space issue had already been discussed in countless meetings. If there was a problem with SOLOMON, it wasn't *his* problem.

No, Victor had a more immediate issue: how was he going to break up the data and make it manageable? The schema that the data miners had created before the launch was completely inadequate. A whole new way of finding important information had to be found; otherwise they would drown in data.

Victor settled into his chair and began thinking.

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The first few months were hectic ones. As the days went by the developers at the Corporation invented better ways to mine the probe data for information that was relevant and useful. The unmanageable became manageable, and people's initial panic started to subside.

Victor's role gradually began to change. Instead of managing the communications themselves he became heavily involved in scanning the data for problems. He wrote a number of data analytic programs that compared the actual data to the predicted optimal decision choices. The three probes had been placed in star systems that would inflict heavy damage upon them. This was done deliberately in order to test their automated repair systems. The parent probes were created out of stable matter, but their children would be formed out of artificial atoms. If the repair system did not work correctly then the children would not survive for very long. Victor's software automatically located areas where the probes were not repairing themselves correctly and flagged them for research. Victor also worked closely with Dr. Mazatl to identify the key decision trees that needed to be closely monitored.

At first Victor's software reported a great many anomalies. However, when Mazatl appointed a team to study the problems they found that the probes were actually making wiser decisions than the plan predicted. There were only a few cases where the probes made an error, and the company was able to pinpoint the problems and remotely upload a patch to resolve the issues. The automated repair system was doing its job.

Overall Dr. Mazatl was pleased with the results. The probes were doing a fantastic job under very difficult circumstances and encountered only minor bugs. Things were going better than he expected.

The next critical date did not occur until July 30, 2416. Thanks to the probe's enormous power, the terraformation of the first world was completed nearly a month earlier than scheduled. It was time for the probe to move on to its next world – but first it would replicate itself.

Victor sat at his desk and watched the entire process on his holoscreen. He knew that there were two other probes which were still hard at work, but he put those probes and their problems on hold for now. Everything depended on a successful replication. If replication failed then the project would fail with it.

As he watched, the Nehemiah IV probe switched modes. It loaded the massive file that contained its pattern and it queued up the components that it needed to manufacture. Then, one by one, it began recreating itself. The probe fabricated pieces in quick succession and placed them outside itself, in space. As powerful as the Nehemiah IV probe was it could not recreate itself whole. No machine that had ever been built could fabricate a device that was five miles long.

It took the probe four hours to create the thousands of components that went into its construction. Once the last part was manufactured, the probe began moving these pieces around and assembling them. The probe had the ability to grab things remotely and move them – an ability it used to move planets – and it quickly and efficiently assembled the many components into an exact duplicate of itself.

One the copy was made, the probe turned on its child and activated its diagnostic mode. The parent then spent two hours conducting a thorough check of every system and subsystem in the child

probe. After all of the components passed all of the tests, the probe uploaded an itinerary to the child and then turned off its diagnostic mode. The child now had its orders.

Both probes left the star system and headed to their next destination. Before there were three probes; now there were four. It had worked.

Victor felt a sense of immense relief. He knew that over the next few weeks the data that was created during the replication process would be analyzed for flaws, but what he had seen looked very promising. *So far so good. But now we have four probes to manage instead of three – and soon we will have six. Can we keep up with the load?*

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That evening Victor began going through a large stack of books that occupied most of the floor space in his living room. In the year since he had launched his probes, the microprobes had traveled to Alpha Mensae and begun ransacking the planet. To his great surprise he discovered that Alpha Mensae was home to dozens of libraries, and nearly all of them were intact. There were far more books on the planet than Victor could possibly handle – but since the bots were programmed to bring *all* of the books they found back to Victor, that is exactly what they attempted to do. When his microprobes found one of the planet's many libraries they replicated dozens of copies of themselves, grabbed all the books they could carry, and returned to Tau Ceti. There were now hundreds of thousands of books on the way back to Victor – and that didn't count the piles of books he had already received.

The software developer belatedly realized that he should have put some kind of filtering mechanism into his probes. There were all kinds of books out there that did *not* deserve to be rescued from the ruined world of Alpha Mensae. Victor had been forced to start piling up books by the thousands in crates in the building's basement. Grimes had agreed to take some of them, but he had stringent requirements. Not all books merited inclusion into the university library – although Grimes did offer to burn the countless romance novels that Victor had found (an offer Victor gladly accepted). Unfortunately for Victor, very few of the books that the probes brought back were worth reading. But he still had to go through them all, lest he inadvertently discard a real treasure.

I guess I was too successful, Victor thought. *Or maybe I wasn't selective enough. I just didn't think this would actually work. Where is a catastrophic system failure when you really need one?*

Victor had spent dozens of hours going through the books that had arrived so far – and more books landed on Xanthe each week. The books in his apartment were the ones that merited further study. Even that number was so overwhelming that he almost considered asking Cynthia to come over and help him.

Almost.

You know, maybe it's time for me to kill my probe program. If there are other books still on the planet then I think they can stay there. I have enough to last for the rest of my life.

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As Victor tried to sort through the mess, he was interrupted by a buzzing noise. Someone was attempting to contact him. Victor made a motion in the air with his hand and a glowing holoscreen appeared in the air in front of him. He was surprised to see that Carroll Lane was calling.

Victor immediately answered. “Hey there! It's great to hear from you. How are things going?”

“Really good, actually. I've made a lot of progress since we last talked.”

“That's fantastic. I'm glad things have been going well. When was the last time we talked, anyway? It seems like it's been months. Where does the time go?”

Lane shook his head. “You've been distracted by that alien message, haven't you? I keep trying to tell you: it's not important! It's probably just some goofball trying to hack the Nehemiah probes. Give it a rest, Victor. Some mysteries aren't worth solving.”

“You're probably right. I just hate loose ends, that's all. I don't like things that I don't understand.”

“Then you're not going to like life very much. It's full of things that are impossible to understand.”

Victor grinned. “I know what you mean. Still, those messages are pretty old news. The big news today is the first Nehemiah IV replication. It completed a few hours ago and it worked perfectly.”

“Of course it did. What did you expect? The parent probes are stable. It's the children that we have to worry about.”

Victor nodded. “Speaking of that, where have you been lately? I haven't seen much of you around the office. In fact, I haven't seen you at all.”

“Oh, I've been busy. My workload hasn't really been that heavy so I've been working from my apartment. That gives me more time to work on my virtual reality project. I've made tremendous progress. In fact, I was wondering if you'd like to come over and check it out.”

“Sure. I'd love to see what you've done. Is it ready for the public?”

“I wish! I'm getting closer but I still have a lot to do. It's far from perfect. But I'd like to get some feedback on what I have so far, and there aren't many people that I trust. You've always had a good head on your shoulders – even if you are a bit gloomy.”

“It's a gloomy age,” Victor replied. “But sure, I'd be glad to help. I'll be over in just a minute.”

Lane nodded and disconnected. Victor stood up, stretched, and left his apartment.

As he walked down the hall and took the elevator he realized that he had lost track of how Lane was doing. The two developers had never been particularly close – but for that matter Victor wasn't very close to anyone. Cynthia was determined to be his friend, and Victor was equally determined to avoid her with the same dedication that he avoided his chicken-raising neighbor. Still, he felt a little bit uneasy about the way he had drifted apart from Lane. The two of them used to work together on a regular basis. Now things were different.

Well, we're working on different things now, Victor thought to himself, as he waved his hand in front of Lane's door. To his surprise the door unlocked. *Evidently I still have access to his apartment. How strange. Lane is clearly not as paranoid as I am. I still have nightmares about the SSF.*

“Hello?” Victor called out.

“Over here,” Lane replied. Victor saw his friend standing at the far end of the room. He was surrounded by computers and other technical equipment.

“My goodness! Your apartment is packed. Is it possible that you actually have *more* stuff than you did before?”

“Absolutely! In fact, it's getting kind of cramped in here. I probably should move to a laboratory downstairs, but hauling all this stuff down the elevator would be such a huge pain that I've put it off. But, yeah, I have lots of new toys. Now that the Corporation is paying my bills I've been able to fabricate everything I've wanted. Since I'm doing 'cutting-edge research', as Mazatl put it, he's given

me free reign to perfect my work."

"So the Corporation is paying for this?" Victor asked in amazement.

"That's right! As long as they get a copy of the tech they're happy to fund me. I'm not sure what they're going to do with it, but that's their problem. I'm sure they'll think of something."

Victor suddenly remembered Lane's injury. "Hey, it looks like your hands have healed!"

Lane nodded as he typed some commands into the console in front of him. "Yep, that cleared up months ago. The pain's gone too. It's amazingly nice to be able to type again. You have no idea what's it like to try to dictate software. It was *not* fun."

Lane pressed a button and a progress bar began inching across the holoscreen. "All right, the simulation is loading now. As I said earlier it's not perfect – I still have a long list of features to add. I'm hoping that if I can build a good demo and really show off its potential, I can get some other people on board to help me finish it. It'll take me forever if I have to do all the work alone."

Victor nodded. "That makes sense. So how does this work?"

Lane climbed over piles of equipment and made his way to a nearby bookshelf, which had three white helmets on it. He picked up two of them and carried them over. Lane handed one to Victor.

"Here's how it works. These helmets are the primary controllers. They act as a relay between the server farm over there and the nanites in your brain. The nanites interact directly with your brain and feed it the simulation data. The helmet monitors your brain to see what you are trying to do, and uses that data to update the simulation and feed the results to the nanites. The helmet actually processes quite a bit of the simulation, but it can't handle everything, of course; there's only so much hardware I can cram into it. It's just responsible for rendering the things that are immediately around you. The larger world is handled by the server farm, which is connected directly to the helmet. All three of them work together to ensure that the simulation feels real and there's no noticeable lag. It's actually kind of cool. The nanites in your brain are the real magic."

"But I don't have any nanites in my brain," Victor pointed out.

"Oh – right. Sorry, I forgot. Just a minute."

Lane walked over to a refrigerator in the corner of the room. He opened it and took out a small blue vial. Lane then walked back to the console and handed it to Victor. "Here, drink this. It doesn't really have a taste. It'll take just a few minutes for the nanites to work themselves into position. You won't feel a thing."

Victor looked at the vial dubiously. "Is this safe?"

"Absolutely. Trust me – I know what I'm doing. The nanites only last for a week and then they will get flushed out of your system. They're completely harmless. I even got the Corporation to sign off on them so I could begin human testing. There's nothing to worry about."

"All right then," Victor replied. He drank the vial. "Hmm. You're right – it doesn't have a taste. It's kind of bland."

"But it works! That's the key thing. Ultimately I'd like for them to last longer, but that's a problem we can solve later. I've already got nanites in my system, so once yours take effect I'll join you. We'll enter the simulation together so I can show you how it works."

Victor nodded. "How will we know when they're in position?"

Lane pressed a key on his console and a box appeared on the holoscreen. "Here, put on your helmet. Once the nanites are online they'll connect to the helmet and I'll engage the simulation. Oh – and you'll want to lie down on that cot over there."

Victor put the helmet on and laid down on the cot. The helmet was dark; it didn't have any windows. He waited in silence. Victor heard Lane muttering to himself, and he heard typing from time to time. “Ah, there we go. Looks like you're online. Let's get this started.”

A moment later Victor felt a curious sensation – it was as if something fuzzy had brushed over him. The helmet he was wearing then vanished, giving him a clear view of the apartment. To his surprise the apartment was now empty, save for the two cots. That's when Victor noticed that Lane was lying on a cot beside him. On the far wall, light streamed through a floor-to-ceiling window.

Victor stood up. “I don't get it. What happened?”

“I started the simulation.”

“Really? But this feels real. It looks real. *You* look real. This is really just a simulation?”

Lane nodded, obviously pleased. “Not bad, is it? I told you I had made some real progress.”

Victor experimentally waved a hand in the air, and then took a step forward. He stopped. “So you're telling me that in reality, I'm still lying on a cot in your cluttered apartment, and I still have a helmet over my head.”

“That's correct.”

“That's amazing. But how is this possible? If you're feeding a simulation to my brain then how is my body still alive? Haven't you disconnected my brain from my body?”

Lane shook his head. “I have, but I haven't. I'm basically feeding a dream into your mind. Do you know how when you're dreaming you seem to be in another place, and yet you're really not? In your dream you can walk around, talk to people, and do things, and yet you're not actually doing any of that stuff. While you're having your dream adventure your body keeps on taking care of itself. I'm just creating an artificial dream world for you to live in. The only difference is that this dream is being created by my computers.”

“Remarkable,” Victor said. He walked over to the window and looked outside. As he stood in front of the window he could feel the heat of the sun. It was as if he was standing in front of a real window. He could even see other buildings down below – but he quickly realized that he didn't recognize any of them.

“What's up with downtown?” Victor asked. “That's definitely not Star City.”

Lane walked over beside him and looked at the view. “You mean it's not the *24th century* version of Star City – the depressing one that we all love to hate. That, my friend, is what Star City looked like back in the 19th century, when Jack Nicholas was governor. This is the city in its golden age.”

“Wow! That's really nice. It's a huge improvement over what the city looks like today. I don't see a single building on fire anywhere.”

Lane laughed. “It's more than just a view, you know.” Lane tapped on the glass window and it suddenly disappeared, leaving a giant hole in the wall. “You're welcome to walk its streets, if you like. As long as you don't try to go inside the buildings the simulation should hold up pretty well. I haven't tried creating their interiors yet.”

Victor quickly took a step back from the hole. “Are you crazy? We're on the 80th floor!”

“This is just a simulation, remember? You can't die! You're still lying on a cot, safe and sound. You're not in any actual danger. Besides, you can fly.”

“I can *what?*”

“Try it,” Lane urged. “Just focus on flying. Tell yourself that you want to go *up*. The nanites will know what to do.”

Victor concentrated for a moment. He then began rising – but far too quickly. He leaped off the floor and banged his head on the ceiling. To his surprise he didn't feel any pain.

"I don't get it. Shouldn't that have hurt?"

Lane shrugged. "I've disabled pain in this simulation. Like I said, none of this is real. In my opinion it's quite a bit *better* than reality. I wanted a world without pain, remember?"

Victor nodded. He carefully levitated himself out of the apartment and into the open air. Lane was right – he really *could* fly. A surge of excitement shot through him as he looked around. He could *fly!*

Victor soared through the sky and dropped down to the street level, and then soared back up again. He flew high above the streets and stared at the buildings around him. The virtual simulation that Lane had created was astounding. The buildings truly looked real.

Yet it was also apparent that something was off. For one thing the streets were deserted; there was no traffic. There also weren't any people anywhere. Yet despite that it was still a fantastic experience. Victor truly felt as if he was there. He could feel the warmth of the sun and smell the crisp autumn air. He could feel the wind whip past him as he soared through the sky. It was astounding.

Victor finally landed in front of the Diano Building. In his day the building was surrounded by a defensive perimeter and all of the windows had been replaced with armor plating. But in this era the building had direct access to the street. The skyscraper's windows were made of glass and they glinted in the morning sun. It was a beautiful sight.

"Nice, isn't it?" Lane said. "Oh – and wait until you see this."

Lane made a gesture in the air and a console appeared in front of him. He tapped a few keys. Instantly the daytime turned to night and the sun vanished. But in place of the sun was something even more amazing: stars.

Victor looked up at the sky in astonishment. He had seen pictures of the stars, of course, but since he had never left the Tau Ceti system he had never seen a starry sky. Part of his mind realized that this was just a simulation, but it seemed real. It truly felt like it was nightfall on Xanthe and the stars had come out. It was beautiful. He stared up at them in wonder and watched the points of light twinkle in the darkness.

"But Lane," Victor said at last, "didn't 19th century Xanthe have a Wall, just as we do? Governor Nicholas couldn't see the stars either."

"You're absolutely right. But this isn't reality – it's something better. In this version of Xanthe there is no Wall. There is also no crime, or poverty, or politicians, or government. Oh – and there's no pain either. This world is whatever its inhabitants want it to be."

Victor paused for a moment. "But if you fill this world with people, won't people just recreate the same problems we had before?"

"Only if you put them all in the *same* world. Then, yes, it would be awful. The truth is you can only have everything you want if you're the only person in existence. But I'm planning on putting each person in their own simulation. That way they can't affect each other! Each person can then customize their world to their own liking."

"Won't it be lonely?"

Lane shook his head. "Absolutely not. I admit I'm still working on the subroutines that simulate people, but I'll get that working in time. We already have all kinds of bots, you know, so it's really just a matter of integrating the bot routines into my simulation software. Once that's working I'll have these streets filled with simulated people who are going about simulated lives. The city will have

traffic and will seem more than just a hollow shell. Of course, once I connect this to the corporate Archives we'll have even more material to work with. We could create a simulation of Earth, or Mars, or any of the colonies, or any world ever visited by a Nehemiah probe. There's all sorts of things we could do! We will be able to bring these worlds to life – we'll have virtual citizens and a virtual civilization. And best of all, *we* are in charge."

"That seems pretty ambitious."

"But very achievable," Lane argued.

"I don't doubt it. You know, it just occurred to me that I'm hungry. Can I eat here?"

"Not really. I mean, in theory you could, but it wouldn't actually do you any good. You'd still be hungry in the real world and those feelings of hunger would feed into this one. That's a problem I still need to solve."

"Is it worth the trouble?" Victor asked. "I mean, who cares? Can't people just eat before they enter your virtual world?"

"Sure, but I want so much more than that. I don't want to bring people here for short visits; I want to find a way to enable people to *live* here. Forever. I want to replace the real world with this one."

"Are you serious? Don't get me wrong – this is nice and all – but there's no way I would want to live here."

"But don't you see its potential? This world can be anything you want it to be. Anything at all! There are no laws here, Victor, and there's no government either. In this world *you* are the one in charge, not President Rios, and you have absolute control. If you want a castle then you can just order one to appear, and it will be done. Anything that you want – anything that you desire – can be created instantly. This is far better than reality could ever be. It's like a genie that grants infinite wishes."

"But it's not real," Victor replied. "This is just a fantasy – a dream. Real life may not be that great, but it's better than just dreaming your life away. At least in real life you're actually *doing* something. All we're doing right now is lying on some cots and daydreaming. I admit it's fun but it's utterly meaningless."

"You're missing the point! In my world people can actually be happy. They can get everything that they want. All of their wishes can come true. There are no limits – not even physical laws! This is far *better* than reality could ever be. Who cares if it's just a fantasy? It *feels* real, it *smells* real, it *tastes* real, and it *looks* real. You couldn't ask for anything more." Lane waved a hand at the simulation he had created. "Why would you want reality when you can have this instead?"

Victor paused a moment to gather his thoughts. "Yes, Lane, I can see the appeal, I really can. I can see some great uses for this. We've all used virtual reality technology to design equipment and this is vastly better. But replacing reality with a fantasy is a fundamentally bad idea. This *isn't real*. Nothing that happens here is real. You're asking people to give up reality for a fantasy."

"Absolutely. And I think they will. In fact, I think most people have done that already."

"But that's the wrong choice! Lane, stop and think about it. The Day of Judgment is coming, and it cannot be avoided. Every one of us will have to stand before God and give an account of our lives – of the things that we did *back there in reality*. There are a whole lot of things that God has commanded us to do. The Lord told us to love one another, to share the gospel, to disciple the nations, to pursue holiness, and so forth. He did *not* tell us to spend our entire lives living out our fantasies.

"The whole problem with mankind right now is that instead of actually doing something with

their lives, they sit at home and spend their every waking moment fulfilling their base desires – or as many of them as they can fulfill on their daily plasma budget. What you are proposing is to give them a way to fulfill *all* of their desires *all* of the time. That is exactly the *opposite* of what mankind needs! The lusts of the flesh, the lusts of the eye, the pride of life – those things do not come from the Father, but from the world. If people start living here then they will do nothing but wickedness and sin. People would quickly become more depraved than you can imagine. It would be mankind's death sentence."

"Well, that depends on what you're trying to achieve," Lane replied. "If *everyone* starts living in my virtual world then it will put an end to poverty, crime, and want. There will be no more riots, no more vandalism, and no more strife. The problems of this world would all be solved. Victor, for our entire lives we have wanted a way to fix civilization. *This is that fix.*"

"Civilization is not going to be fixed – it's going to be made much worse! The problem has always been *people*, Lane. It has always been the corruption that is within us. Sin is the problem. What you are doing is pouring gasoline on the fire. You are offering people a way to completely check out of life altogether and spend their entire lives doing nothing but the things they want to do. This has to be the king of all temptations – a consequence-free existence. This isn't going to fix reality."

"I don't want to fix reality. I want to replace it with something better – with *my* reality. A world where *I* am in charge and where things happen the way *I* want them to happen. A world that plays by my rules. A world with no restraints or limits."

"That's not a kind of world that I want," Victor said firmly.

"But it's what *I* want. And I am convinced it's what mankind wants. You don't have to join me, Victor; I'm not going to force anyone to enter paradise. It's your choice. But let me be clear: the rest of mankind does not share your odd scruples. When I perfect this technology and open it to the public it will change everything. Each person will create their own reality and will live in it forever. The future will be radically different."

"It will also be empty. If you succeed then people will spend their whole lives here and then die. You can't have real children in a virtual reality, Lane. There won't be another generation. A hundred years from now everyone will be dead."

Lane shook his head. "If I can perfect my technology then I believe it will radically lengthen people's lives. In fact, I think people could live in my world for hundreds or even thousands of years. There are some problems to overcome, but I think the issues are solvable. Sure, this will be the last generation – but think how long it will last! I suppose we could always clone more people if we had to, but why bother? Eventually the real world will become a forgotten dream. It won't matter anymore."

"The real world will *always* matter. Reality is going to win in the end. Someone is going to have to maintain all this equipment, you know."

Lane smiled. "That used to be a problem, but then you solved it by creating your self-replicating scavenger bots. I don't know if you're aware of this but the Corporation has started redesigning all of their bots to use your new approach. The maintenance bots of the future will be able to replicate themselves forever! If that technology works out – and on Alpha Mensae you proved the concept pretty thoroughly – then those replicator bots can maintain my simulations for an eternity while I remain in my own blissful world. I'm just surprised you don't see how great this is going to be."

Victor shook his head. "You want people to spend their entire life living in a daydream. I think this technology has some great uses, but replacing reality isn't one of them. You can't put off reality forever. There will be consequences."

“Nonsense. This is going to be the most amazing thing mankind has ever seen. I'm going to offer everyone paradise – and they will come in droves. Just wait and see.”