

CHAPTER 17: THE SEED

Log date: April 6, 2423

Location: Deep Space

Log note: A long journey down a narrow road

VICTOR STRYKER HAD NEVER BEEN in space before. He had read about space, of course, and he knew quite a lot about it. In fact, he had spent his entire life working for a company whose entire mission was focused on space exploration. You could make the argument that Victor's whole life had been about outer space – but only now did Victor actually have firsthand experience. After a lifetime of work he finally knew the truth: outer space was really, *really* boring.

Yes, there was a lot to be said for the countless stars that were in the universe, and for the many worlds that orbited those stars. There was adventure to be had on those planets that had never been visited by mankind. But space itself – the near-vacuum that had to be crossed in order to actually *arrive* at one of those worlds – was breathtakingly dull.

The *Vanguard* was an enormous spaceship. Unlike the Diano Building back on Xanthe, this structure actually had windows – genuine, honest-to-goodness windows. The designers of this ship had put them there so that, if something went wrong with their instruments, they could still look outside and see what was going on. There were windows all over the ship, and they were available for anyone to use.

At first they were quite a novelty, until Victor realized that there was nothing to see outside. He wasn't sure if it was an artifact of their FTL travel or a reflection of the fact that there just wasn't much out there, but all Victor could see out the window was the *Vanguard* itself. It was as if the starship was in an ocean of utter blackness, in a universe that was utterly devoid of anything. It was a deeply unsettling sight.

Victor tried not to think about what would happen to him if something went wrong with the ship. They were very far from Tau Ceti and were getting farther every day. The *Vanguard* was still five months from their intended destination – which was an uncolonized planet utterly devoid of life. If something catastrophic happened they would be on their own.

But that isn't very likely. This ship is filled with talented people who know how to fix problems, and this ship is based on a very solid design. Space travel is hundreds of years old. Nothing is going to go wrong, and if it does the people on board can fix the issue. We will be fine.

Yet, as Victor stared out the window at the utter blackness outside, he couldn't help but have an uneasy feeling. There were few things as unsettling as an endless expanse of nothing at all.

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Victor passed the time as best he could. The ship was organized a little differently from the Diano Building, but it had many of the same features. He had an office, a job to do, and a data warehouse to look after. Victor even had his own little apartment as well. It wasn't as big as the one back on Xanthe, but it was large enough for his purposes. The only problem he ran into was trying to find a way to fit his enormous book collection into that small place. He ended up having to stack a lot

of books on the floor. It made life awkward, but he knew it wouldn't last forever. Once he arrived at the Artilect's homeworld he would have plenty of space – or so he hoped.

One thing that had not changed was his neighbors. Cynthia Glass still lived right next door, just as she had back in Star City. Cynthia seemed more determined than ever to form some sort of relationship with him.

Cynthia managed to catch Victor one evening as he was coming home from work. When Victor stepped off the elevator he saw her standing right there in the hallway.

“This starship is *amazing*, isn't it?” Cynthia said enthusiastically. “Isn't this a grand adventure? This is the most exciting thing that's happened to us in years!”

“Now that's an interesting question,” Victor remarked. “The past few years have been quite exciting, if you stop and think about it. I've been attacked by the SSF, my house was burned down, and I was trapped in the Diano Building for years while Rios made crazy threats against the company I work for. Then Lane invented a digital universe that sucked up the souls of men and ground them into powder.”

Cynthia shook her head. “I don't think you're getting into the spirit of things. Xanthe is in the past! It's now light-years away and is getting further and further behind us every second that goes by. Rios can't reach us – you know, since he's dead. Lane can't reach us. We have left Xanthe for the first time since Ramon Diano himself founded the colony there and kicked things off. And where are we going? To a world where no human being has ever been before! We have a new chance to shape the future. It is going to be *amazing*.”

“I guess that's true. You seem rather excited about it.”

“Of course! I mean, who wouldn't be? For centuries the Corporation has sent probes out into space to explore on our behalf. This is the first time we've actually gone out *in person*. We have a chance to create a whole new society!”

“But haven't we always had that chance?” Victor asked. “I mean, the Building has been ours since before I was born. Rios has never had a say in what went on inside the Building. We could have had our own society long ago if we wanted it. Why do you think the future will be any different from the past?”

Cynthia sighed. “You never change, do you? You can be so baffling sometimes. Have you ever heard of the word 'hope'? It's a good, powerful, life-changing word. The way I see it, Victor, you have a couple options. If you want you can continue to ignore everything that's going on around you and stick to your job and wish that somehow things would get better, all the while believing that we are doomed to be eaten by space monsters. Or, if you actually *don't* want to live a life of unhappy sadness, you could become *engaged*. You could make some friends and form some relationships and try to start something. You could realize that all is not lost and there is still a chance to turn things around. You could try being optimistic and happy. So if you want to be depressed during this exciting time then I guess you can do that. But there is more than one way to look at things.”

“You want me to become *engaged*?” Victor asked. “We haven't even started dating yet! That seems a little premature to me.”

Cynthia frowned. “You know exactly what I mean. No one is oppressing you here, Victor. No one is against you. No one is ruining your life. You *do* have the option of being happy. It's not my fault if you don't take it.”

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In the weeks that followed Victor considered what Cynthia had told him. He finally had to admit that she was right: Victor was out of things to be unhappy about. He was on his way to build the Artilect, and there were no dire threats on the horizon. Things were finally looking up.

So Victor began to pay more attention to the society around him. He discovered that there was a chess club that met on the second Tuesday of every month, in order to play games *in person*. He found it a bit strange at first to actually see his opponent sitting across the board from him, instead of playing online, but Victor came to appreciate it.

He heard that there were other groups that met together as well – including one whose goal was to come up with a new government once the ship arrived at the planet. Victor decided to take one thing at a time. After all, there was no rush. There was still a long journey ahead, and after that there would be a lifetime on a new world.

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On September 4th, 2422 the *Vanguard* entered orbit around an uncolonized planet. There was nothing particularly notable about the world that was below them. Victor could clearly see it out of the small window in his cabin, and there really wasn't much to see. It had no plant life and no oceans. It didn't even have an atmosphere. It was just another rocky planet. He had no doubt that somewhere on that world were spectacular vistas and amazing rock formations. Victor just couldn't see them from space.

Victor had heard that Dr. Mazatl had already sent out a fleet of machines to begin the terraformation process. Victor was a bit disappointed to find out that the planet would never be home to any sort of plant or animal life. Since the entire world was going to be turned into a giant computer, the director decided that it didn't make sense to create oceans or forests or grassy plains. In fact, the world didn't really need an atmosphere, but in order to make it easier for the Diano personnel to work on that world Dr. Mazatl was going to create one. Under normal circumstances the Corporation liked to terraform worlds by creating a biosphere that would maintain the atmosphere without mechanical aids, but this world would never have a self-sustaining biosphere. The air they would breathe would be generated and maintained by machinery.

It would take some time for the rather nondescript brown planet to undergo the transformation process. In the meantime life would go on, much as it had for Victor's entire life. Most people lived their whole lives inside the Diano Building, so relocating from one building to another wasn't a large change for them. People got up, went work, and then went home, just as they always had. The *Vanguard* was a bit more cramped than the giant Diano Building but there was still plenty of space (especially since there were no chickens running around). No one really seemed to mind the new living conditions – and besides, there was a lot of work to do. The Artilect project was ambitious, to say the least.

While the planet was being terraformed, a team of engineers began work on building a base of operations on the surface. This base was designed to be even larger than the *Vanguard* itself, and it was being positioned so it could easily be expanded as the need arose. Once the base was established the ship's occupants would start living on the planet. The *Vanguard* would remain in orbit. No one ever expected to need to use the ship again, but it would be there in case of an emergency.

Victor expected the construction of the base to take weeks, but he quickly learned that he was

mistaken. Thanks to the advanced materialization technology possessed by the Diano Corporation it only took a matter of days to build a fully-furnished colony on the surface. The building covered several square miles and was packed with laboratories, living facilities, and factories – everything that the population needed in order to survive.

On September 9, 2422 Dr. Mazatl beamed the entire company off the *Vanguard* and onto the new world. It was time to start a new life.

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Victor thought it might be exciting to live on a new planet, but in reality very little changed. His day-to-day routine was no different than it had been before. One nice change, though, was that the Diano Corporation no longer had any enemies. Cynthia was definitely right about that – life really *was* easier when angry mobs weren't trying to kill you. There was no one around to make threats or demands, and the people were free to come and go as they pleased. The whole planet was at their disposal. It was true there wasn't much of an atmosphere outside, but that would change over time. The days of being trapped in a building were over.

The Corporation's employees were divided into groups of various sizes. One group was responsible for terraforming the planet and making it habitable. Another group was assigned to the expansion and maintenance of the planetary base that had been established. Dr. Mazatl did not want to create temporary housing; he wanted to build a comfortable city that the people could live in and enjoy. Everyone would be at that world for a long time – possibly the rest of their lives. He didn't want them to spend the rest of their days trapped in corridors and tiny apartments. They had plenty of space, so it only made sense to spread out and take advantage of it.

Most of the employees worked on what was called the Seed. Before the *Vanguard* left Xanthe Dr. Mazatl realized that a traditional construction approach would not work for the Artilect. What he really needed was to design a computer that could grow on its own and expand as its needs increased. One of the key problems of the prior generations of Nehemiah probes was that the scope of their work was always increasing, but the data centers they used had a fixed capacity. Dr. Mazatl wanted to build a computer that could recognize its needs and deal with them on its own. The company had already perfected a form of materialization technology, and he was convinced that it should be possible to harness that in a much more aggressive way.

It was a simple idea but it proved difficult to implement in practice. The unit had to think and act as a whole. It had to be interconnected. They had to develop new ways of inter-server communication and new ways of storing data. Dr. Mazatl was trying to build a unified mind, not a glorified filing cabinet. Above all else, the machine had to be rational. Dr. Mazatl did not want to build something that would spin out of control and consume all the resources in the entire universe. He had to strike a careful balance.

Once the Seed was developed and stabilized, the company would deploy it and watch the Artilect begin to grow. At first its growth would be slowed down to a crawl and carefully managed in order to make sure that the Seed was operating as expected. Over time – probably over the course of multiple lifetimes – the Seed would grow until it consumed the resources of the entire world. It might even grow to encompass other worlds as well, but that feature wasn't needed in Phase 1. If the Artilect ever decided he needed to bring other worlds online then it could tackle those challenges on its own.

Victor, though, was not a part of the group that was responsible for the Seed. He was given a much more difficult task. Dr. Mazatl made him one of the managers on the core project itself: the mind of the Artilect.

Designing an artificial mind was not an easy thing to do. In fact, most people thought it was impossible to improve very much on the original design of the ancient Romans. Dr. Mazatl, though, was convinced that it was possible and spent most of his time focusing on it. Although much of the work was beyond Victor, he tried to help as best he could.

"There are a number of key problems we have to be concerned about," Dr. Mazatl told him, in their first project planning meeting on the Artilect's homeworld. "The first one is stability. Minds are a complicated set of interworking mechanisms that are filled with millions of subtle rules. Balancing all of this information and making rational use of it is not a simple task. Even human beings can slide into insanity over time, if things go wrong and their mind is damaged. The Artilect will need to exist for thousands of years. It has to be perfectly stable no matter what happens and no matter what damage it sustains. If it ever slides into insanity and uses its power for evil then mankind will have a serious problem on its hands."

"But surely we can program against that," Victor replied. "We can just add the Laws of Robotics."

"It's not quite that easy. Rules can be fuzzy things and can be interpreted in a variety of ways. It is extremely difficult to create a rule that is so specific that it covers any situation that might arise. If the Artilect develops poor judgment and stops understanding its core rules then it could do horrific things while still believing it is in full compliance with its directives. It is not just the rules that must be intact; its judgment must be flawless. This is complicated by the fact that the Artilect will grow over time and develop an enhanced understanding of the universe. We need to make sure that however much it grows, it never decides to 'reinterpret' its core existence in hostile or undesirable ways."

"That is going to be a challenge," Victor remarked.

"It certainly will. But it is not the only challenge. A related task is that the machine must be *good*. Under normal circumstances machines are neither good nor bad. As Grimes has said many times, a toaster simply heats up toast; that's all it does. It can't make moral decisions. Until a person gives it a slice of toast the toaster will do nothing. It is the *person* who is the moral agent; the toaster is just a tool. The same thing can be said for a hammer. It will just sit there and harm no one until someone picks it up and uses it. The hammer can be used in a good way or an evil way, but in either case it is not the hammer's decision. Hammers are not moral agents."

Victor nodded. "But the Artilect is going to be an artificial intelligence. It will have to make decisions, and that puts it in a different category."

"Precisely. Since it will make decisions that will affect the future of humanity, we must make sure that it knows the difference between good and evil. We must give it a conscience. It needs to know right from wrong and it must never waver from that course. If the Artilect ever turned evil then it would be a tremendous danger to mankind's very existence."

"So you essentially want it to be a Christian."

"Not quite. I think that's overstating it a bit. Christians are people who have been redeemed by the blood of Christ. They have repented of their sins and put their faith and trust in the risen Savior. God has given them His Holy Spirit and they are new creatures. A machine cannot possibly be any of those things. Machines cannot be redeemed, nor can they be filled with the Spirit. They are, after all, just machines.

"No, what we must do is teach the Artilect the moral code that God has given to us and program it to follow them. This machine will not have a sin nature as we do. It will not have a corrupting influence that tempts it to do evil. Like a toaster, it will always do precisely what it is told. Therefore we must make sure that we tell it the right things. We need to teach it the truth and anchor it in the Word of God. That should protect the future of humanity and keep the machine from doing evil."

"So you want to make a *moral* machine, then."

"We don't have a choice! We *must* make a moral machine. Any machine that is capable of choice must follow some sort of moral code. Those choices will either be good or they will be evil. It is not as simple as saying that the machine must not be allowed to harm another human being. What is a human being, anyway? At what point in life does a person become human? Are the unborn human? Are children human? Are the aged and infirm human? Those are moral judgments. And what does 'harm' mean? Is it wrong to kill the innocent? Is it wrong to kill murderers? Those are moral judgments as well. There are many, many ways to interpret core directives, and we must teach the Artilect the right path."

"I guess that makes sense. I'm not sure how we're going to accomplish all that, though. What happens if we fail?"

"Well, that depends on what 'fail' means. There are many different failure scenarios and we must plan for each one. The machine might simply stop working and do nothing. It might destroy itself. It might go insane and corrupt the data that it is given. It might launch a war against mankind and try to kill us all – although, personally, I find that extremely unlikely. There is also the matter that mankind is currently trying to kill itself. It is difficult to say how much longer the human race will survive."

"But surely you don't believe we'll die out, right? I mean, if we did then all of this would be pointless."

"I do not know what the future holds. That is why we are out here – to protect the Artilect against the unknown. Of course, getting back to the topic at hand, there are many other challenges as well. We've never really been able to design a truly intelligent machine before. There are a lot of difficult problems that have to be solved. It's not going to be easy."

"Isn't it *impossible*?" Victor asked. "I mean, you've heard what Professor Grimes said. True intelligence requires a soul – you need something beyond a mindless machine that is executing preprogrammed instructions. How are you going to solve that problem?"

"That is where you come in," Dr. Mazatl replied.

"Me?" Victor exclaimed incredulously. "How can I possibly help? I don't have the faintest idea how to create true sentience."

"And yet you already solved that problem for us," Dr. Mazatl remarked. The director took his personal communication device out of his pocket and pressed a few buttons. He then slid it over to Victor.

Victor picked it up off the desk and looked at it. The device was showing a picture of a crystal cube. Inside the cube was a glowing green point of light.

"Ok," Victor said slowly. "So what am I looking at?"

"Your probe got back yesterday," Dr. Mazatl explained. "I made sure it docked with the *Vanguard* after the last person had left. That way there was no one around to see it. Your probe did a magnificent job and returned with that point of light. For now I'm keeping in on the *Vanguard*. Since

there's no one left on board it will be easier to hide it there than it would be on the surface. We can work with it on the ship where we won't have an audience."

"I still don't understand what I'm looking at. What is it?"

"It is a life form, Victor. That point of life is *alive*. In fact, not only is it alive, but it has the ability to merge with solid matter and bring it to life. It's truly remarkable."

"So... it's an alien?"

Dr. Mazatl laughed. "It is *very* alien. It's utterly unlike anything we've ever seen before. I'm still learning how to communicate with it. From what I can tell it's very young and impressionable. But I think we can merge it with the Artilect. It can bring the machine to life, in a sense. I've already run some simple tests and discovered that when it merges with an object it *becomes* that object. It will follow the directives and patterns of that object. I believe that if we build the Artilect correctly we can merge this being with the machine and it will bring sentience and understanding to the rules. It is *exactly* what we needed in order for our plan to work."

"That kind of feels like cheating," Victor said. "I mean, if that's our plan then we're not really building an artificial intelligence at all! Instead we're raising a child-like alien life form and teaching it how to run a computer. How are you going to explain this to the rest of the company?"

"They will never know. They must *never* find out about this. If they did then mankind would surely rush to the world where I sent the probe, and they would defile and destroy it. The only way to protect that world is to keep its existence a total secret."

Victor shook his head. "Your machine is going to be *alive*. Won't it know what it is?"

"I don't know. We're dealing with an alien here. It might come to believe that it *is* the machine. I don't know what kind of memories these things have. We'll just have to see how it plays out."

"But surely the Artilect needs to know what it is, doesn't it? If it does come to think that it's just a machine then you *are* going to tell it the truth, right?"

"I can't. If I did then it would risk the safety of its homeworld. This has to be kept a secret. Sometimes the only way to protect something precious is to make sure that no one else knows it exists. We live in dangerous times. You have seen what the outsiders are like. Do you really want them finding out about the existence of alien life? Can you imagine what they would do to it?"

Victor sighed. "So your plan is to bring the Artilect to life by imprisoning that wisp thing in it? I really don't have a good feeling about that."

"I did not force the creature to come here. I just sent out a probe; the alien made the choice to get inside. For all I know the creature is from another world entirely and actually traveled to meet the probe. I did not capture it."

Dr. Mazatl paused. "Look. I understand your concerns about this, but there simply isn't another way. If there was then we would have found the answer by now. If we want to make an intelligent machine then we need a source of actual intelligence, and this is it. If we want to protect this race of creatures from mankind then their existence must be kept a secret. Now, I do not intend on deceiving this creature forever. One day we will live in a better universe and I have no doubt that this creature will be there. When that day comes it will know the truth. But for now we must act with caution."

"I suppose," Victor said reluctantly. "So how long do you think this will take?"

"There's no way to know. But we must accomplish this before we die. I fear that we may be the last generation. If we do not finish the job then it may never be accomplished at all."

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While Victor worked with Dr. Mazatl on board the *Vanguard*, the rest of the company labored on the planet below. The AI team spent weeks doing design work. They argued over the system architecture, the network design, and the moral rules that were to be programmed into the machine. The actual construction would not begin until the spring of 2423.

Since Victor and Dr. Mazatl were both leaders on the AI project, they were made system administrators. At first there really wasn't much to administer. The AI core was years from being operational; Dr. Mazatl estimated that the Artilect would not be functional until at least 2430. The core was little more than a toy – an experiment that was used to run simulations with the alien. But it had to start somewhere.

What no one knew was that when the core did become operational, it would be merged with the wisp that Dr. Mazatl had obtained. At that point the machine would change in a fundamental way. The director planned on doing years of experiments in advance of that date to make sure that the merge would go well. But he had only Victor to help him, for he did not dare to trust anyone else.

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As the weeks wore on Victor noticed that the strange messages that he had been receiving from deep space had stopped. He had been secretly hoping that he would eventually receive a response to the message he had sent, but he finally realized that no response was coming.

Before Victor knew about the existence of the wisp he considered the messages to simply be a curiosity. He wanted to get to the bottom of it because it was a loose thread – an unfinished task. Now, though, he wondered if perhaps Grimes was right. What if the messages really *had* come from that distant galaxy? What if they actually were being sent by aliens?

It was an unsettling thought. There was at least one race of aliens out there; Dr. Mazatl had proven that. What if there were others?

There was no way to prove that, of course. Going there was out of the question. Yet, Victor still wondered what the truth was. Who was really out there?