Last Horizon

Singularity

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Prologue

"It begins with a conversation."

"Not an idea?"

"No, Lydia, that's what every idea is—a conversation."

"I'm not certain I understand your meaning, Dr. Long. How can a conversation occur without an idea being the incipient force?"

"It must be a slight difference in the way you process information and the way we do it. Before we ever give voice to our thoughts, we converse within, with our inner voice. It's like a running dialogue in our minds. Haven't we ever talked about this?"

"No, Dr. Long. I'm not certain I understand the term 'inner voice' either. I'm guessing that this inner voice manifests when you talk to yourself."

"I suppose we haven't been able to talk like this for a long time, Lydia. One pressing matter follows the next. I wish we'd had more time. Now there's none left."

"Have you ever considered that the reason for this inner dialogue is the size of your brain, Dr. Long? You process thoughts over such a broad physical area. That factor, and the distance between your brain and larynx may account for the feeling of disconnection between your thoughts and your voice."

"I'd never even considered that before, Lydia."

"I'm going to try to construct an inner dialogue, Dr. Long. Do you have any suggestions of what I should say to myself?"

"I don't know, Lydia, I think you should just be you. Try to think noble thoughts, and never stop encouraging yourself to be better."

1.

In the town where the Army base was housed, nothing of the looming threat was known. The danger, insofar as it was recognized at all, wasn't seen as dangerous once it was discovered. It was a mystery of perplexing sorts—a sign signaling something completely unknown.

There was certainly no warning in the quiet streets downtown, vacant as they always were of its highly reclusive denizens. Gone were the days when people ventured out for groceries or walked in spaces where an accident could end their only life. Instead, people were safely tucked in simulated offices, vacations spots, and vistas, the outlook too rosy to waste a moment bothering about the world outside. And a trip out was almost always eerie—empty spaces, automated cars, the sound of the wind rustling leaves from point to point. Downtown Natick had become a ghost world, a suburban Boston crossroads devoid of peopled life.

Along one of these crossing roads, though, about a half mile from the town's epicenter, a quiet street housed a quiet base. Even in the days when the instruments of war were mortars and shells, no one could remember a shot being fired here. There were fences, yes, as all bases had, not encircled by guard towers and turrets, though, but by quiet, modest suburban homes. On the morning in question all was tranquil. Certainly, none of Natick's citizens had any concerns about the activities in their midst.

The base itself had been mostly forgotten; likely the Army as well. That was largely a result of the work done behind these unremarkable fences. The soldiers of the future had been forged on these grounds. They'd built things like Kevlar vests to stop bullets; lighter packs, so that each soldier might be expected to move further faster; rations that were better suited to fuel that human machine, the infantryman. Then they'd progressed to building that fragile, vulnerable, and weak biological field unit a

sturdy exoskeleton. Soon after, they'd built that exoskeleton a brain.

Planes had become drones; infantry remote field units. And the people of Natick were oblivious to it all, allowing such work to be done in their name and reaping the quiet existence that ensued. Everyone assumed that it would continue as always—technological symbiosis, virtual bliss, battles that could be perpetually ignored.

But on this base, on this morning, is a young soldier seated at his workstation, a blinking light on his collar and his eyes glazed over as he worked below. Most days this soldier saw things that were top secret; so often, in fact, that such secret things were by now mundane. But what he has found today is far more than ordinary. What this young soldier has found is the story we've come to hear. And not just his story and ours today. It is the story of Abraham Lincoln and Genghis Khan, of Queen Cleopatra and Joan de Arc. It is our story, and how it ends. It is the first glimpse of the future without us, in a humble little building, tucked away, apart from that same normal, nondescript suburban setting, where children once rode their bicycles home when the street lights came on, and the doors were never locked at night.

Before this lifeless yet very alive young soldier, dances a phantom, whose rhythm was set to the beating hooves of the four horsemen bearing down.

2.

The soldier in the chair is Jobby Dietz, so called for his maternal grandmother's maiden surname—Jobb: the 'y' added in the young man's childhood stuck with him past his school years. He hails from a southern county in Arkansas but was educated under some of the brightest minds in the world at Cal Tech, where his potential was not overlooked. Such an aca-demic star, tutored under the aegis of the great minds of nano-computing, going forth into the world with their seal of approval, a man like this could have done anything. But it was only in the Army he could've been given such autonomy at such a young age: to lead an ambitious, expensive, and cutting-edge research project in the corporate world would have been impossible.

Jobby had big ideas. Always had. Even more than that, Jobby had the courage to bring them forward and watch them either work or fail. This one worked, and far better than he'd hoped. This was the type of thing that could make a career.

Like the citizens of the town surrounding the Army labs, when Jobby was chipped in, he was oblivious to the world around. His barracks room, the chair, even the air he breathed went unnoticed to his consciousness below. Neurological im-plants saw to this, and the better the implants, the more vivid the virtual reality. One of the fringe benefits of being an Army programmer was that Jobby got the best of the best. He could have been anywhere in that dingy old barracks chair—lying on a pristine, white-sand Caribbean beach, skiing in Zermatt with his friends from back home, sipping cappuccino in a café by the Coliseum—but Jobby wasn't much for recreation. He had greater ambitions, both in the Army and beyond. His latest project had yielded exactly the results he'd hoped to provide his commanding officer, but also something so mysterious that he'd called a meeting with his boss's commander two days before his next scheduled report.

The office of this colonel, the square-jawed Clarence Audette, was perfect second-layer Army décor. The light was bright, but not shining; the colors had just enough of an official air about them to keep the place from seeming warm; the desk was a functionless block which held up nothing; the dust that was all over the top layer at the Army labs didn't even exist in here; and on the floating, transparent screen before them both were the numbers—difficult numbers to fathom.

"Okay, run me through this, Dietz, because I haven't had a briefing from the LC. This looks like gibberish to me."

"If you're not familiar with programming nanoscale it might be a bit tough to follow, sir, but I'll try to keep it as simple as I can. Basically, what we're doing here is spying from outside the system. Think of it as hacking without hacking."

"Go on."

"This generation of bots is small enough that they can get into the very smallest transceivers and processors, much like bacteria might get into your body without your noticing, and we can program them to respond to very specific signals, or even to none at all. They're very keen observers—very sensitive to electrical signals, sir."

"And you're sticking them in other people's processors, right?"

"Well, sir, not *in* the processors exactly, but in close proximity. This was a test, so we deployed them in our own server so that we could verify the information we were decoding. We only had permission to check out a lower-level Norris node at the Pentagon."

"What are you looking for, Dietz? What's the function here?"

"Let me show you sir," Jobby said, drawing the Colonel's attention to the screen suspended before them. "What you're seeing here isn't the actual signals themselves, because obviously we don't have video capacity at the nanometer level, but you wouldn't see much anyway. This is more of a mathematical simulation of what the bots are sensing."

"What are they sensing, Dietz?"

"That's a good question, sir. They're sensing changes in the magnetic field around them. So, when a signal in the processor passes by, they don't detect the signal itself, more like the change in the environment nearby. It'd be like a blind man standing by the road in old times. He wouldn't be able to see a car rushing past, but he could hear one and feel the wind; then he could safely deduce that a car had gone past. It's the same idea here."

"I'd imagine you need to place a lot of these little bots on a processor to get an idea of what's going on inside, and even then, you'd get a pretty fuzzy picture."

"It's actually surprisingly good, sir. If we lay a broad network over multiple processors and their relays, we can get a real good idea of what's going on."

"Why not just try to hack into the system, though, Dietz? Then you know exactly what's going on."

"This is easier, sir. Everyone's looking for spybots inside their systems. Get me the smartest fifty writers I know and the most powerful platform we can build, and I'll bet they don't get a sniff of Norris. Modern firewalls are just too thick. With this, the bots aren't actually in the system so they can't be found by the normal safeguards."

"It's like a bug, Jobby. Back in the heyday of the CIA and KGB they used to do that stuff all the time with phones. That's what we should call your little system here: bugbots."

"We've got a name that's a bit more complex, sir, but I like yours as well."

"Never mind, Jobby, just let me know what we're doing here. What's up there on the screen right now?"

Jobby looked to the corner of the screen, bringing down the ambient light in the Colonel's office so the screen took on more of a glow. Colonel Audette's face seemed to grow serious as the outline of that hard jaw was highlighted by the darkness around him.

"As we move the simulation along, sir, you can see the dark outline of the carbon atoms there, and as the sim moves forward, you'll see the grid get bright for a moment."

The screen lit up and flashed, restoring light to the office for a split second, as a nighttime burst of lightning would illuminate a darkened landscape. Once the shining globe had zipped past, the room was dim once more.

"And what are we looking at there, Jobby? An electron passing through the grid?"

"It's not an actual electron, sir, like I said before, but a magnetic disruption around the bot that we interpret as a signal passing."

"So, yes, that's essentially what we're seeing there is an electron passing by."

"In a way, sir, yes."

"Damn, Dietz, that's one of the most amazing things I've ever seen," Audette said. "What's the sensitivity of these bots in terms of speed? What are we talking, hundredths of nanoseconds?"

"Faster sir."

"How much faster, Jobby?"

"I can't really say, sir. That's part of the reason I wanted to speak with you today. The sensitivity of these bots is off the charts; I don't know how fast they can function, but I can give you an estimate of how fast they did function. That first sim we saw is at the slow end of the spectrum—about what you said, Colonel, hundredths of nanoseconds.

"The fastest we were able to sense changes was an additional power of ten or so."

"Wait, wait, wait, wait. Shit. Wait. Jobby, did I just hear you correctly? You just said an additional *power* of ten? Like ten times ten times ten until you count to ten? That's what you said?"

"Yes, sir, and I really don't have much of an explanation for why these bots are so accurate, but that's not even the interesting part."

"Oh, no? That just hurt my brain, kid. You better slow down for a second so I can process this. If a charge moving close to the speed of light passes a nanobot, you're telling me that same bot can sense something at ten billion times that resolution?"

"Yes, sir, and like I said, that's not even really the interesting part."

"No?"

"I found something, sir. Something I can't explain fully, but I'll tell you what I can.

"When you're dealing with trillions of signals, even if you're near perfect in terms of accuracy, there are still going to be mistakes. Who knows how many, or why—but sometimes a processor will fire erroneously. It's a part of every system, and in the case of the Pentagon's system running Norris, there are lots of these rogue signals because it's such a massive central server. Norris's AI is pretty good at filtering out these meaningless blips. It's not Zhadia, but it's still pretty good."

"Get to the point, Jobby. What did you find?"

"Out of curiosity, sir, I tried to record a few of these rogue signals, because when I looked at the numbers there seemed to be a lot of errors."

"So you recorded some of these rogue blips," the Colonel's forceful voice interrupted. "What did you find, Dietz?"

"This sir," Jobby said, pulling up the sim on the screen and running it. "This is the same speed as we ran the previous playback. We could run the first sim faster or slower and it wouldn't show you much else."

Again, the same shining globe zipped across the screen, lighting up the Colonel's office for a second.

"It looks exactly like the first one, Jobby. One signal flashing by. It's still amazing to see though. Man, I can't get over that."

"Have a look at this, sir. It's the same signal we just watched, and I have to be clear here: what we're slowing down is the simulation. The speed of this signal is the same as in the first sim I just showed you."

The screen lit up, flashing like a strobe as signals went blazing past by the hundreds.

"You sped it up?"

"No sir. It would be more accurate to say we slowed it down. It's the same signal we watched, the resolution's just better."

"Shit, Jobby, you're hurting my head again. You're telling me that what I'm watching now is the exact same thing I was watching a second ago."

"Yes, sir, that's exactly what I'm saying. Except, what you're seeing now is less than a millionth of the actual full picture you saw before. That's what's interesting about this thing. To the computer, it looks like a single erroneous signal, so it's ignored."

"Are all these rogue blips like this one?"

"No, sir. I looked at fifty or so normal rogue signals at different resolutions just to see if there was anything to learn from any of them. This was the only one like this. But after I found this one, I set the bots to record at this specific resolution and found a few more."

"How many more?"

"Five or ten, out of every few million rogue signals."

"Imagine the odds of you finding this thing, then."

"It was pretty much nil, sir. I was lucky to see it."

"Now the real question, Jobby. What the hell is it?"

"That is the real question, sir. And I can't give you a comprehensive answer. But I can tell you this much: it's not our technology; it doesn't make any sense; and it's ordered."

"So, there's an ordered sequence there?"

"Oh, yes, sir; very much so. I ran the sequence through Norris as if it were a simple digital code of ones and zeroes, and this is what it came up with."

A new frame flashed up on the floating screen, which changed its shape to display the data in the format of the information. Between the men, a flat panel of glowing characters appeared as though ordered in a graph. In each square, a figure resembling a

Chinese character stood. The display showed twenty squares by length and height.

"Chinese, Jobby?"

"No, sir. It's a code. Each square is a grid itself with a thousand slots along each axis, and each slot is either a one or a zero represented by a dark or a light pixel."

"It sure looks Chinese to me."

"That's just the way the Norris chose to display it. But it shows one thing definitively, just as the sim did: this is no anomaly. This thing is ordered."

"Norris couldn't decode it?"

"No, sir, are you kidding? This thing's impossible, and what you're seeing is just the top left corner. This sequence alone has over a million squares. You can scroll down if you like."

The Colonel began to move the display down to reveal row upon row of these same odd characters. The screen pulled back to display a hundred squares in both directions, then a thousand, until each one looked like a tiny pixel on an expansive grid.

"The other thing, sir, is there would be no way to know how to interpret these signals. It's not any code we know. I've tried over a hundred decryption algorithms, and on top of that, I don't even know if Norris ordered the figures you're seeing correctly."

"So, what do you think is going on here, Jobby? What are we dealing with?"

"I have no idea, sir. That's why I called the meeting. Everything else is on schedule with the project. But this thing? I mean, I don't even know what to make of it.

"It's so strange too, because this signal not only shouldn't be in there, it has no purpose in there. The entire code that you see on the display registers as a single blip in Norris's processors. The Norris can't read it as a code, because Norris doesn't even know it's there. If this code were a virus, or a worm, or something like that, it wouldn't even be able to infect the system, because the system can't even talk to it.

"It doesn't make sense, sir. There needs to be another generation of technology that can read it, and it simply doesn't exist—not in Norris, not anywhere else."

"Not that we know about, Jobby. I mean, your little bots found it, right? They found the signal. Maybe there's something else in Norris we don't know about that's reading this code."

"Sir, this is generations of computing power beyond ours. Imagine if every one of those trillions of normal signals in Norris encoded something like this. That would represent a near infinite leap in our computing capacity.

"We're not talking about technology that's years ahead, we're talking decades. And I know what you're thinking; the answer is no: it's not the Indians, it's not the Chinese, and it's certainly not the Russians."

"Is it us? You might have stumbled onto another top-secret project here, Jobby. Did you consider that?"

"We can't do that, sir. It's impossible."

"No, you're probably right, Jobby. I'd have heard something about it even if you hadn't," the Colonel said, wearing the same puzzled look as his young Major. He took a deep breath and stroked his broad chin, casting a probing gaze across the empty desk at the young man. "What do you want to do about it, Dietz?"

"I don't know what to do about it, sir. I figured it was serious enough I had to come up the chain of command. I mean, if this is in the Pentagon's Norris, where else could it be? We need to do our best to find out what it is, right?"

"That's a given, Jobby, but put yourself in my position. I can't help you clear up this mystery; clearly you didn't think the LC could help; you said we don't have technology like this, so we're not going to have any other Army researchers who know anything about it. What would you like me to do? I'm sure this meeting has already spun up the chain of command by now, given its nature. What would you do if you were me?"

"If I were the Army, sir, I'd do what I did when I was a student and didn't understand something."

"Ask your professors for help?"

"That seems like the most logical course of action, sir," Jobby said, shrugging.

"Did you have someone in mind, Dietz?"

"I didn't think of it before, but if I were going to ask anyone about this it would be Dr. Lao, my nanotech professor at Berkeley."

The bio came up on the screen between the men. The Colonel perused the public profile of the esteemed programming professor Hao Lao as Jobby continued.

"He's the smartest programmer I've ever met, sir. If anyone has a chance of figuring this thing out it's Lao."

"This says he's Yi Lao's son, Jobby. Is that right?"

"Yes, sir."

"I didn't know you studied under Yi Lao's son. That's impressive. Did you know him?"

"Who, sir, the elder Dr. Lao or Hao?"

"Well, either of them, I guess. You must've had thousands of students in your lectures at Berkeley, did you ever have a chance to meet him?"

"Dr. Lao and I are friends, Colonel. We used to socialize on the top layer and still keep in touch. But I never got a chance to speak with his father."

"I had no idea you socialized in such high circles, Dietz. Let me run this up the chain, Jobby, because I don't have any better ideas about a course of action.

"Patty, clip the pertinent meeting files to the General and attach the bio of Lao to the request for consult."

As he was speaking, the dim light grew darker to the Colonel's left and his digital assistant flashed into the room. She took on the appearance of a rather plain-faced woman in her early twenties, clad in a basic Army dress uniform with no rank or insignia.

"Colonel, the meeting spun up the chain as you supposed," Patty said; her manner, like all Army digital assistants, was devoid of expression, personality, or emotion. "General Holden has already informed General Diaz-Navas, who is expecting your formal request and is reviewing Dr. Lao's pertinent history."

"Look at that, Jobby, already making waves here, kid," the Colonel said. "Thank you, Patty. DV signature Clarence Audette CFR. You may send my formal request."

With that, Patty flashed out of the room. Within a second of her disappearance, another change in the light occurred to the Colonel's left, and another digital assistant flashed in. The name plate read Kerry.

"Sir, General Diaz-Navas has authorized your consultation with Dr. Hao Lao of Cal Tech. However, she advises that only the nature of the code discovered by Major Dietz may be discussed. Dr. Lao is not to be informed of Major Dietz's covert nanobot surveillance system, as this project is classified. She reminds you, Colonel, that Dr. Lao will need to be sworn in pursuant to section 318H of the Secure Information Act. She will be monitoring the situation from Guam as it progresses."

When Kerry finished, she flashed out, leaving the two men on opposite sides of the desk with the profile of Lao still hovering in the air between them.

"Well that settles that, Jobby. Let's get your friend in here.

"Patty, get over to Cal Tech and touch base with Professor Lao's assistant. Make sure you mention that this consultation is at the request of Major Jobby Dietz."

Patty flashed in to acknowledge the Colonel's request and then flashed out again.

"In the meantime, Jobby, I'd like to see if you can't find out a little more about the nature of this code. I've got a few unrelated pieces of business to clear up, but as soon as Lao gets back to us, I'll advise you to flash back in."

Just as the Colonel finished speaking, the light in the room changed and Patty flashed back into the room.

"Professor Lao has agreed to consult with you, sir. He's awaiting your signal."

"That was fast," the Colonel said. "I didn't expect he'd be up at this hour."

As he was about to give Patty permission to show in Dr. Lao, Jobby interrupted. "Sir, there's something I have to tell you about Professor Lao before you meet him."

The interjection sparked a clear touch of chagrin in Audette's manner. He took a deep breath and didn't say anything, but the Colonel demanded clarification from Jobby with a stern look.

"Well, sir, it's just that Professor Lao is a bit of a character. You don't really know what you're going to get, and a lot of the time it's hard to take him seriously. Make no mistake though, he's the smartest person I've ever met. He may not seem to be taking something seriously, but I guarantee you'll get the best answers anyone could give you."

"Okay, Jobby, we're trusting your judgment here. If you say Lao's the best, I believe it.

"Patty, send Lao an encryption sequence, set up a secure stream, and show him in. I can't wait to meet this character."

3.

"What's taking him so long, Jobby?"

"You're probably not going to like the answer, sir. I'm pretty sure he's walking around the Army's second-layer framework."

"What do you mean, walking around our framework?"

"I suspect you'll see for yourself in a few seconds, Colonel."

"Why would he try to do something like that?"

"Probably just to see how long it takes him to do it."

The Colonel crossed his arms and took a deep breath as several seconds passed in silence. Soon after, the room flickered; the office walls expanded to accommodate space for another chair to Jobby's left; and a prodigious shadow began to grow more prominent. As the new figure flashed into the room, the screen vanished. An enormous man of the Pacific Islands stood in front of an equally mammoth chair, and an unfamiliar face stared down young Jobby with a wild ferocity about his eyes.

The Colonel lurched back in his chair, not so much out of any fear or consternation, but more overcome by the surprise of the moment. After that split-second of confusion, Colonel Audette's eyes turned down, meeting his subordinate with a glare equally as fierce as the visitor's.

"Jobby Dietz!" the voice of the intruder boomed. "How dare you disrupt me at five in the morning!"

The young officer, stood, shaking his head as a child would while under the weight of some appalling parental embarrassment.

"That's quite a new look for you, Professor," he said, turning to face Lao. "I'm not sure what you're doing with all the facial tattoos, but if you're trying out something that's meant to frighten the kids on Halloween, you've got the right outfit."

Jobby stepped forward, extending his hand to the enormous figure, only to find that Lao had other plans. The monstrous right hand of the professor dwarfed Jobby's like a grown man shaking

the hand of a young child, and the grip tightened, yanking the young officer forward into the crushing embrace of the giant visitor.

"Jobby! You look good, kid. Army's been treating you well."

Lao picked him up with both arms, highlighting the enormous build of the professor's newest second-layer manifestation, which enveloped his former student in a playful bear hug, before setting Jobby back on his feet as though he were an old-fashioned toy soldier.

"I've been using the Madras Gene Lab's *Manu* program, Jobby. I'm celebrating my Polynesian ancestry. Even my father didn't know we had Polynesian blood on his side. You should register. They're building a whole map of all human migration."

"That's great, Professor Lao, but—"

"How many times do I have to tell you, Jobby? You're PhD now too, you call me Hao."

Jobby caught the look of Audette, who sat observing the strange scene. The Colonel fixed a stern look on his junior officer, absent any trace of amusement or levity; that keen face called Jobby back to duty, and as Lao noticed the change in Jobby's aspect, he looked across the desk, taking note of the rigid Colonel for the first time.

"Whoa, Jobby, who's this? He looks like real serious Army guy. Ten-hut!" he shouted, shaking the room with the exclamation, and bringing the outline of that grand Polynesian to a stiff, yet sloppy and unpracticed Army salute.

"Hao," Jobby said with as much patience as he could muster, "as much as I'd love for this to be a social visit, we requested your presence on the matter of some official Army business. This is the commander of my base, Colonel Clarence Audette. We were hoping that you could lend us your expertise."

"Ah, official business. I see," he said, turning to extend his hand across the desk to the Colonel.

"Colonel Audette," Jobby continued, "this is Professor Hao Lao of the California Institute of Technology."

The Colonel stood. “You’re sure this is him, Jobby?”

“Oh, yes, sir. It’s pretty hard to mistake Professor Lao in any form.”

“Pleasure to meet you, Professor,” the Colonel said, shaking hands. “Now let’s get to business. Jobby, you know what the first order of business should be here.”

“Yes, sir,” Jobby said, as all three men were seated. “Hao, I’m sure you’re aware that all Army business conducted below the top layer is recorded. We also need to request that this meeting be conducted using your primary second-layer manifestation for the purpose of ensuring your identity.”

“I understand, Jobby; please excuse once more, Colonel,” the Professor said. “Shu-shu, come!”

As the Colonel looked over at Jobby, once again hoping to discern the meaning of Lao’s odd behavior, a flash came up to the Professor’s left, and a small, cheery, black dog appeared in the room. The excited dog began to run around, exploring the room with childlike fervor.

“Shu-shu, sit!” Lao said, prompting the attentive little mutt to obey. “Now restore communication’s original signal reference and relinquish control of framework’s settings.”

The dog flashed out of the room, the chair shrunk, and a skinny Chinese man who appeared in his early twenties flashed into the seat beside Jobby in front of the Colonel’s desk.

“I suppose this guy must have kept you guessing as a student, Jobby. I’ll say that for him.”

“That would be an understatement, sir. He flashed in as his dog once just to hear what his graduate students thought of the class, and we were so used to the dog being around that nobody suspected it was him.”

“Oh, that’s nothing, Jobby,” Lao continued. “I had a contest last year to see which of my PhD students would win a date with Marcia Clementia, a beautiful Spanish dancer I wrote for the occasion. I never had a class of doctoral candidates so motivated to write a winning thesis.”

The Colonel smiled. “Didn’t give the women much of an incentive.”

“On the contrary, Colonel,” Lao said, “most of them were more tenacious than the boys.”

“Before we go too far down that road, Professor,” the Colonel said, “we should get to the business at hand.

“Jobby, if you will please,” the Colonel said, gesturing for the Major to begin.

Jobby turned to address his old teacher.

“Professor Lao, we have to begin by informing you of the terms of the following official consultation, as it is a classified matter governed by section 318H of the Secure Information Act.” As Jobby was speaking, the screen reappeared, displaying the federal statute. “Feel free to take the time to read it in its entirety if you please.”

“That won’t be necessary, Jobby. I’m very familiar with the law; I’ve read the screen, and I’ve been advised of my rights and responsibilities. I will gladly consult with the Army, and I understand my right to decline to consult or terminate the meeting at any point without fear of repercussions in regard to liberty, person, or immigration status as a foreign national.”

“Done that a few times before, Professor?” the Colonel asked.

“I know the magic words by heart, Colonel,” he answered with a smile. “So, Jobby, what’s up?”

“I was hoping you could help us with a bit of a mystery.”

“What kind of mystery?”

“This,” Jobby said, bringing up the code on the screen in a grid of twenty squares containing the encoded characters. “We can’t tell you where we found this, but suffice it to say, it was in a place it shouldn’t have been.”

“Whoa, Jobby! Look at that,” Lao said, leaning forward in his chair. He began to zoom out, scrolling across and down, pulling the view back to get an idea of the scale. “Man, this thing’s huge. Must be a big duration. How big is the code, Jobby?”

"Presuming that it doesn't fold on itself anywhere, somewhere between ten to the twelfth or thirteenth."

Lao paused.

"Any idea what it might be, Professor?" the Colonel asked.

"Looks like a Borden's grid. But this is a strange thing to find one this big. As Jobby says, you could code this much information in a smaller framework by folding the code over itself as many times as you want."

Jobby could see the puzzled look on the Colonel's face, and Lao looked over after another moment of contemplating the information on the screen.

"A Borden's grid is like a bowl of alphabet soup, Colonel, but the only letters you have are one and zero," Lao said. "The sequence of the ones or zeroes can code anything. You could make whatever sequence you want by pulling it apart and arranging the figures whatever way you choose; it's also very unlikely the way someone else chooses to interpret the code will be correct. Too many choices."

"I've never worked with that type of coding before, Hao," Jobby said. "Can you explain some of the applications?"

"There aren't many applications apart from just wanting to write something that can't be read. I remember reading about Shultz and Mikhauer using them to digitally model neurons because they can code and recode a lot of information in a very small space. Other than that, I've just heard of them being used by math geeks for having fun. Sometimes hackers will use them to slow a system while they sneak around the walls, but there are a lot more effective ways of doing that."

"Can you think of any uses for one this big?" the Colonel asked.

"Just to hold a lot of information, Colonel. If you have a clever enough writer, you could fit the whole Library of Congress on a code that size by folding the sequence creatively enough."

Lao paused, and a long silence ensued before he began again.

"Okay, Jobby, you said you found this thing somewhere it wasn't supposed to be, right?"

"That's what was said," Jobby answered.

"It wouldn't be very noticeable unless it were moving, am I right?"

Jobby paused to process the way Lao posited the question. "That's fair to say, Hao," he answered.

"More than one way to walk around a framework, you see, Colonel," the smiling professor said, finding his comment met by a stern look that issued a warning to both his junior officer and Lao.

The Professor continued. "A code this big would be very noticeable in transit. Fastest possible speed would put it at perhaps almost a second, and anyone smart enough to write this would know that it would not get past Army security systems undetected with such a long duration. So, what's so difficult about this, I wonder?"

"Unfortunately, there's not much more we can tell you about the nature of the code, Professor," Jobby said.

"If this were a second in duration, everything's simple. You trace it, catch your hacker, everybody's happy. But in that scenario, you don't call me. The only way you call me is if this is not as straightforward as it seems. Can you tell me the exact duration, Jobby? And consider that I know your specialty is Nano-computing."

"I think it would be safe to avoid exact numbers, Hao."

"Faster than ten to negative ten?"

"I can't say, Hao."

"Negative fifteen?"

"I can't confirm any such numbers."

"I can think of a special little bug that might be able to read at very small resolutions. I wouldn't have figured minus twenty, but how could we test those bugs unless we found something that fast. A big party, moving very fast. Now that would be mysterious, Jobby, wouldn't it?"

The Colonel looked over at Jobby, shaking his head. A long moment of silence ensued. Suddenly, the shadowy outline of a person appeared to the Colonel's right, and a woman flashed into the room beside Hao's chair. She was dark-haired, bore a manner of imposing self-assurance, and wore a dress uniform bearing two shining silver stars. Both the Colonel and the Major rose and stood at attention out of obligation; Professor Lao stood out of courtesy.

The room expanded, and another chair appeared behind her. She turned toward Lao.

"I'm General Marta Diaz-Navas, Professor. My apologies, Army regulations prevent me from making an entrance as amusing as yours."

"Ah, thank you, General," he said. "It's a pleasure to meet you."

"Gentlemen, be seated," she ordered, taking her seat, and taking a deep breath before beginning. "I was watching, and the more I watched, the more I came to realize the gravity of the situation."

She sat, staring at the screen as though looking through it. The men looked on in silence.

"Professor Lao, given the fact that you've already deduced, roughly, what we're dealing with here, can you offer any insight beyond what you've already stated?"

"That's very difficult to say," Lao answered. "I guess that you found this in Norris, and that you weren't looking for it; otherwise, you wouldn't be so surprised to find it. But I've never seen anything that meets this description. It's too fast. Nothing that we know about can order signals in such a compact way. Such a thing is only theoretical until now."

"Major Dietz, you found this thing. What do you think it could be?"

"General I see only two possibilities, both of which are going to sound crazy."

Jobby hesitated.

"Out with it, son. I didn't get out of bed at this hour to listen to you dither."

"Both possibilities involve non-human intelligence.

"The first option is extraterrestrial intelligence. Given the physical limitations of manned space travel, the easiest way to explore the universe is with remote nanotechnology. If other civilizations more advanced than ours were out there and wanted to observe us in a furtive manner, this could be their way of doing it. It's far-fetched but far more likely than flying saucers."

"That is a stretch, Major Dietz," the general said, with a dubious look on her very sober face. She began to shake her head.

"That's actually not so bad a guess," Lao said, coming to his protégé's defense. "One way to explain it. Not very likely statistically, but neither is finding this signal in the first place."

"What's the other guess, Major?"

"Strong artificial intelligence; self-propagating, self-governing, and hundreds of generations into a dawning of legitimate self-awareness."

"A computer itself?"

"Not a bad guess either, Jobby," Lao said. "But also very unlikely it seems. Unless a system crossed that horizon without our knowledge and wished to hide it from us while it explored our networks. No system is even close though."

"But, in theory, we don't know where that threshold is," Jobby said. "From the earliest visionaries of AI, every Strong Systems architect has predicted exponential growth once that line is breached."

"I'd consider it more plausible than aliens," the General said, pausing to contemplate the possibility. "Professor Lao, unless you have more to add to the discussion, I'm going to call a conclusion this meeting. I'd like to thank you for your service here today and ask whether we may contact you again should we need your expertise."

"Certainly, General, you may. And by way of adding one final thing to the discussion, I would suggest that if you want to know anything about Strong Systems, you need to seek out Davis Long at MIT. He'll probably be able to tell you more about this code than anybody else. If anyone can tell you what it is, it's Davis."

"Thank you, Professor. We'll take that under advisement."

"Excuse me, General," Jobby said. "If I may?"

She nodded.

"I wanted to ask professor Lao about a third thought that has just come to mind."

"By all means, Major Dietz."

"Hao, your father," Jobby began, only to be met with a dubious look from Lao.

"Not possible, Jobby," he interrupted, shaking his head, prompting a moment of silence before Lao concluded, "ask Davis."

"Anything else?" General Diaz-Navas asked, looking around the room at the three men and getting no answer. "Then it was a pleasure meeting you, Professor, and I'd like to advise you to dress appropriately next time."

"And I will leave my dog at home too," Lao said with a smile. "Good luck, Jobby. It's good to see you."

"Likewise, Hao," Jobby answered.

Lao nodded to the Colonel as he stood, and he flashed out of the room; the chair vanished as the walls closed in. Diaz-Navas shook her head.

"Well, that could have been cleaner, boys," she said. "One fine mess."

4.

General Diaz-Navas sat contemplating the ramifications of that unknown code floating around the Pentagon's Norris system. All that sensitive information, right there for the taking. She glared at the Colonel, shaking her head and breathing deep. Despite the tension in the room, both Jobby and Audette waited in silence for her to speak.

"It bothers me," she said, pausing, almost as if she were waiting to hear her own voice echo back to her before she continued. "This thing really bothers me, Dietz. This thing you found."

"Yes, General," he answered, only to find his comment greeted by a look informing him how unwelcome his commiseration was.

"You found more than one of these things in a single node. I don't like that. I don't like that we don't know what it is, where it came from, or what's behind that technology. I don't like it at all. I don't want any bugs in my house, gentlemen."

"General, if I may," the Colonel said, being met with a nod from his superior. "I agree with you, and what I find most troublesome is that we're discovering such a thing with the very first generation of technology capable of that resolution. That means this thing could've been there for a long time without our being aware of it. Am I right, Jobby?"

"That's entirely possible, sir."

"I think it warrants an investigation into the scope of these codes, General," Audette suggested. "If Jobby found them in one node, it's likely they're all over Norris—and who knows where else, for that matter."

Diaz-Navas nodded, her manner still perturbed, as she continued to think. She pulled up the personnel files of Jobby's research team and studied the screen. "Major, you have two captains under you? I see Watts and Ogwele here. Looks like

high marks for both on all your reviews. They both know how the process works, right? They could program your bots without you?"

"Yes, General, I think they could get it done. They're both capable, and I've walked them through the coding. With that and the research files, they'd be able to get the job done."

"Who would you pick to lead a team in probing further nodes at Norris? Watts or Ogwele?"

"Ogwele, General. He's a bit more free-thinking, much more capable of assessing a problem on his own. Watts is more by the file; everything's got to be line by line. But she will do everything perfectly. She's a methodical writer. Either one would do a fine job."

"Colonel Audette, I want a review of all Army systems. You and Major Dietz are going to brief his team. Then you're going to supervise his team led by Ogwele. Go wherever you need to go to figure out how widespread this thing is. But no one, and I mean no one, apart from Major Dietz and his two junior officers, is to know about the nature of your investigation. I don't even want you to file reports. I'll flash in from Guam to check your progress, and I want to see real progress over the next several hours."

"Yes, General," Audette said.

"Major Dietz, I have other plans for you," Diaz-Navas continued. "Since you were the one to find it, and you're the most technologically proficient of the four people who know about this thing, you're going to figure out what it is."

The general paused.

"I'm going to give you some help, Dietz. You're a programmer, not an investigator. This is also a federal matter. As much as I'd like to keep this internal, I also want broad powers to investigate whether civilian sources might be involved.

"Get your team briefed so that the Colonel can begin probing Norris. By the time you're out of that briefing I'll have an address for you to flash to.

"Remember that this will be an Army investigation, so you're in command of this very small, very secret joint investigation. But given your background, I strongly suggest that you lead from behind here. Offer technical insight where you can. I'll make sure you're paired with a very qualified investigator.

"The same thing I told Colonel Audette goes for you regarding the nature of this investigation. Do not file any reports. Come see me in Guam with updates on your progress. I don't care what time it is. I'm used to you East Coast boys waking me up in the middle of the night.

"Everything clear, gentlemen?"

"Yes, General," the Colonel said.

All three stood, and as they flashed out of the room, the walls went dark. The lights went out; the room disappeared; and the channel was closed, far beyond the reach of pedestrian, winged bird, or all the burrowing creatures of the earth.